The ISO received comments on the 2025 and 2029 draft Local Capacity Requirements results presented at the March 6, 2024 stakeholder call from the following:

1. California Community Choice Association (Cal-CCA)
2. Form Energy Inc.

Copies of the comments submitted are located on the Local Capacity Requirements Process Page at: http://www.caiso.com/informed/Pages/StakeholderProcesses/LocalCapacityRequirementsProcess.aspx.

The following are the ISO's responses to the comments.

No	Comment Submitted	CAISO Response
1	**California Community Choice Association (Cal-CCA)** **Submitted by: Shawn-Dai Linderman**	
1a	**Please provide your organization's comments on the 2025 and 2029 Local Capacity Requirements Draft Study Results.** The California Community Choice Association (CalCCA) appreciates the opportunity to comment on the 2025 and 2029 Local Capacity Requirements (LCR) Technical Study Draft Results (Draft Results). CalCCA greatly appreciates the significant efforts by the California Independent System Operator Corporation (CAISO) staff to conduct the LCR Technical Study and present the Draft Results. CalCCA does not object to any element of the Draft Results. The Draft Results highlight the critically important role the Transmission Planning Process (TPP) will play when it comes to identifying cost-effective solutions to reliably meeting local capacity area needs under a zero-carbon grid. The ability to retire fossil fuel resources in local areas will depend on either (1) eliminating transmission constraints that limit the number of external resources capable of serving load in the local area, or (2) bringing online enough effective carbon-free resources inside of the local area to replace the existing fossil fuel resources. When cost-effective, new transmission can be extremely effective at reducing reliance on resources inside the local area by increasing the ability to import resources outside the local area to load centers. Because local areas depend heavily on gas-fired resources, it will be critical for the CAISO and the California Public Utilities Commission (Commission) to identify when transmission can cost-effectively reduce LCRs to meet state policy goals. In the Integrated Resource Planning (IRP) proceeding (Rulemaking (R.) 20-05-003), the Commission adopted Decision (D.) 24-02-047, adopting the 2023 Preferred System Plan (PSP) and TPP portfolio that the CAISO will use in its 2024-2025 TPP.[1] In the Decision, the Commission requests the CAISO to conduct a High Gas Retirement Sensitivity, "to identify the transmission resources and costs associated with planning for the potential future retirement of fossil-fueled resources as their economics decline."[2] This sensitivity will	Thank you for your comments. The CAISO will conduct a new set of long-term LCR studies as part of this TPP cycle, please see the draft TPP study plan. CAISO reminds stakeholders that it already conducted studies for alternatives to reduce or eliminate conventional gas generation during 2018-2019, 2019-2020 and 2020-2021 TPP assessment cycles. See details under each area and sub-area sections of the 10-year out LCR reports: http://www.caiso.com/Documents/AppendixG-BoardApproved2020-2021TransmissionPlan.pdf http://www.caiso.com/Documents/AppendixG-BoardApproved2019-2020TransmissionPlan.pdf http://www.caiso.com/Documents/AppendixG-BoardApproved2018-2019TransmissionPlan.pdf

[1] D.24-02-047, Decision Adopting 2023 Preferred System Plan and Related Matters, and Addressing Two Petitions for Modification, R.20-05-003 (Feb. 20, 2024): https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M525/K918/525918033.PDF.
[2] Id. at 75.

No	Comment Submitted	CAISO Response
	inherently provide information about reliability needs in local areas that will emerge when the gas fleet is retired, as a majority of the existing gas fleet is located in local areas. The Draft Results highlight the critical importance of conducting this sensitivity. The Draft Results show that many of the local areas have just enough or not enough internal generation to meet the requirement. One local area is deficient and an additional three local areas have less than ten percent excess generation beyond the requirement. This trend is projected to continue, as demonstrated by the 2032 LCR conducted by the CAISO in the 2022-2023 TPP. In that study, the total LCR requirement increases by almost 5,000 megawatts, two local areas are deficient, and three more have less than ten percent excess generation beyond the requirement. Because many of the local areas are right on the edge of having enough resources to meet the needs, a sensitivity analysis like the high gas retirement sensitivity will inform whether additional gas retirements will trigger the need for mitigation, either through new transmission or new local resources. When the CAISO does its High Gas Retirement Sensitivity, it should take care to make necessary assumptions about electrification, because local areas are where loads will increase the most, and a combination of gas retirements plus electrification could increase the need for mitigation measures. As D.24-02-047 notes, "[a]ny sensitivity portfolios are used to produce transmission location and cost information that can inform future analyses, <u>but the sensitivity portfolios alone usually do not result in direction recommendations for investment for particular transmission projects</u> in the current TPP cycle."[3] Following the sensitivity study, the Commission and the CAISO will need to consider what next steps are needed to enable progress to be made and any necessary actions identified from the sensitivity.	

