

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

Order Instituting Investigation pursuant to Senate Bill 380 to determine the feasibility of minimizing or eliminating the use of the Aliso Canyon natural gas storage facility located in the County of Los Angeles while still maintaining energy and electric reliability for the region.

Investigation 17-02-002
(Filed on February 9, 2017)

**COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE ON THE
ADMINISTRATIVE LAW JUDGE'S RULING ENTERING INTO THE RECORD
ALISO CANYON INVESTIGATION 17-02-002, PHASE 3 REPORT, REQUESTING
COMMENTS**

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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 comments on the *Administrative Law Judge’s Ruling Entering into the Record Aliso Canyon Investigation 17-02-002, Phase 3 Report, Requesting Comments* (“Ruling”), issued by Administrative Law Judge (“ALJ”) Zhen Zhang on January 19, 2022.

I. INTRODUCTION.

CESA appreciates the opportunity to collaborate with the Commission and parties to Investigation (“I.”) 17-02-002. In these comments, CESA seeks to provide feedback on the Aliso Canyon Phase 3 Report (“Report”) and offer actionable recommendations in light of the findings of said analysis. Overall, the Report prepared by FTI Consulting and Gas Supply Consulting (jointly referred to herein as the “Consulting Team”) offers important insights on the merits of different strategies to minimize reliance on Aliso Canyon. Importantly, the benefit-cost analysis included in the Report appropriately finds that investing in zero-carbon electric generation additions yields the highest benefits across the study years. While these results are directionally useful, the Report’s methodological approach has significant shortcomings that limit its

applicability. In this context, CESA elaborates on these limitations and offers means to overcome them, as well as a pathway to develop an optimal portfolio that may reduce reliance on Aliso Canyon in a timely manner. As such, CESA's comments can be summarized as follows:

- The Report clearly indicates that bolstering electric generation in the areas dependent on Aliso Canyon is the most beneficial strategy to reduce reliance on natural gas.
- The Report fails to consider the economic, locational, and technical merits of hybrid assets.
- The Report does not consider the effects of transmission and resource availability limitations within the California Independent System Operator's ("CAISO") footprint on the reliability of the areas dependent on Aliso Canyon.
- The Commission should collaborate with relevant stakeholders to identify an optimal resource mix that can meet the electric shortfalls in a manner consistent with Portfolio 3.

II. THE REPORT CLEARLY INDICATES THAT BOLSTERING ELECTRIC GENERATION IN THE AREAS DEPENDENT ON ALISO CANYON IS THE MOST BENEFICIAL STRATEGY TO REDUCE RELIANCE ON NATURAL GAS.

In the Report, the Consulting Team seeks to identify a viable alternative to the Aliso Canyon natural gas storage facility, as well as evaluating the distinct costs and benefits of the different potential solutions. To this effect, the Consulting Team evaluated five different portfolio types, listed below:¹

- **Portfolio 1 – Gas Transmission Expansion:** Consists of natural gas supply increases either through additional pipeline capacity and/or access to additional natural gas storage capacity.
- **Portfolio 2 – Gas Demand Reduction:** Consists of a combination of building electrification, energy efficiency, and gas demand response.
- **Portfolio 3 – Electric Generator Additions:** Consists of a set of zero-carbon generation capacity above Base Case levels that relies principally on the resource

¹ See Report at 3.

mix from the Commission’s 11.5 GW net qualifying capacity (“NQC”) procurement order.

- **Portfolio 4 – Electric Transmission Additions:** Consists of transmission lines that increase the CAISO interface and/or increase transmission into the Los Angeles Department of Water and Power’s (“LADWP”) territory.
- **Portfolio 5 – Hybrid:** Consists of certain elements from Portfolios 1-4 that cost-effectively address the shortfalls in 2027 and 2035.

The different portfolios were evaluated by the Consulting Team across four metrics (costs, net benefits, benefit-cost ratio, and carbon dioxide emission reductions) for the two study years (2027 and 2035). As it can be seen in Tables 1 and 2 below,² Portfolio 3 is consistently in the top 3 portfolios by total benefits, net benefits, and benefit-cost ratio. These figures demonstrate that, despite significant costs, Portfolio 3 is a dependably attractive investment as it closely aligns with minimizing reliance of Aliso Canyon while retaining reliability, reducing electric costs, and increasing the amount of resource adequacy (“RA”) assets in the state.

