The ISO received comments on the topics discussed at the September 20 & 21, 2018 stakeholder meeting from the following:

1. American Wind Energy Association California Caucus (ACC)
2. Bay Area Municipal Transmission (BAMx)
3. California Energy Commission – Staff (CEC Staff)
4. California Public Utilities Commission – Staff (CPUC-Staff)
5. Center for Energy Efficiency and Renewable Technologies (CEERT)
6. GridLiance
7. Large-scale Solar Association (LSA)
8. LS Power Development, LLC
9. National Grid USA ("National Grid") and Rye Development, LLC ("Rye Development")
10. NextEra Energy Transmission West (NEET West)
11. Pacific Gas & Electric (PG&E)
12. Public Advocates Office
13. San Diego Gas & Electric (SDG&E)
14. Silicon Valley Power (SVP)
15. Transmission Agency of Northern California (TANC)
16. Tenaska

Copies of the comments submitted are located on the 2018-2019 Transmission Planning Process page at:

http://www.caiso.com/planning/Pages/TransmissionPlanning/2018-2019TransmissionPlanningProcess.aspx

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

1. American Wind Energy Association California Caucus (ACC)
Submitted by: Caitlin Liotiris

No	Comment Submitted	CAISO Response
1a	**The 2019-20 TPP must, finally, study and approve transmission consistent with the public policy requirements in effect in California** ACC believes that the delay in studying and approving transmission lines to achieve California's renewable energy requirements must be remedied no later than the 2019-2020 TPP cycle in order to ensure California will have transmission facilities necessary to meet its clean energy requirements. Today, the renewable requirements of SB350 have been usurped by the requirements of SB100. And yet, when the CAISO publishes its 2018-19 TPP, it will have yet to ever study, with the intention to approve, the transmission facilities necessary to achieve the 50% RPS that was mandated by SB350. In short, the legislature has passed a higher renewable requirement before the CAISO has planned transmission for a lower RPS requirement. The delay in meaningful study and subsequent approval of transmission facilities necessary to achieve California's current RPS requirements, if not remedied, has the potential to jeopardize California's timely achievement of its RPS and clean energy goals. The CAISO and California Public Utilities Commission (CPUC) need to ensure that this delay in studying and approving transmission facilities is addressed immediately. The CAISO should work proactively with the CPUC to ensure that the portfolios studied in the 2019-2020 TPP are consistent with the renewable requirements mandated by state law. SB100's renewable mandates are quickly approaching, with RPS requirements of 44% by 2024, 52% by 2027 and 60% by 2030. The 52% RPS requirement is less than ten years away and yet the CAISO has not yet begun approving transmission facilities which may be necessary to achieve an RPS greater than 33%. The CAISO must work with the CPUC to gather the information required to perform base case policy-driven transmission assessments, and to begin approving transmission facilities, associated with those portfolios in the 2019-2020 TPP.	The comments have been noted. The ISO is continuing to actively support the IRP process. While it is true that policy-driven portfolios for RPS levels beyond 33% have not been studied as the basis for policy-driven transmission, this year's portfolio for reliability analysis is based on a 50% RPS, and extensive informational studies have been conducted in past years – as well as underway in this year – on higher RPS levels.

No	Comment Submitted	CAISO Response
1b	**Effective Load Carrying Capability (ELCC) values must be incorporated into transmission planning and interconnection processes** During the September TPP meetings, CAISO indicated that it is working to incorporate the use of ELCC for variable energy resources into the interconnection and transmission planning processes. Use of ELCC for variable energy resources in these processes is paramount to ensuring that the transmission system is appropriately built to accommodate these variable energy resources. CAISO should immediately make clear to stakeholders both the venue for discussing and the expected timing of ELCC implementation in these two processes. Use of the ELCC should be expeditiously implemented in the TPP and interconnection processes, such that CAISO can move forward with determining what transmission (and interconnection) facilities are necessary to deliver California's growing renewable resource portfolios to load.	Use of ELCC methodologies for purposes of considering resource adequacy capacity contributions of different resources are being explored through various CPUC proceedings, and in particular the current Resource Adequacy proceeding, RPS proceeding, and IRP proceeding. The ISO's transmission planning process relies more heavily on powerflow analysis of particular scenarios reflecting particular times of day, and utilizes estimates of renewable generation output at those times. We expect this methodology to migrate into local capacity technical studies, as results of system-wide ELCC methodologies are not directly applicable to specific local capacity requirements.
1c	**Modeling of existing generators in future TPP cycles should be reviewed** Also, during the September TPP meetings, CAISO indicated that it had heard from a lot of stakeholders about the importance of the assumptions surrounding modeling of existing generation. Generally, CAISO currently assumes that resources will remain online until they reach a 40-year life or until the end of their contract (whichever is *later*). ACC shares the concerns that several other stakeholders have expressed about this assumption and whether it realistically represents the future state of the CAISO grid. While CAISO indicated that it will be considering the appropriateness of this assumption for future TPPs, it has not clarified the timeline or venue for such a discussion. CAISO should immediately determine the appropriate venue and timing for such a discussion and communicate those pieces of information to stakeholders.	The ISO's study assumptions in the 2018-2019 transmission planning cycle are based on previous LTPP assumptions as a means to identify the potential impact of some level of potential retirement. For clarity, this assumption goes beyond the current assumptions for gas-fired generation in the CPUC's current IRP process. The ISO will have to consider the impact of any retirements driven by these assumptions on individual project needs on a case by case basis, as well as the potential need for any other sensitivities in considering solutions to previously identified needs. The ISO will be looking to the assumptions developed in the 2019 IRP cycle to inform the 2019-2020 transmission planning cycle. These will be revisited in the development of the ISO's 2019-2020 transmission planning assumptions.
1d	**Treatment of renewable generation additions which are not inside of the CAISO Balancing Authority Area (BAA)** There are a number of new generation resources which are planning to deliver to load serving entities within CAISO, but which directly interconnect to another BAA in the Western Interconnection and utilize transmission service to reach the CAISO's BAA. Several of these resources have signed Power Purchase Agreements with load serving entities in the CAISO and the quantity of resources that fit this description may increase going forward. However, it is unclear to ACC how these BAA to BAA transmission service requests are	As with the location of ISO-BAA generation, renewable energy resources in other balancing authority areas can be incorporated into CPUC-developed RPS portfolios. The ISO would expect that those take into account in particular resources that already have Power Purchase Arrangements with ISO load serving entities. The ISO's forward-looking MIC approach and policy-driven transmission framework can then be used in concert to bring these resources into the ISO balancing authority area. It is the generation developer's

No	Comment Submitted	CAISO Response
	considered, if at all, in the context of the TPP. CAISO should provide additional clarity on how it plans to address these types of resources going forward to ensure it has planned the CAISO transmission system to accommodate these energy deliveries.	responsibility for obtaining transmission service from the out-of-state generator interconnection point to the boundary of the CAISO BAA.
1e	CAISO should open a stakeholder initiative to address the outstanding issues in the TPP As suggested by ACC in the CAISO Stakeholder Policy Initiatives Catalog Process, the needs of the electric grid have changed considerably over the last several years but yet the TPP has not been significantly refined to reflect these changes. The time is ripe for the CAISO to consider whether the current TPP processes are appropriately ensuring the most cost-effective and efficient transmission and non-transmission alternatives are selected and that such facilities meet California's public policy goals and that the assumptions utilized in the TPP are appropriate for achieving those goals. As outlined in the previous sections of these comments, there are multiple areas where revisions and clarifications to TPP processes and assumptions are necessary. ACC urges the CAISO to open a stakeholder process to address the issues identified in these comments, as well as the other TPP-related items ACC and other stakeholders have raised (including CAISO's evaluation of transmission that reaches outside its boundaries, economic benefits of transmission lines that deliver renewable energy, etc.)	As the ISO noted in the Draft Initiatives Policy Catalog, posted on August 8, 2018: "The CAISO has not included this proposed initiative in this catalog because these requests largely conflate the design of the transmission planning process with study assumptions and scope developed as part of each year's study plan with the CPUC. Additionally, the existing transmission planning process specifies the sequential evaluation of the need for reliability, policy, and economic transmission projects. During this sequential evaluation, the CAISO considers transmission alternatives that will optimally meet all three needs and provide the most value for CAISO ratepayers. Stakeholders have the opportunity to propose study assumptions and alternative transmission solutions for the CAISO to consider in its Transmission Planning Process during the study plan phase cycle." The ISO encourages continued participation in the development of planning assumptions both in the ISO's process as well as the CPUC's IRP process, and the case-by-case consideration of transmission needs inside the transmission planning process. The ISO does not see a need for a comprehensive review of the TPP itself.
1f	EODS Assumptions should be reviewed and revised ACC is concerned by the assumption in the TPP that about 40% of new generation resources will be energy-only (EODS). While the assumption is consistent with the modeling conducted in RESOLVE, it does not appear to comport with the reality of the commercial preferences of load serving entities. Market buyers appear to highly value Full capacity Deliverability Status (FCDS) and have not been seeking EODS resources. If buyers continue to seek renewable energy contracts almost entirely with FCDS resources, studying 40%	The ISO encourages ACC to express these concerns in the CPUC's IRP and resource procurement processes, as the policy-driven assumptions are developed in those proceedings, as well as to reiterate them in the ISO's development of the 2019-2020 transmission planning cycle.

No	Comment Submitted	CAISO Response
	of new resources as EODS could result in severely under planning the transmission system to achieve California's RPS requirements. Because the CAISO is only studying sensitivities for its policy-driven studies during the 2018-19 TPP, at a minimum it should study a sensitivity where closer to 100% of all new generation resources are FCDS to better understand the transmission facilities that would be required if the current preference for FCDS resources continues.	
1g	Incremental wind additions studied in the 2018-19 should be consistent with the Integrated Resource Plan (IRP) assumptions The 2018-19 policy-driven sensitivity studies will include generic resources sited at the substation locations developed by the California Energy Commission (CEC). Many of the incremental wind resources that are included in the portfolios, and sited at substation locations by the CEC, are in fact designated as "re-powers" of existing wind facilities. The CEC indicates that 682 MWs of wind capacity is "re-power." Because RESOLVE assumed that all existing generation (including these wind resources) remained online, ACC seeks clarification that the MW of re-power are *incremental* to the wind capacity on the existing system. In other words, the "re-power" MW included in the portfolios should be *in addition* to the capacity of the existing wind resources at those locations. ACC believes this will be the case, but wants to ensure that there is consistent treatment in the incremental MW of wind that is modeled in the TPP and in the IRP's Reference System Plan.	The generic wind resources selected by RESOLVE will be modeled in addition to the existing wind resources. We believe that the CEC staff assumed certain amount of wind re-power capacity for the purpose of creating a spatial representation of renewable resources as explained in "Energy Commission Staff Proof of Concept Report to CPUC Staff".

2. Bay Area Municipal Transmission (BAMx)
Submitted by: Moise Melgoza

No	Comment Submitted	CAISO Response
2a	PTO Request Window Project Applications *General Comment on the high voltage GridLiance Request Window Submission* GridLiance has proposed four major transmission upgrades in this TPP cycle: Amargosa Valley Reliability Improvement Project, Southwest Nevada Reliability Improvement Project, Pahrump Valley Loop-In Project. In order to help stakeholders better understand the need and the driver for the projects, GridLiance should provide information on which circuits are overloaded and the scenarios where these overloads are observed. Some diagrams showing the overloads in addition to the proposed projects would be very helpful. Unfortunately, GridLiance only states that thermal overloads and voltage issues on VEA's 138kV system that serve as a driver for the three proposed projects. Also, no information was provided in regards to what year the identified overloads start to appear and if the overloads are for the summer peak or off-peak cases. Additionally, the preliminary assessment results of the VEA service area released by the CAISO seem to have little correlation with the reliability projects proposed by GridLiance. BAMx recommends that the CAISO not approve these projects until more justification information is provided.	The ISO provides an opportunity for PTOs to present their proposed transmission solutions during our stakeholder meetings for stakeholders to obtain the information and provide comments and ask questions during the meeting. The ISO encourages stakeholders to take advantage of the opportunity to ask questions at those sessions. Regarding the level of information provided by GridLiance, the comment has been noted, and the ISO expects that GridLiance will be reviewing stakeholder comments received on the request window submissions. The ISO will evaluate the need for all valid Request Window submissions, and if we recommend approval will provide adequate justification information.
2b	*Amargosa Valley Reliability Improvement Project* Based on the information provided on the slides for the Amargosa Valley Reliability Improvement Project, there is already an SPS that protects the network for the overloads mitigated by the Amargosa Valley Reliability Project. If GridLiance has identified a need to reduce its reliance on this SPS going forward, a benefit-cost analysis should be presented to justify the capital spending associated with the upgrade.	The comment has been noted, and the ISO will consider this comment in its evaluation of the need for the project.
2c	*Pahrump Valley Loop-In Project* GridLiance prematurely rejects the alternative of building Vista-Charleston Park 138kV circuit because it does not resolve overloads at Pahrump Transformers. GridLiance should clarify why adding additional transformer capacity at Pahrump was not evaluated as part of the Vista-Charleston Park 138kV Alternative.	The comment has been noted, and the ISO will consider this comment in its evaluation of the need for the project.

