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Order Instituting Rulemaking to Oversee the Resource Adequacy Program, Consider Program Reforms and Refinements, and Establish Forward Resource Adequacy Procurement Obligations.	Rulemaking 25-10-003 (Filed October 9, 2025)

JOINT REPLY COMMENTS OF CALIFORNIA ENERGY STORAGE ALLIANCE, FORM ENERGY, HYDROSTOR, AND FOURTH POWER

ON

TRACK 1 PROPOSALS FOR ACCREDITATION OF LONG-DURATION ENERGY STORAGE UNDER SLICE-OF-DAY

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COMMENTS

In accordance with the Rules of Practice and Procedure of the California Public Utilities Commission ("Commission"), the California Energy Storage Alliance ("CESA"), Form Energy, Hydrostor, and Fourth Power ("Joint LDES Parties") hereby submit these joint Reply Comments on parties' opening proposals for the accreditation of long-duration energy storage ("LDES") resources under the slice-of-day resource adequacy program. This filing is made pursuant to the scope and schedule in the Assigned Commissioner's Scoping Memo And Ruling ("Ruling") filed on December 12, 2025, for parties' and the Commission's consideration. This joint filing is submitted by CESA, which is authorized to file on behalf of the undersigned joint parties.

I. Introduction

The Joint LDES Parties submit these reply comments to highlight the broad stakeholder consensus supporting a multi-day horizon for assessing the energy available to charge long duration energy storage ("LDES") resources for purposes of showing their dispatch under the slice-of-day construct. Additionally, these comments highlight significant support for a 50% initial state of charge assumption to be applied to LDES resources upon which additional energy could be added from the pre-dispatch period.

These comments also address the critiques of the Joint LDES Parties' proposals offered by Cal Advocates. Although a diverse coalition of utilities and environmental advocates align with a data-driven approach that assesses the amounts of energy likely to be available to charge LDES resources, Cal Advocates' "worst-day" excess energy multiplier proposal remains an outlier that is not generally favored and would result in problematic outcomes for customers. That methodology ignores evidence of energy abundance during the times when LDES would charge,

and would impose significant, unnecessary costs on ratepayers through directing the utilities toward unneeded additional energy procurement.

The Commission should adopt the Joint Parties' proposal to ensure that LDES resources are accurately valued and reliably integrated into the slice-of-day framework.

II. Areas of Significant Agreement

A. There is broad consensus that the Commission should decide in this Track how to approach LDES resource charging sufficiency

In multiple previous tracks of the Commission's proceedings around the resource adequacy program, it has been identified that there is no clarity around how LDES resources (*i.e.* energy storage resources with durations longer than 8 hours) are treated under the slice-of-day proposal. There have been several proposals made, multiple workshops on the topic, and now several more proposals made, with perhaps the greatest amount of detail reasonably possible available in this Track. The opening comments confirm that virtually every party that addressed LDES accreditation supports adopting an energy sufficiency requirement for LDES and multi-day storage ("MDS") resources in Track 1 of this proceeding.

The Joint LDES Parties, Southern California Edison Company ("SCE"), the California Community Choice Association ("CalCCA"), the California Environmental Justice Alliance and Sierra Club ("CEJA/Sierra Club"), Vistra Corp. ("Vistra"), San Diego Gas & Electric Company ("SDG&E"), and the Public Advocates Office (Cal Advocates) all agree that a system should be adopted under which load serving entities ("LSE"s) can show LDES resources in their slice-of-day compliance filings. The Joint LDES parties urge the Commission to resolve this issue in this Track, based on the robust record developed to date and in this proceeding. Without Commission

action, the uncertainty will undermine LSEs' activities around LDES procurement, which the Commission has stated should happen for the benefit of California's customers.[1]

B. There is broad consensus among parties that the energy used to charge LDES resources should be deemed to come from a multi-day period prior to the "worst day" under the slice-of-day construct.

The Joint LDES Parties' proposal requests the Commission to find that the energy used to charge LDES resources should be assumed to come from the days leading up to the "worst day" slice-of-day period. Although there continues to be various views around implementation details, there is broad agreement among stakeholders that a multi- day look, like that proposed by the Joint LDES Parties, is the appropriate method.

