

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Develop an
Electricity Integrated Resource Planning
Framework and to Coordinate and Refine
Long-Term Procurement Planning
Requirements.

Rulemaking 16-02-007
(Filed February 11, 2016)

**REPLY COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE
ON THE ADMINISTRATIVE LAW JUDGE'S RULING SEEKING COMMENT ON
PROPOSED REFERENCE SYSTEM PORTFOLIO AND RELATED POLICY ACTIONS**

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In accordance with the Rules of Practice and Procedure of the California Public Utilities Commission (“Commission”), the California Energy Storage Alliance (“CESA”) hereby submits these reply comments on the *Administrative Law Judge’s Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions* (“Ruling”), issued by Administrative Law Judge (“ALJ”) Julie A. Fitch on November 6, 2019.

I. INTRODUCTION.

CESA commends all stakeholders that submitted opening comments regarding the development of a Reference System Portfolio (“RSP”) for their input and expertise. CESA is certain that their contributions have moved California closer achieving its ambitious energy and environmental goals. After reviewing opening comments, CESA was pleased to find several parties have echoed our concerns with the proposed RSP. Specifically, CESA notes that several parties have urged the Commission to adopt a greenhouse gas (“GHG”) emission target more stringent than the one proposed by the Commission, 46 million metric tons (“MMT”). In addition, CESA would like to highlight that various stakeholders have pointed out significant structural

limitations in the RESOLVE model, as well as the pertinence of facilitating and/or studying the development of at least one pumped hydro storage resource in the State.

Nevertheless, CESA has encountered in these comments areas and topics where improvement and clarification are necessary. In these reply comments, CESA focuses on the following issues:

- The Commission must recognize the shortcomings of the proposed RSP and instead adopt one that provides certainty to developers and load-serving entities (“LSEs”).
- The effective load carrying capacity (“ELCC”) methodology applied for energy storage resources must be revised and improved before it is incorporated to the IRP process.
- The Commission should focus on developing a capacity counting methodology for hybrid resources in order to include them as candidate resources.
- The Commission should collaborate with the California Independent System Operator (“CAISO”) to investigate the replacement and/or cycling costs associated with battery energy storage resources.
- The Commission should further evaluate the benefits related to long-duration storage in light of the significant selection of storage resources in its proposed RSP.

Finally, while these comments are focused on modeling, CESA urges the Commission to have these modeling results lead to clarity around procurement, as needs in 2024 and 2025 are likely to emerge with the retirement of Diablo Canyon and because procurement of new, preferred resources require some level of lead time (*e.g.*, interconnection process) to generate cost-effective resources to meet the State’s reliability and GHG goals.

II. THE COMMISSION MUST RECOGNIZE THE SHORTCOMINGS OF THE PROPOSED RSP AND INSTEAD ADOPT ONE THAT PROVIDES CERTAINTY TO DEVELOPERS AND LOAD-SERVING ENTITIES.

The Commission’s proposed RSP is the 46 MMT Alternate Case, which distinguishes itself from the 46 MMT Case due to: (1) the inclusion of 2,289 MW of once-through cooling (“OTC”) capacity; (2) the inclusion of a 5 GW import limit in SERVM; 3) the inclusion of a solar PV

deployment limit of 2 GW per year; and, 4) the inclusion of 2 GW of generic effective capacity. In opening comments, CESA advocated for the Commission to consider a lower GHG target, as well as provide more clarity regarding the resources needed to provide the 2 GW of generic capacity. CESA is pleased to find that a multitude of parties have conducted their own capacity expansion modeling in order to present alternative RSPs that can overcome the limitations associated with the Commission’s proposed RSP; namely, the methodological issues related with the inclusion of generic capacity. In its comments, the CAISO highlights that, as presented, the proposed RSP could not be used for the Transmission Planning Process (“TPP”) as it contains vast quantities of resources that cannot be mapped with the necessary granularity.¹ Because of these deficiencies, CAISO recommends the Commission transmit the Preferred System Plan associated with the previous Integrated Resource Planning (“IRP”) cycle for all matters related to the TPP.² This indicates that the Commission’s RSP is not a step in the right direction, as it would hinder the State’s planning process and provide little certainty for relevant stakeholders.

In light of the time constraints associated with the IRP cycle, parties such as Southern California Edison (“SCE”); the Large-Scale Solar Association (“LSA”) and the America Wind Energy Association, California (“AWEA CA”), and the California Community Choice Association (“CalCCA”) have developed their own RSPs to facilitate the adoption of a reasonable and comprehensive RPS. Specifically, CESA urges the Commission to consider the modeling work done by SCE, as it presents insights that can substantially improve the IRP process.

In order to ensure California is on track to achieve its 2045 goals, as set forth by Senate Bill (“SB”) 100, CESA is convinced that the Commission must adopt an RSP that is in line with

¹ CAISO comments at 5.

