

The ISO received comments on the topics discussed at the March 16 stakeholder meeting from the following:

1. [Smart Wires](#)
2. [Southern California Edison \(SCE\)](#)
3. [Bay Area Municipal Transmission group \(BAMx\)](#)
4. [Pacific Gas & Electric \(PG&E\)](#)

Copies of the comments submitted are located on the Local capacity requirements process webpage at:
<http://www.caiso.com/informed/Pages/StakeholderProcesses/LocalCapacityRequirementsProcess.aspx>

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

1. Smart Wires Submitted by: Chris Ariante		
No	Comment Submitted	CAISO Response
1a	<p>Smart Wires appreciates the opportunity to comment on the CAISO's 2021 & 2025 Draft LCR Study Results.</p> <p>Background:</p> <p>In the 2019-20 TPP the CAISO studied the Tesla-Delta Switchyard 230 kV Smart Wires line reactance project as one of 3 alternatives for reducing LCR in the Contra Costa Sub-Area. The Smart Wires solution was the only alternative found to have a B/C ratio higher than 1, and the CAISO noted that the solution could reduce LCR by as much as 1275 MW with a B/C ratio of 2.1 to 3.9 for NP26 and SP26 local capacity, respectively, vs system capacity. (See revised 2019-20 TPP Study results, table 4.10-17)</p> <p>The 2019-20 TPP report concluded that "the Tesla Delta Switchyard 230 KV line reactance project provides significant reduction in Contra Costa sub-area's capacity requirements, however, the need of the same resources towards satisfying the overall GBA requirements still needs to be evaluated. The evaluation will be part of the 2021 LCR Study. The evaluation will be part of the 2021 LCR study which will also include the recently changed LCR criteria. Furthermore, Marsh Landing units 3 and/or 4 are currently required for black start purposes, therefore the benefit to cost ratio may need to be adjusted. For these reasons this alternative is not recommended for approval at this time"</p> <p>Smart Wires requests that the CAISO finalize their determination regarding the amount of LCR capacity that can be reliably reduced in the Contra Costa sub area and define the B/C ratio associated with the Smart Wires line reactance project for doing so. If the cost-benefit ratio remains greater than 1, Smart Wires requests approval for the Tesla-Delta Line Reactance solution to enable this LCR reduction and benefit for ratepayers.</p>	<p>Thank you for submitting the project for evaluation. Based on the 2021 preliminary LCR study results, the LCR for Contra Costa area is 1119 MW. The results also show that almost the same amount of Contra Costa sub-area local resources are required towards satisfying the requirement for overall Greater Bay Area. As such, reducing the requirement for the Contra Costa sub-area will not provide economic benefit. This can be reassessed if the requirement for the overall Greater Bay Area is reduced such that the Contra Costa sub-area local resources are not required towards satisfying the overall Greater Bay Area requirement.</p>
1b	<p><u>Economic Solution for Tesla – Delta Switchyard 230 kV</u></p> <p>Smart Wires submitted a project study request in the 2019-20 TPP which leverages the SmartValve, a modular Static Synchronous Series Compensator (SSSC). The proposed solution would reduce ~1,275 MW of LCR by introducing 12.5 ohms of reactance in series with the Tesla – Delta Switching Yard 230 kV line.</p> <p>Smart Wires' planning level cost estimate for a 12.5-ohm series reactance injection on the Tesla – Delta Switchyard 230 kV line via the SmartValve was</p>	<p>Based on the 2021 preliminary LCR study results, the LCR for the Contra Costa sub-area is 1119 MW. The results also show that almost the same amount of Contra Costa sub-area local resources are required towards satisfying the requirement for overall Greater Bay Area. As such, reducing requirements for the Contra Costa sub-area will not provide economic benefits. This can be reassessed if the requirement for the overall Greater Bay Area is reduced such that the</p>