No	Comment Submitted	CAISO Response
2d	*PG&E's Proposed Voltage Support Projects* The CAISO has shown that there are high voltage issues on PG&E's 500kV system. It appears that the retirement of Diablo Canyon is at least a contributor event to the issue. It is not clear whether the retention of the existing machine(s) at Diablo Canyon as a synchronous condenser(s) would contribute to solving the voltage problem studied. BAMx recommends that the effect/feasibility of this option be studied. PG&E has proposed two large voltage control projects using +/- 500 MVAR STATCOM devices, one at Round Mountain and two at Gates. The choice of technology for the mitigation requires further justification. The threshold questions are the amount of reactive control needed and whether simple switchable shunt reactors would be sufficient. Concerning the amount of reactive control, PG&E did not present information on how the 500 MVAR or 1000 MVARs levels were selected. For example, are these levels in some way linked to the technology selected? Additionally, in the sizing of the amount of reactive control needed at Gates, besides studying the effect of retaining the generators for voltage support, consideration should be made for de-energizing the Diablo-Midway No. 2 or 3 500 kV line to reduce the charging MVARs generated by the lightly loaded line and increase the VARs consumed by the remaining line. As for the technology, there are currently switchable reactors installed in many of the PG&E 500 kV stations. As the data presented show the 500 kV voltages to be consistently high, more justification is needed concerning the level of control required. In the event is can be shown that fast, continuous control is needed, BAMx recommends that the approval not be technology specific. Rather BAMx encourages the CAISO to open approved voltage support projects beyond simple switchable devices to competitive solicitations that specify the required performance characteristics. In that way the market can identify the most cost-effective technology to achieve the desired control.	While conversion of generators to synchronous condensers is technically feasible and in fact was employed on an interim basis by the ISO to address the early retirement of SONGS, we do not expect the conversion to be a feasible long term solution, due to conversion cost, the necessity to retain significant infrastructure at the generating facility, and potential impediments to decommissioning activities. Notwithstanding, the ISO will seek input from PG&E on this issue. The other comments have been noted, and will be considered in the ISO's evaluation of the need for the proposed reinforcements.
2e	*Southern California Regional LCR Reduction* SDG&E has proposed "Southern California Regional LCR Reduction" project establishing a new 230kV circuit between Mission, San Luis Rey, and San Onofre substations along with two phase shifting transformers to control the	The ISO provides an opportunity for PTOs to present their proposed transmission solutions during our stakeholder meetings for stakeholders to obtain the information and provide comments and ask

No	Comment Submitted	CAISO Response
	power flows. The cost estimate for the project is $100-$200 Million. Though SDG&E identifies the main drivers for the project to be congestion mitigation and a reduction of Local Capacity Requirements (LCR) by 315 MW, no economic justification is provided. While this information may inform both the CAISO's economic transmission analysis and the CPUC's Integrated Resource Planning (IRP) process for meeting local capacity needs, the identification of the transmission alternative is only the initial step in the determination of whether it is needed for either of these purposes. For example, the CAISO transmission planner identified that the congestion can be mitigated through generation redispatch and that a newly implemented Remedial Action Scheme had already provided some LCR relief. Therefore, BAMx does not think the proposed project should be approved in this planning cycle, but considered in future efforts in the IRP process at the CPUC. Such a path appears to be consistent with CAISO staff's stated intentions during the meeting (as delineated below).	questions during the meeting. The ISO will evaluate the need for all valid Request Window submissions, and if we recommend approval will provide adequate justification information. Because this particular submittal also indicates potential LCR reduction benefits, the ISO will consider it in our LCR reduction analysis.
2f	Consideration of Storage in 2018-2019 Transmission Plan BAMx supports the CAISO statements that the CPUC IRP process is the appropriate forum to determine economic tradeoffs between retaining existing generation and reducing that need via new transmission or new local resources. Any changes to the structure of resources should be decided in concert with other resources and state policy goals, through the state's IRP process. This IRP process is well-equipped to compare alternatives, such as the local generation, demand response, and energy storage, to transmission resources needed to address local reliability. BAMx also supports the CAISO's statements that its first choice is to have open competitive (procurement) processes to select such preferred resources, including energy storage. In particular, the CAISO has made it clear that "the ISO's economic-driven transmission framework is not an alternative to resource planning." BAMX believes any exceptions to using the IRP as the proper forum for considering storage requires additional discussion/illustrations/examples, in addition to performance specifications on how the storage system will be operated, and capital investment expenditure assumptions applied to storage. We appreciate the CAISO's initial attempt to provide clarification via a high-level "bookend" examples which tend to indicate a very narrow set of conditions and criteria under which energy storage may potentially be classified as a transmission	BAMx appears to have misunderstood the ISO's comments on this issue. We consider the transmission planning process as an appropriate forum for the consideration of transmission or transmission/preferred resource hybrid solutions to reduce local capacity needs for policy or economic reasons, and would rely on policy direction and coordination of study assumptions with CPUC processes in that regard. Further, reliance on preferred resources as part of a hybrid solution requires careful coordination with the local utility and the CPUC as the ISO process can identify the preferred resources as part of a preferred solution, but does not approve resource procurement. We do consider the IRP process to be the appropriate forum for "like-for-like" resource substitution of conventional resources with preferred resources - including storage, consistent with the comment provided in quotations. If the comment in quotations is meant to be a direct quote of ISO material or discussion, references would be appreciated.

No	Comment Submitted	CAISO Response
	asset. We concur with the CAISO's assertion that Storage as a transmission asset must "increase the capacity, efficiency, or reliability of an existing or new transmission facility." But BAMx requests additional discussion on this issue.	
2g	Potential Alternatives for Economic LCR Assessment The CAISO made a presentation concerning challenges in evaluating the economic benefit of reducing the local capacity requirement. BAMx believes that CAISO efforts in this area are misplaced. The evaluation of alternatives for meeting either system or local capacity needs requires an integrated approach that considers all potential alternatives. The capacity expansion models, such as RESOLVE utilized in the CPUC IRP proceeding are more suitable for performing any economic comparison of alternatives for meeting LCR than the CAISO TPP by itself. In particular, RESOLVE includes a constraint that requires that sufficient new resource capacity must be added to meet the local needs in specific LCR areas or the transmission system be enhanced to relax the local needs. To characterize these local capacity needs, RESOLVE relies predominantly on the CAISO's TPP. In other words, a flow of information from the CAISO's TPP to the CPUC IRP on the local capacity needs exists today. Similarly, the determination of the least-cost best-fit alternatives to meet LCR needs the CAISO TPP needs to rely on the CPUC IRP process as it is better equipped in evaluating competing resource alternatives, such as natural gas generation, renewables, energy storage, and demand response. Therefore BAMx recommends that the CAISO's efforts be focused on tightening the coordination between the processes and improving the quality of information flow. For a particular area, if the timing of the CPUC IRP cycle is a constraint, then the CPUC needs to direct its relevant jurisdictional LSE to conduct a Request For Offers (RFO) specifically targeted to procuring local resources including the preferred resource options. Such a solution was suggested by the CAISO to determine the true costs of the preferred resource alternatives to the Puente Project.	The ISO notes that the bulk of the local capacity studies is intended to provide information to support the IRP process as the comments suggest. However, as noted above, the consideration of transmission or hybrid solutions for economic benefits is taking place within the transmission planning process. While these efforts need to be carefully coordinated with the CPUC's IRP process, we do not agree that the IRP process is positioned to make economic-based decisions to approve transmission lines.
2h	2018-2019 TPP Policy-Driven Assessment BAMX has concerns about the sufficiency of the feedback loop concerning transmission constraint information between the CAISO reliability and deliverability assessment, and the CPUC's renewable portfolio. For example,	The comment has been noted, and will be shared with the CPUC, but the ISO does not agree with the level of concern expressed by BAMx. First, the ISO tariff regarding the approval of policy-driven transmission

No	Comment Submitted	CAISO Response
	based upon the current TPP cycle, the CAISO determines that you can accommodate 1,000 MW of Full Capacity Deliverability Status (FCDS) or Energy Only Deliverability Status (EODS) resources in the Kramer and Inyokern transmission area. Given this input, the RESOLVE model used by the CPUC in its IRP develops a renewable portfolio with 1,000MW of renewable resources in Kramer and Inyokern. This new renewable portfolio is then modeled in the CAISO's next year's TPP. Hypothetically, suppose that for some reason, the next year's TPP finds that given the composition of resources chosen in Kramer and Inyokern, and the rest of the CAISO system, it triggers a major new transmission that was not envisioned in the earlier TPP cycles. The implication of this assessment is that this newly identified transmission project would now be identified as a Category 1 policy-driven transmission project, and therefore approved in the next year's TPP. However, if the need for this new transmission project resulting from newly found restrictions in Kramer and Inyokern was communicated to the CPUC IRP process in advance, RESOLVE would have instead selected overall more economic renewable resources elsewhere in the CAISO system that would not have triggered any additional major transmission upgrades. This example demonstrates a need to establish a more effective and timely feedback loop between the CPUC's IRP and the CAISO TPP within the same cycle. While it is presented as a hypothetical, this has actually occurred in another area of the system. BAMx understands that the IRP *42 MMT* Scenario portfolio provided by the CPUC/CEC is being studied as a sensitivity in the 2018-2019 TPP policy-driven assessment to identify Category 2 transmission based on the CPUC IRP Reference System Plan. Therefore, by definition, even if any Category 2 transmission project is identified by the CAISO in 2018-19 TPP, it would not be "approved" as a policy-driven project. However, as described above, we are concerned about the potential for unneeded transmission being approved as policy-driven projects in the subsequent TPP cycles in the absence of a more informed feedback loop between the CPUC's renewable portfolios and TPP within the same cycle.	is more nuanced than portrayed in the comments, e.g. section 24.4.6.6 states: "The CAISO will determine the need for, and identify such policy-driven transmission solutions that efficiently and effectively meet applicable policies under alternative resource location and integration assumptions and scenarios, while mitigating the risk of stranded investment. The CAISO will create a baseline scenario reflecting the assumptions about resource locations that are most likely to occur and one or more reasonable stress scenarios that will be compared to the baseline scenario. **Any transmission solutions that are in the baseline scenario and at least a significant percentage of the stress scenarios may be Category 1 transmission solutions. Transmission solutions that are included in the baseline scenario but which are not included in any of the stress scenarios or are included in an insignificant percentage of the stress scenarios, generally will be Category 2 transmission solutions, unless the CAISO finds that sufficient analytic justification exists to designate them as Category 1 transmission solutions. In such cases, the ISO will make public the analysis upon which it based its justification for designating such transmission solutions as Category 1 rather than Category 2. In this process, the CAISO will consider the following criteria…**" (emphasis added). Further, it is not common for the need for a major transmission line reinforcement to be identified and solution approved all in a single planning cycle, and in any event, the CPUC staff actively participate in the ISO transmission planning process.

3. California Public Utilities Commission – Staff (CPUC Staff)
Submitted by: Karolina Maslanka

No	Comment Submitted	CAISO Response
3a	1. CPUC Staff appreciates the CAISO's assessment of on-hold projects and requests clarification on the conclusions/recommendations presented for several projects. As with previous ISO TPP cycles, CPUC Energy Division CEQA Unit staff are interested in potential regulated utility application filings for a Permit to Construct (PTC) and/or a Certificate for Public Convenience and Necessity (CPCN) which trigger compliance with the California Environmental Quality Act (CEQA) environmental document preparation. Information regarding the status of on-hold projects will allow CPUC staff to better anticipate future project filings and upcoming CEQA work. To this end, the CPUC staff would appreciate the CAISO providing specific assessment outcomes in this TPP for on-hold projects, particularly as to whether they will be approved per the original scope, canceled, re-scoped, or continue on-hold, including the following: <u>New Bridgeville-Garberville #2 115 kV line</u> – Preliminary reliability results presented by CAISO staff indicate no reliability issues were identified in the 18-19 assessment and include a recommendation for cancellation of the current scope. However, the CAISO's recommendation also states, "possible new project including reactive solutions." It is unclear if this new project would serve to mitigate the contingencies and high voltages listed under "Observations" on page 8. CPUC staff request that the CAISO clarify what reliability needs would be mitigated with the implementation of this new project.	The ISO is continuing to assess the projects on hold in the PG&E area in this planning cycle with the goal of finalizing recommendations for either proceeding with the projects "as is", proceeding with revised scopes or canceling the projects.
3b	<u>Atlantic-Placer 115 kV line</u> – Originally approved in 2012-14 TPP but then placed on-hold. Updated reliability assessment results indicate a reduction in contingency types. CAISO staff proposed the project be re-scoped from a new line to three distinct mitigations, including a line upgrade, a transformer, and possibly a connection to the SMUD 230kV network. CPUC staff request that the CAISO provide stakeholders with more detailed information regarding the re-scoped project when it becomes available for stakeholder review.	Please refer to the response to the initial comment 3 (a) above.

