



Storage Issues and CCE 3



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Background: Present Tariff definition of “use limited” clearly includes storage resources

“A resource that, due to design considerations, environmental restrictions on operations, **cyclical requirements, such as the need to recharge or refill**, or other non-economic reasons, is unable to operate continuously.

This definition is not limited to Resource Adequacy Resources. A Use-Limited Resource that is a Resource Adequacy Resource must also meet the definition of a Resource Adequacy Resource.”





Effects of Use-Limited Status

- Affects resource treatment under new availability rules (RAAIM), as developed in RSI 1—*still not implemented*
- Affects automatic bid insertion
- Affects Residual Unit Commitment (RUC)





Reliability Services Initiative (RSI) 1

“Use-limited resources can have daily, monthly, or annual limitations. Daily limitations (e.g. minimum run times, output levels, etc.) [Those limitations] that can be accounted for in the optimization should not necessitate special treatment under the availability incentive mechanism. On the other hand, **the ISO’s market optimization cannot account for certain other limitations that are constrained over a longer than 24 hour time period.** These limitations often create a situation where **a scheduling coordinator must take action counter to the must-offer obligation** in order to **ensure an optimal dispatch.**”

--Final Proposal to CAISO Board, RSI 1, 2/22/15





RSI 1 Continued

“To address this deficiency, the ISO proposes to enhance the energy market optimization and rules where possible and exempt the use-limited capacity from the availability incentive mechanism where energy market changes are not sufficient.”

Has this occurred? Is it sufficient?





Storage Law & Policy in CA

AB 2514 mandated the CPUC to begin a storage program: the Commission issued D.13-10-040 on October 21, 2013, which adopted the Energy Storage Procurement Framework and Design Program

- Requires the three IOUs to procure 1,325 MW of storage capacity by 2020.
- IOU targets:
 - PG&E 580 MW
 - SCE 580 MW
 - SDG&E 165 MW
- Above targets divided into three “storage grid domains”
 - Transmission-connected,
 - Distribution-level, and
 - Customer-Side (Behind the Meter) applications;
- SCE annual targets 90 MW in 2014; 120 MW in 2016; 160 MW in 2018; and 210 MW in 2020
- PG&E Target 90MW in 2014





Storage OIRs/ Procurement to Date

- LCR decision (SONGS replacement) authorized SCE procurement of preferred resources, including 261 MW of Storage or combined Storage/ DR
- D.14-10-045: approved SCE's Energy Storage Procurement Plan. Specifically, authorized SCE to procure 16.3 MW or more of storage resources.
- In December 2015, SCE sought Commission approval of two offers that resulted in the three contracts selected in the energy storage RFO for a total of 16.3 MW.
 - Delivery dates between 2020 and 2034.
 - Final decision on this application is imminent.
- Decision on PG&E RFO results also expected soon





CPUC-CAISO Collaboration on Storage

- Collaboration on ESDER Phase 1 and ESDER Phase 2.
Coordinating between Storage OIR goals and CAISO initiatives
- Developed joint-agency goal to allow storage participation in multiple markets and jurisdictions (multiple use cases).
Development of multi-use policy is underway.





Overview of potential Commitment Cost Issues for Storage Resources

Consider whether each of the 3 types of storage contracts are affected by CCE 3 tariff amendments:

1. DRAM contracts where storage is tied with DR and that are only in place until 2018 (*covered by Rachel McMahon*)
2. Long-term contracts arising from SCE's LCR-RFO, wherein storage is considered "demand response" resource and is either currently bidding or expected to bid into CAISO market as PDR
3. Long term storage contracts procured by IOUs through Storage RFO





Different concerns for Storage contract types

- DRAM concerns (presented by Rachel)
- LCR-RFO contracts: COD 10/2016- 01/2018
 - Resources that are expected to bid in in as PDR are definitely affected by rule change
 - Resources don't seem to be able to bid in as NGR (per SCE)
- SCE Storage RFO contracts: expected COD 2020
 - Contracts do not indicate participating as PDR and cannot unless they are behind-the-meter (BTM) Storage resources (which most do not seem to be)
 - How will these resources be able to reflect start-up costs and reduce risk of being overly-dispatched?
 - How will new scheduling coordinators manage risks?
 - So far resources procured are not BTM, unclear whether they will participate as NGR





SCE LCR-RFO Storage Contracts

- SCE is scheduling coordinator
- Resources will participate as PDR
- Contracts contain the follow provisions for use limitations:
 - Minimum Duration Per Dispatch (in minutes)
 - Maximum Duration Per Dispatch (4 hours—required to meet RA)
 - Maximum Dispatches Per Day (1)
 - Maximum Dispatch Hours Per Month
 - Maximum Dispatch Hours Per Term Year (4-8x monthly maximum)





SCE Storage RFO: Stanton project

- 20 MW system: EGT hybrid technology that pairs a traditional gas turbine with a battery to create a peaker that “can provide superior reliability through GHG-free operation of very fast and flexible capacity”
- COD 2020, 10 year term
- “SCE will **not control the dispatch rights** and does not receive any energy or ancillary service benefits. However, under the RA Only agreement, the resource must bid into the CAISO market as an RA resource.”
- Therefore, burden is on **storage provider** to manage inherent use-limitations of resource, and provider will be liable for RAIM penalties for unavailability
- Provider will also receive diminished RA payments from SCE for under-availability and is **responsible for replacement**





SCE Storage RFO: Western Grid Projects

- Single battery-based storage project split between two separate contracts to address interconnection limitations.
- COD 2020, 15 year term
- Dispatch and RA terms identical to Stanton





Remaining questions to be answered about Storage under amended tariff

1. If RAIM penalties are stayed until 2018, are there other potential problems that could arise when bidding in storage resources as PDR between now and 2018?
 - The problems will be different depending on which party is the scheduling coordinator
 - If the resource were dispatched by CAISO through the market more hours/ days/ # of starts per day than is provided for in the contract b/w the IOU and generator, what would the contractual remedy be?
 - Would SCE need to compensate the storage provider for additional capacity value provided? (the contract clearly provides for compensation for any energy provided)





Remaining Questions, Cont.

2. How will storage resources with existing PDR contracts (that go beyond 2018) ensure that they will not face significant RAIM penalties after 2018 from the expectation that they are always available (inconsistent with their contracts)?
 - Can CAISO estimate how many hours of availability per month are generally expected?
3. How will the CAISO market optimize the use of these (PDR) resources in the future through new market design rules? (As contemplated by the RSI 1 proposal?)

“[CAISO should] enhance the energy market optimization and rules where possible and exempt the use-limited capacity from the availability incentive mechanism where energy market changes are not sufficient.”





Questions about non-PDR Storage Contracts

4. How will the CAISO market optimize the use of storage resources?
(same issue as PDR)
 - What kinds of bid parameters could be included?
 - Storage likely needs to be able to reflect per-start-costs, not just per-MW costs.
5. How will storage resources coming online in the future manage bids to: mitigate unexpected resource degradation, avoid automatic bid-insertion and RUC when non-economic?
 - Is this scoped into ESDER Phase 2? Can the new (under-development) NGR model develop appropriate ways to allow Scheduling Coordinators to manage availability, bid-insertion, and RUC?

