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)

REPLY 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 reply 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.

CESA appreciates the opportunity to provide replies and feedback to the comments parties filed on September 27, 2021. In said comments, a significant share of parties supported the usage of, at most, a 38 million metric ton ("MMT") greenhouse gas ("GHG") emissions target, with some parties urging the Commission to move toward a more stringent goal in upcoming cycles. CESA echoes these comments, noting that the Commission's determination to move away from the 46 MMT target is necessary to achieve the decarbonization goals of the state. In addition, CESA's review of opening comments finds that a majority of parties support the usage of load forecasts that consider increased end-use and transportation electrification. CESA is supportive of

these recommendations and provides some feedback in these comments on how the Commission can plan for high electrification in the current context.

Beyond the comments described above, CESA found some recommendations offered by parties merit further attention. Importantly, CESA recommends the Commission consider revising its use of effective load carrying capability ("ELCC") in this proceeding, addressing significant discrepancies in the Commission's modeled emissions, and reevaluating the data used for the evaluation of long duration energy storage ("LDES") resources. Moreover, CESA supports alternative scenarios that focus on the potential energy storage has to reduce reliance on emitting assets. Finally, the Commission should consider the benefits of maintaining conservative planning assumptions in the interim while the Commission collaborates with other relevant agencies to better integrate the risks of anthropogenic climate change and increased electrification into the load forecasts. As such, CESA's comments can be summarized as follows:

- The Commission should address the discrepancies between emissions calculations for the upcoming Integrated Resource Planning ("IRP") cycle.

- The Commission should utilize forecasts derived from the Integrated Energy Policy Report ("IEPR") to maintain links between the IRP, Transmission Planning Process ("TPP"), and Resource Adequacy ("RA") processes.

- The Mid-Term Reliability ("MTR") persistence assumptions are reasonable in the interim given the limitations of the weather and electrification assumptions used to develop the proposed Preferred System Plan ("PSP").

- The Commission should not delay any further modeling updates regarding LDES.

- The Commission should model scenarios where gas-powered assets are hybridized with energy storage.

- The Commission should refrain from applying the storage ELCC curve embedded in the RESOLVE model and should reconsider using incremental ELCC values for the purposes of MTR procurement until stakeholders fully vet the methodology.

- As a no-regrets action, the Commission should encourage or direct the siting the maximum 1-for-1 replacement of storage to fossil assets in the LA Basin area.

- Reserving deliverability from Diablo Canyon for offshore wind projects would be discriminatory and would represent queue hopping.

II. THE COMMISSION SHOULD ADDRESS THE DISCREPANCIES BETWEEN EMISSIONS CALCULATIONS FOR THE UPCOMING IRP CYCLE.

In opening comments, the California Environmental Justice Alliance and Sierra Club ("CEJA & Sierra") underscored that Staff analysis demonstrates an unexplained and concerning discrepancy between the projected GHG emissions in the RESOLVE and SERVM modeling, but it fails to determine the source of this discrepancy or to conduct any ground truthing.[1] CEJA & Sierra note that this issue is not new or unique to the present IRP cycle, highlighting that prior analyses carried out by the Commission's Energy Division ("ED") have revealed discrepancies greater that 9 MMT GHG between RESOLVE's GHG emissions and actual emissions.[2]

CESA strongly agrees with the concerns voiced by CEJA & Sierra, especially considering that the use of RESOLVE and SERVM is not limited to the present proceeding but is indeed applied in other planning venues across the State. In order to commence addressing these discrepancies, CESA recommends ED collaborate with Southern California Edison's ("SCE") modeling team since their opening comments suggest the issue might be SERVM dispatch. According to SCE, their own capacity expansion and production cost modeling analyses revealed that, compared to SERVM, PLEXOS appears to dispatch the generation resources and storage devices in a more efficient manner resulting in higher delivered renewable energy and less exports

[1] CEJA & Sierra, at 2.

[2] *Ibid.*

and curtailment.[3] Furthermore, PLEXOS has less reliance on unspecified imports and lower exports.[4] In the aggregate, these differences result in SERVM using gas-powered assets considerably more: SERVM results are 54% above the RESOLVE output and a 65% increase in gas use versus the results in PLEXOS.[5]

CESA urges ED to work with SCE and all parties in order to better understand the drivers of dispatch in the SERVM model, its differences with the PLEXOS dispatch logic, and the implications of this dispatch for the iterative capacity expansion process. These steps are fundamental to ensure improved emissions estimations in the upcoming IRP cycles, an indispensable datapoint in California's path towards decarbonization.