[3] Id. at 70 (emphasis added).

No	Comment Submitted	CAISO Response
2	**Form Energy Inc.** **Submitted by: Jason Houck**	
2a	**Please provide your organization's comments on the 2025 and 2029 Local Capacity Requirements Draft Study Results.** Form Energy appreciates the Local Capacity Requirement (LCR) Studies and does not have comments on the concrete results at this time. However, we would like to raise ideas for CAISO to consider before the development of future LCR studies. **Multi-day Periods of Grid Stress in LCR Areas Should Be Considered** Currently, the CAISO conducts studies of the ability to serve a single-day 1-in-10 managed peak load, with tests for a variety of contingencies. Resource contributions are measured in net qualifying capacity (NQC). While the studied contingencies do reflect periods of grid stress, they still focus on single-day needs or emergencies. Additionally, with regard to energy storage, the studies assume that there must be sufficient local resources for energy storage to fully recharge from one day to the next. Increasingly, California has faced multi-day reliability events. Extended heat waves have created multiple back-to-back days of high load, and 2022 saw one of the longest and hottest heat waves in history, a 10-day event that set the record for the highest load experienced on the CAISO system. These extreme events that used to be rare are becoming more common; for example, the August and September 2020 heat waves were 1-in-30 and 1-in-70 events, respectively.[4] Periods of grid stress are also changing: both the California Energy Commission (CEC) and California Public Utilities Commission (CPUC) have identified that the periods that cause the most grid stress in the long run are likely to shift to the winter, during prolonged winter storms that limit solar output. In the next LCR study, CAISO should consider these types of multi-day events and how they could impact local reliability needs. It is essential to begin assessing the ability of local resources to meet net load during sequential day periods of grid stress, rather than solely from one day's net peak to another. In recent LCR studies (e.g. the 2024 and 2028 LCR Studies), CAISO has generated information about each region's estimated maximum energy storage	Thank you for your comments. The current LCR studies assure that if reliability can be maintained for the 1/10 local peak day than reliability will also be maintained for any day with load less than 1/10. The LCR local load forecast level (1/10) is the same as the approved CAISO grid planning standards for local studies. Currently the NERC/WECC/CAISO standards do not plan to maintain the same level of reliability for load exceeding 1/10 local load forecast, like 1/20, 1/30, 1/70 etc.

[4] CAISO, CPUC, and CEC, Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave, January 13, 2021 at 40. Available at: http://www.caiso.com/Documents/Final-RootCause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf

No	Comment Submitted	CAISO Response
	capacity based on an assessment of a region's minimum charging capability within a day under the most critical contingency. This assessment has assumed that all energy storage resources must fully recharge from one day to the next in order to support the next day's local reliability requirements. This approach reflects CAISO's focus on single-day reliability risks and also overlooks the capabilities of newly commercial energy storage resources, such as Form Energy's 100-hour multi-day energy storage system, which will be operational in the CAISO market as soon as 2025. One of the key advantages of multi-day energy storage is that it can discharge continuously at rated capacity over sequential days without having to recharge. This capability provides grid operators with a new means to shift excess energy over longer periods of time and meet local reliability needs across sequential days despite limited local generation. In future LCR studies and assessments of energy storage needs, we encourage CAISO to model scenarios that include multi-day energy storage and reflect that this resource class is not bound by single-day charging constraints in the same way that short-duration storage resources are. **Weather-correlated load profiles and renewable generation profiles should be used in LCR Studies.** CAISO should also further consider the correlation between weather, load, and generator output over multi-day periods. There has been significant discussion in California about the performance of the natural gas fleet during heat waves, and CAISO already considers "temperature-adjusted ratings" or ambient derates in the LCR studies. However, it is not apparent from the study whether CAISO considers multi-day renewable generation shortfall events that are also expected. It is essential that California's energy agencies consistently use load and generation profiles that are correlated to the same weather year and that reflect diverse weather conditions (at least 1-in-10 weather years). System load and renewable generation can often be anticorrelated, meaning that system load is high in hours in which renewable output is low, and is often driven by weather conditions over a given time period. These periods are a driver of needs for firm capacity, making weather-driven input assumptions for load and renewable generation particularly important in the analysis of high renewable grids. For example, Form Energy's analysis has shown that	The current LCR methodology does correlate the load profiles and renewable generation profiles for the peak 1/10 day. The multi-day comments are more suitable towards the LCR criteria methodology and assumptions stakeholder meeting/call held by the CAISO every year around October 30-th before starting a new round of LCR studies.

