



**Stakeholder Comments**  
**2022 and 2026 Draft Local Capacity Technical Study Meeting**  
**Draft Results**  
**March 11, 2021**

The ISO received comments on the topics discussed at the March 11 stakeholder meeting from the following:

1. [Vistra](#)
2. [Bay Area Municipal Transmission group \(BAMx\)](#)
3. [Pacific Gas & Electric \(PG&E\)](#)

Copies of the comments submitted are located on the Local capacity requirements process webpage at:

<https://stakeholdercenter.caiso.com/RecurringStakeholderProcesses/Local-capacity-requirements-process-2022>

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

### 1. Vistra

Submitted by: Cathleen Colbert

No	Comment Submitted	CAISO Response
1a	<p>Vistra Corp. respectfully submits these comments on the CAISO's 2022 and 2026 Draft Local Capacity Requirements ("LCR") Study Results posted on March 9, 2021 and discussed at a public stakeholder call on March 11, 2021. We appreciate that these Draft Results are the result of decisions the CAISO Transmission Planning group previously made when developing its Final Study Plan and final base cases. Vistra is committed to continuing to engage with the CAISO through its processes seeking stakeholder feedback.</p>	Thank you for comments and feedback.
1b	<p>We submitted comments raising issues with storage modelling assumptions in our comments on the CAISO 2022 Local Capacity Technical Study Criteria Methodology and Assumptions and Vistra appreciates the CAISO spending time to summarize and response to stakeholder comments submitted on its LCR Draft Study Manual. In its responses, the CAISO stated in response to Vistra that:</p> <p>"While batteries may still be able to replace some local generation it will require installation of 6, 8 or 10 hour batteries (depending on each local area specific need)."</p> <p>We appreciate the CAISO providing this explanation. The CAISO's analysis is helpful in that it informs the market that the CAISO reliability studies show directionally that there is a need for longer duration assets to complement assets that truly have shorter maximum duration limits. Our concern is that by using the "4-hr storage" concept in the study that the CAISO is injecting into its local reliability study the false construct that batteries being built have a maximum duration physical limit. Our understanding is this in most cases this is not the limit but rather there is the MWh energy limitation we have described, like other energy use limited resources.</p> <p>Similar to other use-limited resources, energy storage has an energy limit (MWh limit) per cycle as well as a maximum cycles per day limit that is limited by other physical characteristics such as its interconnection rights and its round-trip efficiency. An energy storage resource rated to be able to sustain its maximum installed capacity for four hours with a round-trip efficiency of ~90% can provide just short of three cycles per day, however this will impact its incremental operations and maintenance costs. For instance, a 300 MW/1200 MWh energy storage resource could provide twenty-four hours of maximum</p>	The CAISO has changed the language in the LCR reports and presentations to account for the fact that the maximum 1 for 1 MW replacement with 4-hour battery is not a physical limitation for the majority of the areas and sub-area, but rather a MWh limitation.

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	<p>sustainable output of 50 MW per hour without violating its energy limit. An operating pattern likely more consistent with operations would be to provide maximum sustainable output up to 120 MW per hour for 10 operating hours, allowing the remaining 14 hours to be used to re-charge. We note this example assumes one cycle per day limit, which is not generalizable to all energy storage and much more conservative than its physical capabilities. An energy storage resource could cycle up to almost three times per day, only if it is able to reflect the operations and maintenance costs resulting from increased cycles and MWh output in its offers. This example illustrates that the RA procurement framework needs to compensate energy storage RA resource equivalently to provide MWh across the day as it does to those that provide MWh across four-hours. Under the current rules, an energy storage resource willing to provide its MWh across a greater span of hours would have to de-rate its capacity value on a MW basis to provide the MWh over a longer duration, which would adversely impact its economics removing any incentive to build the asset. We support policy changes in this area that direct procurement changes to result in development consistent with reliability needs is the goal.</p> <p>The example above focuses on charging approach that would ensure full state of charge by an earlier hour that could be dispatched based on market needs throughout a much longer discharge period. The alternative scenario should also be explored where an energy resource charges over an extended period or charges during periods where the charge limitation does not affect the local area to provide its full state of charge across the four-hour period at net peak. Energy storage resources have flexibility in how they operate to ensure sufficient state of charge to optimize its use and value in the energy and ancillary service markets. We believe the maximum storage and maximum 4-hr storage analysis should capture the diversity of approaches that could be adopted to charge the battery. the information would be more helpful to inform developers consideration if the CAISO instead reported on the maximum charge MW that CAISO believes can be withdrawn from the grid on an hourly basis within each Local Capacity Area. The information would be more helpful to inform developers consideration if the CAISO instead reported on the maximum charge MW that CAISO believes can be withdrawn from the grid on an hourly basis within each Local Capacity Area.</p> <p>We request the CAISO consider that energy storage resources are providing energy that can be dispatched across the day – not energy that is limited to a</p>	<p>The maximum charge capability in MW by hour can be read from the graph in any area or sub-area of interest.</p> <p>The maximum physical limitation in MW and MWh is already presented. The maximum 1 for 1 MW replacement with 4-hour battery is extra</p>



