BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to consider policy and implementation refinements to the Energy Storage Procurement Framework and Design Program (D.13-10-040, D.14-10-045) and related Action Plan of the California Energy Storage Roadmap	Rulemaking 15-03-011 Filed March 26, 2015

NOTICE OF EX PARTE COMMUNICATION BY THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

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July 13, 2015

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Pursuant to Article 8 of the California Public Utilities Commission (Commission) Rules of Practice and Procedure, the California Independent System Operator Corporation (CAISO) hereby files this notice of the following oral and written ex parte communication with Ehren Seybert, advisor to Commissioner Peterman.

On July 9, 2015 from approximately 9:00 a.m. to 11:00 a.m., the CAISO met with Mr. Seybert and members of the Commission's Energy Division as part of an education session regarding the following topics: (1) interconnection of CAISO-grid connected energy storage, (2) non-generating resources settlement, (3) the distributed energy resource provider framework and (4) the CAISO Energy Storage and Distributed Energy Resources Initiative. The meeting was held at the Commission's offices, 505 Van Ness Avenue, San Francisco, California. Present for the CAISO were Mr. Tom Flynn, Infrastructure Policy Development Manager and Dr. Lorenzo Kristov, Principal, Market and Infrastructure Policy, Mr. Tom Doughty, Director, State Regulatory Strategy and Mr. Dennis Peters, External Affairs Manager.

During the education session, the CAISO representatives presented the slides included as Attachment 1 to this notice. The substantive content of the presentation is captured in Attachment 1.

Respectfully submitted,
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Dated: July 13, 2015

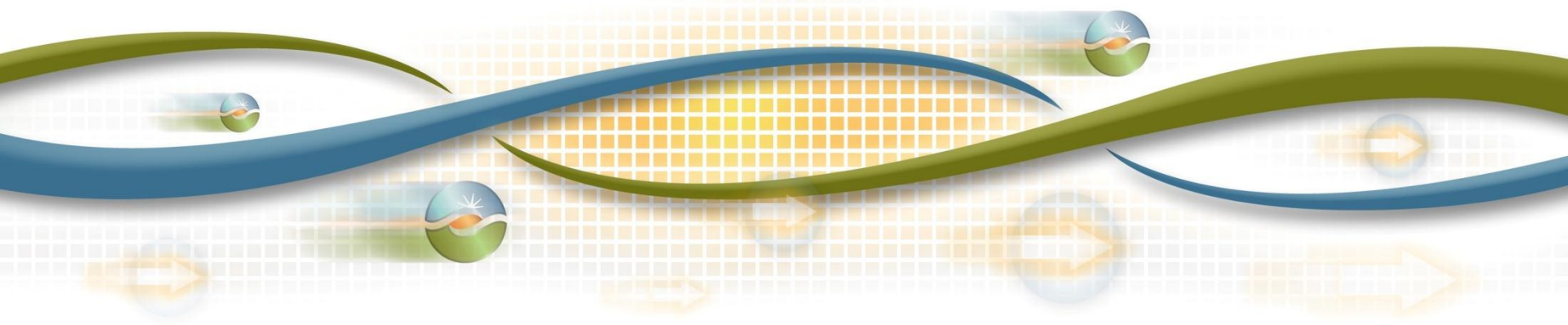
ATTACHMENT 1

California ISO
Shaping a Renewed Future

Energy Storage

ISO – CPUC staff meeting

July 9, 2015



Presentation topics

- Interconnection of ISO-grid connected energy storage
- NGR settlement
- DERP framework
- ISO initiative: Energy Storage and Distributed Energy Resources (ESDER)

Interconnection of ISO-grid connected energy storage

General approach

- Interconnection requests to the ISO grid are governed by the Generator Interconnection and Deliverability Allocation Procedures (GIDAP) approved by FERC in 2012.
- GIDAP can accommodate interconnection of storage projects to the ISO grid that want to be treated as generators.
  - Generator that produces positive energy during discharge mode and negative energy during charge mode (this is consistent with how storage participates in ISO wholesale markets under the NGR model).
  - Must respond to ISO dispatch instructions, including curtailment to manage congestion, during both charge and discharge modes.

Reliability studies

- Considers both discharge and charge modes.
- Involves testing reliability impacts under worst-case conditions (which may differ between discharge and charge modes).
- Discharge mode
  - Studied at maximum instantaneous capability in MWs.
  - Both peak and off-peak periods are studied.
    - Peak = summer peak load (typically 1-in-10 peak load forecast is used).
    - Off-peak = spring weekend daytime peak load (50% to 65% of summer peak load).

Reliability studies (continued)

- Charge mode
  - Studied at highest steady-state charging level in MWs.
  - Both peak and off-peak periods are studied.
    - Peak = summer peak load (typically 1-in-10 peak load forecast is used).
    - Off-peak = night time minimum load (about 40% of summer peak load).
  - Worst-case scenario may be partial-peak
    - Partial-peak = average load of summer weekday two hours before and after the peak period (75% of summer peak load).

Reliability studies (continued)

- Study results will provide information regarding potential overload issues under assumed conditions.
- Will identify NUs or alternatives needed to mitigate reliability problems that cannot be mitigated via congestion management.
- Identified reliability mitigations may include system protection schemes (SPS).
- Unlikely that any such requirements would be identified for charging mode that are in addition to or beyond those required of discharge mode.

