The CAISO received comments on the topics discussed at the September 23 and 24, 2020 stakeholder call from the following:

1. California Public Utilities Commission – Staff (CPUC-Staff)
2. Calpine Corporation (Calpine)
3. Falcon Energy Storage Holdings (Falcon)
4. LS Power Development (LSP)
5. Northern California Power Agency (NCPA)
6. Nevada Hydro Company (NHC)
7. Public Advocates Office (PAO)
8. Pacific Gas and Electric (PGaE)
9. Silicon Valley Power (SVP)
10. Smart Wires
11. Transmission Agency of Northern California (TANC)
12. Vistra
13. Western Grid Development (WGD)

Copies of the comments submitted are located on the 2020-2021 Transmission Planning Process page at:
http://www.caiso.com/planning/Pages/TransmissionPlanning/2020-2021TransmissionPlanningProcess.aspx

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

| 1. California Public Utilities Commission - Staff<br>Submitted by: David Withrow | | |
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| No | Comment Submitted | CAISO Response |
| 1a | CAISO could better explain advantages and disadvantages of short-term versus long-term mitigation measures for identified reliability needs.<br>The CAISO's presentation nicely summarizes the identified need for several dozen potential new upgrades in the PG&E area, including upgrades to address Category P5-5 contingencies on the Round Mountain 230 kV in the North Valley area, the Gates 230kV bus in the Fresno area and the Gold Hill and Bellota 230 kV facilities in the Central Valley. CAISO also identifies need for one new potential upgrade to address a Category P1 contingency in the SCE service area; no new projects are identified in the SDG&E or Valley Electric Association areas.<br><br>For all the identified reliability needs, CAISO notes a range of potential options including special protection schemes, remedial action schemes, unique operating procedures, and generation dispatch limitations. These are often considered "short-term fixes" as opposed to longer-term solutions like line and substation upgrades.<br><br>At some point in this or future TPP cycles it would be useful for the CAISO to review with stakeholders the tradeoffs between these types of mitigation measures and the considerations that CAISO believes are important in determining the best solution. For example, what are the limitations, if any, for using remedial action schemes and what are the specific consequences of resorting to this type of mitigation procedure? CPUC Staff is especially interested in temporal considerations -- how transmission needs that are identified from long-term resource portfolios might influence the type of solution that CAISO believes is best suited for system reliability. | The comment has been noted.<br><br>The mitigation that is identified is the mitigation the CAISO has included within the plans to address the constraints in the planning horizon unless noted as only a temporary solution until longer-term mitigation is in-service.<br><br>The CAISO undertakes the reliability assessment first in the transmission planning process to identify mitigation required to meet the ISO Planning Standards and associated NERC reliability standards. The CAISO then conducts the policy assessment, as well as the economic assessment, to determine transmission requirements to integrate the resources provided by the CPUC in the base portfolio. If modifications are required to the mitigation alternative reliability requirements to integrate the resources in renewable portfolio the CAISO will assess the alternatives to meet both the reliability and policy transmission needs. |
| 1b | CPUC Staff appreciates the CAISO's latest analysis of battery limitations in its 10-year Local Capacity Technical Study.<br>In this long-term capacity technical study, for the first time the CAISO is identifying charging restrictions and limits on 4-hour battery storage for each of the applicable local areas and sub-areas to assist in future procurement and planning. | The comment has been noted. |

| No | Comment Submitted | CAISO Response |
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| | The CAISO's preliminary findings for each LCR identify the maximum storage (MW and MWh) that can charge under contingency conditions to be available the next day to meet local needs, as well as the maximum MW value of 4-hour storage. For example, for the overall LA Basin the CAISO has identified a 2030 LCR need of 6,194 MW. The CAISO has further determined that the storage charging limitation is 3,310 MW and 33,100 MWh and the 4-hour storage maximum is 740 MW in the LA Basin.<br><br>CPUC Staff greatly appreciates CAISO's efforts and recognizes these long-term capacity technical study results for every LCR will inform IRP portfolio mapping and improve the rigor of future resource planning in California. | |
| 1c | CAISO should expand its assessment of wildfire risk to southern California and incorporate impacts from distribution systems in its analysis.<br>While CPUC Staff appreciates this first-time effort to incorporate wildfire risk into transmission planning activities, we strongly encourage the CAISO to expand its assessment beyond the PG&E service area and to include SCE and other Transmission Owners in future assessments.<br><br>We also urge more transparent coordination with the Transmission Owners to account for the load drop due to distribution lines also taken out for PSPS events. It seems appropriate that distribution load loss should be considered in these assessments as well as the potential mitigation projects that would be considered.<br><br>We anticipate that as the methodology matures for this new and unique wildfire assessment, the CAISO will better integrate the analysis of distribution and transmission facilities. For each of the PG&E local areas, the CAISO identified the number of facilities that were impacted at various voltage levels along with the amount of direct and indirect load impacts. The CAISO indicated its next steps will be to develop two more scenarios to apply for PG&E areas and then identify potential mitigation measures, including expediting implementation of active projects, minor scope changes to active projects and potential new upgrades. The CAISO indicated it is looking into three mitigation measure buckets and new upgrades would be more of a last resort for mitigation. | The CAISO is planning to continue the wildfire assessment in the southern areas in the next planning cycle.<br><br>The wildfire assessment is to assess the transmission related impacts of the transmission lines within the Tier 2 and Tier 3 and associated with the PSPS events. There may also be load that may not be served due to distribution facilities also affected by PSPS or wildfire events which may reduce the load that the transmission system needs supply under that specific condition which may vary depending upon the nature of the specific event.<br><br>The CAISO is continuing to coordinate with PG&E on additional scenarios. |

| No | Comment Submitted | CAISO Response |
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| | CPUC Staff looks forward to further discussion at the November stakeholder meeting on this foundational assessment. Given the urgency of wildfire risk in California, CPUC Staff encourages CAISO's efforts to disseminate its findings and expand upon this important assessment in future TPP cycles. | |
| 1d | CPUC Staff continues to encourage CAISO's active involvement in the interregional transmission planning process.<br>Slide 9 of the CAISO's Day 1 presentation graphically displays interaction between the TPP and the process for studying interregional projects with neighboring planning authorities – the biennial planning process in which the CAISO commendably plays an active leadership role.<br><br>CPUC Staff suggests an update be given at the November 17th meeting on the status of the four interregional projects under consideration in this interregional planning cycle. This would help stakeholders understand the viability and potential impacts of these projects on the CAISO system. | The CAISO will provide an update of the interregional transmission planning process in the November stakeholder meeting. |

| 2. Calpine Corporation<br>Submitted by: Li Zhang | | |
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| No | Comment Submitted | CAISO Response |
| 2a | We appreciate that both the ISO and SDG&E studied the Friars area contingency overload, especially for the Doublet Tap-Friars 138kV line constraint. After investigation, we support the evaluation of the permanent resolution of the rearrangement of TL23013 and TL6959 as SDG&E proposed. We notice that this permanent resolution proposal will not be in service until 2026 while the overload issue will become quite severe starting from 2022. We also appreciate the mitigation solutions proposed by CAISO for the above overload issue, i.e. unit re-dispatch, RAS to trip generation and upgrade the relay or adjust relay settings. | The comment has been noted and the CAISO will be evaluating mitigation alternatives submitted by San Diego Gas & Electric. |
| 2b | The following are our comments on the mitigation of the Doublet Tap-Friars 138kV line constraint in San Diego area.<br>• We think that the CAISO's options as interim or near-term resolution are viable, considering the permanent resolution's timeline being several years out.<br>• We have observed the not-so-effectiveness of overloading relief provided by unit re-dispatch between November 2019 and March 2020, when there was severe congestion in the area under outage conditions. We do not think the unit re-dispatch is an efficient way to relieve congestion.<br>• Considering that several RAS have already been proposed and implemented to address various issues in the area, and more RAS will increase operational challenges, we think a permanent approach as the proposal submitted by SDG&E will be a good choice as a long-term resolution.<br>• With more renewable coming online and system changes in the future, we will appreciate that CAISO and stakeholders will continue investigating any viable resolutions to mitigate congestion and reliability issues in that area, including the above-mentioned options or economic transmission upgrade. The successful mitigation could bring more economical power flow to the load and benefit the whole society. | The conditions between November 2019 and March 2020 were due to a long-term planned outage that is not expected to occur on regular basis in the future.<br>The CAISO plans to weigh these types of considerations in its analysis of the alternatives. |

| No | Comment Submitted | CAISO Response |
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| 2c | An independent third-party consultant has helped to evaluate economic benefit of transmission upgrade options based on 2029 CAISO TPP cases. Some upgrade options show positive economic benefit based on CAISO's TEAM approach. We will follow up with you to discuss these findings. | The comment has been noted. |