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	<p>four-hour max duration. We request the CAISO consider reframing this analysis to report on the maximum amount of local RA that can be supported by various durations regardless of technology type rather than solely focusing on four-hour duration storage. Vistra thanks the CAISO for its consideration of our comments.</p>	<p>procurement information that for most areas and sub-areas does not represent a physical limit.</p>

## 2. 2. Bay Area Municipal Transmission group (BAMx)

Submitted by: Paulo Apolinario

No	Comment Submitted	CAISO Response
2a	<p><b><u>Introduction</u></b></p> <p>The Bay Area Municipal Transmission group (BAMx) appreciates the opportunity to comment on the CAISO 2022 and 2026 Draft Local Capacity Requirements (LCR) study results discussed during the March 11, 2021 stakeholder meeting. We continue to see positive enhancements to each year's LCR analysis and look forward to continuing to work with the CAISO to improve and refine the process.</p>	Thank you for your comments.
2b	<p><b><u>BAMx Encourages CAISO's Use of Low-Cost Solutions for Higher Level Contingencies</u></b></p> <p>The Draft 2021 and 2025 LCR study has identified P3 (N-1, G-1) and P6 (N-1-1) types of contingencies as a driver for the LCR needs in many LCR areas and subareas. Per NERC and CAISO's planning standards, these types of contingencies allow for system readjustment between the first and the second outage. As explained in the 2022 study manual, the CAISO has used system readjustment and operating solutions to the extent possible for all known system readjustments and operating solutions for both category P3 and P6 events.</p> <p>In response to BAMx comments on the 2021-2025 Draft LCR, dated March 16, 2020, the CAISO had indicated “[t] is proactively working with the PTOs under both the planning and the operations departments to come up with new operating solutions and system readjustments measures to the extent feasible.” However, we continue to see that the same P3 and P6 contingencies that drove the 2021 and 2025 LCR needs continue to drive the 2022 and 2026 needs as part of the latest assessment.</p> <p>We understand that the CAISO is open to some suggestions/proposals by the involved Participating Transmission Owners (PTO) and others but we believe the CAISO should also be proactive by systematically identifying operating procedures to potentially reduce the LCR needs. BAMx encourages the CAISO to take the lead role in developing these operating solutions.</p> <p>BAMx recognizes that not all low-cost solutions like SPS or bus rearrangement can be economically justified based on LCR reduction due to the lack of corresponding cost reductions. For example, the CAISO considered the Metcalf 500-230 kV Transformers Dynamic Series Reactor Project in the</p>	<p>The CAISO is proactively working with the PTOs under both the planning and the operations departments to come up with new operating solutions and system readjustments measures to the extent feasible. As usual stakeholders are encouraged to bring their own input into the process.</p>

