



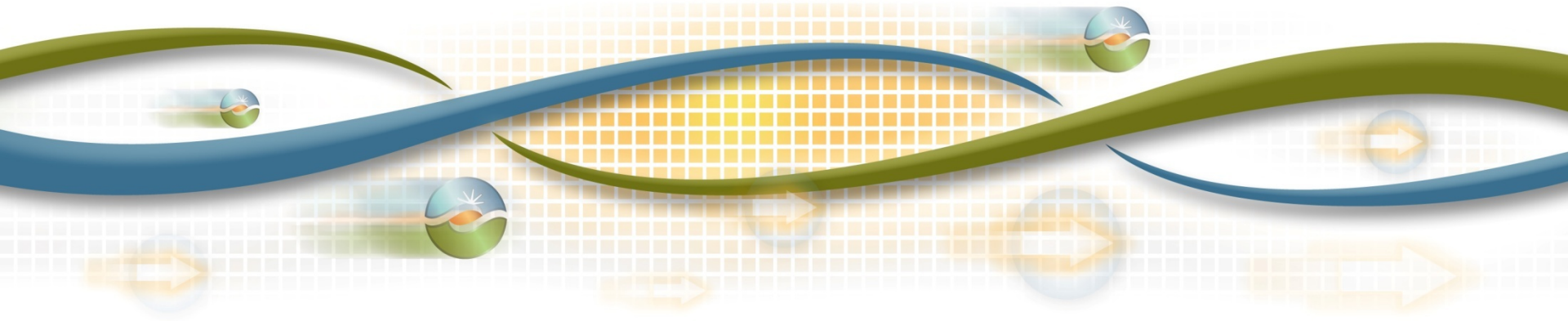
Energy Storage and Distributed Energy Resources Phase 3 (“ESDER 3”)

Issue Paper

Workshop

November 6, 2017

9:00 a.m. – 3:00 p.m. (Pacific Time)