| 3. Falcon Energy Storage Holdings<br>Submitted by: Tim Hemig (Tenaska) and Mike Grunow (Arevon Energy) | | |
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| No | Comment Submitted | CAISO Response |
| 3a | Falcon's comments are primarily intended to provide the CAISO with information regarding the capability of BESS projects to replace and improve upon the reliability features provided by existing carbon-emitting resources in various LCRs. | The comment has been noted. The long-term local capacity technical study is to identify storage capability in the local capacity areas as well as potential economic-driven transmission alternatives to reduce reliance on gas-fired generation or increase storage capabilities in the local capacity areas. The assessment is not assessing resource replacement alternatives as a part of the analysis. |
| 3b | Overview of Falcon Energy Storage Holdings BESS Projects Benefits<br>Falcon has nine Battery Energy Storage System (BESS) projects under development in California. Several projects are capable of coming online as early as summer of 2022, and all can be operational by summer 2023.<br><br>The Falcon BESS portfolio consists of two (2) BESS projects with a combined capacity of 450 MW in PG&E, three (3) BESS projects with a combined capacity of 600 MW in SCE, and four (4) BESS projects with a combined capacity of 900 MW in SDG&E. During the June 3rd TPP stakeholder meeting, the CAISO outlined requirements that BESS alternatives must meet for providing reliability, energy and capacity as potential replacements for fossil fuel-based resources within the same load center or Local Capacity Region. Each of the Falcon BESS portfolio projects provides the required benefits due to interconnection locations within LCR areas and operational flexibility to discharge for the duration needed to meet grid requirements. The Falcon projects are scalable to meet increased resiliency requirements as load and reliability conditions change. Additionally, the projects offer the following benefits:<br><br>1. Flexibility to charge during excess solar and wind output periods in order to make use of oversupply that would otherwise be curtailed<br>2. Support for California's clean energy and GHG reduction goals<br>3. Reliably replacing or reducing capacity required of existing gas-fired generation that is inefficient, costly, or scheduled for retirement, and<br>4. Provide fast response to frequency and voltage events under various grid conditions. | The comment has been noted |

| No | Comment Submitted | CAISO Response |
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| | Falcon believes BESS, and its projects in particular, offer strong value to the CAISO. The remainder of the document consists of a high-level discussion of the ability of BESS to reliably augment solar and wind supply and basic information regarding the Falcon projects. | |
| 3c | BESS Provides Flexibility to Absorb Oversupply of Solar and Wind Output and Enhance Reliability<br>When renewable energy resource output exceeds demand, the CAISO is often forced to curtail wind and solar output to bring the grid's supply and demand into balance. As is well-documented elsewhere1 solar and wind capacity continue to increase in order to meet California's clean energy goals.<br><br>The Falcon BESS projects can positively contribute to the solution by charging their approximately 2,000 MW during severe supply-demand imbalance periods. | The comment has been noted. |
| 3d | GHG Emissions Reduction<br>BESS projects generally reduce GHG and criteria pollutant emissions by facilitating the increased installation and use of other clean, intermittent resources. For purposes of Resource Adequacy, BESS have the capability to replace gas-fired generation on a one-for-one basis unlike solar and wind. Falcon's capacity can reliably reduce reliance on inefficient gas-fired generation based on tailored configurations of charge/discharge durations for each LCR area. BESS is the environmentally preferred solution for LCR resources. | The comment has been noted. Depending upon the storage charging requirements within the local capacity areas, charging may rely upon the gas-generation under resource adequacy contracts for the local capacity area to meet the local capacity needs. |
| 3e | One-to-one Replacement or Reduction of Gas-fired Generation<br>In the 2021 LCT Report2, Table 3.1-3 details the MW, MWh, and duration characteristics required of BESS projects in order to replace gas-fired generation one-to-one. The Falcon BESS projects have the flexibility to be configured to optimally serve the LCR areas within which they are located. For example, in Table 3.1-3 of the LCT Report, the maximum number of discharge hours varies for each of the LCR areas defined and ranges from a low of 7 hours, to a high of 16 hours. For the Falcon BESS projects located in the different LCR areas, they would be | Please refer to response to 3a. |

| No | Comment Submitted | CAISO Response |
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| | configured to discharge as required to support the grid and depending on LCR sub-area requirements.<br>• Projects in PG&E's service territory could be configured to discharge from 4 to 16 hours.<br>• Projects in SCE's service territory could be configured to discharge from 4 to 11 hours.<br>• Projects in SDG&E service territory could be configured to discharge from 4 to 11 hours.<br>•<br>Falcon encourages the CAISO and stakeholders to advance clean energy goals as far as possible within the TPP framework. We note that gas-fired generation is not likely to retire based solely on the age of a facility, but that gas units have retired after relatively few years of service due to unfavorable economics and community desire for cleaner resources. Other factors that should be considered when assessing gas retirements and the need for replacement capacity include:<br><br>• Load-serving entities' and other stakeholder preferences and planning goals for the procurement of non-GHG emitting resources and the ensuing retirement of GHG emitting resources<br>• Expiring contracts of many gas fired assets over the next 2-3 years<br>• Combined cycle gas plants, in particular, are retiring early due to the evolution of the CAISO market which has resulted in uneconomic conditions for such units. These tend to make up large quantities of LCR compliance capacity (500-1000 MW in many cases), creating a large quantity of needed capacity when an unexpected retirement occurs.<br>• Recent procurement trends have favored grid-edge, System RA. Therefore, there is a risk that Local RA needed to replace retiring once-through-cooled Local capacity will be unavailable when needed if the CAISO and other stakeholders do not take a proactive approach to Local needs. | |

| No | Comment Submitted | CAISO Response |
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- Local pollutant rules and community concerns with emitting resources may speed gas project retirements, either due to environmental pressures and/or City or County pressures to retire and to be replaced with non-emitting alternatives such as battery storage.

Table 1 below shows the location of the Falcon projects and LCR needs in associated locations.

*Table 1: Falcon Projects*

| Falcon Flexible Duration BESS Project | POI | In-Service Date | LCR Area/Sub-area | 2021 LCR Deficiency (MW) |
|---|---|---|---|---|
| **SDG&E** | | | | |
| Imperial Valley BESS (200 MW) | Imperial Valley 230 kV Substation | 2023 | LA Basin | 3,888 |
| | | | San Diego | 2,270 |
| | | | San Diego-Imperial Valley | 3,888 |
| Sycamore BESS (300 MW) | Sycamore 138 kV Substation | 2022 or 2023 | San Diego | 2,270 |
| | | | Border | 160 |
| | | | El Cajon | 48 |
| Silvergate BESS (200 MW) | Silvergate 230 kV Substation | 2022 or 2023 | San Diego | 2,270 |
| | | | Border | 160 |
| | | | El Cajon | 48 |
| Talega BESS (200 MW) | Talega 138 kV Substation | 2023 | San Diego-Imperial Valley | 3,888 |
| **SCE** | | | | |
| Hinson BESS (200 MW) | Hinson 220 kV Substation | 2023 | El Nido | 394 |
| | | | Western LA Basin | 3,303 |
| Walnut BESS (200 MW) | Walnut 220 kV Substation | 2023 | Western LA Basin | 3,303 |
| Highgrove BESS (200 MW) | Highgrove 115 kV Substation | 2022 or 2023 | Eastern LA Basin | 2,867 |
| **PG&E** | | | | |
| Martin BESS (250 MW) | Martin 115 kV sub | 2023 | Ames-Pittsburg-Oakland | 1,967 |
| | | | Oakland | 99 |
| Los Esteros BESS (200 MW) | Los Esteros 230 kV sub | 2023 | Llagas | 31 |
| | | | San Jose | 793 |
| | | | South Bay - MossLanding | 1,833 |

Falcon notes that the Highgrove, Walnut, and Silvergate substations are all located near or within Disadvantaged Communities, which has been a preferred locational attribute in recent offtaker solicitations due to the non-emitting nature of Falcon BESS projects.