No	Comment Submitted	CAISO Response
3c	Gates-Gregg 230 kV line – Originally approved in 2012-13 TPP. The 18-19 assessment results indicate no reliability need for this project and the addition of this line would not result in significant transient stability benefits. Is it fair for stakeholders to interpret the 18-19 assessment conclusions as a recommendation for cancelation of the Gates-Gregg 230 kV line?	Please refer to the response to the initial comment 3 (a) above.
3d	Jefferson-Stanford #2 60 kV line – Originally approved in 2010-11 TPP but then placed on-hold. Slide 16 of the Greater Bay Area presentation indicates that the project scope mitigates the original reliability need. However, the slide also indicates that if the Stanford project moves forward then the Jefferson-Stanford line could be canceled. CPUC Staff would appreciate clarification regarding the need for this line.	Please refer to the response to the initial comment 3 (a) above.
3e	Los Padres Division – On page 9 of the “Central Coast Los Padres” presentation the ISO discusses overloads in Los Padres Division at Morro Bay, Mesa, and Diablo. The Midway-Andrew project which was approved in 2012-13 TPP and then placed on hold, is considered a potential mitigation for the identified contingencies. CPUC staff would appreciate updates on the outcomes of further studies indicating which of the alternatives for the maintenance outage of Mesa-Divide 115 kV lines and the maintenance outage of Mesa 230 kV lines or transformers is recommended.	Please refer to the response to the initial comment 3 (a) above.
3f	Bellota-Warnerville 230 kV reconductoring project – According to the PG&E 2018 Q3 Quarterly AB 970 Report, the current project cost estimate of $28 million (2013) remains within the originally estimated cost range. PG&E indicated this project was on-hold (based on information presented at a CPUC CEQA Unit Quarterly meeting with PG&E representatives on February 23, 2018). What is the current status of the Bellota-Warnerville project and does the CAISO expect that it will change?	The ISO has not indicated that this project is on-hold. This project was approved as a policy project. There are existing generators and generators in the queue that require this project to obtain full capacity deliver status (FCDS).
3g	Furthermore, CPUC staff appreciates CAISO’s continued effort to assess previously approved projects that have been placed on hold. CPUC staff have found that the costs of many of the above identified projects have increased beyond the costs originally estimated at time of project approval.	Please refer to the response to the initial comment 3 (a) above.

No	Comment Submitted	CAISO Response
	• The Gates-Gregg 230kV line was originally estimated (2012-2013 TPP, p.149) to cost between $115-$145 million, yet the current TPP document indicates a new estimate of $200-$250 million. • The Midway-Andrew project (page 11 of the "Central Coast Los Padres" 18-19 TPP presentation) shows an initial estimate of $120-$150 million (2012-2013 TPP) increasing to a new estimate of $200-$250 million (according to PG&E Quarterly AB 970 Report, 2018-Q3) • The Atlantic-Placer 115 kV line was originally estimated (2012-2013 TPP) to cost $55-$85 million. Recent documentation (PG&E Quarterly AB 970 Report, 2018-Q3) estimates the cost between $80-$90 million. • The Jefferson-Stanford #2 60 kV line was originally estimated to cost $25-$35 million. Recent documentation (PG&E Quarterly AB 970 Report, 2018-Q3) estimates the cost between $30-$40 million. The observed increase in costs further warrants an evaluation to ensure projects do not move forward based on outdated reliability needs. Considering the updated cost estimates, if it is determined, as the CAISO TPP presentations indicated, that several previously approved projects are no longer necessary, ratepayers may save as much as $408 million.	
3h	*2. CPUC Staff requests that the CAISO include as part of the "reliability assessment results summary" a table that summarizes the results of each sensitivity scenario across all areas in which each sensitivity was studied.* Grouping the information in this manner will help stakeholders understand how the results of various sensitivities vary across the regions of California. For example, in which areas did the "Retirement of QF Generation" sensitivity result in significant thermal overloads, voltage issues, or stability issues? A summary of mitigations as related to the studied sensitivities may also be useful. If it is not possible to summarize mitigation types, CPUC staff suggest that CAISO, at a minimum, indicate whether any of the sensitivity scenarios would require additional mitigations when compared to their counterpart baseline scenarios.	The ISO summarizes sensitivity studies for each of the planning areas in the transmission plan. The ISO does not develop mitigation plans for each violation identified in the sensitivity studies. The ISO will assess if additional information can be included in the transmission plan to provide clarity.
3i	*3. CPUC Staff suggests that PTOs presenting reliability solutions at the stakeholder meeting be required to follow a standard presentation template provided by CAISO. PTOs should express in their presentations*	While implementing a standard presentation template is not necessarily practical for the ISO to implement – as the PTOs are relatively free to

No	Comment Submitted	CAISO Response
	whether their presented reliability solutions directly mitigate reliability issues identified in preliminary reliability results posted by the CAISO in August of the applicable TPP year. CPUC staff appreciate the participating transmission owners' (PTO)s presentations on proposed reliability solutions. However, it was unclear in several PTO presentations what identified contingencies the proposed solutions were mitigating. For additional transparency, CPUC staff suggests that PTOs presenting reliability solutions at the stakeholder meeting be required to follow a standard template provided by CAISO. PTOs should explicitly state whether their reliability solutions directly mitigate any of the reliability issues identified in preliminary reliability results published by CAISO in August of the applicable TPP year.	choose the material they submit and present, we will bring the concerns expressed to their attention and encourage them to review the comments in considering what information needs to be included in next year's presentations.
3j	*4. CPUC Staff appreciates the CAISO's update on the Storage as a Transmission Asset (SATA) initiative. CPUC Staff believes that energy storage, when used for resource substitution, is under CPUC's purview for approval and should not be approved as part of the CAISO's Transmission Planning Process (TPP).* CAISO staff provided helpful bookends regarding the services that energy storage can provide. CAISO staff also indicated that "the ISO does not "approve" non-transmission alternatives in its Transmission Plan." This aligns with CPUC staff understanding that energy storage, when used for resource substitution, is under CPUC's purview for approval. CPUC staff appreciates the numerous questions and considerations outlined by CAISO and looks forward to working with CAISO and stakeholders to further explore how storage as a transmission asset or as a resource solution would fit into already existing planning and competitive solicitation processes at the CAISO and the CPUC.	The comment has been noted, and we look forward to the continued collaboration on these issues.

4. California Energy Commission – Staff (CEC Staff)
Submitted by: Lana Wong

No	Comment Submitted	CAISO Response
4a	*The following comments are related to the 2028 Long-Term LCR Study Draft Results for the LA Basin and the San Diego-Imperial Valley areas* Q1 - how was the DR amount determined? The CPUC unified assumptions has a table that shows 741 MW of DR that can count towards LCR for SCE. How do these numbers reconcile?	The CPUC's "Unified Resource Adequacy and Integrated Resource Plan Inputs and Assumptions – Guidance for Production Cost Modeling and Network Reliability Studies" (the CPUC's Unified Inputs and Assumptions), mentions that the "estimate of DR available to meet LCR needs provided here is only a modeling assumption. As stated above, the Resource Adequacy proceeding will ultimately determine what types of DR programs can count for local RA and meet local capacity needs." It is also mentions that "the CPUC's Resource Adequacy accounting rules currently have no requirement related to "first contingencies" or response times for a resource to count as Local Resource Adequacy capacity". In the Decision D.14-03-004, the CPUC defined that " fast DR located at the most effective LA Basin locations shall be modeled as a "First Contingency" resource, i.e. a resource that can be relied upon post-first contingency to prepare for the second contingency". Furthermore, the CPUC defined that "fast demand response programs in this context are programs that respond to dispatch instructions within 30 minutes or less, including notification time to customers". (Decision D.14-03-004 and the May 21, 2013 revised scoping ruling for LTPP Track 4 area posted at http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M065/K202/65202525.PDF). In the CPUC's Unified Inputs and Assumptions document, regarding the accounting of "fast" and "slower" DR in the future Resource Adequacy process, the CPUC mentions that "the new Resource Adequacy Rulemaking R.17-09-020 will continue to consider whether to change Local Resource Adequacy rules in order to create a requirement regarding how quickly DR resources that are physically located in Local Capacity Reliability Areas would need to respond in order to count as Local RA capacity and whether there is a way to pre-dispatch slower responding resources so that they could also be counted". Additionally, the CPUC mentions that "the Resource Adequacy proceeding will ultimately determine what types of DR programs can count for local RA and meet local capacity needs" (this

No	Comment Submitted	CAISO Response
		statement is from the CPUC's Unified Inputs and Assumptions document, page 73). The CAISO will continue to follow the CPUC R.17-09-20 process and will apply the appropriate types of demand response programs in the Local Capacity Requirement studies once the CPUC releases a Decision for this process. .
4b	Q2 The combined larger region studied in previous years was LA Basin and San Diego subarea, but now it has shifted to the combined LA Basin and San Diego/Imperial Valley area. Can you explain why the larger area shifted to LA Basin and San Diego/IV? What is the impact of the S-Line upgrade on the geographic definition?	The combined larger region expanded to the LA Basin and San Diego-Imperial Valley areas instead of the LA Basin and San Diego subarea after the Imperial Irrigation District (IID) cancelled the two 230 kV tie-line upgrade projects between IID and SDG&E. Those tie-line upgrade projects were part of the base case modeling assumptions for the LTPP Track 4 study. The S line upgrade helps mitigate the first constraint between IID and SDG&E and helps lowering the LCR requirements for the San Diego-Imperial Valley LCR area (assuming same level of resource assumptions in the Imperial Valley area (i.e., having the same net qualifying capacity for solar resources in the Imperial Valley area)). However, this project cannot eliminate the need for local capacity requirements for the overall San Diego-Imperial Valley area because after the S line upgrade, the next limiting constraint (after LCR reduction associated with the S line upgrade) is shifted to the facilities that are in series with the S-line facilities (i.e., El Centro 230/92 kV and then the El Centro 230/161 kV transformer banks). With the previously planned transmission upgrades (but subsequently cancelled by IID), there were no reliability concerns identified for transmission facilities between IID and SCE.
4c	Q3 - Slide 7 and 8: was the peak day 24 hour shape for 1-in-2 hourly forecast multiplied by the 1-in-10 scaling factor to get the 1-in-10 hourly shape, or every hour was multiplied by the scaling factor?	The scaling factor for 1-in-10 load was only applied for the peak day hourly load forecast.
4d	Q4 - The combined larger region studied in previous years was LA Basin and San Diego subarea, but now it has shifted to the combined LA Basin and San Diego/Imperial Valley area. Can you explain why the larger area shifted to LA Basin and San Diego/IV? This change seemed to occur in the 2017-18 TPP because in the 2016-17 TPP, the combined region was based on LA Basin/San	Please see our responses to the No. 4b (Q2) above. The amount of solar generation in the Imperial Valley was not the driver for the shift to the larger area that includes the LA Basin and the San Diego-Imperial Valley areas. The main reason for the shift to the larger area that includes the San Diego-Imperial Valley area was the cancellation of

No	Comment Submitted	CAISO Response
	Diego area. Was the amount of solar modeled beginning in the 2017-18 TPP the main driver for the shift to the combined area of LA Basin/San Diego – Imperial Valley? It seems that after the S-line upgrade, the El Centro transformer is the next limiting element, which means the combined area remains LA Basin/San Diego – Imperial Valley. If solar is driving this change, it seems like the combined area will be based on the larger geographic area including the Imperial Valley for the foreseeable future.	previously planned transmission upgrades between IID and SDG&E by IID. Changes in transmission topology assumptions due to cancellation of previously planned transmission upgrades between ISO and IID caused the shift of new transmission constraint to the larger LCR area. The ISO will be evaluating potential mitigation options to address the transmission constraint in the San Diego-Imperial Valley LCR area as part of the current transmission planning process.
4e	Q5 - Slide 17: Why is the 2023 LCR amount of 6,634 MW different than the amount of 6,793 MW in the 2023 report dated May 15, 2018.	The LCR value for the overall LA Basin identified in the May 15, 2018 Local Capacity Technical Analysis for year 2023 reflects the correct value. The LCR value for year 2023 (for informational comparative purpose) on page 17 of the September 20-21, 2018 Day 2 presentation is an error, reflecting the need for the second-order constraint (after the primary constraint) for the overall LA Basin. It is noted that the value for the overall LA Basin LCR need provided on slide 19 reflects the correct value for year 2023
4f	Q6 - Slide 19: The sum of Western LA Basin and Eastern LA Basin LCR equals the Overall LA Basin LCR in 2028, but not in 2019 or 2023. Why? In the 2018 and 2022 results, the Western LA Basin and Eastern LA Basin LCR also do not sum to the overall LA Basin LCR (as was the case in the 2015/2016 TPP). Please explain these differences and how the boundaries for the subareas changed over time. How do the boundary changes impact the loads and resources in each subarea?	The LA Basin area boundary has not changed. What changes were the limiting constraints for the overall LA Basin for the studies for different years. The changes in the primary limiting transmission constraints could be due to a number reasons, including load forecasts for the study areas, generating resource retirements or additions for specific locations, and transmission topology changes from implementing transmission upgrades.
4g	Q7 - Slide 19: Is the LCR for combined LA Basin/San Diego – Imperial Valley 10,498 MW, or the sum of LA Basin LCR and San Diego-Imperial Valley LCR?	Yes, the 10,498 MW reflects the correct summation for the total of the LCR need for the combined LA Basin and San Diego-Imperial Valley LCR areas for year 2028.
4h	Q8 - Slide 21: what is the amount of solar generation that is adjusted in this sensitivity?	The amount of solar generation that was adjusted to 0 MW output (for 8 p.m. peak load condition) is 1,324 MW of installed value. The wind generation is still assumed to be available at 239 MW of net qualifying capacity. This assumes 2018 NQC value as the long-term ELCC value is not available at this time for wind resources.

No	Comment Submitted	CAISO Response
4i	Q9 - Slide 21-22: Is the LCR for combined LA Basin/San Diego – Imperial Valley 10,851 MW, or the sum of LA Basin LCR and San Diego-Imperial Valley LCR (LA Basin resources dispatched to mitigate the San Diego-Imperial Valley deficiency)?	Yes, this reflects the correct total for the LCR need for the combined LA Basin and San Diego-Imperial Valley areas under the “no solar” study scenario.