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	<p>conservatively estimated at a maximum cost of \$5.4M. This proposed solution provides flexibility in that it can be operated as needed for this application to ensure reliability. Furthermore, the solution can be scaled down in both size and cost should the CAISO's assessment determine that a lower amount of LCR reduction be most optimal.</p> <p>In addition, the SmartValve can introduce line reactance when needed and can internally bypass during normal operation to reduce system losses. The devices can also be re-deployed in the future should the need on this line be alleviated, or scaled up should the need grow.</p> <p>The draft 2021 and 2025 draft Study Results show the LCR in Contra Costa Sub-Area to be 1119 MW and 1417 MW in 2021 and 2025 respectively. Additionally, Smart Wires understands ~398 MW of the Marsh Landing units within Contra Costa may be required for black start purposes, and this may influence the potential need for LCR reduction. If Marsh Landing units remain available, it appears the Sub-Area's LCR could be reduced to ~721 MW. (721 MW was derived from 1119 MW total sub-area LCR minus 398 MW from Marsh Landing that remain for black start). For study year 2025, the reduction in LCR that would be beneficial increases to ~1,020 MW (1,417 MW - 398 MW).</p> <p>In addition, Smart Wires noted that the CAISO draft 2021 / 2025 LCR Study conveyed that some of the Contra Costa Sub-Area resources may be needed for satisfying the overall Greater Bay Area's capacity requirements. However, it is Smart Wires understanding that the effectiveness factor of Contra Costa generation on the GBA LCR constraint, Metcalf 500/230 kV bank, is relatively ineffective at 3%. (See "Table 3B – Generation Effectiveness Factors - Individual Elements" on page 46 of http://www.caiso.com/Documents/2210Z.pdf). Therefore, Smart Wires believes that a reduction of ~721 MW in 2021 and ~1,020 MW in 2025 should be both feasible and beneficial for ratepayers and looks forward to the CAISO's more detailed efforts to quantify the B/C ratio of the potential Smart Wires solutions. As noted above, Smart Wires proposed a 12.5-ohm solution in the 2019-20 TPP. That solution provides up to 1,275 MW of LCR reduction. However, if a reduced solution size is found to be most economic, Smart Wires can deliver a scaled down deployment. Smart Wires has prepared a cost estimate and provided a change file for an 8-ohm solution to facilitate the CAISO's assessment in this regard. As such, Smart Wires can deliver an 8-ohm solution for an estimated cost of \$4.4M. This solution is presented to provide CAISO</p>	<p>Contra Costa sub-area local resources are not required towards satisfying the overall Greater Bay Area requirement.</p>

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	<p>with one additional degree of flexibility should the full 12.5 ohm / 1,275 MW reduction not be required.</p> <p>Smart Wires will separately provide specific change files for both the 12.5 and 8 ohm solutions.</p>	
1c	<p><u>Approval of the Tesla-Delta 230 kV Line Reactance Project Following Completion of the 2021 LCR Study</u></p> <p>Should the CAISO's updated analysis show a B/C ratio higher than 1 for this project, Smart Wires respectfully requests that it be approved upon completion of this 2021 LCR study (as part of the 2019 – 2020 Transmission Planning cycle). Pending approval, Smart Wires would stand ready to deliver the SmartValve devices and support an installation in time for summer 2021. Smart Wires believes that approval of this project following completion of the LCR study will enable the CAISO to deliver the associated ratepayer benefits at the earliest date possible.</p>	<p>Please see response above indicating that the Contra Costa sub-area would be reduced the generation would be required for the Greater Bay area requirements and as such does not reduce the local capacity requirements. The CAISO will continue to assess if there are economic benefits for this upgrade as a part of the transmission planning process.</p>