| No | Comment Submitted | CAISO Response |
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| 3f | Additional Considerations to Advance Clean Energy Storage Resources<br>There are currently many challenges confronting electric reliability and achievement of California's clean energy and GHG reduction goals. Besides the comments provided above, Falcon also wants to point out that the Falcon clean energy BESS fleet is one of the most advanced portfolios in the market ready to resolve the thorniest issues facing the state today and into the future, including:<br>1. The joint CAISO, CPUC, and CEC Preliminary Report of Causes of August Rotating Outages identified several immediate actions needed to ensure reliable energy supply in 2021 and beyond. These actions include procurement of additional resources and expediting fixes to various regulatory processes to bring new resources online quickly. Falcon suggests initiating resource contracting immediately and in parallel tackling the regulatory process hurdles plaguing the market. Lastly, it may be worth considering moving forward with contracting through the TPP process given the extraordinary circumstances facing the state.<br>2. One of the key areas for the state to focus on is to eliminate unnecessary areas of uncertainty that are impeding the ability to bring online new critically needed BESS projects. The frequent discussions related to regulatory and market rule changes related to RA quantification and BESS participation in the CAISO market are slowing down progress. Off takers are reluctant to move forward due to uncertainty that comes with potential future changes and developers and financiers are also challenged to move forward due to potential for changes that could materially affect BESS revenues. Less change and more certainty will go along ways toward expediting the needed procurement of new BESS resources.<br>3. BESS is the environmentally preferred and most cost-effective solution available for these critically needed new resources at scale; superior in all aspects to installation of alternatives including backup diesel generators being considered at the same substations Falcon projects propose to connect into. BESS projects connected into | The comment has been noted. |

| No | Comment Submitted | CAISO Response |
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| | transmission and distribution substations in local grid areas, like the Falcon fleet, can be viable resources to mitigate the impact of PSPS situations by serving as local generation resources during PSPS episodes.<br>4. Without a large fleet of energy storage assets, CA will continue to see large curtailments of renewable energy supply due to renewable overgeneration during low load hours. Falcon projects provide a path toward balancing this oversupply situation and redistributing that otherwise curtailed clean energy to be available in the evening hours. | |

| 4. LS Power Development<br>Submitted by: Sandeep Arora | | |
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| No | Comment Submitted | CAISO Response |
| 4a | PG&E Bulk System Reliability issues:<br>CAISO staff presented several reliability issues for the Bulk system in the Northern California area. These issues include thermal overloads due to several P1, P2, P3, P6, P7 contingencies in the Northern CA Bulk system. For these thermal overloads, CAISO's current recommendation is to operate within the California Oregon Intertie (COI) nomogram, which typically involves reduction in COI flow. In addition, CAISO's study shows thermal overloads under contingency conditions in the Path 26 corridor and the current recommendation to address these overloads is adding additional generation to the existing Path 26 RAS, which will be tripped offline post contingency. While these may be effective short term operating solutions, these are not long term, robust planning solutions and are counter to the going forward demands on the grid which include the need for spare capacity, durability and flexibility. Implementing operating solutions may resolve the reliability need but the implications and effectiveness of these should be carefully assessed. For instance, reducing COI flows and/or Path 26 flows, or tripping additional generation post contingency could result in significant issues and may even be impractical to implement on capacity shortage days such as the recent load shedding events of Aug 14 & 15. COI is a major intertie path that connects CAISO to the Pacific Northwest. CAISO often imports close to 3200 MW into its Balancing Authority from the Pacific Northwest. Relying on reduce flow on a major intertie as an ongoing solution to overloads is not prudent planning and only exacerbates the issue on days when CAISO is short on capacity. As noted in the October 6, 2020, Preliminary Root Cause Analysis report2 for the Aug 14 & 15 events, CAISO reported that transmission constraints significantly reduced access to the needed import resources as: "…transmission constraints from the Pacific Northwest, since through the month of August, a major transmission line in the Pacific Northwest upstream from the CAISO system was forced on outage due to weather and thus derated the California Oregon Intertie (COI). The derate reduced the CAISO's transfer capability by approximately 650 MW and congested the usual import transmission paths across both COI and Nevada-Oregon Border (NOB)..."<br><br>As CAISO prepares its final recommendations for addressing reliability issues identified in the TPP, it should consider transmission solutions to resolve these | The reliability needs of the bulk system were assessed to determine the required performance of the transmission system. The CAISO will continue to assess the reliability needs of the bulk system in future planning cycles. In addition, the economic assessment and potential economic constraint and congestion analysis will be undertaken later in this planning cycle. |

| No | Comment Submitted | CAISO Response |
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| | thermal overload issues and not simply rely on operating solutions. LS Power's proposed Southwest Intertie Project North (SWIP North) is potentially one such long-term transmission solution that can address several thermal overloads and provide a diverse path to California. SWIP North is comprised of a 500 kV transmission line from Midpoint substation to Robinson Summit substation. This line in conjunction with the One Nevada Transmission Line (ON Line), the jointly owned LS Power/NV Energy 500 kV line from Robinson Summit to Harry Allen, and the recently energized Harry Allen to Eldorado 500 kV line provides a parallel path to COI and Path 26. This offsets flows on these interfaces by approximately 300 to 400 MW based on power flow studies conducted by LS Power and provides a new 1000 MW transmission path between Idaho Power, NV Energy & CAISO. LS Power studied the effectiveness of SWIP North to address the Bulk system issues identified by CAISO staff and will be submitting its analysis to CAISO shortly. In the meantime, prior similar analysis submitted by LS Power in CAISO's Transmission Planning cycles3 is available for review. These analyses demonstrate that SWIP North is very effective in alleviating and resolving several contingency overloads.<br><br>In light of the August and September 2020 heatwaves in California & throughout the west, California needs to reconsider its reliance on in state solar to meet current and future demand, and seriously consider if access to diverse renewable resources such as Idaho wind and hydro, Wyoming wind, and Nevada geothermal and hydro would be beneficial. The existing import paths into CAISO are constrained, so in order to unlock access to new diverse out of state renewable resources CAISO must consider new out-of-state transmission projects such as SWIP North. One such resource that is currently in development is Lava Ridge Wind, a 1050 MW wind project in Idaho being developed by an LS Power affiliate. This project has a planned in service date of June 2024. SWIP North is essentially a construction ready transmission project and can be in service by June 2024 if timely approved by CAISO. With the upcoming OTC retirements and planned shutdown of Diablo Canyon Power Plant starting 2024, there is over 5000 MW of projected system capacity shortage as identified by SCE and other LSEs as part of their IRP filings with CPUC4, and SWIP North can help fill some of this need. An additional benefit of SWIP North is that it allow CAISO to experience load diversity benefits. Not all regions in the West peak at the same time of the day, or even in the same operating season. Idaho Power, PacifiCorp West, BPA have load diversity with | |

| No | Comment Submitted | CAISO Response |
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| | California which, if sufficient transmission capacity was available, would allow CAISO access existing resources from these regions. Today some of these resources cannot access CAISO markets due to congestion on existing import paths such as California Oregon Intertie (COI) and Pacific DC Intertie (PDCI).<br><br>LS Power encourages CAISO to consider permanent planning solutions such as one proposed above as it finalizes its 2020-21 Transmission Plan. Continuing to rely on operating solutions that reduce imports will not address the growing capacity shortage concerns and will only lead to more blackouts in the coming years. | |
| 4b | (2) Wildfire Risk Mitigation studies<br>LS Power commends CAISO staff for running comprehensive studies to better understand wildfire risk mitigation issues. We understand that CAISO is still completing this analysis and will present additional studies in November. This study is a step in the right direction given the wildfire related impacts California has been witnessing for last several years. While CAISO has been currently focusing on completing the remaining analysis, we encourage CAISO to provide more details to the stakeholders with respect what next steps it plans to take with the study findings. Will CAISO come up with a proposal on which mitigations require new transmission additions? Will stakeholders get an opportunity to provide inputs on possible transmission solutions? Given the timing of the 2020-21 TPP process, if CAISO presents its analysis at the November stakeholder meeting, there may be a need to allow for additional stakeholder discussions on this important topic before CAISO publishes its draft transmission plan. | The CAISO will look into developing potential mitigations once the scenario analyses have been completed. In developing potential mitigations, the CAISO will first leverage PTO's existing wildfire mitigation plans and also previously approved TPP projects to the extent possible. If these mitigations don't sufficiently address wildfire impact to an area, new transmission solutions may be developed. The CAISO plans to present results from additional scenarios and may also present preliminary mitigation strategy for some areas in the November stakeholder meeting. The need for additional stakeholder discussions will be assessed as needed. |

| 5. Northern California Power Agency<br>Submitted by: Anish Nand | | |
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| No | Comment Submitted | CAISO Response |
| 5a | NCPA appreciates the CAISO performing a wildfire mitigation assessment, developing study scenarios based on 2019 PSPS events, and providing preliminary results. | The comment has been noted. |
| 5b | The CAISO's preliminary results provided load drop as a mitigation. While we understand in certain situations, load drop will be the only mitigation, we request the CAISO to consider less impactful solutions as well:<br>1. Load shed instead of a complete load drop for indirect impacts of transmission level PSPS events.<br>2. Sectionalizing devices between Tier 1 and Tier 2 High Fire Threat Zones where substations in Tier 1 area could avoid loss of their transmission source.<br>3. Considering alternatives to addressing the "next worst N-1" such as under-voltage load shedding schemes.<br>4. Take into account customer counts and the affected area's populations. In certain situations dropping distribution versus transmission load might be less impactful. | Direct and indirect load impacts were reported as a measure of impact of different potential PSPS scenarios. Other alternatives will be evaluated as part of potential mitigation development, once the scenario analyses have been completed. |
| 5c | We encourage the CAISO to perform an assessment of 2020 PSPS events and potential mitigations, along with performing a wildfire assessment for all future planning cycles as well. | The CAISO will consider as appropriate inclusion of extreme event analysis in future transmission planning cycles. |

| 6. Nevada Hydro Company<br>Submitted by: David Kates | | |
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| No | Comment Submitted | CAISO Response |
| 6a | The Nevada Hydro Company ("Nevada Hydro") has submitted again this year its landmark Lake Elsinore Advanced Pumped Storage ("LEAPS") project (FERC Project P–14227) to the Request Window of the California Independent System Operator Corporation ("CAISO") for evaluation in the current transmission plan.<br><br>Mr. Sparks has already concluded that LEAPS does not solve any identified reliability issues. However, we also request that LEAPS be studied as an alternative solution to the San Diego and LA basin LCR requirements, where we suspect the CAISO may see the value LEAPS can provide to California ratepayers and electricity consumers. | The Request Window submission was reviewed with the determination that the submission does not meet a reliability need identified by the CAISO in this year's planning cycle with respect to addressing the identified needs in the transmission reliability assessment results posted on August 14, 2020 and presented at the September 23 and 24 stakeholder meeting of the 2020-2021 transmission planning process.<br><br>The CAISO will review in the LCR assessment. |