5. Center for Energy Efficiency and Renewable Technologies (CEERT)
Submitted by:

No	Comment Submitted	CAISO Response
5a	Informational Study on Increased Transfer Capabilities of Low Carbon Electricity between the Pacific Northwest and California In previous comments on the Information Study on Increased Transfer Capacities of Low Carbon Electricity between the Pacific Northwest and California, CEERT has advocated for increased coordination between CAISO and Los Angeles Department of Water and Power (LADWP) and scenarios with regional clean energy build out in the Pacific Northwest. CEERT applauds the collaborative effort put forward by the CAISO in working with LADWP, the Northwest Power and Conservation Council, and the Pacific Northwest hydro owners in this effort. Continued coordination with LADWP is essential, given the interconnected nature and changing dynamics in the LA Basin. Continued coordination with the Pacific Northwest entities is essential for ensuring best practices for hydro modelling. The accuracy of the hydro modelling will have a significant impact on the value of the study's results.	The comment has been noted.
	There should be clarification on what "potential benefits of increased transfer capabilities" means. Does "increased transfer capabilities" mean simply increased transfers with the current infrastructure or with physical changes to increase transfer capabilities? Potential infrastructure development that could increase transfers should be identified for further study in the next round of the TPP. The study results should include identification of non-physical constraints on increased transfer capabilities, such as export charges or the timing of resource adequacy contracting.	The potential benefits of increasing the transfer capability – either by achieving higher ratings with existing equipment or with reinforcements - are being assessed at a high level, by analyzing the estimated congestion on existing AC and DC interties in the long term. To estimate the congestion in the long term (year 2028), production simulation analysis will be performed as part of the study. Non-physical constraints such as day-ahead vs. real time congestion will be reviewed as well.
5b	Comprehensive Study of the LA Basin in the 2019-20 TPP The Pacific Northwest California Transfers study, LADWP's Once Through Cooling Study, Los Angeles's decarbonization goals and 100% renewables study, the goal of closing Aliso Canyon, the passage of Senate Bill 100, and Executive Order B-55-18 all underscore the need for an integrated LA Basin study. Such lofty goals require coordination between the CAISO and LADWP in studying the best solutions, due to the interconnected nature of the grid in LA Basin. As the topography of the grid changes, impacts to both balancing	The ISO is working with LADWP in the Pacific Northwest California Transfers. One component of that study is focusing on the transfer capability in and out of Sylmar substation which connects the LADWP and ISO balancing areas. The ISO and LADWP are also participating in CPUC proceedings focused on the closing of Aliso Canyon. To the extent that transmission expansion needs are identified in the ISO Pacific Northwest studies, then alternatives which could include strengthening the transmission between the two systems would also be

No	Comment Submitted	CAISO Response
	authorities must be considered. As both the CAISO and LADWP have both undertaken studies to begin identifying means to decarbonize the LA Basin, the 2019-20 round of the TPP should include a joint process between CAISO and LADWP to more thoroughly evaluate needs to achieve both short terms goals of eliminating dependence on Aliso Canyon and increasing resilience of the LA Basin as gas generators retire and the long terms goal of decarbonization are achieved. In addition, such a study should include additional transmission access to Glendale and Burbank, whether a direct tie to CAISO or increased capacity on the Victorville-LA path, so that both of these small utilities have options to respond to the twin policy objectives of decarbonization and retirement of Aliso Canyon.	considered. The ISO is also open to transmission planning discussions with Glendale and Burbank

6. GridLiance
Submitted by: Jody Holland

No	Comment Submitted	CAISO Response
6a	GLW has a strong 230 kV grid that can be leveraged to maximize reliability and generation deliverability, provide low cost interconnections, and minimize curtailment of a balanced portfolio of renewable resources that can be connected to the only portion of the CAISO transmission system located outside of California.	The comment has been noted. For clarification, the ISO Controlled Grid includes existing and planning transmission facilities located outside of California that are not owned by GLW.
	GLW transmission facilities are located in a renewable rich area of the CAISO system that currently has no functional Remedial Action Schemes that address issues on the GLW transmission system. Currently, the GLW system supports minimal renewable generation. However, there is significant activity in the generation interconnection process and the potential is high for development of a balanced portfolio of low cost renewable resources in the range of 2500 to 3000 MW. The Western Interconnection is unique in that it relies heavily on Remedial Action Schemes as long-term solutions to address transmission constraints and reliability issues. Our experience in the Eastern Interconnection and ERCOT points to the use of Remedial Action Schemes as short-term solutions to bridge to long-term reliable resilient transmission solutions. While we understand the rationale and the development for Remedial Action Schemes in the West to address generation that is remote from load centers, the move to renewable types of generation resources demands a change in thought and application of Remedial Action Schemes to a more proactive recognition that reliability and resiliency of the grid requires further transmission development.	The ISO Planning Standards describe the risks and benefits of utilizing Special Protection Systems (SPS) or RAS, and they also provide guidelines for ensuring that reliability is maintained. These guidelines are applied consistently across the ISO controlled grid. If the concerns are more generic, references to the guidelines would be helpful.
	GLW continues to believe that the long-term benefits of transmission are discounted in many situations for the short-term cost benefit of Remedial Action Schemes. The cost of avoiding future Remedial Action Schemes over the life of a line as well as reliability and resiliency benefits along with market flexibility provides for lower cost generation solutions. These quantifiable benefits provide value to customers within CAISO and should be factored into the calculation of costs when considering installation of a Remedial Action Scheme versus the investment in new transmission infrastructure. For these reasons we believe	The ISO seeks to fully identify the long-term benefits of transmission projects, and appreciates input from stakeholders that assist in the effort to quantify these benefits. Specifics are generally best addressed on a case-by-case basis.

No	Comment Submitted	CAISO Response
	CAISO should focus first on long-term robust transmission solutions that bring value to CAISO.	

7. Large-scale Solar Association (LSA)
Submitted by: Tim Mason

No	Comment Submitted	CAISO Response
7a	Introduction The CAISO Transmission Plan (Plan or TPP) is instrumental to ensuring that California meets its long-term electric requirements reliably and at least-cost, as well as ensuring that the electric generating resources used also support California's policy and environmental objectives. It is imperative the Plan provide a long-term view of what is likely to occur based on the best available information so that generation developers can plan where to locate facilities and transmission owners and developers can identify, plan and construct needed facilities to support these resources and load requirements. After reviewing the preliminary reliability studies and presentations at the September 20 and 21 stakeholder meeting, LSA is concerned the 2018-2019 TPP is a reflection of current grid rather than a strategic planning document that envisions and plans for the needs of the future grid. We appreciate that is it difficult to envision how the grid will change over time, and even more difficult to develop and justify the assumptions necessary to model this future state. That said, planning for the future state of the grid is the point of the of the TPP and this Plan, as modeled, is of limited value for helping generation and transmission developers and owners understand what transmission facilities will be required. Our concern with this lack of a long-term vision in the Plan is not new – we expressed similar concerns last year. In the 2017-2018 CAISO Transmission Plan, the default case assumed a 33% renewable energy requirement for California in 2030, despite the fact that the then-current RPS requirements (enacted in SB350 in 2015) were 50% in 2030. This resulted in a Plan that was obsolete by the time it was adopted by the Board of Governors, since it did not accurately reflect future requirements or resources. We fear this plan will suffer the same plight unless several substantial revisions are made for the policy and economic study that is scheduled for completion by November 16. Several key assumptions used in the 2018-2019 TPP analysis are deeply flawed, including the CAISO decision to use the 50% renewable scenario as the "default" case and the incorporation of inappropriate portfolio assumptions that do not reflect commercial or operational reality or current trends in development. These are discussed in detail below.	The ISO agrees with some of the characterizations and disagrees with others. The generation assumptions employed in this planning cycle remain coordinated with the CPUC's IRP process. While studies for approval purposes are limited to 50% RPS for reliability and economic study purposes, the sensitivity work being conducted in this cycle, and the information-only special studies conducted in this and past cycles provide a sound foundation for moving forward when resource procurement decisions are advanced.

No	Comment Submitted	CAISO Response
7b	CAISO 2018-2019 TPP should use the 42 MMT Case as the Default Modeling Case The CAISO developed and is modeling two scenarios for the TPP, including a default case that assumes 50% RPS in 2030, and a sensitivity case that assumes an annual carbon emissions limit from electric generators 42 million tonne (MMT) in 2030. The default scenario represents what was until very recently the legal minimum requirements for renewable resources in California, while the 42 MMT scenario represented the emission goals developed by the California Air Resources Board (CARB) for the electric sector, which was adopted by the California Public Utilities Commission (CPUC) for its 2018 Integrated Resource Plan (IRP) Reference System Plan (RSP). The primary difference between these scenarios is the amount of renewable generation and storage that are included in the resource plan, with the default case including 3,487 MW of new renewables while the 42 MMT scenario includes 10,226 MW of new renewables and 2,000 MW of new storage. On September 10, 2018 Governor Brown signed Senate Bill 100 (SB 100) into law, which requires California LSEs to serve all customer energy needs from carbon-free or renewable resources by 2045. SB 100 also requires that sixty percent of energy served by LSEs is from renewable energy resources by 2030, and establishes new annual RPS procurement targets, whereby each LSE will need to achieve 44% of retail sales by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030. LSA appreciates the passage of this legislation occurred well after the CAISO began the TPP modeling and it is late in the process to shift course. That said, the new requirements are very similar to the 42 MMT sensitivity, and that scenario should be used for the “default” case going forward. Using the 42 MMT as the default case better reflects the current state policies and will result in the development of a more robust and meaningful plan that reflects current legal requirements.	While the 42 MMT case may provide a total amount of renewable generation more consistent with the newly established requirements, the 42 MMT portfolios – that specify amounts and locations of additional generation development – are not supported at this time by the CPUC as the basis for policy-driven transmission approval. The coordination with the CPUC processes is essential for effective implementation of future resource planning, as well as permitting processes.
7c	Portfolio Assumptions The Plan modeling and analysis includes a myriad of assumptions on loads, resources, and transmission, some which are developed by the CAISO and others that are developed by the CPUC and CEC. Regardless where these	

No	Comment Submitted	CAISO Response
	assumptions are generated, the CAISO Plan should reflect the most current information and accurately reflect the likely state of the system and resources. LSA is concerned that the Plan includes many inappropriate, dated and incorrect resource and transmission assumptions which should be rectified prior to the CAISO moving forward with the Plan policy and economic analyses.	The ISO will correct any outdated or incorrect resource or transmission assumptions in the study plan that are identified prior to performing the policy and economic analyses.
7d	Existing resources LSA understands the resource information used in the TPP is from the CPUC IRP, modified by the CEC to provide location-specific information needed by the CAISO for modeling. We are concerned these assumptions significantly overstate the role for existing resources in future years, distorting resource dispatch, transmission flows, and the need for additional resources. Many stakeholders, including LSA, expressed these concerns in the CPUC IRP (which CPUC is a party to), and LSA understands the CPUC is in the process of revising these assumptions for the IRP Preferred System Plan (PSP) currently under development. Per the TPP documentation resources identified as "retiring resources" are assumed to remain on the grid but off-line, including once-through cooling (OTC) resources, the Diablo Canyon Power Plant (DCPP), and other contract-expired resources. These resources are not removed from the plan until they are physically dismantled and disconnected from the system. This assumption leads to potentially misleading results regarding system capacity requirements and transmission availability. Coastal OTC resource are closing not for economics but because they cannot meet the legal environmental requirements that would allow for continued operation. Further, the DCPP closure has been approved by CPUC and is currently being implemented. Given the lead time required to plan maintenance and refueling, it is almost impossible to imagine a scenario that would allow DCPP to continue operating past 2024. Other thermal and renewable resources with contracts expiring in the forecast period are largely uneconomic and, based on the RPS plans recently filed by load serving entities (LSEs) with the CPUC in August of this year, there appears to be no market interest for these resources. All of these resources should be eliminated from CAISO TPP modeling once they are retied by their owners or their contracts expire. If system energy and capacity needs are identified as a result of their exclusion, this represents an important finding for the TPP process.	Regarding assumptions for gas-fired generation and Diablo retirements, the ISO assumptions do include the retirement of generation associated with OTC compliance. Beyond that, the TPP assumptions also included retirement of generators either 40 years old or contract life, whichever is longer, which is consistent with prior LTPP assumptions but more aggressive than the current assumptions in the current IRP process. The ISO will have to consider the impact of any of those retirements on a case by case basis in the transmission planning process. The ISO is also participating in the IRP process, and also studying both system and local impacts of potential future economic-driven reductions in the gas-fired generation fleet as special studies. Regarding leaving generation in a model but offline, the existence of the model for an offline resource does not in itself create misleading results regarding dispatch in powerflow or stability analysis, nor production simulation analysis.