Deliverability studies

- For system and local RA qualification.
- Only considers discharge mode.
- Studied at maximum steady-state discharge output level in MWs sustainable for a four-hour period (consistent with CPUC RA counting rules).
- Peak period is studied
  - Summer peak load (1-in-5 peak load forecast is used).
- Study results will provide information regarding potential overload issues under assumed conditions.
  - Will identify NUs necessary for the project to achieve its requested deliverability status.

NGR settlement

Non-generator resources (NGR) model

- Developed as the initial model for energy storage devices to participate in ISO markets and implemented during 2011-2012.
  - Applies to ISO-grid and distribution connected resources
- NGRs are generation resources with a MWh limitation that can be seamlessly moved within an operation range consisting of
  - positive generation only
  - negative generation only, or
  - positive and negative generation
- ISO settles the energy dispatches for positive or negative energy (i.e., when discharging or charging) at the locational marginal price (LMP).

Settlement treatment for energy storage under the NGR model

Energy	Settlement price	Allocated TAC?	Subject to measured demand uplifts?
Positive gen (discharge mode)	LMP	No	No
Negative gen (charge mode)	LMP	No	No

Round-trip efficiency losses (i.e., the charge/discharge cycle efficiency) are viewed by the ISO as part of charging.

Station power

- Station power would be any energy actually consumed and not energy that is used to charge.
- Since NGRs are treated as generators, the rules for settlement of station power are the same as for conventional generators.
- It may be difficult to distinguish station power consumption from charging unless the two activities are metered separately.
- A project should consult with its LSE to determine how retail charges may apply to its station power consumption.
- ISO checks the station power requirements at sync as part of the new resource implementation process.

DERP framework

Expanding Metering and Telemetry Options initiative (aka “DERP”)

- Distributed energy resources (DER) will represent an increasingly important part of the future resource mix.
- DER will help lower carbon emissions and provide operational benefits to ISO grid.
- ISO’s current tariff does not offer a clear platform for smaller (< 0.5 MW) distribution connected resources to participate in ISO markets.
- DER provider (DERP) proposal takes the first step by establishing a framework to enable DER to aggregate together to meet the ISO’s 0.5 MW minimum participation requirement.

Interconnection of sub-resources in a DERP aggregation

- It is the distribution utility and not the ISO that specifies and administers the connection of resources to a distribution system.
- DERP must comply with applicable utility distribution company tariffs, requirements of the applicable local regulatory authority, as well as interconnection requirements.
- Prior to participating in the ISO market a DERP would need to successfully complete the ISO NRI process for its aggregation.
  - Includes verification that the interconnections for the sub-resources in an aggregation have been approved by the appropriate distribution utility.

Energy storage and distributed energy resources (“ESDER”) stakeholder initiative

Prelude to the ESDER initiative

- In 2013, CPUC established an energy storage procurement target of 1,325 MW by 2020.
- Developers responded with requests to interconnect storage to the ISO grid.
  - Queue cluster 7: 780 MW of energy storage (13 projects).
  - Queue cluster 8: 7,300 MW of energy storage (66 projects).
- In 2013-14, ISO conducted effort to clarify interconnection rules for storage.
- In 2014, the California Energy Storage Roadmap was published.
  - Identified several high priority action items for the ISO on clarifying existing rules and identifying potential enhancements.

ESDER stakeholder initiative is underway.

- In May the ISO launched the new Energy Storage and Distributed Energy Resources ("ESDER") stakeholder initiative.
  - Initial proposed scope and schedule posted May 13.
  - Stakeholder web conference was held on May 21.
  - Written stakeholder comments received May 29.
- On June 25, the ISO posted a revised scope and schedule based on a consideration of the stakeholder comments received.
  - Next step is to publish an issue paper and straw proposal.
  - Work will begin on the 2016 scope of issues early next year.

Scope of issues for potential policy resolution in 2015.

1. Non-generator resource (“NGR”) model enhancements.
   - Update and improve public documentation.
   - Clarify how the ISO uses state of charge in market optimization and consider limited changes (e.g., make initial state of charge a submitted parameter in the day-ahead market).
2. Proxy Resource (“PDR”) and Reliability Demand Response Resource (“RDRR”) enhancements.
   - Consider use of alternative baselines.
3. Multiple use applications for non-resource adequacy (“non-RA”) resources.
   - Provides services to the distribution system or to end-use customers and participates in wholesale market.

Policy development on issues in 2015 scope to be completed by year end.

- Objective is to bring proposed resolutions to policy issues in the 2015 scope to the Board by December.
- This schedule does not include implementation steps.
  - Development and filing of tariff amendments.
  - Making changes to relevant business process manuals.
  - Making and implementing changes to market system software and models.

Scope of issues for potential policy resolution in 2016 and beyond.

1. Additional enhancements to the NGR and PDR market participation models.
2. Open policy issues from the Expanding Metering & Telemetry Options initiative.
3. Open policy issues from CPUC demand response working groups.
4. Distinction between wholesale charging energy and station power.
5. Additional multiple use applications, including RA cases.
6. Alignment between distribution level interconnection and the ISO new resource implementation process.
7. Pseudo-tie or dynamic scheduling arrangements for storage resources.