7. Public Advocates Office
Submitted by: Lina Khoury

| No | Comment Submitted | CAISO Response |
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| 7a | 1. Participating Transmission Owners' Request Window<br>a. PG&E's Proposed Santa Teresa 115 kV Substation Project (Load Interconnection Driven):<br>PG&E proposed the Santa Teresa 115 kV substation project on its property at Edenvale Service Center in San Jose. PG&E's stated purpose for the proposed project is to provide distribution capacity to serve the existing distribution data center and three new distribution data centers to meet customers' load, as well as to improve service reliability and operating flexibility in the south San Jose area. PG&E estimates the transmission cost to be between $6 and $9 million. According to the CAISO's Business Practice Manual for the Transmission Planning Process, solutions addressing grid reliability should set forth a sufficient description of the costs of those solutions. This information is necessary for the CAISO to determine if a proposed solution meets the identified reliability need in a more efficient or cost-effective manner. However, PG&E did not provide a sufficiently detailed description of the estimated costs of the proposed Santa Teresa 115 kV project to determine if the project is the most efficient and cost-effective solution<br><br>Cal Advocates recommends the CAISO provide an itemized list of the capital costs for the transmission portion of the project by project component, and the methodologies PG&E used to develop those capital cost estimates in order for stakeholders to provide input. | Comment has been noted.<br><br>ISO will work with PG&E to provide itemized list of capital costs for the transmission portion of the project. |
| 7b | b. SDG&E's Proposed Bay Blvd-Silvergate Transmission Line:<br>SDG&E proposed adding a second 230 kV line from Bay Blvd to Silvergate to eliminate a P1 overload. SDG&E estimates the costs of the proposed project, which is identified under its metro region reliability and economic project, to be $170 million.<br><br>Cal Advocates observes that SDG&E is showing overloads using the normal rating of the transmission line under contingency conditions, which is not the standard practice. The standard practice would be for SDG&E to use the emergency ratings for reliability assessments. The CAISO also suggested SDG&E could use the 2-hour short term emergency ratings and operation | The CAISO performs its own analysis of reliability, policy and economically driven-project needs of the CAISO system while considering stakeholder inputs. |

| No | Comment Submitted | CAISO Response |
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| | procedure. This allows the market and operators to eliminate the overloads by reducing generation output in the Otay Mesa area. If SDG&E does not revise its practice using the standard emergency ratings, Cal Advocates recommends that the CAISO not approve the project based on a reliability need.<br><br>If there are economic benefits for this project, Cal Advocates recommends the CAISO identify them as part of its economic assessment. The Business Practice Manual dictates that the CAISO assess whether transmission solutions will provide either additional reliability or economic benefits to the CAISO grid. If SDG&E does not demonstrate overload using the standard practice and the CAISO has not identified any economic benefits, the CAISO may not determine that the Proposed Bay Blvd - Silvergate transmission line is needed. | |
| 7c | 2. 2030 Draft Local Capacity Requirement (LCR) Study Results-Overall Summary<br>The purpose of the CAISO LCR studies is to reflect the minimum resource capacity needed in transmission-constrained areas in order to meet the North American Electric Reliability Corporation's (NERC) reliability requirements, the Western Electricity Coordinating Council (WECC), and the CAISO's mandatory reliability standards. The CAISO performs these LCR studies every two years24 for California. As part of the LCR studies, the CAISO also reviews how much energy storage can be accommodated in each LCR area and sub-area based on the restriction of the battery capacity and its charging capability. The CAISO's short and medium-term LCR studies for years 2021 and 2025 included the megawatts and megawatt-hours of the storage amounts. In the latest 2030 LCR studies, the CAISO also estimated the approximate maximum megawatts of "4-hour" storage that can be accommodated in each LCR area and sub-area from the perspective of batteries capability of charging in order to reflect the amount of storage that could be counted for resource adequacy. However, the CAISO has not provided the underlying analysis regarding the capacity of the batteries and its capability of charging in order to support its LCR studies for 2021, 2025, and 2030. To further coordination, openness, transparency, and information exchange, Cal Advocates recommends that the CAISO provide stakeholders with the underlying analysis it performed, in an Excel spreadsheet, to support | 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. |

| No | Comment Submitted | CAISO Response |
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| | its LCR studies for 2021, 2025 and 2030 as soon as possible, so stakeholders have adequate time to provide meaningful input on this analysis. | |
| 7d | 3. 2030 Draft LCR Study Results for the Los Angeles Basin<br>The CAISO assumed the Southern California Edison Company's (SCE) proposed Alberhill project would be in service in its 2030 TPP draft LCR studies. The California Public Utilities Commission (CPUC) previously denied the Certificate of Public Convenience and Necessity (CPCN) for the proposed Alberhill project without prejudice in 2018. SCE filed a second amended application for the proposed Alberhill project on May 11, 2020. Conversely, SCE also submitted a plan in the CPUC's Distributed Resource Proceeding to defer the Alberhill project and evaluate a non-wire solution to address potential overload in the Alberhill service area.<br><br>Given the uncertainty associated with the Alberhill Project, Cal Advocates recommends that the CAISO recognize the potential cancellation and/or deferral of this project in its TPP modeling scenarios. | The CAISO is following the progress of the permitting application of this project and considering it in its processes. |
| 7e | 4. Wildfire Impact Assessment<br>Due to severe flaws in its study methodology, the CAISO's Wildfire Impact Assessment provides little benefit for policymaking or planning. At the stakeholder meeting on September 24, 2020, the CAISO presented preliminary results of a "Wildfire Impact Assessment," which purports to show the potential effects of proactive de-energization events on the transmission system in PG&E's service territory. The Wildfire Impact Assessment examines what would occur if certain electric transmission segments were de-energized to mitigate the risk of wildfire ignition, at summer peak demand conditions.<br><br>The CAISO presented three scenarios; the first scenario posits that PG&E de-energizes all transmission segments running through high fire threat districts (HFTD). The second scenario posits that PG&E de-energizes all transmission segments running through Tier 3 HFTD areas – the highest-risk areas. The third scenario posits that PG&E de-energizes the same transmission segments that were shut off in the de-energization event of October 26-29, 2019. However, the CAISO assumes that distribution lines would remain energized to serve customers in all scenarios. With these scenario assumptions, the CAISO's analysis predicts numerous overloads of the | The wildfire assessment is to assess the transmission related impacts of the transmission lines within the Tier 2 and Tier 3 and associated with the PSPS events. There may also be load that may not be served due to distribution facilities also affected by PSPS or wildfire events which may reduce the load that the transmission system needs supply under that specific condition which may vary depending upon the nature of the specific event.<br><br>The CAISO's assessment is focused on studying different scenarios to provide insight into the potential range of load impacts if different combinations of transmission lines within fire threat zones are included in the scope of PSPS event. As most of the scenarios developed are either boundary condition scenarios or scenarios based on certain weather conditions, identification of potential de-energization of distribution lines are not feasible. For the scenarios based on actual events, the CAISO may incorporate such information if available. |

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| | transmission system in PG&E's service territory, which would require the CAISO to curtail load.<br><br>Unfortunately, the Wildfire Impact Assessment ignores critical facts. It fails to consider the most direct consequence of wildfire-related de-energization events: customers will lose power because distribution lines will be shut off. One cannot analyze a problem while ignoring its most important aspect. Because many customers lose service in de-energization events, load on the transmission system is substantially reduced from normal levels.<br><br>The scenarios that the CAISO presented do not reflect the actual occurrences and outcomes of de-energization events, which primarily affect distribution circuits and not transmission circuits. These scenarios are not relevant to de-energization events that are likely to occur. Indeed, no California electric utility has ever called a transmission-only de-energization event.<br><br>Actual de-energization events to mitigate wildfire risk involve shutting off distribution circuits, resulting in loss of power to many electric customers. For example, on October 26, 2019, PG&E shut off power to nearly one million customer accounts.38 Although the Wildfire Impact Assessment refers to this event as a scenario, the CAISO's assumptions do not match with facts PG&E has provided about their de-energization events.<br><br>Typically, electric utilities de-energize far more distribution lines than transmission lines, because distribution lines pose a greater risk of igniting wildfires. To reduce the risk of vegetation contacting the wires and igniting a fire, transmission lines are mounted higher (above surrounding vegetation) and the surrounding trees are trimmed farther from the wires. Steel transmission towers are more resilient to strong winds than wooden poles. Transmission conductors are also spaced farther apart to reduce the likelihood of arcs, wire-to-wire contact, and animal contacts that cause faults. Because transmission lines carry lower risks of ignitions, shutting off transmission lines is less often necessary.<br><br>Moreover, electric utilities have evidently been reluctant to de-energize transmission lines because doing so might require shutting off power to many customers who do not live in high-risk areas. For example, on October 23, | The CAISO is continuing to coordinate with PG&E on additional scenarios.<br><br>The assessment is of the transmission system related to the transmission lines within the fire zones or affected by PSPS events and is not intended to assess and plan the distribution system needs during these events, this is done by the distribution facility owners as appropriate. |

