

## Introduction

The Configuration and Actions Matrix provides the impacts of specific actions identified within the California ISO Energy Storage Roadmap to specific configurations and applications of energy storage. It is not intended to prioritize actions that come out of the roadmap effort, but more than anything, to act as a cross reference between configurations and actions.

This document provides background on the action-impact rankings for stakeholder feedback.

The ISO is releasing this matrix to allow stakeholders to provide feedback before it is finalized in the roadmap. Feedback on the configurations, applications, and impact rankings will be very helpful to ensure this matrix is a useful part of the ultimate roadmap.

Please send your comments to [EnergyStorage@caiso.com](mailto:EnergyStorage@caiso.com), no later than November 12<sup>th</sup>, 2014.

## Acronyms and Abbreviations used in the Matrix

Term	Definition
AS	Ancillary services
BTM	Behind-the-meter
DG	Distributed generation
DR	Demand response
E	Energy
KYZ	KYZ pulse, a standard interface used to obtain energy measurements from a utility meter
NEM	Net energy meter
NGR	Non-generator resource
NS	Non-spinning
PDR	Proxy demand resource
PLS	Permanent Load Shifting
RA	Resource adequacy
REG	Regulation up/down
SR	Spinning reserves
UDC	Utility distribution company
VEE	Validation, editing, and estimating (i.e., raw data to billing data)
WDAT	Wholesale Distribution Access Tariff

## Impact Ranking

Impacts are ranked as 1, 2, or 3, to determine expected level of impact on a configuration / application by completing the action. A hyphen implies that the action is not applicable.

Note that some specific rankings were not applied to any configuration / applications. For example, “Clarify roles of storage in an evolving RA framework” had impact rankings of 1 and 3, but none of 2.

The following sections provide detail on the scoring decisions that were made.

### Clarify operational needs at transmission level

1	Lower: Operational needs fairly well known / identified, further clarification helpful.
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## Energy Storage Roadmap, Configurations and Actions Matrix (Draft)

2	Medium: Impact for determining where resources are most valued.
3	Higher: How special benefits of resource configuration could be realized in wholesale markets.

### Clarify operational needs at distribution level

1	Lower: Operational needs fairly well known / identified, further clarification helpful.
2	Medium: Impact for determining where resources are most valued.
3	Higher: How special benefits of resource configuration could be realized on distribution grid.

### Facilitate clarification by IOUs of operational constraints

1	Lower: non-exporting.
2	Medium: transparency of operational needs for procurement of distribution-connected.
3	Higher: exporting customer-side.

### Clarify existing energy and AS market products in ISO markets

1	Lower: products well known / identified, further clarification helpful.
2	Medium: products fairly well known; however, some not open to storage.
3	Higher: lack of products or disconnect between available products and their utility.

### Clarify roles of storage in an evolving RA framework

1	Lower: RA may be important as revenue source.
2	Medium: RA likely important as revenue source.
3	Higher: RA important as revenue source.

### Identify gaps/consider changes to existing wholesale market products

1	Lower: Products exist.
2	Medium: Products exist / rule changes could benefit storage.
3	Higher: Products do not exist or products do exist, but the configuration is not supported.

### Clarify role of storage in deferring / eliminating transmission / distribution upgrades

1	Lower: transmission generation or non-exporting.
2	Medium: customer-side.
3	Higher: distribution-connected.

### Consider revising ISO's procedure for AS certification

1	Lower: may have an impact.
2	Medium: impact from aggregations of resources or limited use factors not considered by ISO.
3	Higher: greater impact from customer-driven variable resource sizes, as a result of aggregations or limited use factors not modeled by the ISO.

Streamline rules for aggregations of distributed storage to participate in CAISO markets

1	Lower: Aggregation rules fairly well established.
2	Medium: Aggregation rules not well established.
3	Higher: Aggregation rules not well established and critical due to expected smaller sizing of such resources.

Evaluate need/potential for development of distribution-level grid services

1	Lower: Non-exporting may limit impact.
2	Medium: Important to extract full value.
3	Higher: Critical to extract full value.

Clarify rate treatment for charging mode

1	Lower: Impact, particularly for station power/aux power/etc. on the transmission side.
2	Medium: Important.
3	Higher: Of critical importance.