III. THE COMMISSION SHOULD UTILIZE FORECASTS DERIVED FROM THE IEPR TO MAINTAIN LINKS BETWEEN THE IRP, TPP, AND RA PROCESSES.

In opening comments, a significant share of parties recommended that the Commission utilize high electrification and high electric vehicle ("EV") deployment assumptions when selecting the load forecast.[6] CESA was among those parties, highlighting that the Commission should balance the need to plan for increased electric use with the importance of preserving the linkages between the IRP process, the TPP, and the RA program. CESA advised against using forecasts that would represent a deviation from the single forecast set ("SFS") agreement, as using a single forecast is essential to expedite analyses that yield significant results.

[3] SCE, at 15.

[4] *Ibid.*

[5] *Ibid.*

[6] *See* Pacific Gas & Electric ("PG&E"), at 11-12; SCE, at 16; CEJA & Sierra, at 9; Gridliance West ("GLW"), at 10; Defenders of Wildlife, at 3; American Clean Power – California ("ACP"), at 3; *and*, Union of Concerned Scientists ("UCS"), at 2.

Similarly, San Diego Gas & Electric ("SDG&E") recommends that the Commission ensure consistency in the load forecasts used in the analysis of this proceeding[7] by using the latest version of the mid case IEPR forecast, except for transportation electrification which should adopt the high case.[8] Overall, CESA agrees with this recommendation. Using IEPR-derived load forecasts will enable the IRP, TPP and RA processes to be aligned and timely finalized. It is important to note, nonetheless, the limitations of these IEPR-derived forecasts; in particular, the fact that these fail to fully capture the recently adopted 2035 zero-emissions vehicles ("ZEV") goals due to the timing of their development and, as a result, likely materially underestimates the EV load by 2030.[9] CESA elaborates over how to manage these risks in the following section.

IV. THE MTR PERSISTENCE ASSUMPTIONS ARE REASONABLE IN THE INTERIM GIVEN THE LIMITATIONS OF THE WEATHER AND ELECTRIFICATION ASSUMPTIONS USED TO DEVELOP THE PROPOSED PREFERRED SYSTEM PORTFOLIO.

Several parties argue that the proposed PSP is potentially overbuilt, particularly in the later years of the analysis, after 2026. Parties identify several potential sources for this result: the persistence of the MTR planning reserve margin ("PRM") assumption, the method with which RESOLVE estimates contributions to the PRM, and SERVM dispatch, among others. As a result of these assumptions, these parties argue that the proposed PSP is potentially overbuilt on the order of between 3 GW and 10 GW by 2032.[10] In light of these results, these parties advocate for the Commission adopting a portfolio that, through different modifications, limits the amount of capacity selected by the 2032 end year.

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[7] SDG&E, at 3.

[8] *Ibid.*

[9] PG&E, at 11.

[10] *See* California Community Choice Association ("CalCCA"), at 6; PG&E, at 8; City and County of San Francisco ("San Francisco"), at 3; *and,* SCE, at 5 and 10.

CESA continues to believe that the Commission should engage in a planning exercise that, through a thorough and transparent loss-of-load expectation ("LOLE") analyses study, identifies a desirable PRM. In the interim, nonetheless, the persistence of MTR assumptions, inclusive of the 22.5% PRM, represents a viable hedge against the uncertainties related to weather and load forecasts considered in this proceeding. As discussed above, a significant number of parties recommended the Commission incorporate the impacts of increased end-use electrification when developing the PSP. Some parties, like the Environmental Defense Fund ("EDF") properly noted that doing so is in fact an insurance policy, since, if the Commission authorizes procurement based on a lower load forecast and some of the new resources do not come online, serious problems are likely to result; whereas authorizing procurement based on the 38 MMT target with the highest electrification load forecast available and falling short would imply less severe consequences.[11]

The importance of this hedging cannot be overstated, especially considering that both the Commission and parties are aware that current weather forecasts might be inadequate due to the effects of anthropogenic climate change. Moreover, hedging by increasing the PRM is warranted considering the known limitations of the IEPR High EV forecasts, which do not account for the recent 2035 ZEV target, as noted in previous replies. Analysis provided by the California Independent System Operator ("CAISO") supports this conclusion. In opening comments, CAISO noted that their assessment od the proposed PSP provides only about 500 MW of effective capacity above the level necessary to meet the 0.1 LOLE in 2026.[12] As such, while it is desirable that the Commission engage with parties to develop a thorough and transparent LOLE study to identify the required PRM for the IRP, the MTR persistence assumptions are reasonable in the interim

[11] EDF, at 5.