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| | 2019, PG&E de-energized distribution lines in the North Bay, but did not shut off the Geysers #9 Lakeville Line, a 230 kV transmission line. According to the California Department of Forestry and Fire Protection (CAL FIRE), the Geysers #9 Lakeville Line ignited the Kincade Fire northeast of Geyserville on the night of October 23, 2019.<br><br>The Wildfire Impact Assessment does not provide a realistic or informative analysis of de-energization events for wildfire mitigation. Because the study's assumptions are not based in fact, the findings should not be used for policymaking or planning.<br><br>If the CAISO is concerned that de-energization events will overload the transmission system, it should commence a new analysis with realistic assumptions. Any analysis of de-energization events must account for reductions in load caused by the de-energization of distribution circuits. The CAISO should confer with electric utilities and other stakeholders to develop the parameters for the study. A good starting point would be to develop scenarios based on de-energization events that have occurred. The CAISO could also consider policy changes, such as adopting a presumption that any newly constructed transmission lines should not pass through Tier 3 HFTD areas. | |

| 8. Pacific Gas & Electric<br>Submitted by: Mike Pezone | | |
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| No | Comment Submitted | CAISO Response |
| 8a | PG&E appreciates and supports the CAISO's efforts to evaluate 2019 wildfire information to assess potential mitigations in the PG&E service territory within 2020-21 TPP cycle.<br>Overall, PG&E is supportive of CAISO's inclusion of a wildfire risk assessment in the Transmission Planning Process. PG&E looks forward to coordinating with the CAISO on transmission system hardening and welcomes the opportunity to support CAISO's identification of approved and potentially new projects that mitigate wildfire risk.<br><br>PG&E will continue to provide additional scenarios for CAISO analysis. When available, these additional scenarios may contain updates to the PSPS scoping criteria and methodology. | The comment has been noted and the continued support with the analysis. |
| 8b | PG&E North Bulk System Reliability Assessment<br>As part of the bulk system preliminary reliability assessment results for the northern portion of the PG&E system presented at the stakeholder meeting, the CAISO has recommended to install a new RAS to bypass series capacitor(s) on the Round Mountain-Table Mountain #1 or #2 500 kV Lines to mitigate the overload caused by an outage on one of the two lines. In addition to the new RAS, the CAISO also has recommended other actions to mitigate identified thermal overload concerns in the northern portion of the PG&E system, these include adding Colusa generation tripping to California-Oregon Intertie (COI) RAS and continuing to assess Northern California hydro dispatch patterns to improve modeling (2019-2020 ISO Transmission Plan, COI Nomogram assessment for the long-term planning horizon). PG&E is supportive of developing mitigation to the identified potential issues, but would like to continue to work with the CAISO to evaluate all the recommended actions collectively and in further detail to ensure the impacts from the Round Mountain Reactive Support project are fully considered, to allow for the coordination with neighboring systems who are COI rights owners, and if necessary, to evaluate the economic need for the various upgrades. | The comment has been noted and the CAISO will continue to assess in the economic assessment potential alternatives the associated potential economic benefits. |
| 8c | Align TPP study criteria with CAISO's recent tariff revisions.<br>The CAISO undertook a two-year effort in the 2018-2019 and 2019-2020 transmission planning processes to provide a comprehensive review of the | The CAISO updated the local capacity technical study criteria in the CAISO tariff to align it with the ISO Planning Standards that are used in the reliability assessment of the transmission planning process. The |

| No | Comment Submitted | CAISO Response |
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| | alternatives to reduce or eliminate local capacity area requirements for gas-fired generation in 22 areas and sub-areas. Subsequent to the completion of the final assessments, on December 9, 2019, the CAISO filed tariff revisions to update its local capacity technical study criteria. The tariff revisions, among other things aligned the contingencies studied in the local capacity technical study with the transmission planning studies.<br><br>The updated criteria resulted in an ~1,800 MW increase in the Greater Bay Area local requirement but this same contingency was not identified in the transmission planning process to reduce requirements for gas-fired generation. PG&E recognizes the challenges with the timing to implement the updated criteria, but it is important to reassess the alternatives along with second and/or third level constraints to reduce or eliminate the local requirements using the updated criteria. | local capacity studies identified that were undertaken in the 2018-2019 and 2019-2020 transmission planning process were based upon the local capacity technical study criteria in the tariff at the time of the assessments. The local capacity technical studies undertaken within 2020-2021 transmission planning process use the current local capacity technical study criteria that is now consistent with the ISO Planning Standards.<br><br>While the long-term local capacity technical study in 2018-2019 transmission planning process did not assess the P6 contingency of a transformer contingency followed by another contingency resulting in the lower local capacity requirement in the Greater Bay Area, the PG&E bulk system analysis in the transmission planning process did identify the need to dispatch the generation in the area, which has adequate installed capacity to mitigate for the P6 contingency though not being required to be contracted for local resource adequacy. This further highlighted the need to align the local capacity technical criteria in the tariff with the ISO Planning Standards. |

| 9. Silicon Valley Power<br>Submitted by: Albert Saenz | | |
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| No | Comment Submitted | CAISO Response |
| 9a | The City of Santa Clara dba Silicon Valley Power (SVP) appreciates the opportunity to comment during the development of the 2020-2021 Transmission Plan. SVP has reviewed the results of the CAISO reliability assessment for the SVP/San Jose areas and noted the lack of any mitigations suggested by the CAISO and the lack of Request Window proposals by PG&E for this particular area. The CAISO assessment shows a P5 overload on the Los Esteros-Silicon Switching Station 230 kV line as early as 2025 using the baseline scenario. We also note that the CAISO assessment shows a P1 loading of 100% on the Los Esteros-Nortech 115 kV Line with the loss of SSS-NRS 230 kV under the baseline scenario. In addition, if we consider the outage of SVP's internal DVR generation, i.e., a P3 contingency, it would result in a significant overload on the Los Esteros-Nortech 115 kV Line. Similarly, the CAISO has identified "Continue to Monitor Future Load Forecast" or "Sensitivity only" as mitigation measures for several baseline and SVP high load sensitivity scenario overloads. However, such solutions are not appropriate or adequate for serving the dramatically growing SVP loads.<br><br>SVP believes some long-term solutions should be developed now for the area. Past history shows it often takes significant time to complete approved projects. In SVP's comments on the 2020-2021 TPP Study Plan, dated February 28, 2020, we provided a table identifying examples of PG&E projects with long implementation lead times in the range of 6 to 15 years. We believe it is important to timely develop and approve a plan to relieve the overloads delineated above.<br><br>The number of overloads increases substantially and begin even sooner in the sensitivity cases. SVP believes that the results of the SVP High Load sensitivity case should be thoroughly considered in developing a plan of service for the area. SVP load growth projections are primarily driven by large scale data center block loads that do not follow the CEC load models. SVP is concerned with the adopted CEC forecast not accurately representing SVP's load growth. SVP's load growth includes CEC approved small generator exemptions granted to hyper-scale data centers in SVP's service territory. These new data centers are in construction and will be coming online between 2021 and 2025 with new loads totaling to more than 700MW as shown in Table 1 below. Note that the | The CAISO did not see the P3 issue highlighted by SVP as CAISO utilizes Security constrained reliability dispatch to redispatch generation for P3, P6 contingencies. Mitigation alternatives for P1 and P5 constraints are under review.<br><br>The comment has been noted.<br><br>The comment has been noted. |

| No | Comment Submitted | CAISO Response |
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| | adopted CEC 1-in-10 peak load for SVP in the year 2025 is 672MW, while SVP's actual 2020 peak load is 592MW, year-to-date. SVP is currently working with the CEC's Energy Assessments Division on its demand forecast process to ensure that the CEC's forecast accurately captures future demand growth in the SVP area. | |

