

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

Order Instituting Rulemaking to
Continue Electric Integrated Resource
Planning and Related Procurement
Processes.

Rulemaking 20-05-003
(Filed on May 7, 2020)

**COMMENTS OF THE CALIFORNIA ENERGY STORAGE ALLIANCE ON THE
ADMINISTRATIVE LAW JUDGE'S RULING SEEKING COMMENTS ON PROPOSED
PREFERRED SYSTEM PLAN**

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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 Seeking Comments on Proposed Preferred System Plan* (“Ruling”), issued by Administrative Law Judge (“ALJ”) Julie Fitch on August 17, 2021.

I. INTRODUCTION.

The issuance of the Ruling represents an important step in the continued evolution of the Integrated Resource Planning (“IRP”) process. With this Ruling, the Commission has, for the first time, compiled a portfolio based on the aggregation of individual filings submitted by load-serving entities (“LSEs”). In addition, the proposed Preferred System Plan (“PSP”) represents the first time the Commission would utilize a 38 million metric ton (“MMT”) statewide greenhouse gas (“GHG”) emission target by 2030, a substantial modification relative to the prior PSP. CESA welcomes these key areas of progress and appreciates the opportunity to respond to the questions included in the Ruling and provide feedback on the development of the PSP.

Overall, CESA supports the analysis and sensitivity scenarios considered by the Commission, which represents significant effort on the part of the Commission staff in aggregating two different sets of individual IRPs and in reflecting the outstanding directed procurement pursuant to Decision (“D.”) 21-06-035, the Mid-Term Reliability (“MTR”) Decision. The results of the production cost modeling (“PCM”) analysis carried out for the purposes of this Ruling, as well as other studies referenced herein, generally conclude that if the proposed PSP, inclusive of the resources considered in D.19-11-016 and the MTR Decision, the state will be on track to a reliable grid that would meet GHG targets consistent with Senate Bill (“SB”) 100. This being said, CESA considers that the proposed PSP could still be enhanced by considering more updated and adequate load assumptions, as well as performing incremental PCM analysis to ensure the aggressive buildout rate expected in the coming five years should be accelerated or modified in order to preserve reliability. CESA’s comments can be summarized as follows:

- The Commission’s finding that the aggregated portfolios include a smaller amount of diverse assets yet more resources with higher net qualifying capacity (“NQC”) than the Reference System Plan (“RSP”) could be explained by the amount of four-hour battery energy storage systems (“BESS”) that LSEs included in their individual filings in order to meet their share of long duration energy storage (“LDES”) selected under the RSP.
- The fact that the reliability shortfall is more significant for the 46 MMT aggregate portfolio than for the 38 MMT one, indicates that, in addition to the enabling of our decarbonization goals, pursuing a 38 MMT planning target also represents a reasonable hedge against potential capacity shortfalls.
- Staff’s consolidation of solar resources to align with battery locations is a step towards representing co-located and hybrid resources, but it only captures the siting advantages of co-location since the capacity expansion model, RESOLVE, and does not count with hybrid and/or co-located candidate resources with their specific cost assumptions.
- Assuming that LDES assets contemplated in D.21-06-035 will require the extension to 2028 represents a conservative “worst case” scenario and the

Commission would be remiss if it did not evaluate capacity expansion decisions with LDES assets coming online by 2026.

- CESA requests the Commission perform additional analysis that considers (1) the integration of LDES assets under the long lead-time (“LLT”) umbrella, as described in the MTR Decision, by 2026; (2) a 38 and 30 million MMT emissions target; (3) the 2020 Integrated Energy Policy Report (“IEPR”) load assumptions; and (4) the IEPR 2020 High EV (unmanaged) load modifier.
- While CESA understands the Commission’s interest in exploring the capacity expansion effects of the PATHWAYS High Electrification forecast, it is important to contemplate the potential challenges of adopting a PSP that would deviate from the single forecast set (“SFS”) agreement.
- While the PCM analysis contained in the Ruling demonstrates the reliability of the 38 MMT Core portfolio in 2026 and 2030, it also reveals important inconsistencies in the models and analyses that the Commission and other agencies have utilized over the last year, such as the California Energy Commission’s (“CEC”) MTR Reliability Analysis.
- Given the importance of fully stochastic PCM analysis of the reliability of the proposed PSP, the Commission should perform PCM analysis on the 38 MMT 2020 IEPR + 2020 IEPR High EV (unmanaged) and the 38 MMT Core portfolios for 2022 through 2026, and 2030.
- CESA supports the Commission’s intent to collaborate with the CEC and the California Independent System Operator (“CAISO”) in order to assess the options available to develop a high electrification forecast to be used in the Transmission Planning Process (“TPP”) for the purposes of using the 30 MMT High Electrification case as an additional policy-driven sensitivity.
- The Commission should authorize LSEs to engage in and propose procurement for mutual benefit.
- Following a “bottom-up” approach to direct procurement related to the proposed PSP may be preferable to a “top-down” approach since it would direct LSEs to obtain the resources already contemplated in their planning.
- The Commission should not accelerate procurement associated with the MTR Decision.
- Geographically-targeted procurement should be encouraged to reduce reliance on the Aliso Canyon natural gas facility and reduce GHG and pollutant impacts in

disadvantaged communities (“DACs”), with steps to more significantly reduce or fully eliminate reliance on Aliso Canyon being informed by modeling completed in I.17-02-002 and/or by other parties.

II. **RESPONSES TO QUESTIONS INCLUDED IN THE RULING.**

Question 1: Please comment on the individual IRP portfolio aggregation performed by Commission staff.

CESA appreciates the Commission’s commitment to developing solutions that enable the expeditious aggregation of LSE plans. The design of RECARTE represents an encouraging development for the IRP proceeding. Furthermore, during the aggregation process, the Commission additionally reviewed the Clean System Power (“CSP”) calculators, another filing made by LSEs in September 2020 in order to estimate the GHG emissions associated with their portfolios. In the Ruling, the Commission notes that both the 46 MMT and 38 MMT aggregations came in under the target GHG amounts. This result, however, is not reaffirmed by the PCM using the SERVVM model. The misalignment between these two models is significant and should be studied further by the Commission.