Table 1: 2027 Cost Benefit Summary Results (Millions of 2019 USD)

Portfolio	Benefits	Benefits Rank	Net Benefits	Net Benefits Rank	Benefit-Cost Ratio (“BCR”)	BCR Rank	Reduction in CO2 Emissions (million metric tons)	Emission Reduction Rank
Portfolio 1a	\$0.00	6	(\$100.40)	6	NA	NA	0	6
Portfolio 1b	\$0.00	6	(\$147.30)	7	NA	NA	0	6
Portfolio 2	\$247.30	5	\$49.40	4	1.25	2	1.857	2
Portfolio 3	\$712.60	1	\$59.70	3	1.09	4	1.243	5
Portfolio 5a	\$283.10	4	\$86.80	1	1.44	1	2.097	1
Portfolio 5b	\$435.80	3	\$60.30	2	1.16	3	1.673	3
Portfolio 5c	\$548.30	2	\$34.40	5	1.07	5	1.481	4

² *Ibid*, at 4.

Table 2: 2035 Cost Benefit Summary Results (Millions of 2019 USD)

Portfolio	Benefits	Benefits Rank	Net Benefits	Net Benefits Rank	Benefit-Cost Ratio (“BCR”)	BCR Rank	Reduction in CO2 Emissions (million metric tons)	Emission Reduction Rank
Portfolio 1a	\$0.00	8	(\$66.80)	6	NA	NA	0	7
Portfolio 1b	\$0.00	8	(\$118.30)	7	NA	NA	0	7
Portfolio 2	\$193.60	3	(\$450.70)	9	0.3	6	0.986	2
Portfolio 3	\$895.10	1	\$298.40	1	1.5	3	1.072	1
Portfolio 4a	\$195.30	2	\$69.80	3	1.56	2	0.061	6
Portfolio 4b	\$176.30	4	\$86.70	2	1.97	1	-0.035	9
Portfolio 5d	\$65.30	7	(\$173.80)	8	0.27	7	0.427	3
Portfolio 5e	\$83.50	6	(\$38.50)	5	0.68	5	0.268	4
Portfolio 5f	\$126.30	5	\$26.80	4	1.27	4	0.17	5

As it can be observed in the tables above, Portfolio 3 is always among the most beneficial portfolios for each of the study years. For 2027, Portfolio 3 is the one with the highest benefits; nevertheless, the costs associated to it make it so that it places third in terms of net benefits. The two portfolios that surpass it, Portfolios 5a and 5b, are combinations of Portfolios 2 and 3 that are essentially a mix of gas demand reductions strategies and electrical generation investments. Importantly, the two portfolios that surpass Portfolio 3 in terms of net benefits are the ones with fewer electric resource additions. This suggests that cost assumptions are the key factor differentiating these portfolios. CESA hypothesizes that the omission of solar PV generation, even in hybrid configurations with storage resources, is likely to be the driver of higher costs for Portfolio 3. This topic is further explored in Section III of these comments.

Something similar occurs in 2035, where Portfolio 3 has the highest benefits, net benefits, and emission reductions, but ranks third in terms of BCR. The two portfolios with BCRs higher than that of Portfolio 3, Portfolios 4a and 4b, assume significant transmission investments. Portfolio 4a increases the CAISO’s interface limit by approximately 2.9 GW and Portfolio 4b increases it by 1 GW while adding 1 GW of interzonal transmission between Arizona and the LADWP’s territory. Critically, neither of these portfolios identify specific transmission additions or upgrades that may provide the modeled benefits. In fact, the Consulting Team notes that quantifying the impacts of such additions would require power flow modeling, which is beyond

the scope of the Report;³ as such, these portfolios should not be considered as viable alternatives comparable to Portfolio 3, but as “what if” scenarios that have not been realistically vetted or developed.

Taking the above into account, the Commission should consider that Portfolio 3 is the solution with the most benefits associated to it in both 2027 and 2035. Portfolio 3 is also consistently among the highest ranked in terms of net benefits and BCR, falling behind other options mostly due to inadequate resource and cost assumptions, as discussed in Section III. The Commission should therefore work with stakeholders to further develop a version of Portfolio 3 that optimally meets the needs of the areas dependent on Aliso Canyon.