Table 1: New SVP Data Center Loads: 2021-2025

| | Substation | Substation Status | Transmission Voltage | Project Status | CEC (small power plant exception) Permitted | Requested Capacity (MW) | Permitted Capacity (MW) | Service Date |
|---|---|---|---|---|---|---|---|---|
| 1 | Mathew | Existing | 60kV | In Construction | N/A | 47 | 50 | Q1-21 |
| 2 | Fairview Bank 3 | Existing | 60kV | In Construction | N/A | 30 | 30 | Q2-21 |
| 3 | Parker Bank 3 | Existing | 60kV | In Construction | Yes | 99 | 99 | Q4-21 |
| 4 | Oaks Jct | New | 60kV | In Construction | N/A | 27 | 27 | Q1-22 |
| 5 | San Tomas Jct | New | 60kV | In Construction | Yes | 99 | 99 | Q3-22 |
| 6 | Memorex Jct | New | 60kV | Planning | - | 99 | 90 | Q2-23 |
| 7 | Stender Way Jct | New | 60kV | Design | N/A | 48 | 48 | Q1-23 |
| 8 | Freedom Circle Jct | New | 60kV | Planning | Yes | 49 | 99 | Q2-23 |
| 9 | Laurelwood | New | 60kV | Planning | Yes | 49 | 99 | Q1-23 |
| 10 | Martin Ave Jct | New | 60kV | Planning | @ CEC | 125 | 96.5 | Q2-23 |
| | | | | | | | | |
| 11 | Pacific | New | 60kV | Study | - | 99 | 0 | |
| 12 | Bowers Ave Jct | New | 60kV | Study | - | 99 | 0 | |
| | | | | | Sum | 870 | 737.5 | |

In summary, SVP believes there is a strong potential to exceed the forecast shown not only in the baseline scenario, but also in the SVP High Load scenario for the 2020-2021 TPP. The necessity to plan for projects to alleviate future overloads projected in the base cases and sensitivity cases is critical given the timing of these new loads. SVP is concerned that even if CAISO starts to develop mitigation plans to mitigate the above-mentioned overloads on the current planning cycle, the required transmission upgrades may not be built in time to reliably serve the expected future loads in the Santa Clara/San Jose load area. Since any reinforcement of the transmission in the SVP/San Jose area will probably take significant time to construct, it is critical for CAISO and PG&E to develop mitigation plans in the current planning cycle.

| 10. Smart Wires<br>Submitted by: Andrew Martin and Chris Ariante | | |
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| No | Comment Submitted | CAISO Response |
| 10a | 1. Leveraging SmartValve Solutions for Cost Effective LCR Reduction<br>Smart Wires' SmartValve solutions utilize Static Synchronous Series Compensator (SSSC) technology to introduce inductive or capacitive reactance in series with a transmission line or transformer. As a modular SSSC, the SmartValve provides a fast, flexible, and cost-effective solution option. The modular design of the technology enables solutions to be scaled up or down or even relocated as system needs change over time. Additionally, the power electronics based solution can take on various operating missions throughout the assets life if or as system conditions change. These attributes enable these solutions to provide considerable planning and operational flexibility amidst uncertain planning scenarios and deliver a highly cost competitive solution when comparted to traditional alternatives such as new builds, reconductors, other power flow control technology, or energy storage.<br><br>In the context of LCR, SmartValve solutions can be deployed in series with a particular constrained transmission line or transformer to push flows onto parallel paths. This effectively increases the ability for local areas to import system capacity and reduces the need for specific local capacity. SmartValve solutions can be manually operated or configured to act automatically within seconds based on observed conditions. | The comment has been noted. |
| 10b | 2. SmartValve for Greater Bay Area (GBA) LCR Reduction<br>As presented by PG&E during the most recent stakeholder meeting, PG&E has worked with Smart Wires to study and scope a SmartValve solution alternative to reduce the GBA LCR. Smart Wires looks forward to CAISO's evaluation of this project proposal and stands ready to support PG&E and CAISO in this effort as needed. | The comment has been noted. |
| 10c | 3. SmartValve for Contra Costa Sub-area LCR Reduction<br>In the 2019/2020 TPP cycle Smart Wires submitted a solution to reduce Contra Costa Sub-area LCR. While CAISO's evaluation showed the solution was cost beneficial with a benefit-to-cost ratio of 2.1 to 3.9, CAISO identified that the generation within Contra Costa was required to meet the overall Greater Bay Area requirement. Pending the results of the CAISO's assessment of PG&E's proposed SmartValve solution to reduce GBA LCR, Smart Wires requests a re- | The CAISO will reevaluate the benefit in conjunction with the PG&E smart valve alternative. |

| No | Comment Submitted | CAISO Response |
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| | evaluation of the benefits provided by this previously proposed and vetted Smart Wires' Contra Costa project. | |
| 10d | 4. SmartValve for San Diego – Imperial Valley Area LCR Reduction<br>Smart Wires conducted analysis on the San Diego – Imperial Valley Area LCR and found the SmartValve could provide a cost effective solution option. As presented as part of the Draft 2030 LCR Study Results, the Yuka – Pilot Knob 161 kV line is driving an LCR of 3718 MW in this area. The results of Smart Wires' analysis show six SmartValve 10-1800i devices could be used to introduce up to 20 ohms to impede the flow of power on the Yuka – Pilot Knob 161 kV line following limiting contingency events. Smart Wires' study results indicate this size of a deployment could provide in excess of a 900 MW LCR reduction.<br><br>The 60 MVAr SmartValve solution includes six SmartValve 10-1800i devices and has a planning level cost estimate of $7M - $9M. With a capacity value of ~$19,000 per MW-year for local versus SP 26 capacity, a reduction in 900 MW yields a benefit of $17M per year. This indicates the solution's benefits would far exceed the total solution cost. This solution may be scaled up to further reduce local requirements and increase benefits to ratepayers. | For the Pilot Knob-Yucca Smart Wires proposal, the CAISO would like to point out that the Yucca-Pilot Knob 161 kV line is not a CAISO controlled facility. Before the CAISO would proceed with an analysis of this proposed solution, the CAISO would need to know if the facility owner is supportive of it. Smartwires may want to contact the facility owner to determine if they support the proposal and include that information in a future submittal. |
| 10e | 5. SmartValve for Other Local Areas<br>Smart Wires believes these types of solutions can be used to cost-effectively reduce or eliminate local requirements for several areas in addition to the three presented above. In the 2019/2020 TPP cycle, CAISO considered the influence of several transmission alternatives to reduce LCR including reconductors and series reactors. Smart Wires requests CAISO to consider SmartValve as part of the tool kit when conducting this type of analysis more broadly in this cycle. Other areas where SmartValve solutions may be able to provide cost-effective reduction of LCR include, but are not limited to:<br>• South Bay-Moss Landing Sub-area<br>• South of Table Mountain Sub-area<br>• San Jose Sub-area<br>• Western LA Basin Sub-area, and<br>• - The Overall LA Basin | The comment has been noted. |

| 11. Transmission Agency of Northern California<br>Submitted by: Keith Johnson | | |
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| No | Comment Submitted | CAISO Response |
| 11a | TANC, through its members, is the primary owner of the California-Oregon Transmission Project ("COTP") and a party to the Federal Energy Regulatory Commission ("FERC") jurisdictional California-Oregon Intertie ("COI") Owners Coordinated Operations Agreement and the COI Path Operator Agreement (both as amended and referred to as governing agreements). As set forth in the agreements, TANC and the other COI owners jointly monitor planned projects that may adversely impact the transfer capability of COI and provide guidance to the CAISO for the operation of COI towards the common goal of optimizing COI transfer capability. TANC is pleased with the coordination of the CAISO in the California Operations Studies Sub-Committee, where alongside the other COI owners substantial improvement to the operation of COI have been achieved. Some of these improvements were made as a result of implementing more effective tools in the control room, but others were made to overcome recent challenges driven by changes in the resource fleet and impacts driven by climate change.<br><br>TANC's primary focus related to the TPP is to protect and maximize the transfer capability in both directions of the COTP and the COI (also known as Path 66) consistent with the various applicable governing agreements.<br><br>Maintaining high transfer capability on COI has become more important in recent years to the Balancing Authorities in northern California and the Pacific Northwest. The need for dependable and high import capability was evident in California during the late summer and early fall of 2020 when there were several incidents of deficiencies in available resources in California. Although some customers lost power, many did not because of the power that was able to be imported from neighboring regions including the Pacific Northwest. This need was also evident in March of 2019 when an extended cold front hit the Pacific Northwest following a dry rainy season. With the seasonally light load in California, COI was used to send needed power to the Pacific Northwest as the region managed the challenges of limited available resources.<br><br>The need for maintaining high transfer capability on COI will continue to be important in the future as the percentage of variable energy resources in the resource fleet continues to grow, more dispatchable and baseload generation | The comment has been noted. |