Southern California Edison, for example, explicitly acknowledges the need for a multi-day energy assessment.[2] While supporting certain aspects of the Cal Advocates' proposal, SCE recommends that the "Forward Charging Period" should not be four days as the Cal Advocates recommended, but that it should instead be extended to seven days. SCE notes that a longer period better aligns with the CAISO's actual operational timeframes for managing long-duration assets and ensures that the resource adequacy program reflects the unique characteristics of LDES resources.[3]

The Joint CCAs (Ava Community Energy and Peninsula Clean Energy) also expressly endorse the proposal that LDES resources be deemed to have access to multiple days of available energy leading up to the slice-of-day period for purposes of determining their available discharge

[1] The decision in the integrated resource planning ("IRP") proceeding (R.25-06-019) issued on February 26, 2026 (D.26-02-057, at 144) requires that LSE's procure 2,000 MW NQC capacity by summer 2030, 2,000 MW by summer 2031, and 2,000 and that one quarter of this capacity be either LDES resources or clean firm resources. This indicates that a significant amount of new LDES capacity could be on the system by summer 2030, and RA rules will need to properly account for those resources. The Commission identified the need for up to 2,000 MW of LDES procurement in D. 24-08-064 issued on August 29, 2024.
[2] SCE Comments at 16.
[3] SCE Comments at 17.

during the slice-of-day.[4] The Joint CCAs support this position with empirical data that confirms that under such an approach, which matches the operational purposes of LDES resources, there are significant amounts of energy available during the prior days, even during historical high grid stress events like those that occurred in September of 2022.[5] The Joint CCAs urge that this demonstrates the value of LDES resources in moving energy over extended time periods into grid stress periods, and validates the importance of the Commission adopting a multi-day charging sufficiency assessment for LDES resources. They argue that failing to account for this multi-day energy availability would be "aggressively conservative," and understate the capacity LDES can provide.[6]

NextEra also supports an assessment of the energy available in the period leading up to the slice-of-day for LDES resources. It expressly supports the Joint Parties' framework, noting that the multi-day accounting seems to be an appropriate way to value LDES resources because "customers will benefit most from a method that reflects that most-likely charging behavior of LDES resources and does not artificially force it into periods of grid stress."[7]

CEJA / Sierra Club also support the Joint LDES Parties' proposal, finding that it "best takes the unique contribution of LDES into account by accounting for the ability to charge LDES over the course of multiple days."[8]

Vistra supports a multi-day look for energy sufficiency as well, proposing that 7 days would be appropriate. GreenGen also expresses some support for the Joint LDES Parties' proposal to use a multi-day period leading up to the slice of day to determine energy sufficiency

[4] Joint CCA Comments at 6.
[5] Joint CCA Comments at 7.
[6] Joint CCA Comments at 6.
[7] NextEra Comments at 18.
[8] CEJA / Sierra Club Comments at 11.

for LDES resources (although it does not recommend it as appropriate for open-loop pumped storage). GreenGen's comments recognize the critical importance of acknowledging that energy used for LDES charging should not be assumed to come from the worst day. It states that "[t]he [Joint LDES Parties'] proposal's effort to avoid forcing LDES to recharge during peak stressed days addresses a compliance gap between Effective Load Carrying Capability ("ELCC") accreditation and SOD showings," and calls it a constructive proposal for the Commission to consider.[9]

Although Cal Advocates continues to argue that the excess energy available on the "worst day" under the slice-of-day construct should be used to determine the energy available to charge LDES resources, it is also clear that Cal Advocates' at least supports a look at multiple days leading up to the slice-of-day period to determine energy sufficiency. Specifically, Cal Advocates clarifies that it believes that the "worst day" excess energy may be a reasonable proxy for the energy available in prior days. Although the Joint Parties strenuously disagree with this assertion, it is important to note that the Cal Advocates' proposal also supports energy from prior to the worst day being the relevant source of energy for LDES resources under the resource adequacy program.

C. There is support for the Joint LDES Parties' 50% Initial State of Charge Assumption

The Joint LDES Parties also ask the Commission to assume a 50% initial state of charge for LDES resources before calculating what additional energy is made available for charging in the days leading up to the slice-of-day period. SCE expressly supports this assumption. Contrasting the Joint LDES Parties' proposal with the Cal Advocates' proposal, SCE observes that the Cal Advocates' proposal "underestimates charging energy available to LDES resources

[9] GreenGen comments at 3.

in the days and weeks preceding grid stress periods," and argues that the Cal Advocates' proposal should be adjusted so that the initial state of charge assumption is 50%, followed by a seven-day forward charging period to charge LDES resources further. Like the Joint LDES Parties, SCE recognizes that this approach can be adjusted over time as operational experience is gained, but points out that it is a better starting point than a zero percent assumption for initial state of charge.