III. THE REPORT FAILS TO CONSIDER THE ECONOMIC, LOCATIONAL, AND TECHNICAL MERITS OF HYBRID ASSETS.

In their description of Portfolio 3 within the Report, the Consulting Team notes that solar capacity was excluded from the analysis of the contributions of incremental electricity additions for 2027 and 2035 since the expected shortfall peaks at 10 PM.⁴ Because of this exclusion, not only solar but also hybrid solar-plus-storage resources, whether in-front-of-the-meter (“IFOM”) or behind-the-meter (“BTM”), are completely excluded from the resource mix assumed for Portfolio 3.⁵ This exclusion is a fundamental flaw of the Report. Excluding solar-plus-storage hybrids from Portfolio 3 greatly affects the costs associated with this alternative, and it fails to recognize the fact that these assets can be feasibly placed in urban areas within southern California, minimizing land use and utilizing the region’s superb solar resource.

The Report’s deficient representation of the capabilities of solar-plus-storage hybrids has the potential to skew results towards retaining polluting facilities for longer than necessary and/or overprocurement of incremental capacity, both being sub-optimal outcomes for Californian ratepayers. The Consulting Team’s exclusion of solar assets, even in hybrid configurations, also artificially increases the costs associated with Portfolio 3. According to the National Renewable Energy Laboratory’s (“NREL”) Annual Technology Baseline (“ATB”), the

³ Report at 59.

⁴ Report at 50.

⁵ *Ibid.*

data source for resource cost assumptions used in the Report,⁶ the total overnight costs (\$/kW) of a class 5 land-based wind generator are approximately 19% higher than those associated with a class 5 utility-scale solar asset.⁷ Since the Consulting Team’s decision to exclude solar generation makes it so that the only generators in Portfolio 3’s resource mix are geothermal and wind assets, the aforementioned overnight cost difference has a significant effect on the economic evaluation of this alternative.

CESA is aware of the complexities of modeling hybrid resources; nevertheless, the current proceeding’s impact on California’s efforts to reliably decarbonize its electric sector merits the rigorous assessment of all asset types that can contribute to minimizing reliance on Aliso Canyon. This rigorous review of the different resources available should also include consideration of hybridizing existing natural gas facilities, as these investments can bolster local reliability while minimizing natural gas demand.

CESA has continuously advocated for the Commission to proactively consider the role of gas-plus-storage hybrids in a grid with increasing flexibility requirements and progressively more stringent emission targets. CESA has highlighted that hybrid gas-plus-storage resources are not a hypothetical future technology; but one that has been installed and is currently operating at multiple locations on California’s grid.⁸ The inclusion of these hybrids as a candidate resource could additionally provide insights regarding the benefits of locating capacity in constrained areas, an issue that the Commission has indicated a growing interest in within the recent Preferred System Plan (“PSP”) Proposed Decision (“PD”).⁹ In line with the analytic intent of Portfolio 3, the hybridization of existing gas facilities represents a readily-available and low-cost upgrade option that would reduce gas demand, increase the available generation within the areas served by Aliso Canyon, and should thus be specifically modeled as part of any analysis related to this investigation.

⁶ Report at 54.

⁷ NREL (National Renewable Energy Laboratory). 2021. 2021 Annual Technology Baseline. Golden, CO: National Renewable Energy Laboratory.

⁸ CESA, *Comments of The California Energy Storage Alliance On The Proposed Decision And Alternate Proposed Decision Requiring Procurement To Address Mid-Term Reliability (2023-2026)*, filed under Rulemaking (“R.”) 20-05-003 on June 10, 2021, at 10.

⁹ See Commission, *Decision Adopting 2021 Preferred System Plan*, filed under R.20-005-003 on December 22, 2021, at 162.