In its comparison of both aggregated portfolios, the Commission staff underscores two key observations. First, the aggregated portfolios include more resources with higher NQC than the RSP. Second, the aggregated portfolios generally include a smaller share of diverse resources (*e.g.* geothermal, LDES, offshore wind, out-of-state [“OOS”] wind, and biomass) than what was recently required by the MTR decision. Both of these highlights could be explained by the amount of four-hour BESS that LSEs included in their individual filings in order to meet their share of LDES selected under the RSP, compounded with the lack of NQC or longer-duration energy valuation for LDES assets to support Resource Adequacy (“RA”) compliance.

In D.20-03-028, the Commission instructed LSEs to include in their individual plans resources in the general categories identified in the Commission’s RSP and in the alternative portfolio at the 38 MMT GHG level in 2030. Ordering Paragraph (“OP”) 6 of D.20-03-028 noted that individual LSEs may vary the specific resources selected within each category, with these being LDES (then defined as 8-12 hours); short-duration storage (4 hours or less); renewables; hybrid resources; and others.¹ Given this guidance, LSEs submitted that it could be possible to meet LDES requirements by procuring a combination of short-duration storage. This alternative resulted in a number of LSEs going above their shares of BESS and below their share of LDES.

Table 1: LSE-Specific Planned vs. CPUC Modeled Storage Buildout by 2030 (38 MMT)²

Load Serving Entity (LSE)	LSE Code	LSE Type	LSE IRP Planned Battery Storage (MW)	RSP Modeled Share of Battery Storage (MW)	Difference (MW)	Long Duration Storage by 2030 (MW)	RSP Modeled Share of Long Duration Storage (MW)	Difference (MW)
Apple Valley Choice Energy	AVCE	CCA	10.5	27.0	(16.5)	3.0	4.0	(1.0)
City of Baldwin Park	BP	CCA	11.5	28.0	(16.5)	3.0	5.0	(2.0)
City of Commerce	COM	CCA	13.5	46.0	(32.5)	3.0	8.0	(5.0)
Clean Energy Alliance	CEA	CCA	77.0	41.0	36.0	7.0	7.0	-
Clean Power Alliance	CPA	CCA	762.0	634.0	128.0		156.0	(156.0)
Clean Power San Francisco	CPSF	CCA	250.0	133.0	117.0	15.0	22.0	(7.0)
Desert Community Energy	DCE	CCA	89.0	27.0	62.0	7.0	5.0	2.0
East Bay Community Energy	EBCE	CCA	432.0	367.0	65.0	80.0	53.0	27.0
Lancaster Clean Energy	LCE	CCA	12.5	64.0	(51.5)	4.0	11.0	(7.0)
Marin Clean Energy	MCE	CCA	540.0	272.0	268.0	45.0	45.0	-
Monterey Bay Community Power	MBCP	CCA	396.0	226.0	170.0	50.0	37.0	13.0
Peninsula Clean Energy	PCE	CCA	350.0	139.0	211.0		23.0	(23.0)
Pico Rivera Innovative Municipal Energy	PRIME	CCA	9.5	28.0	(18.5)	3.0	5.0	(2.0)
Pioneer Community Energy	PION	CCA	57.0	58.0	(1.0)	10.0	10.0	-
Pomona Choice Energy	POM	CCA	16.5	47.0	(30.5)	3.0	8.0	(5.0)
Rancho Mirage Energy Authority	RMEA	CCA	10.5	31.0	(20.5)	3.0	5.0	(2.0)
Redwood Coast Energy Authority	RCEA	CCA	23.0	21.0	2.0	7.0	4.0	3.0
San Diego Community Power	SDCP	CCA	416.0	369.0	47.0	65.0	61.0	4.0
San Jacinto Power	SJP	CCA	7.0	18.0	(11.0)	2.0	3.0	(1.0)
San Jose Clean Energy	SJCE	CCA	210.0	202.0	8.0		33.0	(33.0)
Santa Barbara Clean Energy	SBCE	CCA	11.0	38.0	(27.0)	3.0	6.0	(3.0)
Silicon Valley Clean Energy	SVCE	CCA	191.0	194.0	(3.0)		32.0	(32.0)
Sonoma Clean Power	SCP	CCA	84.0	108.4	(24.4)	20.0	20.0	-
Southern California Edison	SCE	IOU	1,676.0	1,856.0	(180.0)		64.2	(64.2)
Valley Clean Energy Alliance	VCE	CCA	63.0	44.0	19.0		7.0	(7.0)
Total			5,827.5	5,018.4	809.1	358.0	634.2	(276.2)

Note: ESPs have been eliminated for clarity as their information is confidential and redacted from public records.

While LSEs are not bound to adhere to the portfolio selections made in the RSP, it is worth noting that LSEs’ collective IRP submissions for lesser shares of LDES is particularly attractive

¹ 2019-2020 Electric Resource Portfolios to Inform Integrated Resource Plans and Transmission Planning, D.20-03-028, issued in R.20-05-003 on April 6, 2020 at 105-106.

² CESA conducted our own aggregation of data from the RTDs filed on September 1, 2020 in R.20-05-003.

for LSEs given the current state of NQC counting for energy storage within its RA framework. Today, energy storage assets receive an NQC value equal to the maximum power the asset can continuously sustain for four or more hours,³ resulting in higher incentives for LSEs to procure four-hour energy storage assets that will be fully credited instead of LDES resources that would not yield incremental RA value. As such, allowing LSEs to vary the specific assets selected under each of the RSP's resource categories paired with the RA valuation of storage assets resulted in aggregate portfolios with more NQC and less storage diversity. The consequences of these factors are more pronounced in the 38 MMT scenarios than the 46 MMT scenarios, largely due to the fact that the 38 MMT RSP portfolio included 1,605 MW of LDES, 64% more than its 46 MMT counterpart.⁴ As a result, the 38 MMT aggregate portfolio, and the 38 MMT Core portfolio in turn, contains a significantly higher share of BESS assets as compared to the RSP. While heavy reliance on BESS assets is not concerning on its face,⁵ we offer these observations as additional explanations for the results from the aggregation of LSE portfolios, as well as some recommendations in subsequent responses (*see* Question 15) on how the Commission could manage the challenges associated with bringing over 10 GW of BESS online in the next 3-4 years.

Question 2: Comment on the reliability analysis of the aggregated 38 MMT LSE plans.

The PCM of the aggregate portfolios revealed that both the 46 MMT and 38 MMT aggregations failed to meet reliability targets – *i.e.*, the industry standard of a 0.1 or less loss-of-load expectation (“LOLE”) for the analyzed years, 2026 and 2030.⁶ Notably, the reliability

³ 2020 *Qualifying Capacity Methodology Manual*.