[12] CAISO, at 2.

given the limitations of the weather and electrification assumptions used to develop the current and proposed PSP.

V. THE COMMISSION SHOULD NOT DELAY ANY FURTHER MODELING UPDATES REGARDING LONG-DURATION ENERGY STORAGE.

Hydrostor requests that the Commission improve the inputs and assumptions for LDES resources such that pumped hydro storage ("PHS") is not the sole proxy for these assets.[13] CESA strongly supports this recommendation as, currently, the cost assumptions, land use limitations, and transmission requirements associated with PHS continue to largely drive the selection of LDES assets within the IRP framework despite the fact that other technologies can meet those operating characteristics. In order to address these deficiencies in the RESOLVE model, CESA recommends the Commission expeditiously incorporate the model modifications, inputs, and assumptions associated with the California Energy Commission's ("CEC") examination of the value of LDES in conjunction with Energy + Environmental Economics ("E3"). This would imply *ad minimum*, including more available candidate resources in RESOLVE that do not share the resource limits of PHS and assessing a methodology to determine contributions to the PRM by these assets. Since the PSP has implications on transmission investments as identified in the TPP as well as local capacity requirement ("LCR") displacement of gas generation, it is important to more granularly and specifically model LDES candidate technologies with different capabilities, different cost structures, and different locational or siting constraints.

[13] Hydrostor, at 5-6 and 8.

VI. THE COMMISSION SHOULD MODEL SCENARIOS WHERE GAS-POWERED ASSETS ARE HYBRIDIZED WITH ENERGY STORAGE.

Middle River Power ("MRP") recommended that the Commission evaluate a scenario in which gas peaking units are hybridized with short-duration (*i.e.,* less than four-hour discharge duration) energy storage,[14] noting that, because a significant fraction of peaking unit dispatches are short-duration dispatches that could be fully displaced by discharging the battery energy storage systems ("BESS"), emissions reductions up to 70% could result, a figure that becomes more intuitively plausible because operating the BESS to cover a short-duration dispatch obviates the need to start up the gas turbine and eliminates the disproportional emission impacts associated with a unit start-up.[15] CESA agrees with MRP's recommendation and has previously requested the Commission consider integrating gas-storage hybrids as candidate resources in RESOLVE to identify optimal hybridization opportunities. In January 2019, within 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.[16] 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.[17] This scenario could additionally provide insights regarding the benefits of locating capacity in constrained areas, such as urban enters with local capacity needs as noted by San Francisco.[18] As such, CESA recommends the

[14] MRP, at 3.

[15] *Ibid,* at 8-9.

[16] 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.

[17] 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 this proceeding on June 10, 2021, at 10.

[18] San Francisco, at 4.

Commission considers incorporating gas-storage hybrids as a candidate resource and evaluate the merits of hybridization in a specific IRP case.

VII. THE COMMISSION SHOULD REFRAIN FROM APPLYING THE STORAGE ELCC CURVE EMBEDDED IN THE RESOLVE MODEL AND SHOULD RECONSIDER USING INCREMENTAL ELCC VALUES FOR THE PURPOSES OF MTR PROCUREMENT UNTIL STAKEHOLDERS FULLY VET THE METHODOLOGY.

SCE recommends that the Commission *not* use the ELCC method currently being used in determining the contribution of variable resources in staff's modeling, filing requirements, MTR procurement compliance, and Resource Data Templates.[19] SCE justifies this recommendations noting that, in their own modeling, the duration of an unserved load event is never beyond three hours; as such, SCE concludes that four-hour batteries are sufficient to serve the load during the critical hours and should have a 100% PRM contribution. [20]

CESA strongly agrees with SCE's recommendation for several reasons. First, as underscored by SCE's analysis, CESA is unsure if utilizing ELCC methodologies to ascribe value to dispatchable energy storage resources is fundamentally appropriate. The ELCC methodology seeks to evaluate the degree of overlap or correlation between a non-dispatchable generating asset's output and the loss-of-load probability ("LOLP"). While dispatchable energy storage assets are energy-limited, meaning that their output is restricted to a subset of hours in a day, they can decide when to output in order to match grid needs; thus, increasing the aforementioned overlap with LOLP. This behavior could be incented through prices or products since the asset is dispatchable. In essence, energy storage is more similar to a system with an energy limitation than an intermittent renewable resource.