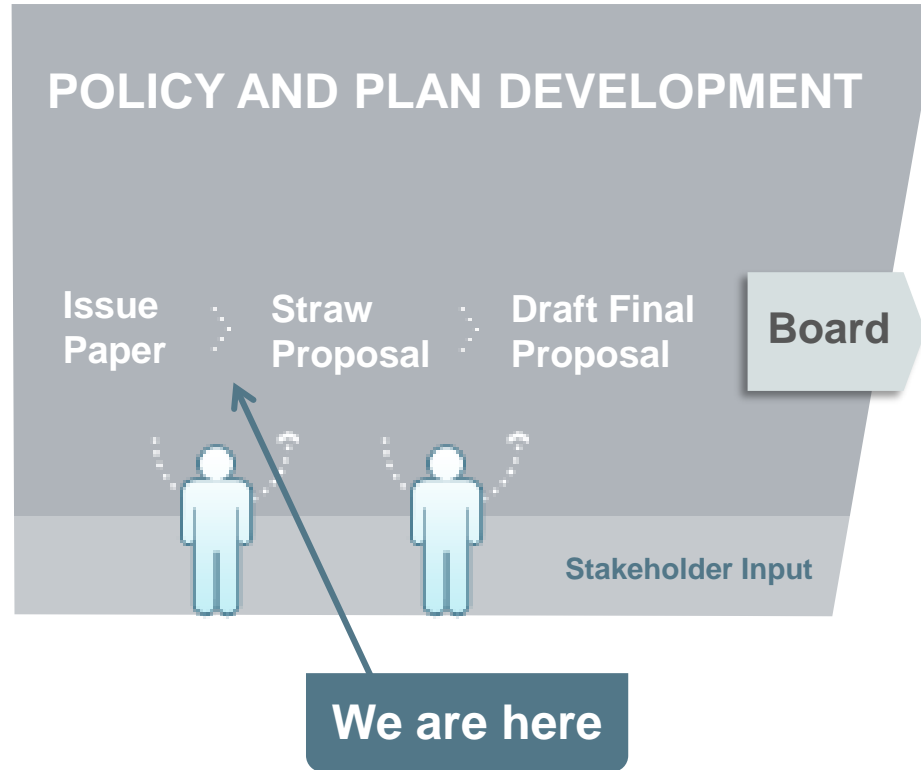


Agenda

Time	Item	Speaker
9:00 – 9:10	Introduction	James Bishara
9:10 – 9:15	Review Agenda and Objectives	Eric Kim David Schlosberg (eMotorWerks) Ted Ko (Stem)
9:15 – 11:00	Potential Scope for Demand Response (DR)	
11:00 – 12:00	Potential Scope for Multiple-Use Applications (MUA)	
12:00 – 1:00	Lunch	
1:00 – 2:45	Potential Scope for Non-Generator Resource (NGR)	
2:45 - 3:00	Next Steps	James Bishara

STAKEHOLDER PROCESS

ISO Policy Initiative Stakeholder Process



Objectives for today

- For each topic, we will follow the structure outlined below
 1. Review, clarify, and get consensus on the issue
 2. Identify any issues not already captured
 3. Discuss prioritization of items for ESDER 3

Below are the potential scope items that were proposed in the Issue Paper

Demand Response

1. Demand response modeling limitations
2. Weather-sensitive DR
3. Removing single LSE requirement and DLA discussion
4. RDRR economic buy-back of day-ahead awards
5. Recognition of behind the meter EVSE load curtailment
6. Load consumption/shift product

Multiple-Use Application

1. 24x7 CAISO participation requirement for DERs
2. Wholesale market participation model for a micro-grid

Non-Generator Resource

1. Reflecting costs and NGR use limitations
2. Managing SOC and throughput limitations

POTENTIAL SCOPE FOR DEMAND RESPONSE

1. Demand response modeling limitations

- Commitment costs and the impact of a 0 MW Pmin
 - DR resources do not have defined commitment costs
 - DR resources are being committed in RUC and are susceptible to infeasible real time 5-minute dispatches
- Minimum and maximum run-time constraints
 - The existing minimum run-time constraint may not effectively utilize DR operational characteristics when its Pmin is equal to 0 MW
 - Utilization of a maximum run-time is desired over use of maximum daily energy limit parameter

Stakeholder Positions

- SCE - Supports
- PG&E - Might not be appropriate venue
- SDG&E - Supports
- Ohm Connect - Supports
- CLECA - Supports
- CESA - Only if there is space
- eMotorWerks - Should be in separate initiative
- Olivine - Supports
- NRG - Supports
- Joint DR Parties - Supports
- DMM - Supports; recommends additional topic *re* PDR load and baseline data

2. Weather-sensitive demand response

- Weather-sensitive PDR/RDRR cannot deliver a fixed resource adequacy qualifying capacity amount since its capability depends on weather conditions
- The ISO believes that this issue requires vetting at the CPUC/LRA because the resource adequacy qualifying capacity rules are established by the LRA
- SDG&E raised an issue that occurs due to bidding requirements and the must offer obligation

Stakeholder Positions

- SCE - Supports but needs coordination with CPUC
- PG&E - Supports but points out CPUC proceeding
- SDG&E - Supports and has an example of the MOO bidding requirements for PDR
- CLECA - Supports and suggests working group
- CESA - Does not support
- eMotorWerks - Does not support
- Whiskerlabs - Supports
- Joint DR Parties - Supports
- DMM - Supports

3. Removing single LSE requirement/ DLA discussion

- Currently, PDR/RDRR design requires that aggregations must be located under a single load serving entity (LSE), represented by one demand response provider (DRP), and within a single sub-LAP
 - Stakeholders have expressed difficulty in meeting or maintaining the 100 kW minimum participation requirement
 - Application of a default load adjustment requires consideration if the ISO relaxes this requirement.
 - Issues related to removal of the default load adjustment may need to be addressed jointly with CPUC