⁴ 2019-2020 *Electric Resource Portfolios to Inform Integrated Resource Plans and Transmission Planning*, D.20-03-028, issued in R.20-05-003 on April 6, 2020 at 46.

⁵ However, CESA underscores that the lack of consideration of multi-day reliability risks may be overlooked in current IRP modeling, which may point to additional value attributable to LDES resources.

⁶ Ruling at 9.

shortfall is more significant for the 46 MMT aggregate portfolio than for the 38 MMT one. The LOLE of the 46 MMT aggregation is 24% higher in 2026 and 66% higher in 2030, relative to the 38 MMT aggregation.⁷ This indicates that, in addition to advancing decarbonization, pursuing a 38 MMT planning target also represents a reasonable hedge against potential capacity shortfalls.

CESA is less concerned by the inability of the aggregated portfolios to meet the 0.1 LOLE metric since these aggregations do not include the requirements included in the MTR Decision (D.21-06-035), even if it highlights how future IRP cycles must consider ways to improve reliability-focused capacity expansion in RESOLVE's system modeling and in the individual LSE's development of IRP filings. As such, the aggregated portfolios only represent the planning done prior to D.21-06-035, which was known to be potentially deficient in the near-term (2021-2023) and mid-term (2023-2026). In this context, the incrementality of the capacity directed in D.21-06-035 to the individual IRP plans becomes essential. As a result, the CESA recommends the Commission ensure that the resources contained in the individual IRP plans and the MTR Decision are timely deployed (*see* our response to Question 12).

Question 3: Comment on the appropriateness of the scenarios and sensitivities developed in RESOLVE to be considered as the preferred portfolio. Suggest any alternative sensitivities or changes to the analysis.

In general, the majority of the scenarios based on the forecasts developed by the CEC Integrated Energy Policy Report (“IEPR”) result in fairly similar builds, varying around the order of 1 GW in magnitude. Despite this relatively small variance, some assumptions are essential for a portfolio to reliably reflect the future conditions of the grid. CESA requests the Commission perform additional analysis that considers: (1) the integration of LDES assets under the long lead-time (“LLT”) umbrella, as described in the MTR Decision, by 2026; (2) a 38 MMT and 30 MMT

⁷ Ruling at 10.

emissions target; (3) the 2020 IEPR load assumptions; and (4) the IEPR 2020 High EV (unmanaged) load modifier. These modifications and sensitivities provide assurances for the purposes of selecting a PSP since they contemplate the most recent load forecasts while considering the rising electrification of the transportation sector in a conservative fashion. Our proposed incremental sensitivity analyses are summarized below:

Table 2: Incremental Scenarios and Sensitivities Recommended by CESA

Scenario name in Attachment A	MTR-related LDES online year	Incremental RESOLVE modeling	Incremental SERVM modeling
38 MMT Core	2026	Yes (2022-2026, 2028, 2030, 2032, 2035, 2040, 2045)	Yes (2022-2025, 2030)
38 MMT Core	2028	No	Yes (2022-2026, 2030)
38 MMT 2020 IEPR + 2020 IEPR High EV (unmanaged)	2026	Yes (2022-2026, 2028, 2030, 2032, 2035, 2040, 2045)	Yes (2022-2026, 2030)
2020 IEPR + 2020 IEPR High EV (unmanaged)	2028	No	Yes (2022-2026, 2030)

A. Integration of LDES Assets by 2026

To capture the requirements of MTR Decision (D.21-06-035), the Commission added the required resources or resource attributes to cover the 11.5 GW NQC ordered in D.21-06-035, assuming that LLT resources will be online by 2028, not 2026. Essentially, this assumes that LLT assets will require the extension contemplated in D.21-06-035. While understanding the motivation to plan with a conservative “worst case” scenario in mind, we see benefit in evaluating the case in which LLT assets could come online by 2026. This is particularly plausible for certain LDES technologies that are modular, scalable, and not geographically constrained, increasing the feasibility of certain LDES assets to meet the 2026 timeline, provided LSEs act expeditiously and various interconnection and upgrade timelines are completed in a timely manner. CESA requests

deeper consideration of this sensitivity since SERVM analysis demonstrates that enforcing 2026 rather than 2028 delivery dates on the LLT resources yields significantly lower GHG emissions and reduced reliability risk, potentially affecting the resource build selected in subsequent years.

B. 38 MMT and 30 MMT Emissions Target

CESA appreciates staff's continued modeling of the 46, 38, and 30 MMT targets. The communication of these three decarbonization alternatives provides stakeholders a valuable framework to compare the results of the capacity expansion process while highlighting least-regrets actions. However, now and going forward, CESA recommends that the Commission focus primarily on the 38 and 30 MMT scenarios, as they most closely represent the future envisioned by Senate Bill ("SB") 100 and reflect the urgency of stemming the fallout of recent emergency and extreme events (*i.e.*, drought, heatwaves, wildfires) magnified in magnitude and frequency by climate change.

C. 2020 IEPR Load Assumptions

CESA supports the Commission's consideration of updated load assumptions as included in the 2020 IEPR. The use of the most recent load assumptions is particularly important considering the feedback provided by the CAISO during the Commission's development of the MTR Decision. In comments to the *Administrative Law Judge's Ruling Seeking Feedback on Mid-Term Reliability Analysis and Proposed Procurement Requirements* ("MTR Ruling"), the CAISO correctly observed that the Commission's analysis could potentially understate the magnitude of need since the peak demand in the 2020 IEPR is 1,222 MW higher than in the 2019 IEPR, the forecast that is also utilized in

the 38 MMT Core scenario.⁸ Moreover, the CAISO underscored that 2020 IEPR also forecasts that the shape of load will change earlier than expected. As described below, based on the 2019 IEPR, the peak hour occurs at hour ending 8 p.m. PDT starting 2024 whereas in the 2020 IEPR forecast the peak hour shifts to 8 p.m. PDT as early as 2023.