[19] SCE, at 9.
[20] *Ibid.*

Second, even if assuming *arguendo* the use of ELCC is methodologically sound, the Commission should refrain from using the assumed curve and the values for MTR procurement since the underlaying assumptions merit revision and have not been publicly vetted by parties. In particular, the assumptions related to the expected solar buildout, an essential variable when estimating the ELCC of energy storage, are questionable and disconnected from the expected build rate associated to the LSEs individual IRP filings. This is clear from the Incremental ELCC Study, in which consultants to the Commission note the solar buildout assumptions are more conservative than the actual annual LSE planned additions to guarantee against overestimating the ELCC provided by near-term solar additions (and the diversity benefit those would provide to storage additions) should LSEs not secure the very high level of near-term build contained in the LSE plans.[21] This assumption is especially damaging for near-term four-hour storage additions since increasing solar penetration steepens the net load shape, allowing for more storage capacity to provide reliability value. The application of ELCC in tranches also raises a number of implementation questions as to how procurement and commercial online date of resources would be impacted in terms of their capacity amounts that they would count toward an LSE's requirements.

VIII. AS A NO-REGRETS ACTION, THE COMMISSION SHOULD CONSIDER SITING THE MAXIMUM 1-FOR-1 REPLACEMENT OF STORAGE TO FOSSIL ASSETS IN THE LA BASIN AREA.

CEJA & Sierra, among other parties, suggest the Commission should order no-regrets procurement of energy storage resources in the LA Basin and San Joaquin Valley consistent with CAISO local area analyses on the level of four-hour duration storage that can be deployed before

[21] *See* Incremental ELCC Study, at 23.

reaching transmission constraints.[22] CESA supports the Commission *ad minimum* evaluate the impacts of these potential procurements by siting the maximum 1-for-1 replacement of 4-hour storage for mapping and TPP purposes with regards to the LA Basin, as noted in CESA's opening comments. If the Commission considers such procurement is reasonable and feasible, CESA supports the recommendations of CEJA & Sierra.

IX. EVEN IF THE COMMISSION COULD RESERVE DELIVERABILITY FROM DIABLO CANYON FOR OFFSHORE WIND PROJECTS, THIS ACTION WOULD BE DISCRIMINATORY AND WOULD REPRESENT QUEUE HOPPING.

In the Ruling, the Commission asked parties to comment on the potential reservation of transmission deliverability rights associated with Diablo Canyon Power Plant ("DCPP") for offshore wind or other resources to utilize. In opening comments, a number of parties highlighted that the Commission does not have the necessary jurisdiction to ensure such reservation as Transmission Planning Deliverability ("TPD") capacity rights are under the jurisdiction of the Federal Energy Regulatory Commission ("FERC"). Moreover, some parties noted that, even if the Commission were able to coordinate with the CAISO, PG&E, and other applicable regulators and stakeholders, reserving deliverability rights for offshore wind is not recommendable.

For example, LS Power underscored that the Commission should not act to preserve transmission deliverability rights for offshore wind or other resources as these resources should be subject to CAISO transmission and interconnection processes and tariff requirements equally to all other resources and should not receive special treatment.[23] This sentiment is echoed by other parties such as Vote Solar, Solar Energy Industries Association and Large-Scale Solar Association

[22] CEJA & Sierra, at 26.

[23] LS Power, at 14.

(collectively, "Joint Solar Parties") and Hydrostor.[24] CESA agrees with these statements and recommends the Commission does not seek to preserve transmission rights for the delivery of offshore wind in order to maintain the principles of FERC's Open Access Transmission Tariff.

Again, even if the Commission were to more deeply contemplate and advance this idea, the Commission should more broadly expand the inquiry to assess which resources would best benefit California ratepayers through the preservation of these deliverability rights. It is not clear if reserving these rights for a resource/project type with long lead times and uncertainty of their prospects of securing the necessary permits and approvals is in the best interest of ratepayers when reliability and procurement needs are significant in the mid-term. We cannot know unless further analysis is conducted..

X. 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,

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[24] *See* Joint Solar Parties, at 10; *and*, Hydrostor, at 12.