² CAISO comments at 1.

the GHG reductions necessary. This means that both the inputs and results of the IRP process must align with the future electric system. As noted by SCE, the 46 MMT Alternate case does not prepare California to meet said goals.³ Thus, it is imperative to reevaluate the proposed RSP so as to minimize the risk of insufficient or erroneous procurement. CESA believes the Commission should consider the following changes within the proposed RSP:

- **Adopt a 30 MMT GHG target:** Parties such as Protect Our Communities (“POC”), LSA, AWEA CA, Sierra Club, the California Environmental Justice Alliance (“CEJA”), the Union of Concerned Scientists (“UCS”), the Natural Resources Defense Council (“NRDC”), the Environmental Defense Fund (“EDF”), the Center for Energy Efficiency and Renewable Technologies (“CEERT”), and Eagle Crest support the adoption of this emissions target as its resource buildout more closely aligns with the ones seen in the 2045 Framing Study.
- **Adopt an RSP that models resources up to 2045:** In the Ruling, the Commission has noted that cases that run through 2030 – but not further – may result in sub-optimal resource portfolios if the magnitude and timing of electricity demand changes drastically after 2030.⁴ Considering the State’s electrification goals, as well as the falling costs of energy storage, it is increasingly likely that sectors such as transportation will become heavily electrified in the 2020-2045 period; thus, and in order to minimize the uncertainty related to the fulfillment of the SB 100’s mandate, CESA agrees with parties such as CAISO and UCS that the Commission must adopt a RSP that optimizes capacity expansion with 2045 as its end-year.
- **Eliminate the 2 GW of generic capacity:** The inclusion of generic capacity seriously hinders the value of the Commission’s proposed RSP. Parties have noted that this addition could be related to the 5 GW import limit applied to SERVVM, implying that an elimination of said limit would obviate the need for generic capacity. Nevertheless, SCE’s modeling work shows that even with a restrictive import limit, generic capacity might be unnecessary if the Commission instead includes the capacity related to D.19-11-016.⁵ Regardless of its cause, the Commission should avoid adopting an incomplete RSP – *i.e.*, one that does not fully communicate the type and amount of resources needed in the coming years. Thus, CESA exhorts the Commission to evaluate which resources can provide the needed reliability at the lowest costs and without jeopardizing the emission target that would be adopted. This could be done either by evaluating other core cases using SERVVM or forcing certain resources in RESOLVE before feeding those portfolios for SERVVM verification.

³ SCE comments at 3.

⁴ Ruling, Attachment A, at 115.

⁵ SCE, at 5.

CESA recognizes that the Commission’s staff might not be able to accommodate all these modifications given the time constraints of the IRP proceeding; hence, CESA would support a partial adoption of SCE’s proposed 38 MMT Alternate Scenario, which partially addresses some of CESA’s concerns. It is worth noting that SCE’s proposed 38 MMT Alternate Scenario provides considerable GHG reductions relative to the Commission’s proposed RSP for a minimal increase on cost (about \$300 million per year).⁶ It is also relevant to state that this difference is based on significant assumptions related to the cost of both the 2 GW of generic capacity and the 3,300 MW related to D. 19-11-016;⁷ nevertheless, CESA finds that those assumptions are reasonable.

CESA would like to establish that we do not consider SCE’s proposed RSP to be flawless. As mentioned in their comments, SCE did not evaluate the reliability of this portfolio using a loss-of-load-expectation (“LOLE”) methodology.⁸ Thus, CESA would recommend that, if considered, the Commission run additional reliability tests on SCE’s portfolio. Furthermore, CESA would recommend tweaking this portfolio and have it optimize resource buildout up to 2045 in order to provide added guidance to developers and LSEs.

III. THE ELCC METHODOLOGY APPLIED FOR ENERGY STORAGE RESOURCES MUST BE REVISED AND IMPROVED BEFORE IT IS INCORPORATED TO THE IRP PROCESS.

CESA is supportive of the Commission’s efforts to approximate the capacity value provided by energy storage resources as the energy mix changes. Nonetheless, CESA believes that, as it stands, the ELCC curve that has been applied in this IRP cycle has not gone through the necessary level of vetting and feedback to be incorporated, as noted by SCE.⁹ CESA already

⁶ SCE comments at 29-33.

⁷ *Ibid.*

⁸ SCE comments at 33-34.

⁹ SCE comments at 12-13.

mentioned that the ELCC curve had been developed for a specific duration of energy storage and the Commission has not clarified how it affects the capacity value of resources with longer durations. These interactions are particularly relevant if the Commission opts to adopt an RSP with a more stringent GHG target. In opening comments, UCS and POC highlight this issue, noting that the current ELCC curve for storage might underestimate the capacity of these resources at higher renewable penetrations.¹⁰ Since there are interactions between the ELCCs of solar PV, wind and energy storage, CESA urges the Commission to develop a more detailed and dynamic ELCC curve for energy storage before applying it to the current IRP cycle. CESA believes the development of a more thorough ELCC methodology for energy storage resources would be helpful to alleviate the concerns of parties like Calpine, which note that a potential overestimation of the capacity provided by storage could lead to the need of generic effective capacity.¹¹

IV. THE COMMISSION SHOULD FOCUS ON DEVELOPING A CAPACITY COUNTING METHODOLOGY FOR HYBRID RESOURCES IN ORDER TO INCLUDE THEM AS CANDIDATE RESOURCES.