Table 3: IEPR Forecasted Peak Hour 2021-2026 (Hour Ending in Pacific Daylight Time)⁹

	2021	2022	2023	2024	2025	2026
IEPR 2019	7 PM	7 PM	7 PM	8 PM	8 PM	8 PM
IEPR 2020	6 PM	7 PM	8 PM	8 PM	8 PM	8 PM

According to CAISO’s analysis, the differences between the 2019 and 2020 IEPR forecasts are significant when considering the potential for capacity shortfalls during the summer peak, especially since the peak hour now occurs later in the day when solar generation is declining. According to these analyses, the use of the 2019 or 2020 IEPR accounted for a difference of over 2 GW in the estimated shortfall by 2026.¹⁰ Despite the limitations of both the Commission’s and CAISO’s deterministic stack analyses for the purposes of the MTR Ruling, the capacity expansion modeling results of the 38 MMT 2020 IEPR case also demonstrate the importance of considering this shift in demand. The 38 MMT 2020 IEPR case selects 2 GW less solar and approximately 200 MW more of BESS by 2032, relative to the 38 MMT Core portfolio.¹¹ While these differences are relatively minor relative to the magnitude of incremental capacity needed, it underscores that it is generally desirable for the Commission, CAISO and all agencies and regulators to use the most recent load assumptions in their planning processes. While CESA understands that

⁸ CAISO Comments on MTR Ruling filed in R.20-05-003 on March 26, 2021 at 7.

⁹ *Ibid.*

¹⁰ *Ibid* at 8.

¹¹ Ruling, Attachment A, at 73.

the development of the proposed PSP represented particular challenges, the Commission would be amiss to delay the use of the most recent load assumptions. This is particularly important considering that the IRP functions as a biannual process and that the portfolio selected under this proceeding will be utilized to inform the CAISO's TPP.

D. 2020 IEPR High EV (Unmanaged) Load Modifier

CESA is generally supportive of considering high electric vehicle ("EV") load in the assumptions of the IRP process. While CESA understands the Commission's interest in exploring the capacity expansion effects of the PATHWAYS High Electrification forecast, it is important to contemplate the potential challenges of adopting a PSP that would deviate from the SFS agreement. As the Commission notes in the Ruling, doing so could require significant modifications to the models, inputs, and assumptions utilized in this proceeding and the TPP. Balancing these factors with the urgency of commencing procurement activities to retrain near- and mid-term reliability must be considered when selecting a portfolio to serve as the PSP.

To this end, CESA recommends the Commission perform incremental analysis on the 38 MMT 2020 IEPR + 2020 IEPR High EV (unmanaged). This portfolio merits further consideration as it only differs from the 38 MMT Core case by approximately 1 GW, yet it manages to incorporate the most recent load projections and consider high EV load. Essentially, this scenario manages to preserve the comparability of the forecasts used across agencies and planning venues, easing its use for the purposes of TPP, a key consideration for adopting it as the PSP.

Question 4: Comment on the SERVVM analysis and results of the 38 MMT Core Portfolio.

The Ruling notes that the 38 MMT Core portfolio meets LOLE targets in 2026 and 2030.¹² In addition, staff highlighted that the 38 MMT Core portfolio yields significantly lower GHG emissions than the 38 MMT aggregated portfolio.¹³ While the analysis contained in the Ruling demonstrates the reliability of the 38 MMT Core portfolio in 2026 and 2030, it also reveals important inconsistencies in the models and analyses that the Commission and other agencies have utilized over the last year. SERVM's evaluation of the 38 MMT Core portfolio results in a LOLE of 0.064 by 2026.¹⁴ The CEC's MTR Reliability Analysis, on the other hand, reports a 2026 LOLE of 0.005 for the proposed PSP scenario.¹⁵ The difference between these two analyses cannot be overlooked: it is a full order of magnitude. Despite the fact that both analyses find the proposed PSP reliable, SERVM attributes a LOLE 1,280% higher than the CEC's analysis. This twelve-fold difference demonstrates the urgent need for comparable, consistent analyses that happen within a regular cadence of planning and procurement activities.

Since its introduction to the IRP process, CESA has supported the use of SERVM as a reliability check for the portfolios constructed by RESOLVE. The use of PCM to complement capacity expansion modeling is common across the industry and provides further insights with increased geographical, operational, and temporal granularity. The temporal component is particularly important considering the time-horizon limitations of the RESOLVE model, which makes capacity expansion decisions looking at 37 independent (*i.e.*, non-consecutive) days. CESA has long noted that RESOLVE's architecture makes the model unable to fully capture the reliability value of LDES. Notably, the results from SERVM's analysis demonstrate said value as

¹² Ruling, at 20.

¹³ *Ibid.*

¹⁴ *Ibid.*

¹⁵ CEC, *Midterm Reliability Analysis presentation*, August 30th, 2021, at 33.

the analysis shows that enforcing 2026 rather than 2028 delivery dates on the LLT resources considered under the MTR Decision yields significantly lower GHG emissions and reduced reliability risk.

Given the importance of this fully stochastic PCM analysis of the reliability of the proposed PSP, it is unfortunate that the Commission has decided to only analyze the LOLE of this portfolio in 2026 and 2030, especially considering that the results for the 2022-2025 period would have provided perhaps the most credible data on the potential for near- and mid-term reliability issues. Moreover, modeling the 2022-2025 period in SERVM would also communicate to the Commission and parties if and how much capacity would be needed in the 2022-2024 period, a decision that so far has been taken using expedited and simplified deterministic analyses. CESA notes that full PCM analysis of the next five years is essential to determine the adequacy of the dramatic build rate implied by the 38 MMT Core scenario and other sensitivities analyzed by the Commission. In light this and given the importance of communicating robust LOLE estimates, CESA recommends the Commission perform PCM analysis on the 38 MMT 2020 IEPR + 2020 IEPR High EV (unmanaged) and the 38 MMT Core portfolios for 2022 through 2026, and 2030.

Question 5: Comment on the appropriateness of the 38 MMT Core Portfolio as the PSP.

As noted in our responses to Question 3 and 4, the case that most conservatively includes the aforementioned changes is the 38 MMT 2020 IEPR + 2020 IEPR High EV (unmanaged) scenario. As a result, CESA requests the Commission perform incremental capacity expansion and PCM analysis on both the 38 MMT Core and the 38 MMT 2020 IEPR + 2020 IEPR High EV (unmanaged) scenarios.

Question 6: Comment on whether the load forecast assumptions should be adjusted to include higher load, particularly related to EV adoption or higher electrification more broadly.

Please refer to CESA’s responses to Questions 3 through 5.

