BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Oversee the Resource Adequacy Program, Consider Program Refinements, and Establish Annual Local and Flexible Procurement Obligations for the 2019 and 2020 Compliance Years.

Rulemaking 17-09-020
(Filed September 28, 2017)

NOTICE OF EX PARTE COMMUNICATION OF THE CALIFORNIA ENERGY STORAGE ALLIANCE

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October 25, 2017
BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Oversee the Resource Adequacy Program, Consider Program Refinements, and Establish Annual Local and Flexible Procurement Obligations for the 2019 and 2020 Compliance Years.

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Pursuant to Rule 8.4 of the Rules of Practice and Procedure of the California Public Utilities Commission ("Commission"), the California Energy Storage Alliance ("CESA") hereby gives notice of the following ex parte communication.

On October 22, 2017, CESA’s Executive Director, Janice Lin, gave a presentation titled the “Future of California’s Energy Grid: Highly Renewable, Highly Flexible “ (which is attached hereto as Appendix A) as a participant in a panel discussion titled “The Future of Energy Storage in the Aftermath of the Aliso Canyon Leak” at the 2016 Environmental Law Conference at Yosemite, sponsored by the State Bar of California Environmental Law Section located at the Tenaya Lodge in Yosemite National Park, California. The panel discussion in which Ms. Lin participated lasted from approximately 11:00 a.m. to 1:30 p.m.

Ms. Lin provided an overview of grid reliability challenges for California’s current and future renewable energy mix, the importance of encouraging fast flexible resources to provide current and future ramping needs, and the strategic role of flexible resource adequacy enhancements that are urgently needed. Further, Ms. Lin explained the role of energy storage as a key component of the CAISO’s flexibility tool kit in helping to maintain reliable and cost effective grid operations.
Commissioner Liane M. Randolph was also a participant in the panel discussion.

To receive a copy of this ex parte notice, please contact: please contact Michelle Dangott, at 818.961.3003 or mdangott@energyattorney.com.

Respectfully Submitted

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October 25, 2017
APPENDIX A
Future of California’s Energy Grid: Highly Renewable, Highly Flexible

Janice Lin
Co Founder & Executive Director, California Energy Storage Alliance (CESA)

Yosemite Law Conference
October 22, 2017

About CESA

The California Energy Storage Alliance (CESA) is a 501c(6) membership-based advocacy group committed to advancing the role of energy storage in the electric power sector through policy, education, outreach, and research. CESA was founded in January 2009 by Janice Lin and Don Liddell.

CESA’s mission is to make energy storage a mainstream energy resource in helping to advance a more affordable, clean, efficient, and reliable electric power system in California.
California’s policies are creating a need for more flexible and grid integration solutions to maximize renewables investments and manage grid reliability:

- **SB 350** established a 50% RPS by 2030, among other requirements for electric vehicles, energy efficiency, and disadvantaged communities.
- **SB 32** set a goal to reduce California’s GHG emissions by 40% from 1990 levels by 2030.
- **NEM 2.0 Decision** largely maintained tariff and continued rooftop PV growth trajectory.
- **SB 338** provides direction that planning exercises should consider roles for storage and preferred resources in meeting ramps and peaks.
- **SB 100** did not pass in the 2017 Legislative session, but may be considered next year to set a 100% RPS by 2045.
- **Executive Order B-16-2012** set a long-term goal of reaching 1.5 million zero-emission vehicles (ZEVs) on California’s roadways by 2025.
- **Zero Net Energy (ZNE) Homes vision** was established by the CPUC to have 100% of all new homes be ZNE starting in 2020.
Future of California’s Energy Grid:
Highly Renewable, Highly Flexible

Focus for Today:
The strategic (and urgent) role of Flex RA in achieving a highly flexible, reliable fleet

Energy Storage: the Ultimate Flexibility Tool

- Electro-Chemical
- Mechanical
- Bulk Mechanical
- Thermal
- Bulk Gravitational
- Transportation
Expedited Aliso Canyon Procurement Demonstrated Rapid Speed of Installation

In < 8 months, 99.5 MW of energy storage was procured and operational to address reliability issues stemming from limitations of the Aliso Canyon gas storage facility

<table>
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<th>MW</th>
<th>MWh</th>
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Updated May 2, 2017

Long term planning is preparing for new operational needs as generation fleet evolves

A unified vision should guide planning, procurement, and operations

Source: CAISO Flexible Resource Adequacy Criteria and Must Offer Obligation Working Group Meeting 9/26/17
IRP: More Renewables are Needed to Meet 42MMT 2030 GHG Goal

The CPUC’s Reference System Plan recommends + 9,000 MW of utility-scale solar PV and + 1,100 MW of wind in California (on top of assumed +16,000 MW of additional rooftop PV)

Current Real-Time Operational Difficulties

Planning models often focus on three-hour ‘solutions’, which can blur actual hourly and intra-hour ramps, outages, and other factors that make the real-time operation of the grid a growing challenge.
Flexible ramping has been historically provided by the CAISO’s gas fleet, which face financial hurdles due to GHG policies and lower (sometimes negative) energy prices.