No	Comment Submitted	CAISO Response
	LSA is also concerned that the failure to remove these resources distorts available transmission capacity and transmission needs for new generators. The information provided at the Stakeholder meetings is silent on how the removal of these resources will impact transmission capability. Based on lack of transmission availability in the areas where known resources are retiring, such as DCPP, it appears the transmission is still allocated to these resources. The retirement of these resource will free up a substantial amount of transmission, which can then be used by new and preferred resources without having to add additional infrastructure.	
7e	Behind the Meter Photovoltaic (BTM PV) TPP modeling includes BTM PV as a supply side resource rather than a load modifier. LSA appreciates that the size and impact of BTM PV on the grid makes it difficult to model as a load modifier, and it is expedient to include this as a supply resource, but there are several unconsidered consequences of this, include the role of BTM PV in providing for Resource Adequacy, the impact on the transmission system and a broader question of how all BTM resources should be treated in system modeling. According to the CAISO's own definition of resources, BTM PV is clearly a load modifying resource. In its Demand Response and Energy Efficiency Roadmap: Maximizing Preferred Resources guide, the CAISO identifies which resources are supply and which are load modifiers, explaining: Supply-side resources are those energy supplies available to the ISO to balance net load. These resources can take different forms, ranging from conventional generators to demand response. Supply-side resources are used to directly balance load, manage congestion and satisfy reliability standards. Supply-side resources inject or curtail energy in specific locations, and can be modeled, optimized, and dispatched when and where needed by the ISO. Load-modifiers are those resources or programs not seen or optimized by the ISO market, but they modify the fundamental system load shape, preferably in ways that harmonize with ISO grid operations.	The TPP model does not include BTM PV as a supply side resource. It is modeled as a component of load in power flow and is appropriately modeled as generation in dynamic studies for a more accurate representation of dynamic response. The comments pertain largely to RA resource counting protocols, which is the topic of an ongoing proceeding at the CPUC.

No	Comment Submitted	CAISO Response
	By these definitions, BTM PV is clearly a load modifier, as they are neither seen nor optimized by the CAISO, but they do modify the fundamental load shape. Further, BTM PV resources cannot be supply resource as they cannot be used to directly balance load, manage congestion, be optimize or dispatched. LSA is also concerned about this assumptions impact on the determination of RA requirements. Including BTM PV resources as a supply resource may qualify them as RA resources, though they do not possess any of the characteristics necessary to be RA resources. The CAISO's glossary defines resource adequacy as: The program that ensures that adequate physical generating capacity dedicated to serving all load requirements is available to meet peak demand and planning and operating reserves, at or deliverable to locations and at times as may be necessary to ensure local area reliability and system reliability. BTM resources are widely distributed, static, and are neither "at or deliverable to locations and at times as may be necessary to ensure local area reliability and system reliability." LSA believes that for RA purposes, BTM PV should be counted as a load for purposes of RA requirements determination, but the BTM PV should not be provided any RA capacity benefit.	
7f	Modeling Behind the Meter Resources LSA is also concerned about the modeling of BTM solar and other BTM generation technologies. There are numerous BTM wind facilities, a rapidly expanding number of fuel cells and other BTM generation technologies, and a rapid expansion of BTM storage, which will dramatically change customer load shapes. These resources are not considered supply resources by the CAISO, rather are load modifiers. BTM PV resources are no different from these, other than the fact that there is a higher penetration of them on the system. To the extent the CAISO believes that BTM resources, due to their scale and impacts, should be considered as unique and different from other load modifiers, LSA believes the CAISO should assess this is a separate stakeholder process.	As noted above, BTM PV is not considered a supply resource in the TPP. BTM resources consisting of other technologies are not modeled explicitly as a component of load at this time due to their relatively low volume and data availability. BTM PV data is provided by CEC as part of its demand forecast.

No	Comment Submitted	CAISO Response
7g	New renewable resources The TPP incorporates the CPUC IRP assumption of resource need, which forecast an addition of 3,487 MW in the default case and 10,226 MW in the 42 MMT case. While we appreciate the coordination between the two initiatives, the IRP assumptions on new solar resources do not reflect the market reality of where future solar will be located, and perpetuating this mistake in TPP modeling undermines the usefulness of the Transmission Plan. In the IRP, all of the new solar resources are located in Southern California, which does not reflect the current or future development patterns. LSAs analysis of the interconnection queue reveals that in recent years solar interconnection requests have been shifting northward, and going forward solar development will likely be less concentrated in Southern California. To illustrate this, of the CAISO 2018 interconnection requests that identify PV as the Type 1 fuel source, 12 of the 29 were located north of Kern County, while the IRP and TPP assume all new solar will be located in or south of Kern County. A more evenly distributed set of solar resources makes sense for several reasons. First, solar PV costs have fallen precipitously in recent years, making it economic to build in areas with lesser irradiance, such as central and northern California. Additionally, there is very limited transmission capacity available in southern California and developing any major transmission facilities will take over ten years, and interconnection costs for generators locating there are substantial and many times, prohibitive. Finally, in their IRP and RPS Plans, many LSEs express strong interest in procuring resources in or adjacent to their service territories, and developers are responding to this by developing projects that are more distributed throughout the state and region.	The comments have been noted, and, pending any changes in the CPUC-provided RPS portfolios in this cycle, will be taken into account in coordination with the CPUC on 2019-2020 planning assumptions.
7h	FCDS and EODS LSA is deeply concerned over the TPP assumption that approximately 40% of new resources will have energy-only interconnections. This may be consistent with CPUC IPR RESOLVE modeling, but this in no way reflects the market for RPS-complaint resources. Market buyers have no appetite for long-term contracts with EO resources, as borne out by recent RFPs from Community Choice Aggregation (CCA) entities.	The ISO agrees that past procurement was essentially all focused on deliverable resources. However, as ELCC methodologies and increased penetration of BTM PV generation reduce the capacity benefit of grid-connected PV, past procurement practices and outcomes may not be indicative of future needs. This is another issue best addressed in the IRP process.

No	Comment Submitted	CAISO Response
	This is also reflected in the interconnection queue. Only one of the 29 solar resources seeking interconnection in 2018 selected Energy-only as the preferred interconnection. Unless there is a substantial market alteration, is unlikely that we will see the assumed contracting and development of EO resources. Failure to plan sufficient transmission to interconnect resources requiring FCDS will result in California neither achieving its mandated RPS requirements nor its GHG emissions goals.	

8. LS Power Development, LLC
Submitted by: Sandeep Arora

No	Comment Submitted	CAISO Response
8a	(1) PG&E Bulk System Reliability issues: CAISO staff presented several reliability issues for the Bulk system in the Northern California area. These issues are (a) thermal overloads of several 500 kV transmission lines and transformers for several Category B and C contingencies (b) High/Low System voltages under System Normal and Contingency conditions (c) Low voltages in Transient stability runs due to stalling of induction motor load and High Voltages in Diablo retirement cases. Thermal Overloads: For thermal overloads, CAISO's current recommendation is to reduce flows on COI and Path 26 and/or Generation re-dispatch. While these may be effective short term Operating solutions, these should not be used as long term Planning solutions. Implementing Operating solutions may resolve the reliability need but reducing COI and Path 26 flows to below their path rating prevents economic/low carbon energy imports to serve California load, which shows up as congestion cost that increases ratepayer burden. As CAISO prepares its final recommendations for addressing these issues, it should consider transmission solutions to resolve not only High/Low voltage issues but also thermal overload issues. LS Power's previously proposed Southwest Intertie Project North (SWIP North) is potentially one such long term transmission solution that can address several thermal overloads. 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 Harry Allen to Eldorado 500 kV line (currently under construction by LS Power affiliate DesertLink) provides a parallel path to COI and Path 26. This significantly offsets flows on these interfaces, by approximately 300 to 400 MW based on power flow studies conducted by LS Power. LS Power studied the effectiveness of SWIP North to address the Bulk system issues identified by CAISO staff in prior Transmission Planning cycles and based on these studies SWIP North was very effective in alleviating and resolving several Category B and C overloads.	The ISO reliability studies did not identify reliability concerns with operating within the nomograms for the paths. Analysis within the economic assessment will be used to determine if there is economic benefit to increase the capability of the identified paths.

No	Comment Submitted	CAISO Response
	Voltage Issues: For the voltage issues identified by CAISO under System Normal & Contingency conditions and also under Transient Stability runs, LS Power recommends that CAISO re-run the studies by including SWIP North as a transmission solution. While SWIP North may not resolve the high voltage issues, it should help address the low voltage issues both under post transient and stability scenarios.	
8b	(2) Economic Study Assumptions As LS Power has commented in last few Transmission Planning cycles, the economic model for quantifying Pacific AC Intertie (PACI) & Nevada-Oregon Border (NOB) congestion needs to be improved such that it correctly captures the congestion that routinely takes place across these interfaces. Rather than repeating its prior comments, LS Power is referencing comments that it filed earlier this year for 2018/19 Study Plan. To the best of LS Power's knowledge these modelling improvements have not been included in the economic model to be used for 2018/19 Transmission Planning Economic Studies. CAISO staff did make reference at the Sep 21, 2018 Stakeholder meeting that it is continuing to investigate Day Ahead COI congestion. While LS Power appreciates CAISO's efforts on this, it requests that CAISO provide more information on what it is investigating and whether it is planning to include any modelling enhancements so this congestion can be correctly captured in Economic Studies. Unless modelling enhancements are included, study findings for this year will yet again fail to correctly capture this important congestion issue.	As indicated at the September 20-21 stakeholder meeting the ISO is continuing to assess the congestion and will be presenting additional information at the November 16 stakeholder meeting.
8c	(3) Increased Capabilities for Transfers of Low Carbon Electricity between the Pacific Northwest and California As reported at the Sep 21, 2018 Stakeholder meeting, CAISO is currently performing both near-term (2023) and longer-term (2028) assessments for this study. The near-term assessment is focused on finding minor upgrades that can improve COI transfer capability from 4800 MW to 5100 MW in North to South direction and Longer-term assessment will look at the production cost simulation (economic) benefits of further improving transfer capability between Pacific Northwest and California by installing green field projects. As LS Power previously commented, this new study cannot provide accurate results without properly capturing the economic congestion that takes place on the PACI/NOB	The difference between the day-ahead congestion on COI observed in the market and the real time congestion observed in the operation and modelled in production cost simulation will be reviewed as part of this study. The focus of the long term analysis in this informational study is to assess potential benefits of increasing transfer capability. However this study will not select/recommend a preferred alternative to increase the transfer capability.

No	Comment Submitted	CAISO Response
	interfaces in the base model for the Study. If modelling enhancements are not implemented, results of this study, especially the longer-term assessment will look no different than Economic Study results from last few Transmission Planning cycles. Additionally, COI path rating is 4800 MW in North to South direction but operating nomograms typically do not allow these transfers due to transmission constraints. Improving the Path transfer capability to 5100 MW but still being restricted by today's operating nomograms will not provide desired benefits. LS Power believes that this study should provide a comprehensive evaluation that collectively addresses all issues at this interface including the inherent need to alleviate the documented congestion. Further, as CAISO performs this study it should take a holistic approach in reviewing options for improving transfer capability between the Pacific Northwest & California. While some options may offer short term limited benefits and others may offer long term reliability, economic and policy benefits, all of this should be considered as CAISO concludes its recommendations on the study. Greenfield projects such as SWIP North, which LS Power has submitted for economic evaluation in the past TPP cycles and 2018/19 TPP should be considered as a solution for improving the transfer capability. SWIP North reduces COI & Path 26 flows by ~300 MW or more, based on the WECC Path Rating study work conducted by LS Power. Further, based on CAISO's analysis done under the Transmission Planning Process, CAISO found that SWIP North reduces congestion hours on COI by 39%.	
8d	(4) Interregional Planning Studies At the Stakeholder meeting, CAISO provided an update on the ongoing Interregional Planning work and based on this LS Power understands that CAISO is performing economic analysis for SWIP North project. We recommend that as part of this analysis, CAISO also quantify the benefits of GHG reductions resulting from SWIP North. SWIP North will make available 1000 MW of new transmission capacity to CAISO that will enable the regional grid to operate more efficiently and source additional low carbon resources to serve California load resulting in reduced GHG emissions. CAISO's past analyses have primarily been focused on production cost savings, however in	The ISO will select high priority studies or upgrades for detailed economic assessment. The selection process is following ISO's tariff and is based on production cost simulation results and other related assessments, such as reliability and LCR studies. The results will be presented in the final stakeholder meeting which will be in February. Emission cost has been modeled in the PCM, and has been used in the economic dispatch in simulation. So the impact of emission reduction on the production benefit is already captured in the TEAM analysis.

No	Comment Submitted	CAISO Response
	addition to these savings, reduction in GHG is also a key benefit and it should be quantified.	Reduction in GHG can be measured based on simulation results but should be separated from TEAM analysis.

9. National Grid USA ("National Grid") and Rye Development, LLC ("Rye Development")
Submitted by: Henry Tilghman

No	Comment Submitted	CAISO Response
9a	<u>Scope of Special Study</u> Given the location of National Grid and Rye's pumped storage projects near the border of the transmission grids of the Pacific Northwest and California, National Grid has a vested interest in the Special Study. National Grid supports the objectives of the Special Study, which specifically include identifying changes needed to: • Increase the capacity of the AC and DC Interties; • Increase dynamic transfer capability on the AC and DC Interties; • Automate operational controls on the AC and DC Interties; and • Assign resource adequacy value to imports to California. National Grid and Rye Development believe that a study of this type is long overdue, given the West Coast states' alignment on decarbonization goals and the significant high-voltage transmission system between California and the Pacific Northwest vis-avis the AC and DC Interties. The Pacific Northwest has significant amounts of existing and potential, zero carbon energy generating resources that could help California meets its energy policy goals. At the same time, the Pacific Northwest also has significant potential for very attractive large-scale energy projects that can absorb surplus energy from California and return it to California consumers in times of need.	The comment has been noted.
9b	<u>Special Study Assumptions Are Conservative</u> Hopefully, the Special Study report will underscore for readers that the study's assumptions are highly conservative; and therefore, any results, even if benefits are shown, are likely incomplete, and potentially misleading, due to those very conservative assumptions. A more robust study that considers the benefits of closed-loop pumped storage would provide more accurate and complete results. Investment in modern, highly flexible closed-loop pumped storage would yield additional benefits to both California and the Pacific Northwest, not only by expanding the seasons and conditions when the benefits of the Pacific Northwest's zero carbon resources are available, but also by increasing utilization of the high voltage	The ISO intends to provide adequate opportunity for comment on draft results, and specific comments or concerns should be submitted in the next comment window so that they may be incorporated as early as possible. Past study work has included considerable analysis of benefits of large storage, and the ISO is looking to update some of that analysis to the extent possible in this cycle. A more heavily integrated study is impractical in this planning cycle. Please refer to the comments below.