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	<p>2020-2021 Transmission Planning Process as it would have provided some significant reduction in the Greater Bay Area requirement. Although based on the latest publicly available 2018 RA prices, the CAISO determined that this particular project provided almost negligible LCR benefit for this area, BAMx encourages the CAISO to study such projects in future transmission planning cycles.</p>	<p>The CAISO will continue to work with the PTOs and stakeholders to identify and approve low cost solutions to the identified criteria violations as well as economic projects that reduce LCR costs in the future transmission planning processes.</p>
2c	<p><b><u>CAISO Needs to Demand that PTO's Complete Transmission Projects in Timely Fashion</u></b></p> <p>BAMx observes that there is a common feature among some LCR areas, such as Sierra, Stockton and Kern where the 2026 LCR needs are expected to be higher than envisioned earlier due to delay in transmission projects in-service dates. For example, the overall LCR requirement is higher due to delay in East Marysville 115/60 kV and the Gold Hill 230/115 Transformer projects in the Sierra local area. BAMx notes that PG&amp;E projects have had long implementation lead times in the range of 6 to 15 years. Such delays are especially problematic from the ratepayer perspective. Not only do these project delays typically result in increased capital costs but also burden the load-serving entities with high LCR procurement costs.</p> <p>BAMx urges the CAISO work with that the PTOs prioritize the reliability transmission projects with LCR reduction benefits and complete them in a timely manner.</p>	<p>The CAISO is constantly coordinating with the PTOs regarding prioritization of already approved transmission projects. Furthermore, the ISO constantly encourages the PTOs to bring the project to completion in a timely manner. The CAISO Tariff does not give CAISO the authority to demand or dictate the completion time for approved transmission projects. The PTOs are responsible for receiving regulatory approvals and for constructing the already approved transmission projects. For questions about in-service dates or delay to in-service dates please contact the respective PTO.</p>
2d	<p><b><u>Potential Storage Additions Calculations</u></b></p> <p>BAMx applauds the CAISO's extensive efforts in putting together the analyses and graphs illustrating the comparison of the yearly load curves against the import capability of each subarea and the peak day load profiles against the import capability. For each one of the LCR areas and sub-areas, the CAISO has also identified an approximate amount of storage that can be added to each subarea from a charging restriction perspective. However, no underlying calculations were provided on how the CAISO has derived these values.</p> <p>BAMx understands that the CAISO utilized spreadsheets and techniques that were tailored to the different circumstances in the LCR areas. BAMx appreciates that this analysis will continue to evolve and be refined, as the storage charging estimates are informational only, considered preliminary, and will be refined in subsequent studies. For example, the CAISO has made</p>	<p>As stated before, the CAISO will continue to improve and refine the storage charging estimates. Currently they are considered preliminary, and as a result is premature to provide them at this time. The CAISO may reconsider the issue in the future.</p>



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	<p>substantial refinement to its last year's analysis by including the maximum 4-hour storage estimate for each sub-area and area.</p> <p>BAMx notes that stakeholders continue to be unclear about the determination of storage sizes that can be added in the LCR sub-areas and how this data could be used to appropriately select and site battery storage. In our past comments, we had requested the CAISO to provide the underlying calculations used to obtain these values as well as any work-products, including spreadsheets used to calculate the charging capacity values for all the LCR subareas. If the CAISO is unwilling to provide the underlying calculations and spreadsheets, any additional documentation including a flowchart would be appreciated.</p>	
2e	<p><b>Conclusion</b></p> <p>BAMx appreciates the opportunity to comment on the CAISO 2022 and 2026 Draft LCR study results. We hope to work with the CAISO staff to continue to improve and enhance its capabilities.</p>	Thank you for your comments.

### 3. Pacific Gas and Electric (PG&E)

Submitted by: Mike Pezone

No	Comment Submitted	CAISO Response
3a	<p>PG&amp;E appreciates the opportunity to provide comments following the March 11th stakeholder meeting on the 2022 Local Capacity Requirements (LCR). Below please finds PG&amp;E's brief comments.</p>	<p>Thank you for your comments.</p>
3b	<p><b>Clarification and Interpretation of Local Deficiency Estimates</b></p> <p>The CAISO notes that the overall LCR for the Greater Bay Area has increased by 1,211 MW (6353 MW in 2021 and 7564 in 2022) due mostly to a 140 MW (2543 MW in 2021 and 2683 MW in 2022) increase in the San Jose area load forecast. PG&amp;E requests that the CAISO provide details of the methodology used to evaluate deficiency, for example, whether it assumed extra resources in the most effective location within the deficient area. PG&amp;E also requests that in future analyses, the CAISO provides LSEs additional information of the most effective substations at relieving the constraint in the most optimal fashion.</p> <p>Additionally, the CAISO has also noted in previous LCR reports that a resource deficient area implies that in order to comply with the reliability criteria, load may be shed immediately after the first contingency. PG&amp;E requests the CAISO to confirm, if the additional Greater Bay Area procurement is made and all resources available in the San Jose sub-area are procured, there may still be insufficient resources in the San Jose sub-area to comply with the reliability criteria resulting in load supply at risk under most stressed system conditions.</p>	<p>In order to estimate the deficiency the CAISO is generally increasing the most effective resource beyond its NQC in order to mitigate the problem. However, the Bay Area overall requirement did not increase because of the deficiency in the San Jose sub-area, it increased because resources around San Jose have been fully utilized in the past in order to minimize the Bay Area overall, as such the increase in San Jose load, very effective to the Bay Area main requirement, has to be made up by resources far less effective located in Pittsburg and Contra Costa sub-areas.</p> <p>As previously stated in the LCR reports, any resource deficient area or sub-area implies that in order to comply with the reliability criteria, load may be shed immediately after the first contingency in order for the system to be secured after the second contingency. San Jose sub-area is no different. PG&amp;E should strive to install currently approved transmission projects in all deficient areas and sub-areas as soon as possible.</p>