The Joint CCAs also endorse a non-zero initial state of charge. They recognize that "absent serious conditions, operators rarely run batteries down to zero percent state of charge. An accreditation methodology that assumes otherwise is inconsistent with storage resource operation."[10]

Various other parties express support for the Joint Parties' proposal specifically, presumably including the 50% initial state of charge assumption.[11]

D. There is a widely shared concern that the Cal Advocates' proposal to use the excess energy from the "worst day" as the measure of energy available to charge LDES resources is too conservative, and would be harmful to customers

Several stakeholders have voiced significant concern that the Cal Advocates' MDESR proposal relies on logic that does not reflect grid reality. NextEra states that it agrees with the Joint LDES Party proposal because it believes that "customers will benefit most from a method that reflects that most-likely charging behavior of LDES resources and does not artificially force it into periods of grid stress."[12] The Joint CCAs describe the Cal Advocates proposal as "prohibitively conservative" and argue it would "undermine the Commission's Integrated

[10] Joint CCAs at 7.
[11] *See* CEJA / Sierra Club Comments, NextEra Comments.
[12] NextEra comments at 18.

Resource Planning (IRP) LDES deployment efforts by undercutting LDES value to LSEs."[13] This sentiment is echoed by CalCCA, which labels the approach "unrealistic and prohibitively conservative."[14] Similarly, although SCE couches its recommendation as proposed modifications to the Cal Advocates' proposal, SCE's proposed construct aligns more closely with the Joint LDES Parties' proposal. SCE recommends a "seven-day rather than four-day Forward Charging Period" and "increasing the assumed initial state of charge (SOC) from 0% to 50%." SCE explicitly notes that the Cal Advocates' current proposal "underestimates the charging energy available to LDES in the days and weeks preceding stressed periods."[15]

Not only does logic point to the Cal Advocates' proposal of using "worst day" energy to charge LDES resources as being too conservative, but parties in this proceeding have provided data that demonstrates that this is the case. The Joint LDES Parties provided analysis that shows the extent to which differences in load in the days before the "worst day" are less—demonstrating massive amounts of energy that is available to charge LDES resources during that period from the resources that have already been secured by LSEs to meet their "worst day" loads. Importantly, this energy is **above and beyond** the excess energy that is available in the worst day and represents **additional energy available to charge LDES resources that is not accounted for at all by the Cal Advocates' proposal**. In other words, if the Commission were to adopt the Cal Advocates' proposal to use the "worst day excess energy" as a proxy for the energy available in prior days, it would exclude the energy shown in the Joint LDES Parties' analysis, because the excess energy would still be available in those prior days in addition to the slack energy identified by decreased loads in that period.

[13] Joint CCA Comments at 6.
[14] CalCCA Comments at 20.
[15] SCE Comments at 17.

Empirical data from the Joint CCAs also confirms the availability of large amounts of "slack" energy in the days leading up to extreme events. The Joint CCAs provided empirical support for this position through an analysis of CAISO demand data. Their analysis of the September 2022 heatwave shows that the 4-day and 8-day periods preceding the peak day "experienced 13% and 10% lower average demand, respectively."[16] By showing that actual grid conditions during a crisis do not match the Cal Advocates' "worst-day" proxy, the Joint CCAs have demonstrated that the Cal Advocates' proposal would massively underestimate LDES's ability to meet peak loads through transferring energy from periods of abundance to periods of scarcity.

III. Areas of Continued Disagreement

Although, as described above, there are several areas of substantial agreement on how energy sufficiency should be determined for LDES resources, a number of implementation issues continue to be contested among the parties. These include whether the data necessary to implement the Joint LDES Parties' proposal is too complex to come by, the assumed level of LDES resources' initial state of charge, whether the proposal should cover all storage resources with a duration in excess of 8 hours, and whether the treatment of short-duration energy storage should also be modified. These issues are addressed below.

A. Certain parties' assertions that the Joint LDES Party proposal relies on data that is too complex are not compelling

SCE suggests that the Joint Parties' multi-day framework introduces unnecessary administrative complexity.[17] First, complexity is not a valid reason to adopt a fundamentally

[16] Joint CCA Comments at 8.
[17] SCE Comments at 16.

inaccurate reliability assessment that would ultimately result in expensive and unnecessary additional energy procurement paid for by ratepayers. Furthermore, these concerns are overstated. The Joint Parties have demonstrated that this methodology is manageable. Specifically, during the Energy Division's workshop, the Joint Parties elaborated on simplifications to using specific load profiles from prior days with slack values applied to aggregate peak day energy. Additionally, during the workshop the Joint Parties provided a functional spreadsheet tool that allows LSEs to easily model these multi-day requirements or that can be directly integrated into the existing LSE RA Plan template.