No	Comment Submitted	CAISO Response
	transmission system for more effective coordination of regional low-carbon generation resources, flexible generation resources, and storage. In doing so, pumped storage resources have the unique capability of providing greater reliability and flexibility to both the Pacific Northwest and California transmission systems at a time when flexibility is most needed in order to integrate increasing amounts of variable generation.	
9c	<u>Next Steps/Future Studies</u> National Grid and Rye Development hope that the current Special Study is not the final analysis of the potential benefits for increased use of the transmission system for transfers between California and the Pacific Northwest. National Grid and Rye Development encourage CAISO to conduct subsequent transmission planning studies with generation assumptions that reflect the likely future mix of generation resources for the Pacific Northwest, while also taking into account the carbon policy goals of Oregon and Washington. In particular, any future study should consider pumped storage generation resources. National Grid and Rye Development also look forward to a future study program that fully evaluates the likely significant benefits associated with additional flexible generation and storage, particularly resources located near the Celilo Converter Station, John Day Substation, and Malin Substation. These locations, in particular, are likely to serve as points on the regional transmission system where significant benefits could be provided in terms of enhancing reliability and flexible transfer capability along the AC and DC Interties, as well as for facilitating transfers of energy between the Pacific Northwest and California, which will become increasingly necessary in order to absorb California's growing overgeneration. For any future studies, National Grid and Rye Development would be happy to provide technical data or otherwise cooperate with the study team in order to ensure a robust and complete study of the benefits associated with the increased transfer of low carbon energy between California and the Pacific Northwest.	The special study in the 2018-2019 transmission planning process is an informational study. The potential need for further assessment in this area in future planning studies will be based upon the outcomes of this study.

No	Comment Submitted	CAISO Response
9d	Evaluation of Policy and Regulatory Barriers to Increased Transfers National Grid and Rye Development also suggest that any future study include an analysis of market seams issues and other policy or regulatory barriers that limit energy transfers between California and the Pacific Northwest. For example, National Grid and Rye Development suggest that any future study should examine the impact of California's Export Fees, as well as the transmission rates on the Southern Intertie charged by BPA and others. These issues are currently not considered by the Special Study and are currently a significant deterrent to expanded use of the AC and DC Interties. Other stakeholders could likely add to the scope of issues to be examined in a study of policy and regulatory barriers to increased transfers. Such an examination of export fees and transmission rates seems especially timely since CAISO work to date suggests that roughly 3,700MW to 6,300MW of available South-to-North transmission capacity currently exists on the Pacific Intertie (*i.e.* PDCI and COI combined).2 The principal reason that this South-to-North Intertie capacity goes unused is the CAISO's $11-12/MWh export fee. Eliminating or discounting this fee (*e.g.* waiving it when CAISO's Day Ahead Market projects negative prices at either NP-15 or SP-15) would help CAISO and other scheduling coordinators in California avoid significant midday curtailment of solar resources after 2020. This phenomenon, if not mitigated, will continue to grow exponentially after 2020, as California utilities add roughly 2GW of solar per year (both central station and rooftop) from now until 2030.	The comment has been noted, and will be considered in future planning and/or policy discussions.

10. NextEra Energy Transmission West, LLC (NEET West) Submitted by: Brian McDonald		
No	Comment Submitted	CAISO Response
10a	CAISO should consider releasing for competitive solicitation in the current TPP various 500 kV Bulk Dynamic Reactive Voltage Systems (Gates, Round Mountain) required to address existing voltage issues on the 500 kV network in Northern California, and to address voltage stability concerns resulting from the Diablo Canyon Nuclear Power Retirement in 2025. CAISO's 2018-19 TPP reliability study demonstrated that post-Diablo Nuclear retirement, and due to unacceptable high voltage conditions observed in normal and post-contingent conditions, recommendation is provided to consider installing dynamic reactive support system at 500 kV Gates and 500 kV Round Mountain area1 (up to 548 kV on Gates normal are observed, possible dynamic stability issues in the Gates area, High voltage on 500 kV wide system in Northern California in off- peak cases, low voltages with 500 kV contingencies on Maxwell and Olinda 500 kV in peak cases, renewable units tripping due to low or high voltage, Low voltages due to stalling of induction motor load). CAISO indicated that the size, type and location of reactive support is being further assessed and verbally confirmed that final project solutions will be included in the current CAISO 2018-19 TPP cycle. NEET West has observed the reliability concerns at Round Mountain within the last three TPP cycles: 2015-162, 2016-173, and 2017-184; which makes the most recent 2018-19 TPP results the fourth (4th) year of evaluation. PG&E concurred with the CAISO regarding the high voltage condition as recently their 2018 Request Window Proposals presentation, which displayed real time voltage data for the past year at Round Mountain and Table Mountain 500 kV Substations exceed high end thresholds of 540 kV across the entire year. While NEET respects that the PG&E Bulk system is highly complex, a four (4) year planning period which identifies existing real time high voltage issues should be resolved in a more proactive manner. Per NERC Standard TPL-001-4 Requirement R2.7:	The comments have been noted and will be considered in the upcoming evaluations.

No	Comment Submitted	CAISO Response
	"For planning events shown in Table 1, when the analysis indicates an inability of the System to meet the performance requirements in Table 1, the Planning Assessment shall include Corrective Action Plan(s) addressing how the performance requirements will be met." The decommissioning of the Diablo Canyon Power Plant ("DCPP") will further perplex optimal voltage control on the Northern California Bulk 500 kV transmission system. Finally, by taking into consideration the long lead time required for constructing the transmission projects, NEET West recommends that CAISO finalizes the dynamic reactive proposals at both locations in 2018-19 TPP cycle and to consider opening both candidate projects (at Gates and Round Mountain) for competitive solicitation.	
10b	CAISO should consider developing a transmission solution in the current TPP for the Suncrest - Sycamore 230 kV thermal overloads (also Suncrest and Miguel transformers) observed in 2017-18 TPP and to release the identified project for competitive solicitation The San Diego Main 2020, 2023 and 2028 Summer Peak, and 2023 Spring Off-Peak baseline scenarios detail overloads to the Suncrest-Sycamore 230 kV lines, the Suncrest 500/230 kV transformer banks, and the Miguel 500/230 kV transformer banks due to P6 contingencies. On page 214 of the Day 1 presentations, the CAISO results list potential mitigation solutions that include implementing 30-minute ratings and implementing operator actions. The proposed solutions rely on applicable 30 minute emergency ratings to allow time for operator action following the 2nd contingency. NEET West conducted detailed studies to test the proposed CAISO mitigation solutions and determine if the listed operator actions could mitigate the overloaded facilities. NEET West tested the following operator actions: • Adjust 30-min available demand response • Dispatch available and future energy storage resources • Adjust the IV PFC to shift power off the California transmission through the CFE system and back into California across the Tijuana-Otay Mesa 230 kV line.	The ISO's reliability assessment does not currently support the need for transmission upgrade to meet applicable reliability criteria. The newly implemented TL23054/TL23055 RAS is adequate to mitigate the Suncrest - Sycamore 230 kV overload concerns since the 30-minute emergency rating of the 230 kV lines allow operation actions to eliminate the overload concerns within 30 minutes.

No	Comment Submitted	CAISO Response
	While performing the studies, it was determined that there is a limit to the amount of flow that can be rerouted through the CFE system. It was observed that using the IV PFC will offload the Sycamore- Suncrest lines under contingency conditions; however, it also increases flows on Tijuana-Otay Mesa 230 kV line. Therefore, the available IV PFC operator adjustment is finite, and studies must ensure that the assumed adjustment does not generate other overloads elsewhere on the system. NEET West studies determined the following regarding the suggested operator actions: • The tested operator actions are not enough to mitigate the overloads evaluated on the SDG&E system for loss of the ECO-Miguel 500 kV line combined with a single Sycamore-Suncrest 230 kV line (RAS #1), which the CAISO preliminary reliability results show with a 128% and 135% overload in the 2028 SP and 2023 SOP cases respectively. Operator actions included tripping demand response, utilizing energy storage, and adjusting the IV PFC. • The best case of operator actions evaluated shows a 102.7% and 115.3% overload to the remaining Suncrest-Sycamore 230 kV line following the loss of the ECO-Miguel 500 kV line combined with loss of a single Suncrest-Sycamore 230 kV line for 2028 summer peak and 2023 Spring Off Peak cases respectively. • The operator action of shifting power through the CFE system has its limitations because it causes an overload to the Tijuana-Otay Mesa 230 kV line for loss of the ECO-Miguel 500 kV Line combined with loss of a single Suncrest-Sycamore 230 kV Line. • There is no adjustment to the IV PFC that can balance flows to a level capable of avoiding overloads on both the Suncrest-Sycamore 230 kV line and Tijuana-Otay Mesa 230 kV line in the 2023 off peak cases for loss of the ECO-Miguel 500 kV line combined with a single Sycamore-Suncrest 230 kV line (RAS #1). • Based on the above, NEET West suggests that CAISO performs more analysis and to develop a comprehensive long term transmission project for this area. NEET West has evaluated adding a 3rd 230 kV Suncrest – Sycamore 230 kV transmission line or alternatively adding energy storage (~200 MW) at Sycamore. Finally, the identified project solutions	

No	Comment Submitted	CAISO Response
	(transmission and/or energy storage at 230 kV level) should be considered as candidates for competitive transmission solicitations.	
10c	**CAISO should consider canceling Midway – Andrew project and develop a Least Cost Long-Term Reliability Transmission Solution in the current TPP for the Central Coast Los Padres ("CCLP") and release it for competitive solicitation** The reliability constraints (thermal and voltage) in the CCLP area will continue to persist, as reported by CAISO in Day 1 presentations page 125 which indicated that P6 contingencies remain to cause reliability violations until the project is placed into service. The Midway – Andrew project approved in 2012-13 TPP was placed on hold by the CAISO for future evaluation in the 2018-19 TPP. The original project cost was $120-150 million escalated to $215 million (Day 1 presentations, page 125). PG&E has pushed the forecasted in-service date from June 2025 to December 2025 and by delaying the start of the most optimal transmission project another year, the Los Padres area will remain vulnerable to the reliability constraints mentioned in the Draft Plan. CAISO is currently evaluating mitigation options that include increasing emergency ratings coupled with lower voltage capacitor banks or SVC's as well as SPS to shed load. NEET West is concerned as the extensive and perpetual reliability issues in the Los Padres area stem from only having two 230 kV sources into the area (Mesa and Morro Bay). It's unlikely that these concerns can be mitigated without the implementation of a new source into the area and NEET West discourages the use of SPS to shed load when a viable transmission alternative exists. Furthermore, it is clear from the 2017-18 and 2018-19 TPP that the Midway-Andrew 230 kV project is no longer needed as initially proposed. The system needs and configuration have significantly changed since the initial approval of the Midway-Andrew Project, due to the announced retirement of the Diablo Canyon Power Plant which will leave underutilized transmission in the area that can be reallocated to resolve this reliability concern. The mitigation needed in this area will no longer include main components of the original Midway-Andrew Project which included a 65-100 mile new line between Midway and Andrew. These scope changes will have a significant impact to the estimated budget for	The ISO is continuing to review the need for the project in the 2018-2019 transmission planning process to determine whether to proceed with the original scope, re-scope the project or cancel the project based upon the current need.

No	Comment Submitted	CAISO Response
	the project. Furthermore, it is difficult to argue that changes to project scope of this magnitude can be grandfathered in under an old tariff that did not approve the new scope, nor include the best interests of ratepayers by not allowing an opportunity for competitive solicitation. NEET West recommends that CAISO performs a comprehensive evaluation in the current cycle to identify and to approve a new transmission project that will comprehensively mitigate the reliability issues in this local area.	
10d	CAISO should consider releasing for competitive solicitation in the current TPP a new 230 kV transmission project necessary to address the reliability violations on the Amargosa 230/138 kV transformer in the Valley Electric Association ("VEA") system The CAISO's 2018-19 Reliability Assessment – Preliminary Study Results for VEA area identified a number of P1, P4 and P7 contingencies that generated potential overloads to the Amargosa 230/138 kV transformer for which a potential mitigation solution may be needed. NEET West encourages the CAISO to study the VEA closely because it was found that the previously approved Charleston-Vista 138 kV line does not resolve the overloads to the Amargosa 230/138 kV transformer. Specifically, a N-1-1 outage of the new Charleston-Vista 138 kV line combined with loss of Gamebird-Pahrump 138 kV line will result in overloads to the Amargosa 230/138 kV transformer. Furthermore, GridLiance's Request Window presentation suggested that the previously approved Charleston-Vista 138 kV line needed to be 230 kV (page 6-7, GridLiance Request Window Proposals, CAISO 20018-19 Sep 20-21 Meeting). NEET West recommends that CAISO evaluates a new Charleston – Vista 230 kV line as well as a new Gamebird – Charleston 230 kV transmission line solution to determine which project is the most effective in removing the overload to the Amargosa 230/138 kV transformer bank (i.e., recommend testing N-1-1 conditions: loss of Charleston – Vista 230 kV combined with Gamebird – Pahrump 230 kV line). Consequently, the identified project solution should be considered as candidate for competitive transmission solicitation.	The comment has been noted.