In 2022, hybrid resources will provide significant capacity in the Commission’s RA Program.¹⁰ These resources participate in the CAISO markets by optimizing their joint output through bids under 24-by-7 must-offer obligations (“MOO”). By virtue of their ability to arbitrage onsite generation and manage their state-of-charge (“SOC”) through bids, hybrid resources are able to optimize their output based on grid needs. Given the complementary reliability benefits of solar and storage resources as well, the costs to construct a portfolio to meet reliability in a way that does not mirror what is expected pursuant to D.21-06-035 are also inflated. As such, CESA does not agree with the simplified assumption that the dispatch of hybrid resources cannot be optimized and that solar-plus-storage resources are unable to provide energy once the sun sets. CESA also considers that the definition of Portfolio 3 would allow for the evaluation of upgrading existing fossil-fueled capacity to gas-plus-storage assets. CESA recommends that the Commission cure this fundamental deficiency of the Report in its development of an optimal resource mix by incorporating both solar- and gas-plus-storage hybrids as candidate resources in a future capacity expansion modeling effort, as outlined in Section V of these comments.

IV. THE REPORT DOES NOT CONSIDER THE EFFECTS OF TRANSMISSION AND RESOURCE AVAILABILITY LIMITATIONS WITHIN THE CAISO’S FOOTPRINT ON THE RELIABILITY OF THE AREAS DEPENDENT ON ALISO CANYON.

As noted previously in Sections II and III, while the Report’s results point toward the viability of a solution akin to Portfolio 3, the methodological deficiencies of this analysis merit further exploration by the Commission. CESA is particularly concerned with the lack of consideration of transmission and resource/land availability constraints in the areas that are dependent on the natural gas storage of Aliso Canyon. The apparent omission of these constraints makes it more complex to assess whether the resource mix associated with Portfolio 3 is feasible given the transmission and land constraints of the LA Basin.

A sizable fraction of the load served by resources that draw from Aliso Canyon is located within the CAISO’s LA Basin local reliability area (“LRA”). LRAs are load pockets with limited

¹⁰ According to CAISO, over 1 GW of storage in hybrid or co-located configurations will be online by the end of Q1 2022. See <http://www.caiso.com/Documents/Presentation-StorageForum-Oct28-2021.pdf>

transmission and/or generation, making them particularly tough areas to serve. Given the difficulty of meeting load in these circumstances, the Commission instructs jurisdictional load-serving entities (“LSEs”) to procure capacity specific to LRAs, Local RA, in order to ensure local reliability. In this context, the LA Basin’s LRA status underscores that limited assets can be developed internally, mostly due to land constraints and transmission limitations. This is confirmed by the CAISO’s most recent Local Capacity Technical Study (“LCTS”), which notes that, given transmission limitations, only 650 MW of 4-hour storage could be deployed in the LA Basin to replace natural gas assets one-for-one by 2026.¹¹ This figure shows that the development of electrical resources in the areas served by generation dependent on Aliso Canyon require further analysis. CESA recommends that the Commission cure these deficiencies, along with those related to candidate resources, by performing capacity expansion modeling specific to the LA Basin. CESA offers comments on this matter in Section V.

V. THE COMMISSION SHOULD COLLABORATE WITH RELEVANT STAKEHOLDERS TO IDENTIFY AN OPTIMAL RESOURCE MIX THAT CAN MEET THE ELECTRIC SHORTFALLS IN A MANNER CONSISTENT WITH PORTFOLIO 3.

As underscored throughout these comments, the Report is correct in directionally suggesting that a solution based on incremental electric generation additions is the most beneficial strategy to minimize reliance on Aliso Canyon. The Report, however, omits significant factors into its analysis, such as the consideration of solar-plus-storage hybrids, and the potential land and transmission limitations of the area served by generators dependent on Aliso Canyon.

In order to cure these deficiencies, CESA recommends that the Commission, within either this proceeding or the Integrated Resource Planning (“IRP”) proceeding, collaborate with relevant stakeholders to develop a methodological framework that can identify an optimal portfolio to meet the expected electrical shortfall, as defined in the Report, and accelerate the transition away from relying on Aliso Canyon. This effort would likely require capacity expansion modeling tuned to specifically meet the reliability needs of the LA Basin and other areas reliant on Aliso Canyon. The model utilized by the Commission should take into account

¹¹ CAISO, *2026 Local Capacity Technical Study*, at 24.

the transmission limits within these areas and between these areas and the broader CAISO footprint. The model employed should also consider solar generation, both standalone and in hybrid configurations with energy storage, as candidate resources, in addition to those already within Portfolio 3's resource mix. Finally, the model should evaluate the potential of upgrading existing fossil-fueled resources to gas-plus-storage hybrids, as noted in Section III.

VI. CONCLUSION.

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

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Jin Noh', written in a cursive style.

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