More fundamentally, the Commission does not need to create new, burdensome data streams to implement a multi-day energy sufficiency assessment. Data from the Integrated Energy Policy Report (IEPR) can be used to establish the demand trends for the days preceding a monthly peak, and this demonstrates how much "slack" is available in the system over those days, above and beyond the excess energy that is available in the slice-of-day period. By leveraging existing, state-vetted forecasts, the Commission can ensure that LDES accreditation is based on reliable and reasonable sources of data, rather than the artificial scarcity of the Cal Advocates' "worst-day" proxy. This approach was discussed in the Joint LDES Parties' proposal and workshop presentation. This represents a methodology that is significantly simpler than a requirement that LSEs generate load profiles for multiple days prior to the peak day.

Notably, several parties most impacted by the administrative requirements of the resource adequacy program agree that the Joint Parties' framework can be implemented in a streamlined manner. Specifically, CalCCA notes that

> [I]f the Joint Parties' proposal is adopted, the Commission should adopt a default and voluntary calculation methodology for 'shifted energy.' The default methodology should

be either the Joint Parties' proposed 'system-wide prior day factors' or 'system-wide average day factors.'"[18]

Additionally, the Joint CCAs "support adoption of the streamlined 'slack value' approach, which strikes an appropriate balance between accuracy and administrative complexity."[19]

The Joint Parties are largely indifferent to the specific mathematical approach used to calculate excess energy — whether it be granular modeling or system-wide average factors — provided the methodology captures the physical abundance of energy available in the days leading up to the "worst day." Any of these approaches would be vastly superior to the Cal Advocates' proposed assumption that excess energy only be calculated based on load profiles from the worst day.

B. The parties that do not support a 50% Initial State of Charge assumption for LDES resources do not adequately consider the costs of being overly conservative.

Certain parties—specifically Cal Advocates, Vistra, and SDG&E—urge the Commission to adopt a 0% Initial State of Charge (ISOC) assumption for the period leading into the "pre-charging" window. These parties argue that a 0% floor is necessary to be "conservative" and to err on the side of grid reliability. However, these parties fail to recognize the cost to customers and economic inefficiency of their proposed conservatism. As the Joint CCAs and SCE have both noted, assuming a resource enters a multi-day stress event completely empty is an unrealistic baseline that fails to reflect how these assets are operationally managed. And, it would send an erroneous signal to LSEs to acquire excess energy on the worst day in order to charge LDES resources—an expensive and unnecessary burden for customers.

1. Over-conservatism would discourage the deployment of the very resources California needs for reliability

[18] Cal CCA Comments at 20.
[19] Joint CCA Comments at 10.

A zero percent charged state is the absolute lower bound of physical possibility for an LDES resource. There is no empirical or operational reason to believe this would be the expected state of a long-duration resource. In reality, it would be certain to be a wrong assumption, and be overly pessimistic because there is no chance that an average or persistent value for residual energy in LDES resources will be zero. Being overly conservative in this manner does not protect the grid; rather, it hurts customers and undermines California's prospects for achieving its energy policy goals. By under-counting the value of LDES, the Commission would create a massive commercial disincentive for LSEs to procure these resources. There is no benefit to being so conservative that the state fails to secure the multi-day resources it actually needs for long-term reliability.

2. Baseline modeling should reflect reasonable assumptions, not extreme outliers

The purpose of the resource adequacy program is to ensure sufficient capacity for expected peak conditions, not to model unrealistic and worst-edge-case scenarios. Forcing a 0% initial state of charge into the slice-of-day construct for LDES is fundamentally inconsistent with how the Commission treats other resources. For example, the Commission does not model all natural gas resources under the assumption that their fuel supply is permanently constrained by an Operational Flow Order ("OFO"), for example. Nor does it assume that gas resources are more likely to go on a forced outage because they may be running for multiple days at a time. Those types of unusual or extreme conditions are incorporated via specific metrics like EFORd, not as a baseline accreditation assumption. LDES should be afforded the same reasonable treatment.

3. Cal Advocates misinterprets Form Energy's dispatch modeling to justify a flawed assumption

Cal Advocates continues to argue that because some of Form Energy's own dispatch modeling shows low states of charge during certain months, a 0% initial state of charge assumption is warranted. This argument overlooks critical information previously provided to rebut this claim. The modeling in question assumed resource dispatch based solely on market price data in a transparent, merchant-style simulation. In periods where the resource showed low charge, it was simply because reliability did not require the power at that time, and it was dispatched based on energy prices. In actual grid operations, an LDES operator, who presumably procured the resource for reliability purposes, will manage the system to ensure charge is maintained when a reliability event is anticipated. The modeled scenarios cited by Cal Advocates are simply the demonstration of how a resource may operate to maximize revenues *when there is no reliability need* assumed. Form subsequently provided a modeling scenario that retained a 24-hour charge, to show that this could be done **simultaneously** with market optimization for the remaining charge. This supports that reliability can be supported by LDES resources, even if they are also dispatched for price arbitrage purposes under non-reliability constrained scenarios.