Question 7: Comment on the proposal to use the 38 MMT Core Portfolio as the reliability and policy-driven base case in the TPP.

Please refer to CESA’s responses to Questions 3 through 5.

Question 8: Comment on the proposed policy-driven sensitivity portfolio for the TPP based on the 30 MMT GHG limit in 2030 with the high electrification load assumptions. Suggest any additional or alternative scenarios that should be analyzed as policy-driven sensitivities.

According to Appendix A of the Ruling, the 30 MMT High Electrification (Managed EV profile) (“30 MMT High Electrification”) sensitivity results in much higher 2032 resource build relative to both the 38 MMT Core (an incremental 25 GW) and the 38 MMT High Electrification (an incremental 13 GW) scenarios.¹⁶ Notably, despite the significant increase in load due to end-use electrification, the majority of it is served by additional solar PV and battery resources through 2032.¹⁷ This trend continues into 2045, with RESOLVE selecting 108 GW of solar PV and almost 53 GW of BESS. Oddly, this portfolio also includes 4.4 GW of natural gas capacity by 2045, despite the fact that it additionally selected 2.3 GW of geothermal, a firming renewable asset.¹⁸ This could be explained by RESOLVE’s inability to consider the potential for multi-day energy arbitrage due to its modeling of the system in 37 independent “representative” days.

Given the 30 MMT High Electrification portfolio would inform transmission planning during the 2022-2032 horizon, CESA supports the Commission’s intent to collaborate with the CEC and the CAISO in order to assess the options available to develop a high electrification forecast to be used in the TPP. Overall, the 30 MMT High Electrification scenario most closely

¹⁶ Ruling, Attachment A, at 99.

¹⁷ *Ibid.*

¹⁸ *Ibid.*

resembles a grid seeking to both rapidly decarbonize while expanding its energy delivery. As such, this case represents a viable starting point for a policy-driven sensitivity.

Question 9: Comment on whether and how the Commission should act to encourage specific non-transmission alternatives to be built, if identified as part of the CAISO TPP process, both for the two specific projects identified in the 2020-2021 TPP, as well as in general for future such opportunities.

CESA applauds the Ruling's recognition that Commission action, above and beyond the guidance provided via the IRP's planning and procurement tracks, is needed in order to guide optimal procurement outcomes, such as one that would encourage storage as a transmission asset ("SATA"). The Ruling accurately notes that single entities often lack the proper incentives to conduct procurement of certain types of resources. CESA is hopeful that the CAISO will relaunch the SATA Initiative to tackle some of these cost recovery and market participation questions to provide more comprehensive guidance on the SATA use case. However, even in the absence of such comprehensive guidance and mechanisms, CESA believes that SATA projects could be pursued and operationalized to both meet IRP procurement needs as well as transmission reliability needs, so long as the storage resource is not needed as strictly a transmission asset, which could be the case where SATA resources are needed for real-time contingency and dispatch.

For example, in Application ("A.") 20-04-013, Pacific Gas and Electric Company ("PG&E") submitted Local Area Reliability Service ("LARS") contracts for Commission approval of 37.5 MW of four-hour battery storage systems that would meet transmission needs identified and approved in the 2017-2018 TPP and would provide Local RA in place of the Oakland Power Plant. In this case, the CAISO committed to using day-ahead market tools to ensure reliable operations in local areas, including an assessment of forecast critical loading conditions in the local area and the possibility of and recovery from contingency conditions, which would then instruct and prepare the storage assets to charge and be ready as a transmission asset. At the same time, it

is important to note that the Application was fraught with disagreement among parties regarding the appropriate cost recovery mechanism (*i.e.*, use of the CAM in this case) for energy storage resources that function as both transmission and generation resources at different times. Other issues were raised over the course of the A.20-04-013 proceeding, but the Commission could act within this proceeding to clarify the appropriate cost recovery mechanism to be used if such projects were to be proposed. Until transmission cost recovery mechanisms are developed, CESA suggests that generation-related mechanisms could be used given the likely dominance of the storage assets being used for day-to-day RA capacity purposes, considering contingency events are infrequent even though they maintain primacy in accordance with the Multiple-Use Applications Decision (D.18-01-003).¹⁹ In doing so, CESA believes that SATA resources could be pursued in the interim with clarifications on this front.

In addition, for SATA resources upon providing certain clarifications on their procurement, CESA recommends that contract approval processes be streamlined and avoid the delays and disputes experienced in A.20-04-013. Understandably, as a novel use case, the project was facing policy questions and issues for the first time (*e.g.*, cost recovery), but CESA observed a troubling relitigation of deeply technical needs assessments already conducted by the CAISO in the TPP, which only serves to delay contract approval and the prospects of its approval and timely deployment. Although A.20-04-013 was dismissed due to interconnection delays,²⁰ a similar contract approval process would be untenable. As such, any procurement framework for SATA resources for the purposes of supporting IRP procurement needs as well should clarify the cost recovery mechanism and otherwise leave the technical needs assessment and operationalization

¹⁹ See Table 1 in D.18-01-003 at 10 and Rule 5 in Appendix A of D.18-01-003.

²⁰ See D.21-06-045.

pathways to the TPP, with the Commission contract approval process focusing on more appropriate criteria, such as cost reasonableness. In this way, SATA resources could serve a critical role in saving ratepayer dollars and in cost-effectively supporting both transmission reliability and long-term capacity needs. Given the fact that these resources may be able to leverage network resource interconnection processes, there may be additional advantages in relieving the cluster study interconnection queue backlog.

Furthermore, while the SATA application provides a clear example of an understudied application, certain early-stage resources also face costs and structural barriers that pose similar challenges despite the fact that their deployment could be in the interest of ratepayers and the state. These include the quick turnaround time for solicitation processes and commercial online date due to just-in-time procurement, financing barriers to bridge the “valley of death” between pilot and demonstration stage to commercial stage, and the scale needed to support economies of scale for certain technology and project types. In order to address this issue and facilitate procurement that supports system reliability, portfolio diversity, and other policy objectives, the Commission should authorize LSEs to engage in and propose procurement for mutual benefit (coined heretofore as “Mutual Benefit Procurement”). CESA recommends that the Commission commence the development of a well-defined and streamlined process for the proposal and approval of such projects based on the Procurement Framework Staff Proposal. Establishing this process will support the deployment of resources that are in alignment with the Commission’s policy goals while both balancing the need for oversight and providing an opportunity for appropriate allocation of both costs and benefits.