2. Southern California Edison (SCE) Submitted by: Wei Zhou		
No	Comment Submitted	CAISO Response
2a	<p>SCE appreciates the opportunity to provide the comments on the CAISO's 2021 and 2025 Local Capacity Requirements (LCR) study draft results dated March 16, 2020.</p> <p>SCE is concerned with how the CAISO has seemingly excluded the benefits of the Pardee-Sylmar No. 1 and No. 2 230 kV Line Rating Increase Project (Pardee-Sylmar Project) in the draft 2021 and 2025 LCR results for the Big Creek-Ventura Local Area. As documented in the CAISO Board- approved 2019-2020 Transmission Plan, posted on 3/26/2020, the Pardee-Sylmar Project will reduce LCR for the Big Creek-Ventura area by 837 MW, with an achievable in-service date of May 2023. This 837 MW LCR reduction benefit of the Pardee-Sylmar Project approved in the 2019-2020 Transmission Plan is not fully captured in the draft LCR results which show only 110 MW of LCR reduction from the prior year in 2025 for the Big Creek-Ventura Local Area. Exacerbating SCE's concern, the 110 MW LCR reduction is due to a decrease in the load forecast, which indicates that the expected benefits of the Pardee-Sylmar Project on the LCR have not been factored into the LCR study.</p> <p>SCE objects to the LCR study not incorporating the approved Pardee-Sylmar Project, even if the approval occurred after the study was initiated, but before the study concludes. This is particularly important as the project is expected to have significant benefits in lowering the LCR for the Big Creek-Ventura Local Area and thus lowering ratepayer procurement costs in meeting the local resource adequacy (RA) requirement. Failing to account for the Pardee-Sylmar Project in the LCR study will instead result in a local need at a level that is artificially set, with the undesirable outcome of load serving entities having to unnecessarily procure additional resources to meet the "need". For this reason, given the magnitude of the impact of the Pardee-Sylmar Project, SCE respectfully requests the CAISO incorporate this project in the final LCR study. In particular, the local RA requirements for multi-year forward procurement should be inclusive of the Pardee-Sylmar Project to avoid over-procurement. This information is provided annually to the CPUC in the RA OIR and should represent expected grid conditions to avoid potentially costly over-procurement.</p>	<p>The CAISO has updated the study results for year 2025 and implicitly the estimated needs in year 2023 by including the newly approved Pardee-Sylmar No. 1 and No. 2 230 kV Line Rating Increase Project. The results are included in the draft 2021 and 2025 Local Capacity Technical Study reports as well as the presentations for the April 13 stakeholder call.</p>

3. Bay Area Municipal Transmission group (BAMx) Submitted by: Paulo Apolinario		
No	Comment Submitted	CAISO Response
3a	<p><u>Introduction</u></p> <p>The Bay Area Municipal Transmission group (BAMx) appreciates the opportunity to comment on the CAISO 2021 and 2025 Draft Local Capacity Requirements (LCR) study results discussed during the March 16, 2020 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 and support.
3b	<p><u>Need to Develop Low Cost Solutions for Higher Level Contingencies</u></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. For LCR needs driven by P3 and P6 contingencies, BAMx requests the CAISO to proactively identify and review whether any operating solutions between the first and the second contingency could be implemented in order to reduce the identified LCR values. 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>Additionally, some of the identified constraints could be mitigated with little capital costs using a load dropping Special Protection Scheme (SPS) or by reconfiguring a substation for a P2 type of outage. BAMx suggests the CAISO work with the PTO's to come up with mitigation options for the newly identified constraints as well as a cost estimate for each mitigation as part of this year's TPP process. The CAISO, with stakeholder input, could evaluate the tradeoffs of mitigating the constraint against keeping the generation in service via expanded RA procurement values.</p>	<p>As explained in the 2021 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>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> <p>The CAISO will work with the PTOs and stakeholders to identify and approve low cost solutions to the identified criteria violations as long as they are needed to meet reliability standards. However 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 CPUC provides aggregate cost for local resources vs. system resources, but not cost differences between areas versus sub-areas. There would be no incentive to eliminate a local sub-area if that would not reduce the overall local area need, because there are no savings (cost differential is \$0).</p>
3c	<p><u>Possible Mitigations That Should be Investigated in the TPP</u></p> <p>We suggest the investigation of the partial list of proposed mitigations in the table below. BAMx appreciates that the load dropping SPS's as potential</p>	Please refer to the responses above.