Clarify existing tariffs for BTM storage devices paired with NEM generators

1	Lower
2	Medium: May be of medium importance if storage may exceed load
3	Higher: Extremely important

Consider new proceeding for stand-alone BTM storage devices to address rates for charging and exporting power

1	Lower
2	Medium
3	Higher: Important for clarifying and simplifying energy storage deployment.

Define and develop models and rules for multiple-use scenarios

1	Lower
2	Medium: Products may exist.
3	Higher: Products do not exist or rules exclude participation.

Identify and develop clear models of use cases for hybrid energy storage sites

1	Lower
2	Medium: hybrid configuration (when combined with facility gen)
3	Higher: Not modeled by ISO as hybrid configuration

Clarify requirements and rules for participation

1	Lower
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2	Medium: when a product does exist, rules may not be clear
3	Higher

Prepare report / summary of efforts underway to develop publicly available models for assessment of energy storage

1	Lower: Of some value, but evaluation and refinement of methodologies is where the real value will surface.
2	Medium
3	Higher

Consider refinements to evaluation methodologies used by IOUs to support CPUC decision on storage procurement

1	Lower
2	Medium: Important to ensure distribution-connect resources are credited for full value (customer-sited)
3	Higher: More important (distribution sited, and presumably generally higher cost than customer-sited)

Establish value of / regulatory policy framework for shared ISO/UDC metering or meter data

1	Lower: Sharing already exists (e.g., PDR)
2	Medium: Sharing could reduce costs
3	Higher: Sharing does not exist or no metering solution exists today

Establish rules for resource owners to submit SQMD

1	Lower: Transmission connected, likely not a concern to be ISO metered entities; or, owners already able to submit SQMD (PDR).
2	Medium: Likely would be helpful (depending on size of resource).
3	Higher: Large impact when aggregating smaller assets.

Establish rules for UDC subtractive metering for BTM wholesale resources

1	Lower
2	Medium: Could simplify settlement for dedicated wholesale participation.
3	Higher: Could enable simple carve out of wholesale participation, enabling access to dual-use.

Establish rules for certifying sub-metering and 3rd party meter data collection / VEE

1	Lower: sub-metering may not be necessary, ISO metered entities mostly sufficient.
2	Medium: Sub-metering rules do not exist, may be useful in some cases.
3	Higher: Rules do not exist and often useful to explicitly define participation.

Complete Expanding Metering and Telemetry Options Phase I and II

1	Lower: Transmission connected, likely not a concern to be ISO metered entities; or, owners already able to submit SQMD (PDR).
2	Medium: Likely would be helpful (depending on size of resource).
3	Higher: Large impact when aggregating smaller assets.

Evaluate CAISO telemetry requirements for smaller resources

1	Lower
2	Medium
3	Higher

Evaluate KYZ, increasing 1-minute requirement, 10 MW limit

1	Lower: such enhancements may have limited cost reduction value
2	Medium: such enhancements could impact costs
3	Higher: such enhancements could significantly reduce costs

Evaluate value of common telemetry framework for California

1	Lower: Has value when required by UDC
2	Medium: Has value
3	Higher

Complete Expanding Metering and Telemetry Options Phase I and II

1	Lower: Perhaps some lower value.
2	Medium: Data concentration has value in some cases.
3	Higher: High value considering expected aggregations and/or size of resources.

Review existing fire protection codes / identify best practices

Assumption in this case that fire protection becomes more critical moving from Transmission to Distribution, to BTM.

1	Lower
2	Medium
3	Higher

Determine applicability and scope of UL and other certifications

Assumption in this case that UL becomes more critical moving from Transmission to Distribution, to BTM.

1	Lower
2	Medium
3	Higher

Address certification process for integrated device metering

1	Lower: Cost of metering compared to asset relatively lower.
2	Medium: Cost of metering compared to asset relatively higher.
3	Higher

Address fees for interconnection of non-exporting resources

1	Lower
2	Medium: Equal issue for all BTM non-exporting storage assets.
3	Higher

Clarify existing interconnection processes

1	Lower: Interconnection process may need clarification.
2	Medium: Interconnection process could benefit from clarification.
3	Higher: Interconnection process could greatly benefit from clarification.

Coordinate between Rule 21 and WDAT to streamline queue management processes

1	Lower
2	Medium: Equal issue for assets that could be either rule 21/WDAT
3	Higher

Evaluate potential for a streamlined "faster track" interconnection process

Expectation is that the smaller the asset size, the more important and relevant a fast track process is.

1	Lower
2	Medium
3	Higher