Stakeholder Positions

- SCE - Supports
- PG&E - Supports with coordination with CPUC
- SDG&E - Suggests with coordination with CPUC
- Ohm Connect - Supports
- CLECA - Supports
- CESA - Supports if there is space
- eMotorWerks - Supports
- Olivine - Supports
- Whiskerlabs - Supports
- NRG - Supports
- Joint DR Parties - Supports; any changes should also accommodate DER participation more broadly than at a per-sub-lap basis
- DMM - Supports

4. RDRR economic buy-back of day-ahead awards

- Stakeholders requested RDRR to adjust bids in real-time market to leverage economic buy-back of their day-ahead awards
 - All reliability-triggered MWs that qualify for RA under RDRR must be available to the ISO in real-time
 - RDRR participation model excludes this capability due to special treatment of reliability-triggered capacity
 - ISO prefers to pursue capabilities available with PDR.
- SCE commented that challenge is with some DR resources being partially a PDR and RDRR

5. Recognition of behind the meter Electric Vehicle Supply Equipment load curtailment

- ESDER 1 implementation included the meter generator output (MGO) performance measurement
 - Recognized a sub-metered storage device contribution to facility load curtailment during a CAISO dispatch event
- Stakeholders have expressed the need to extend the MGO concept to the sub-metered EVSE
 - Would provide an option for recognition of a EVSE sub-meter for direct performance measurement of load curtailment

Stakeholder Positions

- PG&E - Supports for DERs generally and CPUC involvement
- SDG&E - Supports but wanted more information
- CESA - Supports
- eMotorWerks - Supports
- Joint EV Charging Parties - Supports
- Joint DR Parties - Supports
- DMM - Supports

*Presentation from David Schlosberg
(Joint EV Charging Parties)*

6. Load shift capability

- The concept of load consumption was introduced in the ESDER 2 initiative, but required more work after ESDER 2 concluded
- Discussions with the storage community ensued to consider a load shift capability where excess, negative priced energy could be stored and later released for productive purposes
 - Initial focus on BTM storage whose energy charge and discharge can be directly metered and monitored
- Consider a load shift capability from conventional load management, which is not directly metered, as a potential future effort

Stakeholder Positions

- SCE - Supports but further discussion needed
- PG&E - Supports
- SDG&E - Supports but wants coordination with CPUC
- Ohm - Supports with broader technologies
- CLECA - Supports but not as high of a priority
- CESA - Supports
- eMotorWerks - Supports
- Olivine - Have concerns and supports further vetting
- Whiskerlabs - Supports but consider thermal storage
- Joint DR Parties - Supports but consider thermal storage; also, don't discount consumption opportunities
- DMM - Supports but don't limit load consumption opportunities

*Presentation from Ted Ko
(Stem)*

Additional topic on demand response modeling enhancements

- The ISO and CPUC held a joint workshop on “Slow Response Local Capacity Resource Assessment” on October 4
 - The ISO presented an import/export bidding option for PDR to help count towards local RA
 - PDR would participate in the fifteen minute market and can submit bids either in an hourly block, hourly block with a single intra-hour economic schedule change, or as a 15-minute dispatchable resource
- http://www.caiso.com/Documents/Presentation_JointISO_CPUCWorkshopSlowResponseLocalCapacityResourceAssessment_Oct42017.pdf
- Is this an item to consider for ESDER 3?

POTENTIAL SCOPE FOR MULTIPLE-USE APPLICATIONS

Multiple-use applications are when DER provide services and receive compensation from more than one entity.