| No | Comment Submitted | CAISO Response |
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| | retires, and new challenges arise driven by climate change. To meet the future needs of the system, TANC believes the CAISO should undertake proactive transmission planning efforts to maintain and enhance the transfer capacity ratings of the COI. TANC (along with its members) supports a more proactive approach and is open to future coordination efforts with the CAISO and other regional entities with the common goal of improving the bi-directional transfer capability of COI to better meet current and future needs of the region. | |
| 11b | **While the relocation of the STATCOM increases the need to operate a remedial action scheme ("RAS"), TANC supports the STATCOM project.** In all peak load cases with COI transfers north-to-south ("N-S") an overload resulted on the Round Mountain-Table Mountain 500-kV transmission line following the outage of the adjacent Round Mountain-Table Mountain 500-kV transmission line. In the 2025 and 2030 peak load cases, and with the inclusion of the Round Mountain STATCOM, the resulting overload on the adjacent line is exacerbated when the outage location is north of the Round Mountain STATCOM station. To mitigate this reliability issue, the CAISO proposes (as it has in the past) to bypass the series capacitors on a Round Mountain-Table Mountain 500-kV line due to overloads on the line which shifts flow to the COTP and other parallel electrical paths until flows can be reduced through import curtailments. As in previous transmission planning cycles, TANC supports the implementation of the recommended RAS as it allows for increased COI N-S transfers during typical operating conditions and during conditions with planned maintenance outages on the 500-kV system south of the California-Oregon border. However, with the changed location of the Round Mountain STATCOM in the 2020-2021 TPP studies it is clear the need for the RAS is even greater than noted in past studies to mitigate the system impacts caused by the STATCOM at its new location. TANC supports efforts to better locate the STATCOM or consider options that do not increase the need for RAS actions if feasible. | The CAISO is continuing to work with PG&E on the RAS modification that was recommended in the previous planning cycle. |
| 11c | **TANC supports reactive additions to PG&E's system.** As in previous TPP cycles, the CAISO is recommending dynamic reactive support projects be installed at Round Mountain and Gates to mitigate the low voltage and high voltage concerns resulting on the 500-kV system. TANC agrees with the CAISO's conclusions and supports the two recommended projects. Although the Round Mountain STATCOM will require some minor new RAS, the two | The comment has been noted. |

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| | projects will add the needed voltage support to the 500-kV system in the coming years with the expected changes in available resources. | |
| 11d | TANC supports further study to reduce COI export limitations. In the off-peak studies with COI transfers south-to-north ("S-N"), an overload results on the Olinda 500/230-kV transformer following the loss of the Round Mountain 500/230-kV transformer, and vice versa. The proposed mitigation for these overloads is to reduce COI S-N flows and/or redispatch generation. TANC agrees with the mitigation options for the near-term horizon but recommends that the CAISO investigate a potential long-term solution that will not require the limits to the transfer capability between California and the Pacific Northwest. As the Western markets continue to evolve and California adds significantly more renewable energy (primarily solar), being able to export excess generation will become a greater priority. TANC is studying COI export capability in its 2020 Annual Assessment and would welcome coordinated study efforts with the CAISO to explore COI export improvements. | The CAISO will continue to assess in the economic assessment the identified export limitations. |
| 11e | TANC appreciates the CAISO's economic study improvements, but more coordination is needed. COI overload mitigation action for thermal limitations on the bulk system has for years relied primarily on curtailing imports to operate within the adjusted seasonal COI nomogram rather than making fixes to improve the transfer capability of the system. TANC is encouraged by the reactive support additions as noted above and encourages study of additional fixes to increase the usability of the existing system. TANC recognizes that the CAISO has made efforts to better recognize limitations associated with transmission outages. Scheduled and unplanned outages are major sources of limitations that will likely contribute to increased renewable curtailments in future years or exacerbate supply shortages at any time. TANC continues to monitor actual congestion compared to that forecasted by the CAISO and will seek to identify improvements in economic studies to more accurately forecast future congestion. TANC encourages the CAISO to monitor and explore potential congestion forecast improvements and work with stakeholders in such efforts.<br><br>The August 14 and 15, 2020 rotating outages on the CAISO's system demonstrate that the needs of the system are changing and how key the COI is to California. In mid-August every MW available for import reduced the amount | The reliability needs of the bulk system were assessed to determine the performance of the transmission system and reliability needs. The CAISO will continue to assess the reliability needs of the bulk system in future planning cycles. In addition, the economic assessment and potential economic constraint and congestion analysis will be undertaken later in this planning cycle. |

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| | of MW of load that needed to be curtailed. TANC encourages the CAISO to take a careful look at the assumptions being used in the CAISO's reliability and economic studies to ensure that those studies capture the current needs of the system. TANC believes that there is a pressing need for transmission expansion, and as the resource mix in California and the West continues to evolve the importance and use of interstate transmission will increase. TANC believes it is imperative that future economic analyses reflect a realistic amount of congestion on Path 66. At a minimum, analyses should not reflect a decrease in congestion compared to real market performance unless there is consensus among stakeholders that such a paradigm is likely. TANC believes it is critical for the CAISO to look for every opportunity to maximize the existing transfer capability of the COI and identify when new incremental capability would be beneficial using accurate forecasts of congestion exposure that reflect the benefits of system improvements. | |

| 12. Vistra<br>Submitted by: Cathleen Cobert | | |
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| No | Comment Submitted | CAISO Response |
| 12a | Vistra Corp. respectfully submits comments in response to the CAISO's 2020-2021 Transmission Planning Process, Phase 2, Reliability Assessment and Study Updates. In the 2030 Draft Local Capacity Requirement Study Results, the CAISO shows that the Greater Bay Area has an overall 7,455 MW local capacity requirement of which there is a 111 MW deficiency between this LCR and the existing generation capacity needed to meet it. Vistra believes greater development of energy storage can be a highly effective tool to allow the system to meet the reliability needs shown in the LCR, both in the near term and as energy storage systems replace the local gas-fired units as they retire. However, the draft study shows there are very limited amounts of energy storage that can be added in the Greater Bay Area and its sub-areas for at least two reasons: (1) when charging exacerbates congestion on certain constraints, the mitigation approach is to restrict charging, and (2) the new maximum 4-hour storage limit. | The comment has been noted |
| 12b | First, Vistra believes a potential alternative to maintain reliability criteria within the Greater Bay Area and sub-areas is to upgrade certain limiting transmission facilities instead of curtailing energy storage to remain within the current limits. For example, the "Moss Landing-Las Aguilas 230 kV" constraint requires South Bay-Moss Landing sub-area to have 2,185 MW LCR. By upgrading this line rating, the CAISO can significantly reduce the sub-area LCR and allow for additional capacity to meet the LCR while also supporting increased levels of renewable integration. This can support reliably integrating renewables through bringing lower-cost supply from Westland into the sub-area that can be stored in storage resources and reserved to serve load in the peaking hours where the system has the greatest reliability need. In addition to considering this issue in its production cost savings (economic planning study) and policy-driven (RPS transmission plan analysis) benefits, we respectfully request the CAISO consider recommending transmission upgrades to be an alternative for targeted LCR areas and sub-areas in its reliability assessments. | The comment has been noted |
| 12c | Second, Vistra asks the CAISO to consider delaying including the new maximum 4-hour storage limit in its modeling until the Transmission Planning Process's next iteration. We believe there is a lack of clarity on the methodology for determining the maximum 4-hour storage as well as how it | The maximum 4-hour storage is not a real physical system constraint. It is an estimate of maximum MWs of 4-hour batteries that can displace on a 1 for 1 MW bases other local resources required in other to meet local capacity needs in that particular local area or sub-area. |

| No | Comment Submitted | CAISO Response |
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| | would impact local resource adequacy sufficiency assessments. Specifically, slide 16 reads "approximate 4-hr storage" and we are unclear on the methodology the CAISO is using to estimate the approximate max 4-hr storage values and ask for a description of the methodology as well as insight into when this value will be updated from an approximate value to a final value used in the RA assessments. Further, based on CAISO's explanation that "once the local need passes the 4-hour mark, [storage resources] do not eliminate the local need for other local resources on a 1 for 1 MW basis", our understanding is 4-hour storage resources will be limited to the new maximum 4-hour storage limit. If for example the 200 MW limit on the South Bay – Moss Landing sub-area is imposed, this could significantly limit storage development in a manner that may work in opposition to goals to leverage storage to (1) serve as replacement for retiring thermal generation or (2) support increased renewable integration through consuming excess generation and reducing curtailments. Consequently, we respectfully ask to defer this item. | Installation of additional 4-hour batteries beyond this MW threshold is possible, however it will not eliminate other needed local resources on a 1 for 1 MW bases. This estimate of future development is not used in individual LSE compliance however it may be useful to regulators when approving entire portfolio of new resources. The CAISO is not directly using this information in it backstop authority either, mainly due to its generic (estimate) nature. In its backstop authority the CAISO is using the actual characteristics of batteries installed in that particular local area and sub-area and they could be different that the previously provided estimate (see the assumptions section in the appropriate LCT study reports). |