The Commission should clearly define the resources attributes and project characteristics merit eligibility for Mutual Benefit Procurement. In this response, CESA offers the following criteria as a starting point for conversation on eligibility:

- Resources must not be fossil-fueled.
- Resources that provide transmission deferral value.
- Due to their size or geographic requirements, resources that can be considered under the LLT umbrella.
- Technologies that support system-level reliability through portfolio diversity, as reasonable.
- Technologies that support the accelerated retirement of fossil fuel-based generation capacity.
- Emerging technologies that support long-term portfolio cost reductions.

The Commission should explicitly allow the use of this procurement mechanism for LSE-owned and operated projects in cases where such a structure would yield significant learnings and allow LSEs to gain experience with first-of-kind projects. In order to balance procedural efficiency with the need for appropriate Commission oversight, LSEs should be empowered to seek approval for projects that meet the outlined criteria in a Tier 3 Advice Letter.

Question 10: Comment on the options raised in Section 7.2 of this ruling to address procurement for system benefit more broadly. Suggest whether and how a particular cost recovery framework can be adopted quickly or discuss additional considerations that should be explored.

Please refer to CESA's response to Question 9.

Question 11: Comment on the busbar mapping approach.

CESA recognizes the significant effort that the Commission staff have undertaken to update the busbar mapping process to allow for meaningful results in the CAISO's TPP. Attachment C of the Ruling explains that the battery busbar mapping process utilizes information provided by CAISO and the non-battery busbar mapping process to establish a ranking

methodology for all substations considered. The result of all these considerations is a process that seeks to first assign batteries to substations with transmission headroom and commercial interests using the prioritization described above, and then assigns remaining BESS to substations with fully deliverable (“FD”) solar assets to capture the increased use of co-located/hybrid configurations.²¹

Overall, CESA supports the modifications as a substantial improvement over previous rounds of the IRP. CESA is particularly supportive of staff’s efforts to map out battery storage in a way that aligns with market interests while supporting the effective use of renewable energy, minimizes ratepayer costs, and supports local reliability needs. Despite the merits of the busbar mapping methodology, it is not lost on CESA that the Commission has decided to use this step of the IRP/TPP process to merely approximate the systemic advantages of pairing renewable generation with BESS (be it in a hybrid or co-located configuration), rather than modeling them fully starting in the capacity expansion process.

The fact that variable energy resources (“VERs”) paired with BESS are not considered as candidate resources with their own cost assumptions within RESOLVE limits the ability of IRP modeling to capture the full economic advantages of co-location. This should be improved in future cycles by, at the very least, assuming two hybrid candidate resources based off the heuristic shared by E3 and Astrape Consulting in the Incremental ELCC Study. A viable starting point is the the Incremental ELCC Study, which demonstrates that solar-plus-storage assets with a 1:1 installed capacity ratio and wind-plus-storage assets with a 2:1 capacity ratio, are capable of reliably maintain the storage component charged for the majority of the time. As a result, this sizing assumption could ease the consideration of paired assets as candidate resources.

Question 12: Comment on whether the Commission should require the procurement of resources contained in the individual IRP filings and

²¹ Ruling, Attachment C, at 19.

have LSEs face penalties and/or backstop procurement requirements with cost allocation arrangements, similar to those for D.19-11-016 and D.21-06-035.

According to the CEC's MTR reliability analysis, incremental procurement of fossil-fueled resources is not needed assuming the resource build related to the proposed PSP is realized. These results highlight that securing the incremental resources associated with the proposed PSP is essential in the near-term. Nevertheless, as CESA details further in responses to Questions 4 and 16, the CEC's analysis has significant limitations compared to full PCM analyses. With these considerations in mind, CESA recommends the Commission consider the benefits of producing said analyses and sharing them with parties ahead of the final decision adopting a PSP and related procurement. If the aforementioned PCM analyses support the CEC's findings that incremental capacity in the order of what is selected in the proposed PSP is essential to meet a 0.1 LOLE, the Commission would be required to issue procurement requirements as soon as possible, as a series of conditions previously noted in these comments have increasingly complicated the integration of capacity (*see* Question 15).

Given that time would be of the essence, the most expedited way to ensure LSEs procure the capacity needed would be through what the Ruling describes as the "bottom-up" approach. This would imply the Commission requiring jurisdictional LSEs to procure for the assets included in their own individual filings, in addition to the capacity outstanding from D.19-11-016 and D.21-06-035. This option may be preferable to a "top-down" approach since it would direct LSEs to obtain the resources already contemplated in their planning. Moreover, provided the Commission's RECART tool has successfully aggregated the individual plans, the bottom-up approach already provides assurances regarding the potential for duplication of resources in reporting. In sum, a bottom-up approach could be preferable to expedite procurement since it builds upon the plans LSEs have shared and worked on for the last two years.

Question 13: Comment on whether you would prefer an approach where the Commission determines procurement need for GHG-free resources or the GHG-free attributes of resources at the system level and then uses a need allocation methodology to assign procurement to individual LSEs. If you propose this type of alternative approach, please address the following aspects:

- (1) Need allocation, by year
- (2) How to address new and existing resources
- (3) Whether procurement should be all-source or resource-specific
- (4) Resource attributes required (MW, MWh, percentage of GHG-free energy, etc.)
- (5) Duration (through 2030, 2032, interim milestones, etc.)
- (6) Cost allocation
- (7) Compliance, monitoring, and enforcement arrangements.

Please refer to CESA's response to Question 12.

Question 14: If you believe the Commission should take more of a programmatic approach to GHG-beneficial procurement, explain the process you recommend and your rationale.

CESA has no comment at this time.

Question 15: Comment on whether and how much procurement required in D.21-06-035 should be accelerated to 2023 and/or suggest additional actions to facilitate additional resources in response to the Governor's Proclamation from July 30, 2021.

CESA does not recommend accelerating to 2023 any procurement pursuant to D.21-06-035, which was only recently issued and because of the limited lead time to bring incremental resources online by 2023. As expressed in our testimony in R.20-11-003, new-build resources require at least 4-6 years of lead time, and there are a number of macroeconomic factors that must be taken into account that are beyond the control of sellers and buyers, such as the COVID-19 pandemic, the global semiconductor shortage, and tight battery supplies. Delays in the

interconnection process and in the construction of network upgrades have exacerbated this situation. In this context, CESA finds the prospect of accelerating procurement in D.21-06-035 to 2023 to be challenging, and in many cases, infeasible. Any accelerated procurement should thus not be required or directed.