4. The Commission should adopt a realistic 50% ISOC today and refine it based on future data.

The Joint LDES Parties support setting initial state of charge levels according to realistic LDES capabilities. A 50% assumption serves as a conservative, middle-of-the-road proxy that reflects the physical reality of assets designed to carry energy across multiple days. The Commission should adopt this baseline now and adjust it in future proceedings as actual operational data from the growing LDES fleet becomes available.

C. Despite its claims to the contrary, Cal Advocates' proposal really does tie LDES value to the energy available on the "worst day."

Cal Advocates argues that under its proposal, LDES charging is not entirely dependent on "worst day" energy because that value is simply used as the basis of a multiplier in their calculation. They suggest this approach minimizes the impact of peak-day scarcity by making the requirement only fractional. However, this defense overlooks a fundamental accounting reality: under the Cal Advocates' approach, excess energy on the worst day remains the **foundational and only** data point used to measure energy availability. Even if the requirement is fractional, the starting point of the calculation is still tethered to the most constrained hours of the month. By ignoring the actual, verifiable energy abundance in the days leading up to a peak event, Cal Advocates' proposal continues to force LSEs toward unnecessary and costly over-procurement.

Under the Cal Advocates' formula, if a compliance showing has zero excess energy on the "worst day," an LDES resource would effectively be assigned zero value, regardless of how much energy it banked during the preceding days of renewable oversupply. This is a harmful and counter-intuitive assumption. LDES is specifically designed to solve the problem of "worst-day" scarcity by shifting energy across a multi-day horizon. To adopt an accreditation framework where LDES cannot serve load during a crisis because it cannot find charging energy during the peak of that same crisis would be a significant failure of program design.

D. The Commission should adopt a proposal for LDES resources that covers all resources in that category

In its opening comments, CalCCA proposes that LDES be defined strictly as a resource in which the full "charge-discharge cycle is greater than 24 hours". While this definition attempts to create a clear boundary, it relies on a categorical approach that does not account for the

varying physical characteristics of emerging storage technologies. In contrast, the Joint LDES Parties proposed a Pre-charging Period Table designed to provide flexibility for future resources with different characteristics. This sliding scale approach is tied to operational realities, and also has the benefit of allowing the Commission to adopt a proposal that applies to all resources with 8+ hours of duration.

The danger of the CalCCA approach is that it creates arbitrary "edge cases" that could lead to strange and inequitable results. For example, consider two different 10-hour storage resources. A 10-hour resource with a higher round-trip efficiency (RTE) or faster charging cycles might complete a full charge-discharge cycle in just under 24 hours; under CalCCA's definition, this resource would be excluded from the LDES framework. However, a 10-hour resource with a slightly lower RTE or slower charging capability would exceed the 24-hour threshold and be classified as MDS. It is not logical to subject two resources with the same discharge duration to entirely different sets of RA rules based solely on minor variations in efficiency or charging speed. Both resources behave like LDES in their ability to provide multi-hour and multi-day support to the grid, and both should be treated similarly.

The Joint LDES Parties urge the Commission to develop rules for accrediting all storage resources with the ability to discharge at full output for 8 or more hours, or more simply, all LDES resources.

E. The Joint Parties' proposal does not affect how short-duration storage is treated under slice-of-day

In its opening comments, Vistra makes a compelling argument that an LSE may have excess stored energy from prior days that could be used to offset charging requirements on the "worst day," regardless of whether the storage fleet is comprised of short-duration energy storage, LDES, or multi-day storage. The Joint Parties' proposal was specifically focused on

LDES treatment because the current scope of this track is to address the unique accreditation challenges facing long-duration assets. In future iterations or subsequent tracks of the RA program, it could make sense to address Vistra's proposal for determining short-duration systems' state of charge coming into the slice-of-day period . For now, the Commission should adopt the Joint Parties' proposal to ensure that LDES resources are accurately accredited for the 2027 compliance year.

IV. Conclusion

For the reasons set forth above, the Joint LDES Parties respectfully request that the Commission adopt their proposed framework for ensuring energy sufficiency of LDES resources, and reject the Cal Advocates' proposal. Aligning the resource adequacy program with the physical reality of LDES is critical to maintaining grid reliability at the lowest possible cost to ratepayers.

This joint filing is submitted by CESA, which is authorized to file on behalf of the undersigned Joint LDES Parties.

Respectfully submitted,

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