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	<p>mitigation measures need to be evaluated as part of the annual Transmission Planning Process (TPP) - however BAMx believes that operating solutions could be developed as interim mitigation for some cases listed below.</p> <p>North Coast North Bay: Fulton sub-area</p> <p>North Coast North Bay: Overall requirement</p> <p>Fresno: Hanford sub-area</p> <p>Fresno: Coalinga sub-area</p> <p>Fresno: Reedley sub-area</p> <p>Fresno: Panoche 115 kV sub-area</p> <p>Fresno: Herndon sub-area</p>	<p>Economic benefit cannot be quantified.</p> <p>Alternative to meet TPL standards, economic benefit can be quantified.</p> <p>Economic benefit cannot be quantified.</p> <p>Alternative to meet TPL standards, economic benefit cannot be quantified.</p> <p>Alternative to meet TPL standards, economic benefit cannot be quantified.</p> <p>Economic benefit cannot be quantified.</p> <p>Economic benefit cannot be quantified.</p>
3d	<p><u>Additional Visibility into the Binding Constraint</u></p> <p>The 2021 and 2025 Draft LCR study results were obtained by the CAISO using the new LCR study methodology that evaluates the LCR needs based on the most stringent of all NERC, WECC and CAISO mandatory standards. During the CAISO's approval process of this change in LCR criteria, BAMx had submitted comments requesting that the CAISO provide the identified LCR needs using both the previously studied criteria and LCR needs identified under the updated study methodology. Providing both values would afford decision-makers a better understanding of the tradeoffs between eliminating the newly identified constraint versus relying on the local RA capacity. In its response, the CAISO had identified that "the ISO will highlight the difference in binding contingencies and magnitude of changes between criteria through the LCR study process." Although this information was not presented during the March 16th stakeholder meeting, BAMx hopes to see the CAISO include information on the previously identified binding constraint in the LCR report. This would provide the stakeholders with a better understanding regarding the LCR reduction costs that could be mitigated by eliminating the identified constraint under the updated LCR technical criteria.</p>	<p>Each area presentation during the March 16th stakeholder call had a section about changes from year 2020 to year 2021; where pertinent, the presentation specified if the change to LCR criteria had a positive or negative effect and has quantified the magnitude of the change.</p> <p>The information requested by BAMx does not provide stakeholders with a better understanding regarding the LCR reduction costs that could be mitigated by eliminating the identified constraint under the updated LCR technical criteria, since the second most constraining problem may not be the same as it was under the old criteria.</p>

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3e	<p><u>Potential Storage Additions Calculations</u></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 Greater Bay Subareas, 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. BAMx requests that the CAISO provide the underlying calculations used to obtain these values as well as any workproducts, including spreadsheets used to calculate the charging capacity values for all the LCR subareas.</p>	<p>The CAISO utilized spreadsheets and techniques that were tailored to the different circumstances in the LCR areas. These will continue to evolve and be refined, as the storage charging estimates are informational only, considered preliminary, and will be refined in subsequent studies. Accordingly, it is premature to be providing these materials at this time and the ISO will consider the issue in the future.</p>

4. Pacific Gas and Electric (PG&E) Submitted by: Matt Lecar		
No	Comment Submitted	CAISO Response
4a	PG&E appreciates this opportunity to comment on the 2021 and 2025 Local Capacity Technical Study Draft Results, published on March 12th and presented to stakeholders on March 16th, 2020. PG&E recognizes the substantial efforts and commends the CAISO Staff for its hard work in performing this study. Below are comments that address a concern with the identified need in the Greater Bay Area study results.	Thank you for your comments.
4b	<p><u>Comments on the Overall Greater Bay Area Study Results:</u></p> <p>In the draft LCR results for the overall Greater Bay Area, the CAISO has identified that in both 2021 and 2025, an outage of both Metcalf 500/230 kV #11 & #12 Transformer Banks (T-1-1) results in an overload of the remaining Metcalf 500/230 kV #13 Transformer Bank. This double transformer bank outage and identified overload has resulted in an increased generation requirement in the overall Greater Bay Area, which the CAISO has calculated to be 6,353 MW and 6,110 MW respectively, as compared to last year's study results of 4,550 MW and 4,395 MW, respectively. This is an increase of roughly 1,800 MW from one study year to the next.</p> <p>PG&E believes that this increase is primarily due to the change in LCR criteria in which CAISO now considers a T-1-1 (loss of a transformer followed by the loss of second transformer) in its calculation of the LCR. This double transformer outage was not considered in the previous LCR criteria.</p> <p>PG&E further believes that this transformer outage criteria should not be applied at Metcalf 500 kV Substation given the layered and robust strategy for addressing the loss of high voltage transformers at the substation.</p> <p>First, all of Metcalf 500/230 kV transformers have on-site spares that are ready to be used in the event the situation arises. Switching in either one of these on-site spare units is estimated to take anywhere from 12-24 hours depending on the situation and conditions.</p> <p>In the event one of the 500 kV single-phase transformers is permanently out of service and not repairable, PG&E would switch in the afore mentioned on-site spare and then use an off-site Capitalized Emergency Material (CEM) 500 kV</p>	<p>The CAISO appreciates the layered and robust strategy for addressing the loss of high voltage transformers at the Metcalf substation.</p> <p>The CAISO operators need to readjust the system within 30 minutes in order to prepare for the next most limiting contingency and while the PG&E plan is to replace a failed Metcalf transformer bank within 24 hours, its strategy is to rely on internal resources within the Bay Area in the interim. The CAISO must include those resources as required to meet the standards and therefore included in the LCR requirement. The CAISO will continue to work with PG&E planning and operations departments to explore options that can be implemented such that within 30 minutes after the loss of the transformer bank, the flows from Metcalf are diverted to other 500/230 kV stations serving the Bay Area in a manner that will result in reduction of local capacity requirement. PG&E should move forward expeditiously with rates for the Metcalf 500/230 kV transformer banks if technical data supports such an action.</p>