Question 16: Comment on the CEC’s MTR reliability analysis, the determinations regarding the need for fossil-fueled generation resources, and the actions, if any, that the Commission should take as a result.

On August 30, 2021, the CEC held a workshop to present the MTR Analysis, which focused on whether capacity incremental to that identified in the PSP or directed in D.19-11-016 and D.21-06-035 is required in the 2022-2026 period to retain a 0.1 LOLE. For this study a wide range of weather and outage conditions were evaluated, although it was not performed to the same specifications of the SERVIM runs used within this proceeding. The results of the MTR Reliability Analysis indicate that there is no need for incremental capacity beyond what is considered in the proposed PSP. In addition, this study indicates that, relative to the “PSP scenario”, the scenarios with no age-based gas retirements and gas in place of the PSP do not represent incremental reliability. As a result, staff did not recommend incremental procurement of fossil-fueled resources assuming the resource build related to the proposed PSP is realized.

Overall, CESA agrees with the conclusions of the MTR Reliability Analysis, particularly as they relate to the procurement of incremental gas-powered assets. This analysis provides clear indication that the Commission can preserve the reliability of California’s electric grid while advancing its decarbonization mandate. Thus, CESA supports staff’s recommendation that incremental procurement of fossil-fueled resources is unnecessary, assuming the realization of the resource build associated to the proposed PSP. Every effort should be made by the Commission to ensure the successful deployment of the PSP resources in the necessary timeframe by accelerating interconnection and ensuring accountability on timely transmission upgrades. The key takeaway

form the MTR Reliability Analysis is that the Commission must take the actions necessary to ensure the timely development of the resources included in the proposed PSP.

The MTR Reliability Analysis concludes that the “Procurement scenario”, which only assumes the addition of the capacity considered in D.19-11-016 and D.21-06-035, fails to meet the 0.1 LOLE standard in 2022, although it achieves it in subsequent years. This is largely due to the NQC difference between the proposed PSP and Procurement scenarios, as observed below.

Table 4: Comparison of 2022 Scenario Additions in the MTR Analysis (MW)

Resource Type	PSP Scenario	Procurement Scenario	Difference
Geothermal	0	8	-8
Biomass	19	7	12
Shed DR	151	34	117
Wind	1,310	242	1,068
Solar	2,211	780	1,431
4-hr Energy Storage	2,159	936	1,221
Total	5,850	2,007	3,843
NQC	2,753	1,070	1,683

These differences are the most significant in 2022, as this is the only year for which the CEC’s analysis of the Procurement scenario yielded a LOLE value greater than 0.1. As Table 4 illustrates, the total NQC difference between both scenarios equals 1,683 MW in 2022. CESA has requested clarification from the CEC regarding how this difference was estimated, as it implies a significant need to accelerate incremental capacity integration for 2022. As noted in CESA’s response to Question 15, the Commission should consider incentives to accelerate the deployment of assets included in D.19-11-016 and D.21-06-035, and direct incremental procurement related to the proposed PSP (*see* Question 12). Given the 2022 NQC difference between the PSP and Procurement Scenarios totals 1,683 MW NQC, CESA recommended in the Emergency Reliability proceeding, R.20-11-003, consider incenting the acceleration of at least 2 GW of incremental NQC to be online by August 1, 2022, but also with additional or accelerated resources coming online by

August 1, 2023.²² The magnitude and timing of this procurement acceleration seeks to balance the need to ensure reliability during the net peak period with the interconnection and commercial realities of the Californian electric power sector. While these actions are pertinent, it is essential to underscore that, for a number of reasons beyond the control of buyers and sellers of these resources, the ability to accelerate online dates for energy storage to this level is challenging.

Finally, as explained in our testimonies in R.20-11-003, the Commission should also seek incremental third-party and utility-owned storage if they can meet the Summer 2022 or 2023 commercial online dates, and leverage behind-the-meter (“BTM”) energy storage resources to the greatest extent possible and reasonable, which can provide incremental capacity as quickly deployable resources and/or as existing resources with incremental export capacity that can be delivered if load limitations are lifted and BTM export capacity is recognized and compensated.

Question 17: Comment on the definition of eligible renewable hydrogen proposed in this ruling.

CESA does not offer comment at this time.

Question 18: Comment on the percentage of renewable hydrogen facilities that should be required, if any, and the timing of the transition from a blend to full renewable hydrogen combustion, including the option for inclusion of fuel cells. Discuss the feasibility and cost of achieving a 100 percent renewable hydrogen blend by 2036 in your comments.

CESA does not offer comment at this time.

Question 19: Comment on proposed measures regarding NOx emissions from facilities using renewable hydrogen.

CESA does not offer comment at this time.

Question 20: Comment on whether the Commission should take any initial actions on geographically-targeted procurement, particularly with respect to

²² Noh, Jin, *Opening Testimony of Jin Noh on Behalf of the California Energy Storage Alliance*, filed under R.20-11-003 on September 1st, 2021, at 8.

Aliso Canyon, or more broadly, and respond to the factors discussed in Section 12 of this ruling.

CESA is deeply appreciative of the Commission's consideration of this topic within the Ruling,²³ as we support the Commission's focus on reduced GHG and pollutant impacts in DACs. According to the Commission's data, DACs have a disproportionate share of fossil-fueled power plants: almost 40% of conventional generators are located within DACs while only 25% of the population live in DACs.²⁴ In light of these facts, the deployment of solutions that can minimize or eliminate the reliance on fossil fuels is of paramount importance to protect the state's most vulnerable populations.

To this effect, CESA has recommended the Commission consider the role of gas-plus-storage hybrids several times within the IRP proceeding. In January 2019, within Rulemaking ("R.") 16-02-007, CESA strongly urged the Commission to update its proposed IRP methodology to include hybridization of existing gas-fired resources as a candidate resource.²⁵ Since then, CESA has highlighted that hybrid gas-plus-storage resources are not a hypothetical future technology: it has been installed and is currently operating at multiple locations on California's grid. Moreover, CESA has provided analysis which demonstrates the potential of these solutions. On December 20, 2018, CESA shared its own independent analysis with the Commission, which modeled the effects of hybrid gas-plus-storage resource deployment on California's system. The model optimized long-term capacity expansion decisions in a manner very similar to RESOLVE. At a

²³ Ruling, at 42.