11. Pacific Gas & Electric (PG&E) Submitted by: Matt Lecar		
No	Comment Submitted	CAISO Response
11a	PG&E provides the following comments in the 2018-19 Transmission Planning Process (TPP), with regard to the reliability results and economic and policy study updates presented and discussed during the Stakeholder meeting of September 21-22, 2018. PG&E appreciates the CAISO for recognizing the critical link of generation assumptions in reliability studies when considering the economic pressure being placed on gas-fired resources due to the significant amount of renewable resources being added to grid. This will be an important assumption to coordinate and properly assess system risks to ensure that reliability is optimized at least cost to customers.	The comment has been noted.
	PG&E's comments focus on the CAISO's request for stakeholders to propose solutions in this comment window related to the economic study of Local Capacity Requirements (LCR) in select local areas and sub-areas. PG&E recommends CAISO evaluate two different sets of solutions to prepare for the impacts of generation retirements in constrained local areas of the system. First, PG&E believes there are certain candidate areas with the right load profile characteristics, in which preferred resource solutions (perhaps in combination with low cost transmission equipment upgrades, rerates, or operating procedures) can provide valuable LCR relief today, at a lower cost than either new major transmission capacity or backstop procurement of local generation. PG&E requests CAISO provide the necessary additional load shape information that will help PG&E to pursue economically cost-effective storage and/or preferred resources as part of a future CPUC procurement request. The second set of options PG&E proposes involves new transmission capacity. Over the longer-term planning horizon, as California moves to meet the accelerated de-carbonization commitments under SB 100 (i.e. 50% RPS by 2026, 60% by 2030, and 100% carbon-free by 2045), much more gas-fired generation will likely need to retire, including units in constrained local areas. PG&E encourages CAISO to begin evaluation now of new transmission projects that can alleviate LCR constraints in the future, recognizing that major new transmission may take multiple TPP cycles to study and approve (and additional years to site, permit, and construct). PG&E provides proposals for three such projects below. PG&E notes that it is not seeking approval for these	The ISO expects this to be part of the scope of work, with the range of LCR reduction mitigations needing to be considered on a case by case basis.

No	Comment Submitted	CAISO Response
	projects in the 2018-19 TPP, but rather requesting CAISO to begin the study process toward potential approval in a future TPP.	
11b	Local Capacity Requirements (LCR) in Select Local Areas and Sub-areas Based on the load shapes provided and the LCR needs described within the CAISO study results, there appear to be a number of PG&E LCR areas and sub-areas that would be candidates for preferred resource solutions to replace uneconomic gas-fired generation. PG&E requests that the CAISO confirm the specific estimate and energy-limited resource characteristics for the following PG&E local areas and sub-areas: • The Bay Area subareas of Llagas and Contra Costa. • The Sierra subareas of South of Rio Oso and South of Table Mountain. • The Stockton subareas of Webber and Stanislaus. • The Greater Fresno subareas of Reedley, Borden, and Herndon. • The Kern subareas of Kern and Kern Oil. PG&E identified these areas based upon the peak load profiles projected to exceed capacity for timeframes under an estimated 6 hours, including 4 subareas with projected timeframes of approximately 2 hours or less.	The comment has been noted.
11c	Transmission Project Proposals South Bay-Moss Landing and San Jose Sub-areas The CAISO's 10-year LCR study results for South Bay–Moss Landing Sub-area identified an LCR need of 2100 MW under Category C contingency. The most limiting contingency is a N-1-1 of Tesla – Metcalf and Moss Landing – Los Banos 500 kV lines, which is expected to overload the Moss Landing – Las Aguilas 230 kV Line. PG&E believes that major transmission upgrades in this area such as bringing a new 500 kV source would be required in order to relieve the identified overloads and drastically reduce the LCR in this sub-area in order to reduce reliance on local resources in the longer term. One potential option PG&E would propose for reducing the LCR need within South Bay – Moss Landing Sub-area is to bring one more 500 kV transmission line from Tesla into the Bay Area terminating at Metcalf in order to increase power transfer capability from the bulk system. Specifically, PG&E proposes to utilize existing 230 kV line facilities emanating from Tesla Substation towards the Bay Area by rebuilding into a single 500 kV line. Then a new 500/230 kV	The ISO will provide consideration of the alternatives in the economic assessment of LCR areas.

No	Comment Submitted	CAISO Response
	Substation would be installed in the Sunol area, where multiple 230 kV Lines from Newark turn north or south. The proposed Sunol Substation will be a stop for the new 500 kV line between Tesla and Metcalf. The section of the new 500 kV line between Sunol and Metcalf substation would also be developed by rebuilding existing 230 kV line facilities already going into Metcalf Substation. The new Sunol Substation will have one 500/230 kV transformer and also loop into multiple 230 kV lines in the area to maintain existing connections, to further increase the power transfer capacity and improve overall reliability. Permitting for a project of this scale is expected to be complex and lengthy. In service date could be about 10 years from approval and the cost would likely range between $500 million to $1 billion. In addition to the New Tesla – Sunol – Metcalf 500 kV Line with Sunol 500/230 kV Substation described above, and in order to fully realize the LCR reduction for both the South Bay – Moss Landing and San Jose Sub-areas, a few 115 kV facility overloads will need to be mitigated. PG&E has identified that the 115 kV lines from Newark to NRS and Newark to Kifer, a total of about 28 circuit miles would need to be reconductored. Alternatively, installation of about 400 MW of energy storage in this area may also mitigate some of these concerns. Together this collection of upgrades would enable the reduction of generation of about 1500 MW in the South Bay – Moss Landing and San Jose Sub-areas. Please refer to "Attachment 1 – PGE 2018_LCR Reduction Projects-Sunol.pdf" for a pre and post single line diagram, vicinity maps and for pre and post power flow solutions for this option. A second alternative would include upgrading (unbundling and reconductoring) the same existing 230 kV tower line above to create a new Tesla – Metcalf 230 kV Line (~ 46 mi). The new 230 kV line would provide additional importing capability support from Tesla to Metcalf area and relieve the strain on the southern importing boundary of South Bay – Moss Landing Sub Area. However, PG&E studies show that the reduction of LCR with this 230 kV only option would be limited to about 300 MW and thus the area would still be reliant on local area generation in the long term particularly as load grows in the area. This alternative should be further evaluated with additional preferred resources in the area to potentially have a greater impact on meeting or reducing the LCR. The cost for this option is expected to be lower than Alternative 1 but much of	

No	Comment Submitted	CAISO Response
	the tower rebuilding and reconductoring still remains. The in-service date is also expected to be about 10 years from approval. A third alternative would be to reconductor the Moss Landing – Las Aguilas 230 kV and Moss Landing – Coburn – Las Aguilas 230 kV Lines (~52 mi). This alternative is likely to reduce the LCR by about 300-400 MW. This alternative should also be further evaluated with additional preferred resources in the area to potentially have a greater impact on meeting or reducing the LCR. The cost for this option is expected to be lower than Alternative 1 and 2 but may still be significant due to the length of the line and the amount of tower rebuilding expected to be needed. Similar to Alternative 1, in order to fully realize the LCR reduction indicated, the limitations identified for the San Jose Sub-area will also need to be mitigated. PG&E estimates that a total of about 28 circuit miles of 115 kV lines would need to be reconductored or preferred resources such as energy storage would need to be installed within the San Jose 115 kV system.	
11d	<u>Ames/Pittsburg/Oakland Sub-area</u> CAISO identified a 10-year LCR requirement of 2022 MW under Category C contingencies for this sub-area. The most limiting contingencies include 1) Newark – Ravenswood and Tesla – Ravenswood 230 kV Line and 2) Moraga – Sobrante and Moraga – Claremont No.1 115 kV lines which overload the Ames – Ravenswood No.1 115 kV line and Moraga – Claremont No.2 115 kV lines, respectively. PG&E believes major transmission upgrades in this area such as bringing a new 500 kV source would be required in order to relieve the identified overloads as well as to further reduce reliance local resources and further reduce the LCR requirement. One potential option that can be consider for the long term, is to build a new 500 kV and 230 kV substation to be located in Solano County which would connect to the Vaca Dixon – Tesla 500 kV line. This option would then include building two new 230 kV lines from the new substation to Pittsburg 230 kV Substation which is approximately 5.3 miles in distance. The new 230 kV lines will likely need to cross under the Sacramento River to the East Bay. The new substation connecting to the Vaca Dixon – Tesla 500 kV line along with the 230	The ISO will provide consideration of the alternatives in the economic assessment of LCR areas.

No	Comment Submitted	CAISO Response
	kV lines would add a new and diverse source into the area that could effectively reduce reliance on local generation and reduce the LCR in the sub-area. Resources can be utilized from the northern or southern part of the system giving more flexibility for renewable power to serve Bay Area load. Permitting for a project of this scale is expected to be complex and lengthy. In service date could be about 10 years from approval and the cost would likely range between $500 million to $1 billion. Please refer to attachment “Attachment 2 – PGE 2018_LCR Reduction Projects-Collinsville.pdf” to find a pre and post single line diagram, vicinity maps and for pre and post power flow solutions for this option. As a general matter, please note that with the options presented above for either or both local sub-areas, the implication is that the greater Bay Area generation could be significantly reduced in the longer term. PG&E strongly recommends CAISO to fully evaluate how new projects, transmission addition and/or preferred resources, such as these would be integrated in such a way that no other overall reliability concerns are created as a result of the lack of generation in such a large load pocket as the Greater Bay Area.	
11e	<u>Oakland Sub-area</u> CAISO’s 2028 Long-Term LCR study results for Oakland sub-area indicated that the worst Category C contingency of Oakland C-X#2 &#3 115 kV cables can overload the Oakland D-L 115 kV cable, which established 14 MW of LCR need in Oakland sub-area. With the Alameda CT in service, there is no deficiency identified. PG&E recommends monitoring the load forecast in this sub-area and if needed to increase the amount of preferred resources to be installed in this area to ensure the longer term 10 year horizon is appropriately covered.	The scope of Oakland Clean Energy Initiative (OCEI) project modeled in the 2028 case is based on the year 2023 need. The preferred resource part of the OCEI project could be adjusted if the load increase in the area materialize.
11f	<u>Pease Sub-area</u> CAISO’s long-term LCR study results for Pease Sub-area indicated an LCR need of 92 MW under Category C contingency. The most limiting contingency is N-1-1 of losing Palermo – Pease 115 kV and Pease – Rio Oso 115 kV lines, which will overload the Table Mountain – Peachton and Peachton – Pease 60 kV Lines.	The ISO will provide consideration of the alternatives in the economic assessment of LCR areas.

No	Comment Submitted	CAISO Response
	As shown during the stakeholder meeting, it is clear that this sub-area is radially served from Table Mountain Substation with a long 60 kV line when losing the Pease 115 kV source (either through L-1-1 of losing the two 115 kV lines terminated at Pease or through T-1-1 of losing the two 115/60 kV transformers). As such, PG&E notes that it is possible that such contingencies may result in local voltage collapse before thermal limits are reached. This would be particularly the case if no local generation is present. To address the identified concerns driving the LCR need in the Pease Sub-area, PG&E would like to propose the following alternatives for the CAISO to consider: Alternative 1: Install a DTT to trip the load at Harter upon the loss of Palermo – Pease and Pease – Rio Oso 115 kV Lines (P7-1). Depending on the remaining generation, voltage support equipment (25 MVARs) will need to be installed in order to reduce the local LCR need to roughly 50 MW. Alternative 2: Looping Palermo – Nicolaus 115 kV line into Pease 115 kV Bus. Pease 115 kV bus is being rebuilt into BAAH. Looping in the line will require a 5th bay to be installed. The new loop would be installed on a double circuit pole and be about 5.5 miles in length. This alternative is expected to remove all local LCR needs . Alternative 3: Convert Table Mountain – Peachton and Peachton – Pease 60 kV Lines to 115 kV lines. This line is about 30 miles in length and has several substations along the way. Assuming no reconductoring is required, in order to convert to 115 kV operation, this option would require conversion of at least 5 substations, needing to replace a total of seven (7) distribution transformers, building new bus terminations at Table Mountain and Pease Substations and upgrading any limiting elements along the lines and inside each substation. This alternative could reduce the LCR needs to about 20 MW. This project is not recommended due to the potential high cost while not entirely mitigating the need for local generation.	