No	Comment Submitted	CAISO Response
	renewable energy output can fall more than 25% below the 35-year average on a periodic basis, with 100-hour events occurring once every ten years and 50-hour events occurring more than once every two years.[5] These lulls can be due to weather patterns that are not necessarily considered to be extreme for other purposes but should be explicitly considered in the LCR studies. While these recommendations cannot be easily incorporated into the current technical studies, Form recommends that CAISO begin to consider how to incorporate this type of analysis into future LCR studies. This may also require stakeholder engagement outside of the typical LCR study cycle that begins in October with results adopted in May. **Longer-Term Scenarios Should be Considered in the LCR Studies, Including Accelerated Gas Retirement Scenarios** Currently, CAISO's LCR studies focus solely on the near term, with a maximum five-year look-ahead. However, the CPUC's Integrated Resource Planning (IRP) studies examine longer-term portfolio needs out to 2045 and include scenarios with far higher quantities of renewables and storage, and far lower levels of existing natural gas resources, than what CAISO models in LCR studies. This temporal mismatch threatens California's ability to ensure a reliable, least-cost system in the long run, and it fails to send appropriate investment signals to resource developers. The near-term focus of CAISO's LCR studies limits CAISO and other stakeholders from understanding the nature of long-run local reliability challenges and the kind of local resources that will be needed to support local reliability and meet state zero carbon goals. We therefore recommend that CAISO's future LCR studies consider long-term scenarios that align with the CPUC's IRP portfolios. This approach would make LCR studies a resource that can inform future considerations about resource accreditation or resource performance needed to ensure local reliability. It can also help the CPUC expand its IRP process to optimize for both local and system reliability requirements, potentially lowering ratepayer costs in the process. Relatedly, California has ambitious natural gas retirement goals, with the CPUC recently adopting an Integrated Resource Plan that includes 2.7 GW of	The CAISO completes long-term LCR studies every two years. They are included as an Appendix to the TPP report. Please see CAISO response to item 1a above.

[5] Form Energy, Opening Comments of Form Energy, Inc. on Administrative Law Judge's Ruling Seeking Feedback on Mid-Term Reliability Analysis and Proposed Procurement Requirements submitted to CPUC Rulemaking 20-05-003, March 26, 2021, at 3-7. Available at: https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M376/K501/376501686.PDF

No	Comment Submitted	CAISO Response
	gas retirement by 2030 and 6.6 GW of retirement by 2045. The CPUC is also exploring a high gas retirement sensitivity of 9.3 GW of natural gas retirements by 2035 and 15.9 GW by 2039, which CAISO will be studying in the 2024-25 Transmission Planning Process (TPP). The CAISO should not only consider these gas retirements in the TPP but should also consider the impact of gas retirements on local capacity needs and the attributes of storage and other firm zero-carbon resources that can substitute for these retirements. In particular, the CAISO can play a unique role in determining where it may be most cost-effective to retire gas. For example, in 2017, the CAISO released the Moorpark Sub-Area Local Capacity Alternative Study, which showed that energy storage could provide an alternative to building a new natural gas plant. This study was conducted on a one-time basis in response to a specific request from the CEC. However, this study showed a concrete path forward for the replacement of gas, which the CPUC could then act on through procurement orders. The CEC also recently sponsored a study on retiring the Los Angeles Basin. The study showed that 2 GW of long-duration storage and 1.3 GW of 4-hour lithium-ion storage is found to be the least-cost substitute for gas power plants located in disadvantaged communities, lowering system costs by 3%.[6] This study can serve as a blueprint for how other local reliability areas can be studied in the future. As California moves towards decreasing reliance on gas, the CAISO should look to provide additional information on how to maintain local reliability and decrease costs in specific LCR areas in the long run. This could be conducted in the main LCR study process or could be directed in another workstream to provide additional time for study and stakeholder engagement.	

[6] Energy and Environmental Economics (E3), Form Energy, and the University of California San Diego (UCSD), Assessing the Value of Long-Duration Energy Storage in California, December 2023. Available at: https://www.energy.ca.gov/publications/2024/assessing-value-long-duration-energy-storage-california