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	<p>single phase spare to permanently replace any failed Metcalf 500 kV unit, including any of the units at Metcalf. Depending on the environment and urgency, the CEM Spare should be able to be on-site and energized in about 3 months.</p> <p>Lastly, if for some reason the on-site spare were to be permanently out of service and the CEM spare is not available (an extremely unlikely scenario) then a different spare from other stations or from other positions from within the same station could be used. Relocating a Spare within the same station may take around 2 months to complete. Relocating a Spare from another station may take up to 3 months.</p> <p>As described above, PG&E counts on a very robust and layered strategy for addressing the loss of high voltage transformers at Metcalf 500 kV Substation, such that the station would not operate with two 500/230 kV transformer banks out of service for an extended period of time. In fact, PG&E expects that after the initial transformer failure, the spare and therefore the transformer would be brought back into service between 12 - 24 hours of the event. A second failure could be mitigated within 2 -3 months, but during that time there would be two energized transformers at Metcalf.</p> <p>Furthermore, NERC's TPL-001-4 reliability standard contemplates that "When an entity's spare equipment strategy could result in the unavailability of major Transmission equipment that has a lead time of one year or more (such as a transformer), the impact of this possible unavailability on System performance shall be studied." In Metcalf's case as described the spare equipment strategy ensures both failed banks would be back in-service well within the one-year period specified in the NERC standard.</p> <p>In 2007 FERC in Order 693 also considered this same issue and discussed the relationship between transformer outages and a spare equipment strategy: "...the consideration of planned outages is inextricably linked with spare equipment strategy. Thus, if an entity's spare equipment strategy for the permanent loss of a transformer is to use a "hot spare" or to relocate a transformer from another location in a timely manner, the outage of the transformer need not be assessed under peak system conditions. However, if</p>	

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	<p>the spare equipment strategy entails acquisition of a replacement transformer that has a one-year or longer lead time, then the outage of the transformer must be assessed under the most stressed system conditions likely to be experienced."</p> <p>Lastly, PG&E is also investigating the possibility of obtaining higher ratings on these three 500/230 kV banks to further support the capacity needs in the Greater Bay Area. However, PG&E does not yet have the results of the bank capabilities analysis and other equipment limitations.</p> <p>In summary, given PG&E's robust and layered 500/230 kV transformer bank spare strategy, where a failure of a transformer could be mitigated quickly returning Metcalf to having three 500/230 kV transformers in mere hours and loss of a second would be mitigated in a matter of weeks while keeping two 500/230 kV transformers energized, and in meeting NERC and FERC's guidance on spare equipment, PG&E recommends CAISO not apply the Metcalf 500/230 kV #11 & #12 Transformer Banks (T-1-1) outage in the determination of the overall Greater Bay Area LCR.</p>	