| 13. Western Grid Development<br>Submitted by: Christine Vangelatos, ZGlobal on behalf of Western Grid Development | | |
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| No | Comment Submitted | CAISO Response |
| 13a | At the 2020-2021 Transmission Planning Process Stakeholder Meeting on September 23-24, 2020, the CAISO invited stakeholders to submit alternatives related to local capacity technical studies along with stakeholder comments by October 8, 2020. Accordingly, Western Grid Development LLC ("Western Grid") is pleased to submit the Pacific Transmission Expansion Project ("PTE" or "PTEP") as a potential alternative to reduce or eliminate the gas-fired generation for targeted LCR areas and sub-areas, provide incremental LCR and assist in achieving goals established by Senate Bill 100.<br><br>In the previous and current TPP cycles Western Grid has requested CAISO to study the PTEP as an economic project. The PTEP is a 2,000 MW controllable HVDC subsea transmission cable with four Voltage Source Converter stations connecting Diablo Canyon switchyard to Goleta, Redondo Beach and Huntington Beach substations in Southern California. The project cost is estimated at $1,850 million. In the 2019 – 2020 Transmission Plan1, the CAISO determined that the PTEP will increase capacity on the existing CAISO grid to allow transfers of available resources from the Diablo Canyon 500 kV switchyard to the three southern terminals including a 500 MW terminal connecting to the Goleta substation in the Big Creek–Ventura areas. The CAISO concluded that PTEP would reduce LCR requirement in the Big Creek–Ventura area by 393 MW thus reducing the reliance on 393 MW of gas-fired generation. The same analysis concluded that the PTEP reduces the Western LA Basin LCR requirement for by 1,889 MW thereby allow 1,889 MW of reduction in gas-fired generation. However, at the same time, the CAISO showed an increase in LCR for Eastern LA and San Diego LCR by 149 MW and 140 MW respectively2.<br>The net LCR reduction for LA Basin and Big Creek-Ventura areas was determined by CAISO to equal 1,993 MW of local capacity. The Net LCR Benefits (net decrease in cost) has a present value of $463 to $628 million. However, production costs (or energy costs) increase by a present value of $117 million, thus CAISO concluded the PTEP project benefits ranged from $346 to $511 million, which resulted in a benefit to cost ratio below 1.0. | The comment has been noted. |
| | Western Grid requests that CAISO consider an enhanced alternative option for PTEP for purposes of evaluating transmission alternatives for the 2030 LT LCR | The CAISO will review in the LCR assessment. |

| No | Comment Submitted | CAISO Response |
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| | study to be included in the 2020-2021 TPP. We have performed initial assessment and our studies indicate that two project configurations provide substantial benefits:<br><br>Option 1: PTEP provides 2,000 MW into Big Creek/Ventura and LA Basin by injecting up to 500 MW at Goleta, 1000 MW at Redondo Beach and 500 MW at Huntington Beach.<br><br>Option 2: PTEP provides 2,000 MW into Big Creek/Ventura and LA Basin and by injecting 500 MW at Goleta, 500 MW at El Segundo, 500 MW at Huntington Beach and 500 MW at San Onofre.<br><br>a. We request the CAISO evaluate both Option 1 and Option 2 as alternatives for meeting local LCR needs and calculate the amount of LCR reduction under both Option 1 and 2 in Big Creek/Ventura, LA Basin, and San Diego/Imperial Valley for the 2,000 MW injection.<br>b. Evaluate both PTEP Option 1 and Option 2 as transmission options that, combined with storage, could eliminate, or materially reduce gas-fired generation in targeted areas and subareas. The analysis should strive to find a desired mix of in-basin batteries plus new transmission to out-of-basin resources that can materially reduce or eliminate the need for in basin gas-fired generation.<br>c. Develop a cost comparison between meeting LCR requirements with (a) in-basin batteries, versus (b) the cost of new transmission that delivers of out-of-basin renewable resources to the LA Basin and reduces the LCR requirement. Costs for (a) and (b) could be compared to the PTEP proposal. This cost comparison should extend to the point where in-basin gas fired generation is “materially reduced or eliminated”.<br>d. Western Grid also requests the CAISO apply available market data to determine the economic benefits of the PTEP alternative compared to gas fired generation. Specifically, we request the LCR value $/KW -mo. for specific local generation that the PTEP displaces rather than an average LCR value that does not represent the actual cost of LCR paid by ratepayers in 2019 and beyond. We have found publicly available LCR payments in the LA Basin as shown below. We believe transparency is paramount to effectively and appropriately analyzing this and all projects | |

| No | Comment Submitted | CAISO Response |
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| | and informing the CPUC Resource Planning and Procurement Proceedings.<br>e. We ask that CAISO estimate the emission savings that the PTEP would provide. Based on our calculation, the PTEP will displace 7,358 GWh3 of gas generation in the load pockets of southern California. Assuming 16.70 $/metric ton (CARB August 2020 estimate), this generation reduction would translate to $8.88 per MWh or $65 million per year.<br>f. Although we have not completed an uncertainty impact analysis for the PTEP, we believe, based on initial analysis, the impact is significant. We agree with CAISO that it is important to perform sensitivity studies to cover events such as fires, we also recommend CAISO widen the scope of its sensitivity studies and conduct a comprehensive analysis that includes probability of uncertain events such as fire, loads, temperature, gas price increase, transmission and generation outages. | |
| | Resource Adequacy Value<br>When calculating benefits, CAISO should apply an LCR price that is more reflective of market realities. Based on the publicly available data reflected in Table 1 to 3, the weighted average price of local capacity contracts in the Western LA Basin is about $8.90/kW-Month. As reflected in the tables below, this is based on an analysis of the publicly available data for existing LCR contracts totaling roughly 3,644 MW's of existing gas plants in the LA Basin. | The CAISO is planning on using the methodology that was applied in the past planning cycles with the updated publicly available resource cost of local versus system from the CPUC. |

| No | Comment Submitted | CAISO Response |
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Table 1: 2019 Average Capacity Cost for Western LA Basin Gas-fired Resources (not including retiring OTC unit

| Western LA Basin Generators (natural gas-fired) | 2019 Avg Capacity Cost ($/kW-Month) | NQC (MW) | $/YEAR |
|---|---|---|---|
| El Segundo Energy Center | 19.76 | 526.68 | $124,907,429 |
| Malburg power plant | 26.84 | 134 | $43,153,574 |
| Walnut Creek Units | 17.16 | 480.65 | $98,968,457 |
| Long Beach Peakers (Hinson) | 4.395 | 260 | $13,712,400 |
| Harbor | 3.925 | 99.99 | $4,709,529 |
| Total | 14.42 | 1501.32 | $285,451,389 |
| **Weighted Average Cost** | 15.84 | | |

Table 2: 2019 Average Capacity Cost for Western LA Basin Gas-fired Resources (retiring OTC units)

| Retiring OTC Generators in Western LA Basin | 2019 Avg Capacity Cost ($/kW-Month) | NQC (MW) | $/YEAR |
|---|---|---|---|
| Alamitos* | 3.65 | 335.06 | $14,675,628 |
| Huntington Beach* | 3.65 | 451.55 | $19,777,890 |
| Redondo Beach | 4.25 | 1355.73 | $69,142,230 |
| Total | 3.85 | 2142.34 | $103,595,748 |
| **Weighted Average Cost** | 4.03 | | |

Table 3: Summary 2019 Average Capacity Cost for Western LA Basin Gas-fired Resources

| | 2019 Avg Capacity Cost ($/kW-Month) | NQC (MW) | $/YEAR |
|---|---|---|---|
| Total Table 1 and Table 2 | 10.45 | 3644 | $389,047,137 |
| **Weighted Average Cost** | 8.90 | | |

In summary, the PTEP is a viable transmission solution that,

1. Provides 1,993 MW of LCR benefits as CAISO found in the 2019-2020 TPP and using a weighted average cost of 8.90 $/KW-mo., the annual LCR benefit is estimated at $213 million annually.
2. Provides ISO Ratepayers' benefits estimated at $53 million annually4
3. Reduces Emissions from gas-fired generation with benefits of $65 million annually.

| No | Comment Submitted | CAISO Response |
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Table 4: Summary Estimated Benefits for PTEP

| | ($/year) | Present Value $ |
|---|---|---|
| Benefits | | |
| Local Capacity Requirement (LCR) Savings | $213,600,000 | $2,952,199,776 |
| ISO Ratepayer Benefit | $53,000,000 | $732,521,480 |
| Emission Benefits | $65,342,592 | $903,110,419 |
| Total Benefits | $331,942,592 | $4,587,831,675 |
| Capital Investment | | |
| **Transmission Revenue Requirements** | **Annual Transmission Revenue requirements $** | **Present Value Revenue Requirement $** |
| CAISO Transmission RR | $185,000,000 | $2,405,000,000 |
| | | |
| Benefit to Cost | 1.79 | 1.91 |

Additionally, CAISO should quantify these additional benefits that will be provided by PTEP:

1. Ability to provide fast ramp capability
2. Transmission capability for connecting offshore wind generation
3. Ability to provide dynamic and stability to the grid using the Voltage Source Converters.
4. Energy cost savings and congestion cost benefits for increasing transmission capability between the Northern and Southern California
5. Fire and uncertainty mitigation
6. Reduced costs for renewable build up to comply with AB 100.