²⁴ CPUC, 2019. "Proposed Preferred System Portfolio for IRP 2017-18: System Analysis and Production Cost Modeling Results." Available at: https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectPowerProcurementGeneration/irp/2018/Attachment%20A_Proposed%20Preferred%20System%20Portfolio%20for%20IRP%202018_final.pdf

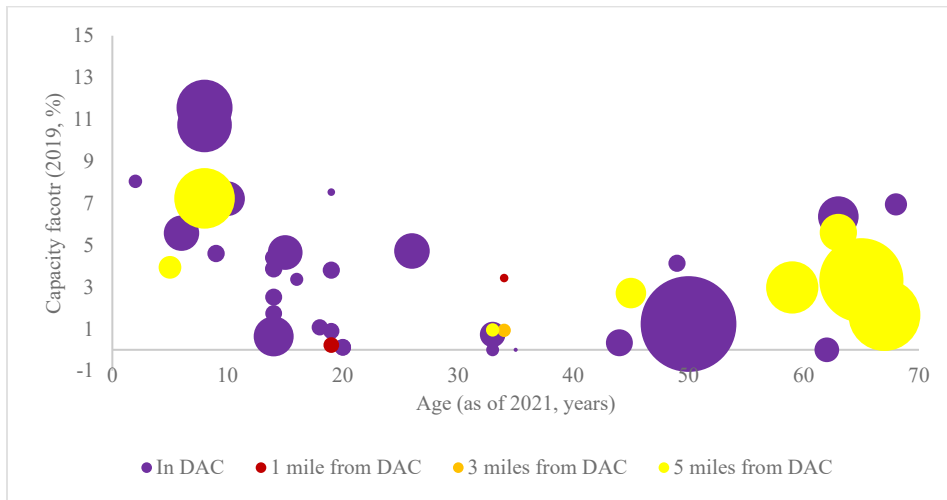
²⁵ CESA, *Comments of the California Energy Storage Alliance to the Administrative Law Judge's Ruling Seeking Comments on Inputs and Assumptions for the Development of the 2019-2020 Reference System Plan*, filed under R.16-02-007 on January 4, 2019, at 16.

high level, the modeling inputs were nearly identical to the 2017-2018 IRP inputs, the ones applicable at the time, except that 1,100 MW of existing gas resources were made eligible for hybridization with battery storage. The results showed that every single one of the candidate resources made eligible for hybridization was ultimately selected under the economically optimal scenario.²⁶ These results demonstrate that there is merit in directing these resource types as a least-regrets investment.

As the Ruling notes, the work required to identify how geographically-targeted procurement can mitigate the reliance on fossil fuels is complex and cross-sectoral. In order to substantially contribute to this conversation with robust and credible analysis, CESA, with the support of a subset of our membership, will partner with Strategen Consulting and the Pacific Northwest National Laboratory (“PNNL”) to empower the Commission by identifying a diverse and optimal portfolio of zero-carbon generation and energy storage in the LA Basin. Currently, we envision this study will support clean air and local reliability by identifying a portfolio that can effectively reduce or eliminate the reliance on peaker plants. This is a subset of interest since, out of the 12.6 GW of fossil assets internal to the LA Basin, 70% (8,666 MW) had a capacity factor equal or less than 15% in 2019, the most recent year with available data. Figure 1 below shows these peaker assets, plotting the relationship between their age and capacity factor while communicating the operating capacity of the asset and its proximity to a DAC. Notably, all of the assets with capacity factors equal or less than 15% are at least 5 miles from a DAC, with the majority being within the boundaries of a DAC.

²⁶ See Attachment 1 of CESA, *Comments of the California Energy Storage Alliance to the Ruling of Assigned Commissioner and Administrative Law Judge Seeking Comment on Policy Issues and Options Related to Reliability*, filed under R.16-02-007 on December 20, 2018.

Figure 1: All fossil-fueled resources in the LA Basin with a capacity factor under 15% (2019)²⁷



In order to determine an optimal replacement portfolio for these assets, this project will utilize first-in-class capacity expansion modeling with enhanced geographical and temporal granularity. CESA looks forward to share on an ongoing basis the findings of our Los Angeles Local Area Storage Study (“LASS”) in the future to inform I.17-02-002 and R.20-05-003.

While a thorough cross-sectoral analysis will be required to deeply decarbonize resource-constrained DACs, there is some low hanging fruit that the Commission should consider in the near-term: the potential to replace gas-fueled capacity for 4-hour energy storage as identified in the CAISO’s Local Capacity Technical Studies (“LCTS”). CESA recommends the Commission establish a process that links the IRP modeling efforts, the TPP, and the CAISO’s LCTS into actionable directives that would get us closer to replacing at least a fraction of the polluting assets. To do so, CESA recommends evaluating the TPP results in light of those shared in the LCTS. This process would enable the Commission to identify areas where the amount and characteristics of storage mapped are equivalent to those indicated in the LCTS, facilitating the issuance of procurement directives that ensure said resources will be timely deployed.

²⁷ Prepared by Strategen Consulting with S&P data, 2021.

Question 21: Comment on whether and how the Commission should act to preserve transmission deliverability rights in the central coast area that could be utilized for offshore wind or other resources.

CESA does not offer comment at this time.

Question 22: Comment on the amount of offshore wind, if any, that should be included in the 2022-2023 TPP base case. Comment on how the results of the 2021-2022 TPP offshore wind sensitivity case should influence this issue.

CESA does not offer comment at this time.

Question 23: Comment on whether and how the Commission should act to support the development of OOS renewables/wind and the transmission to deliver it. Be as concrete and specific as possible in your recommendations.

CESA does not offer comment at this time.

Question 24: Comment on specific actions the Commission can take to ensure retention of existing resources needed both for reliability and/or GHG emissions purposes.

CESA does not offer comment at this time.

Question 25: For any of the potential procurement requirements discussed in this ruling, allocation of need to LSEs is a required step. Comment on how the methodologies should account for in-CAISO POU load and what steps the Commission should take to ensure those POUs bear their share of responsibility for reliability and GHG impacts.

CESA does not offer comment at this time.

III. 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.

Jin Noh
Policy Director
CALIFORNIA ENERGY STORAGE ALLIANCE

Date: September 27, 2021