- Since early 2016, the ISO has collaborated with the CPUC staff in its Energy Storage Proceeding Track 2
- A report was released on May 18, 2017 and a workshop was held on June 2, 2017

Non-24x7 ISO participation

- Currently, DERs utilizing the NGR model or participating as generators are settled 24x7 as a wholesale market resource
- These resources are subject to financial settlement for its consumption or production in each interval
 - Regardless of market award or a dispatch
- Stakeholders desire the ability to opt out of ISO market participation and settlement in some intervals in order to provide services to other entities

Stakeholder Positions

- SCE - Supports but continued discussion at CPUC
- PG&E - Does not support due to concern with similarity with PDR
- SDG&E - Does not support, with several follow up questions
- CESA - Supports
- eMotorWerks - Supports
- Olivine - Supports
- NRG - Supports
- DMM - Continues to assess possible impacts of contemplated changes

Wholesale market participation model for a micro-grid

- Stakeholders have asked how micro-grids could provide wholesale energy and ancillary services
- Several sub-issues were identified in the issue paper
 - Can a micro-grid aggregate internal facilities and participate under NGR?
 - Can the entire micro-grid participate as an NGR?
 - If the NGR model does not work what other models?
 - How to distinguish between wholesale consumption for ISO grid services versus retail consumption for internal load?

Stakeholder Positions

- SCE - Supports and cites existing CPUC framework
- PG&E - Questions on micro-grid participation under current models
- SDG&E - Questions to consider
- CLECA - Not a priority
- CESA - Does not support; suggests stakeholder catalog
- CHBC - Supports
- eMotorWerks - Does not support
- Olivine - Supports but broaden scope and treat micro-grid as a technology

POTENTIAL SCOPE FOR NON-GENERATOR RESOURCES

Use limited status for non-generator resources

- The ISO is open to considering a use-limited status for NGRs
 - As long as the use-limitation is consistent with those of other generation resources and complies with the definition set by the Commitment Cost Enhancements initiative
- Should NGRs be considered as a use-limited resource?

Throughput limitations for non-generator resources

- The ISO is open to discussing ways to define explicit energy storage costs to manage throughput.
 - Material Maintenance Adders or Variable O&M charges
- Current modeling and bidding practices allow resources to be represented in a way that meets the resource's physical limitations
- What are use cases that warrant a need for throughput limitations?

State of charge management for non-generator resources

1. Real-time optimization and dispatch based on SOC
 - Stakeholders want a high degree of certainty on its resource between the bid and market dispatch
2. Multi-segment ancillary service bids
 - Stakeholders want to submit multi-segment A/S bids to manage their real-time SOC

Questions for state of charge management proposals

- Under each proposal, what are the use cases that warrant the change?
- Are there existing market functionalities that can resolve these issues?

Stakeholder Positions

- SCE - Issue paper was a good starting point for the discussion
- PG&E - Supports throughput limit as parameter, RAAIM exemption after throughput limit is exhausted; does not support the proposals for SOC management outside of real-time optimization
- SDG&E - Supports
- CESA - Supports
- Olivine - Need to review current NGR model
- NRG - Supports
- DMM - Supports; consider economic rather than contractual limitations

NEXT STEPS

Next Steps

Milestone	Date
Post issue paper	September 29, 2017
Stakeholder call	October 12, 2017
Stakeholder comments due	October 18, 2017
Stakeholder workshop - Issue Paper	November 6, 2017
Stakeholder comments due - Nov. 6 workshop discussion and presentations	November 20, 2017

Request written stakeholder comments on the workshop be submitted by COB November 20 to initiativecomments@caiso.com

The **comments template**, as well as all materials related to the ESDER Phase 3 initiative, are available at:
http://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyStorage_DistributedEnergyResources.aspx

Acronyms

Acronyms

1. DER - Distributed Energy Resource
2. PDR - Proxy Demand Resource
3. RDRR - Reliability Demand Response Resource
4. DRP - Demand Response Provider
5. EVSE - Electric Vehicle Supply Equipment
6. NGR - Non-Generator Resource
7. SOC - State of Charge
8. MUA - Multiple-Use Application
9. MGO - Meter Generator Output
10. RUC - Residual Unit Commitment
11. LRA - Local Regulatory Authority
12. LSE - Load Serving Entity
13. DLA - Default Load Adjustment
14. A/S - Ancillary Service