In opening comments, LSA, AWEA CA, Vote Solar, and the Solar Energy Industries Association (“SEIA”) advocate for the adoption of a 30 MMT scenario based on the Battery Pairing sensitivity conducted by the Commission.¹² These parties have used this sensitivity as it approximates the financial benefits of pairing renewable generation (mainly solar PV) with energy storage resources. Such an approximation is necessary since RESOLVE currently does not feature hybrid resources as candidates for economic selection.¹³ These parties argue that this scenario is particularly attractive as it yields significant savings relative to its core case peer, the 30 MMT

¹⁰ UCS comments at 3 and POC comments at 13.

¹¹ Calpine comments at 2.

¹² LSA and AWEA CA comments at 5-6.

¹³ LSA and AWEA CA comments at 7.

case.¹⁴ CESA is receptive of these comments; nevertheless, we believe that a scenario heavily reliant on paired resources require the Commission to establish a capacity counting methodology for hybrid resources.

Calpine has expressed concern over the capacity accounting of paired resources within RESOLVE. Without a specific candidate resource, Calpine has mentioned that storage resources that would be deployed in a paired fashion might be counted and valued as standalone resources, potentially overstating their capacity contributions.¹⁵ Not all hybrid resources have significant operational restrictions; however, this potential discrepancy underlines the need for the Commission to act in an expeditious manner to determine capacity counting methodologies for these resources. Hence, CESA supports the inclusion of hybrid resources as candidate resources while also adopting capacity counting methodologies.

V. THE COMMISSION SHOULD COLLABORATE WITH THE CAISO TO INVESTIGATE THE REPLACEMENT AND/OR CYCLING COSTS ASSOCIATED WITH BATTERY ENERGY STORAGE RESOURCES.

Several parties raised the issue of replacement and cycling costs associated with energy storage resources. In their comments, Eagle Crest, CAISO, and Calpine highlight that RESOLVE currently does not consider variable operation and maintenance (“O&M”) costs and/or replacement costs for these resources.¹⁶ CESA appreciates these comments as they highlight the need for further understanding of storage technologies and their operation, just like with any other resource or technology. Given the CAISO’s ongoing initiative, CESA recommends that the Commission closely collaborates with the CAISO to assess these costs for the following IRP cycle.

¹⁴ LSA and AWEA CA comments at 9.

¹⁵ Calpine, at 6.

¹⁶ See Eagle Crest at 9, CAISO at 14, and Calpine at 4.

CESA would like to note that understanding the cycling and replacement costs of energy storage resources is necessary to ensure the proper operation of storage resources. At the same time, as part of these discussions and investigations, CESA also notes that battery storage costs are falling quickly and that there have been improvements to storage usage and cycle life with different and/or changing battery chemistries. Furthermore, with storage projects being contracted for augmentation of capacity, such cycling “costs” may be reflected elsewhere. As such, CESA recommends that the investigation into cycling costs take into account all of these factors.

VI. THE COMMISSION SHOULD FURTHER EVALUATE THE BENEFITS RELATED TO LONG-DURATION STORAGE IN LIGHT OF THE SIGNIFICANT SELECTION OF STORAGE RESOURCES IN ITS PROPOSED RSP.

CESA is pleased to see several parties are aware of the significant value that could be provided by long-duration resources in a context of high renewable and storage penetrations. Unfortunately, as noted by some of these stakeholders as well, the current modeling tools are not equipped to perceive this value. CESA echoes the arguments made by Southern California Gas Company, Eagle Crest, and CalCCA relative to the need for including alternative energy storage technologies as candidate resources. In particular, CESA would like to underline the analysis carried out by CalCCA, which shows that accelerated procurement of long-duration resources (up to 7 hours) would lead to reduced capacity requirements in future years,¹⁷ as well as reduced gas retention, reduced combined-cycle gas turbine (“CCGT”) dispatch, and reduced curtailment.¹⁸ Furthermore, CESA notes that the inclusion of different storage technologies with longer durations can serve as a mitigating factor for any risks related to overreliance on four-hour battery storage resources. Importantly, CalCCA’s findings support additional investigation of long-duration

¹⁷ CalCCA, at 14.

¹⁸ CalCCA comments at 20-22.

energy storage. The performance characteristics and cost structures of various long-duration storage resources can be sufficiently different to warrant further review and modeling of diverse long-duration storage options.

VII. CONCLUSION.

CESA appreciates the opportunity to submit these reply comments to the Ruling and looks forward to working with the Commission and stakeholders in this proceeding.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "Alex J. Morris".

Alex J. Morris
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CALIFORNIA ENERGY STORAGE ALLIANCE

Date: January 6, 2020