Implications for California’s Flexible Fleet

CAISO Distribution of Negative Prices: Mar-May 2012-2017

CAISO Solar Generation vs. Thermal Dispatch

Increasing mid-day solar generation reduces net load to be met by dispatchable fleet.

Less thermal generation dispatch, but it is still needed for evening ramp and peak.

Fast flexible fleet is needed to deal with forecast error

Deviation from RTD Forecast to Actual

Deviation from FMM Forecast to RTD Forecast

Deviation from DA Forecast to FMM Forecast

Source: CAISO (2017)
Inadequate Flexibility Tools for the CAISO

California can better incentivize flexible resources that are fast-ramping, quick starting, and have low minimum operating levels (Pmin) – i.e., System/Local RA looks like Flex RA!

Flex RA should be used to incentivize fast flexible resources to meet CAISO’s operational needs

Source: CAISO (2017)

In 2030, Much More Flexibility Will Be Needed

Adding the Proposed Reference System Plan from the IRP will increase ramp rates as well as downward ramping needs

Source: CAISO OASIS data (2016)
2030 Grid Operations with Renewables: Spring

**Today:** Net load is met by Flexible Gas, Baseload Gas, Nuclear, Geothermal, Imports/Exports, and Curtailments

**2030:** Net load will need to be met by a combination of Flexible Resources, Imports/Exports, and Curtailments

These steep ramps and overgeneration risks are not just a spring-time problem

Source: CAISO OASIS data (2016), 2030 IRP Proposed Reference System Plan Scenario
The Flex RA Program is Strategically Important To Development of Grid Reliability Toolkit

Flex RA Program Should Provide Economic Signal for Grid Needs:
- Value ramping speed and low Pmin
- Value ‘negative generation’ contributions (charging)
- Develop short duration products (5-min, 15-min, hourly), in addition to 3-hour product

Flex RA Program Reform should happen ASAP, in parallel to IRP – key to begin developing flexible fleet

Pathways to Collaborate & Find Solutions

CPUC and CAISO initiatives will address these challenges and opportunities:

- **CPUC Resource Adequacy (RA) proceeding** can tune or improve planning and procurement of needed flexible capacity resources. Flex RA is critical to ENSURE a viable fleet with the right participation requirements
  - CAISO indicating current Flex RA isn’t working. Instead of providing market signals, RA sometimes yields cheapest 'limp-along' payments to keep old, inflexible generators alive.

- **CPUC Integrated Resources Plan (IRP) proceeding** will identify reliability-driven and policy-driven grid needs and reference plans
  - Very cool and cutting edge modeling and planning effort but should ensure even extreme conditions and intra-hour ramps are reliably met.
  - CESA suggestion: consider cost of keeping gas fleet available and/or fast gas retirement scenario

- **CAISO Flex Capacity (FRACMOO), Energy Storage Participation improvements, Frequency Response, and other initiatives queued up or underway**
  - Better defining ‘flex need’, setting up capacity ‘needs’ that can inform RA construct, considering overgeneration and solutions from Storage
Key takeaways:

1. Much more flexible resources are needed to reliably operate the grid

2. Flex RA is strategically important to California’s grid reliability

3. Reform is urgently needed - should provide clear, non-discriminatory market signals so fast flexible resources can compete head to head against conventional resources

4. Appropriate market signals will stimulate investment toward a fleet with the necessary flexibility capabilities

5. Energy storage is the ultimate flexibility tool for the grid

Thank You!

Questions?

Janice Lin
Co Founder & Executive Director, California Energy Storage Alliance (CESA)

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Backup Slides

Energy Storage Is Arriving

Each of California’s three investor-owned utilities (IOUs) are making major progress toward their 1,325 MW energy storage procurement target by 2020, including 99.5 MW of energy storage that was procured and operational in six months to address reliability issues stemming from limitations of the Aliso Canyon gas storage facility.

- SCE has met its customer domain target and must now fulfill its overall target with T&D domain storage.
- SDG&E has met its overall target but must still procure 7.5 MW to meet its customer domain target.
- PG&E must still fulfill its energy storage targets in all three domains.

SDG&E procured 37.5 MW that counted toward AB 2514 targets.
SCE procured 62 MW that counted toward AB 2514 targets.
SDG&E procured 37.5 MW that counted toward AB 2514 targets.

Updated July 7, 2017