12. Public Advocates Office
Submitted by:

No	Comment Submitted	CAISO Response
12a	Recommendations for CAISO Transmission Planning Process Studies Generation Retirements: The Public Advocates Office supports the CAISO's evaluation of the expected generation retirements beyond those expected through compliance with "once through cooling" requirements. The Public Advocates Office also recommends that the CAISO consider a special study on expected generation retirements due to economics and or end of useful life. The results of such a study would enable the CAISO and California Public Utilities Commission (CPUC) to understand the full scope of potential generation retirements in the CAISO Balancing Authority Area (BAA) and to plan recontracting, local preferred resources and/or associated transmission infrastructure accordingly.	The ISO has conducting studies on the implications of additional retirement of gas fired generation on the transmission system – which is being updated in this cycle – as well as conducting additional study in this cycle on local capacity requirement implications and reduction opportunities. Additional work will also seek to take into account continued coordination with the CPUC on future generation retirements.
12b	Renewable Integration: The Public Advocates Office supports the CAISO's coordination with the California Energy Commission (CEC) and CPUC on gross load and excess behind-the-meter production forecasts as stated in its comments on the CAISO's Excess Behind the Meter Production straw proposal. The Public Advocates Office also recommends that the CAISO consider initiating a special study or section of the TPP that examines the impact of increased new renewable generation on the transmission system, specifically due to shifting the peak hour such as the peak hour shift in the San Diego Gas & Electric Company's (SDG&E) service area from 4 pm to 7 pm. This will enable the CAISO and stakeholders to better understand the impact of new renewable energy generation and shifting peak hours in the CAISO's BAA and on its ability to reliably serve load as well as the transmission requirements for generators to receive Full Capacity Delivery Service (FCDS) and to plan associated transmission infrastructure accordingly.	A number of the issues set out in the comment are being explored in different studies and sensitivities underway. We will look at providing a more comprehensive overview of these issues as we complete and document the various results.
12c	Production Cost Modeling Benefits of Large Storage: The Public Advocates Office supports CAISO's continued study of the benefits of large storage on the CAISO controlled grid.	The comment has been noted.
12d	Increased Transfer Opportunities between Pacific Northwest and California: The Public Advocates Office agrees that this special study should consider the range of possible economic benefits that could result from increased	The long term production simulation analysis will provide a preliminary estimate on the anticipated demand in Pacific Northwest for California's

No	Comment Submitted	CAISO Response
	transmission capacity between the Pacific Northwest and California, specifically the opportunity to sell excess California solar energy to the Pacific Northwest. To this end, the study analysis should estimate the Pacific Northwest's anticipated demand for California's excess solar energy.	solar. It is expected that in the spring, there would be opportunities to export California's excess solar to the northwest in the middle of the day, and import hydro generation from the Pacific Northwest to provide the evening ramp.
12e	Recommendations for Project Approved in Previous TPPs Gates-Gregg 230 kV Line Project: As stated in its 2017-2018 TPP comments, the Public Advocates Office recommends that the CAISO cancel the Gates-Gregg 230 kV project to avoid incurring any additional unnecessary costs related to this project. The project is no longer needed for reliability or transient stability.	The ISO is seeking to resolve the status of this project in the 2018-2019 cycle. However, the ISO must clarify that as discussed in last year's transmission planning cycle, the carrying costs on costs incurred the project while the project is on hold are not being recovered from ratepayers if the project is canceled; the costs will be incorporated into the capital cost of the project if the project moves forward and is completed.
12f	Ten West Link: The Public Advocates Office requests information on the expected timeframe regarding when the CAISO will post the revised needs assessments for the Ten West Link project also known as the Delaney Colorado River transmission 500 kV project. The Public Advocates Office also requests that the needs assessment include an enhanced project costs and benefits analysis. With anticipated gas-fired generation retirements in California due to surplus generation capacity on the grid as well as the currently expected retirements of coal generation in the Southwest, the economic benefits of this project should be revisited. This project is also expected to provide policy and reliability benefits to Arizona ratepayers, but there has been no discussion or consideration of a cost sharing agreement for this project with the state of Arizona.	As stated in the stakeholder meeting, the ISO plans to participate in the project proponent's CPCN application proceeding at the CPUC and follow the timelines in that process.
12g	Valuing Local Capacity Requirements The CAISO is seeking stakeholder feedback on how to value reductions in the Local Capacity Requirements (LCRs). The Public Advocates Office recommends consideration of the economic value of local generation or alternative methods and resources such as demand response (DR) and storage to reduce LCRs. The Public Advocates Office also recommends that the CAISO coordinate with the CPUC on its LCR evaluation and share this information for incorporation in the CPUC's Integrated Resource Plan (IRP).6 Specifically, CAISO should post for stakeholder review its economic valuation for existing,	The ISO was seeking input on how to value reductions in local capacity requirements for consideration of transmission options, or hybrid solutions where transmission components require approval through the ISO's transmission planning process. The studies will also be coordinated with the CPUC, as the resource component of a hybrid solution needs to be coordinated with the CPUC as well as consideration of any resource substitution alternatives – those being under the purview of the CPUC.

No	Comment Submitted	CAISO Response
	new and or local generation to meet LCRs. Such economic evaluation should occur under the rubric of the CPUC's IRP.	
12h	Recommendations for New Projects Interregional Projects *North Gila-Imperial Valley #2* The LCR evaluation for this project should consider the economic value of local generation and alternative resources such as DR and storage to meet demand and or reduce the LCRs in the service area.	The comment has been noted.
12i	Southwest Intertie Project North The project sponsor has identified economic, policy and reliability benefits that the Southwest Intertie Project North (SWIP North) would deliver. For cost allocation, the Public Advocates Office recommends that the CAISO provide more information on the entities that will benefit from this project with respect to policy targets, reliability issues and economic outcomes. For cost allocation, the Public Advocates Office recommends allocating costs based on load or usage, consistent with Federal Energy Regulatory Commission Order No. 1000, which requires that transmission costs be allocated commensurate with benefits received.	If the project proceeds, the ISO would expect Regional costs to be allocated according to the ISO's Regional (High Voltage) tariff. Similarly, we would expect any interregional cost allocation – to the extent it is pursued – would commence through the interregional coordination and cost allocation processes established in the planning regions' FERC Order 1000-compliant tariffs.
12j	CAISO Balancing Authority Area Projects *GridLiance West's Amargosa Valley Reliability Project* GridLiance West7 has proposed a new 230 kV circuit and 230/138 kV transformer at Valley Switch Station, with an estimated cost of $41.5 million.8 This facility upgrade would support the Valley Electric Association (VEA) system. GridLiance West states that the Amargosa Valley reliability improvement project would improve "overall grid reliability," but it did not demonstrate that the existing system design fails to meet required North American Reliability Corporation (NERC) planning standards and therefore requires this transmission upgrade. The CAISO's current system assessment does not support this recommended system upgrade and the other project upgrades that GridLiance West proposed. The CAISO should not approve GridLiance West's proposed Amargosa Valley reliability project or GridLiance West's other proposed reliability projects as reliability improvement projects without first completing a formal cost and benefit analysis as envisioned in the CAISO Planning Standards, Section 5.4. As for the Pahrump Valley Loop-In	The comment has been noted. The ISO will evaluate all the Request Window submittals and alternatives thoroughly.

No	Comment Submitted	CAISO Response
	Project, in the event that upgrades are ultimately justified through a formal cost and benefit analysis, other alternative solutions to the 138-kV system and associated 230/138 kV transformer upgrades should be evaluated.	
12k	*Pacific Gas & Electric's (PG&E) New Reactive Support Projects* More information is needed on how the levels of support were identified for the two large PG&E Reactive Support Project proposals. The most cost-effective technology to address any deficiencies is also unclear. PG&E's reactive support projects should be subject to competitive bid solicitation for reactive support solutions to address any identified high voltage issues rather than proscribing technology solutions. Competitive solicitations should not have proscribed solutions to allow for the possibility of receiving proposals that have lower cost solutions than what would have been proscribed, which would reduce costs for ratepayers.	The PG&E proposals and other alternatives will be evaluated in the transmission planning process. If reactive support solutions are found to be needed, the ISO's tariff rules for determining eligibility for the competitive solicitation process will be applied. As in the past, the ISO would not expect the functional specifications for the selected project to be more technology-specific than necessary.
12l	*San Diego Gas &Electric Company's (SDG&E) Local Capacity Requirement Reduction Proposals* The economic value of SDG&E's proposed mitigations to reduce LCRs should be evaluated in comparison to alternatives. The CAISO also proposed lower costs solutions to address potential overloads on SDG&E's system, such as re-dispatching energy and enhanced coordination control and remedial action schemes that should be further explored.	The comment has been noted.

13. San Diego Gas & Electric (SDG&E) Submitted by:		
No	**Comment Submitted**	**CAISO Response**
13a	Presentation: SDG&E Main System Preliminary Reliability Assessment Results Slide 10 (Potential Mitigation Solutions Summary) SDG&E is concerned that adding more operating procedures and relying on short-term emergency ratings as mitigation for BES overloads will contribute to the loss of life of our critical transmission assets. Secondly, we are seeing a high proliferation of operating procedures which makes operating the system more difficult and complex for the Grid Operations teams at SDG&E and the CAISO.	It is common practice to rely on applicable short-term emergency ratings as long as the events do not occur very often. There is no need to add more operation procedures to manage the overload concerns as the existing congestion management mechanism in the ISO market is able to manage the overloads. The ISO believes the overload concerns for the post-contingency of P6 event are very rare.
13b	Slide 13 (No. 1 – Talega – San Onofre 230kV Line) SDG&E agrees that reducing the reactive power output of the synchronous condensers at Talega within the 30-minute window would resolve this P6 contingency.	The comment has been noted.
13c	Slide 14 (No. 2 – Encina – San Luis Rey 230kV Path) SDG&E will be taking a closer look at reducing northbound flow following the 1st contingency and if it is acceptable to our Grid Operations team. We believe a solution to this issue would be the "Southern California LCR Reduction" project.	The comment has been noted.
13d	Slide 15 (No. 3 – Silvergate – Old Town 230kV Path) SDG&E concurs that re-dispatch of Otay Mesa generation would mitigate this P6 contingency.	The comment has been noted.
13e	Slide 16 (No. 4 – Miguel BK80 and BK81) SDG&E believes that it would be challenging to apply the following after the 2nd contingency: 1. Redispatch generation at Imperial Valley 2. Adjust the Imperial Valley phase shifters 3. Procure PR and ES up to 300MW in the San Diego area	The ISO's reliability assessment does not at this time identify the need for the third bank at Miguel to meet applicable reliability criteria. The 30-minute emergency rating of the banks could be used to bring down the power flow under their long-term emergency ratings within 30 minutes, by re-dispatching generation in the greater IV area, adjusting the IV PST, and/or dispatching the preferred resources and energy storages

No	Comment Submitted	CAISO Response
	SDG&E recommends installing a 3rd bank at Miguel as we had presented in the 2015 cycle. A sudden failure of these units would be highly detrimental to our system because of the substantial lead time required to install a replacement.	
13f	Slide 17 (No. 5 – Suncrest BK80 and BK81) SDG&E believes that it would be challenging to apply the following after the 2nd contingency: 1. Redispatch generation at Imperial Valley 2. Adjust the Imperial Valley phase shifters 3. Procure PR and ES up to 300MW in the San Diego area SDG&E will take a closer look at mitigating this contingency.	The ISO's reliability assessment does not at this time identify the need for the third bank at Suncrest to meet applicable reliability criteria. The 30-minute rating of the banks could be used to bring down the power flow under their long-term emergency ratings within 30 minutes, by re-dispatching generation in the greater IV area, adjusting the IV PST, and/or dispatching the preferred resources and energy storages
13g	Slide 18 (No. 6 – Suncrest – Sycamore 230kV Path) SDG&E will take a closer look at mitigating this overload, especially for the P1 violation. Note that SDG&E has presented several options for mitigating overloads on the 230 kV system west of Suncrest substation in previous iterations of the TPP. It is SDG&E's philosophy that reliance on SPS and RAS scheme to address issues on the transmission system that are permanent and likely to worsen over time is acceptable only in the short term. Permanent system constraints and persistent adverse operating conditions should be addressed with permanent solutions. In addition, as the number of RAS and SPS schemes proliferate, the risk of unintended consequences due to an unforeseen interaction increases, so the CAISO should strive to minimize the addition of new RAS schemes and eliminate existing ones where feasible and cost-effective.	The comment has been noted.
13h	Slide 19 (No. 7 – Suncrest 500kV Bus) SDG&E will work with the CAISO in determining how a coordinated control scheme among the reactive power support facilities would reduce the high voltage.	The comment has been noted.

No	Comment Submitted	CAISO Response
13i	Slide 20 (No. 8 – IID S-Line 230kV tie line) SDG&E concurs that this would be an adequate mitigation until the S-Line upgrade takes place.	The comment has been noted.
13j	<u>Presentation: San Diego Gas & Electric Area Sub-Transmission Preliminary Reliability Assessment Results</u> Slide 5 (Borrego Area P1 Contingency Thermal Overload) SDG&E concurs that this would be an adequate mitigation for the P1 thermal overload.	The comment has been noted.
13k	Slide 7 (Avocado Area P1/P2.1 Contingency Thermal Overload) SDG&E agrees with the CAISO's proposed mitigation for these P1/P2.1 violations.	The comment has been noted.
13l	<u>Presentation: Consideration of Storage as a Transmission Asset in the 2018-2019 Transmission Planning Cycle</u> SDG&E appreciates that the CAISO has taken time to present and clarify how storage as a transmission asset (SATA) will be considered in this planning cycle. We have been actively looking at SATA alternatives for our proposed projects. We will continue to work with the CAISO and various stakeholders and will participate in and monitor this initiative closely.	The comment has been noted.
13m	<u>Presentation: 2028 Long-Term LCR Study Draft Results LA Basin and San Diego-Imperial Valley Areas</u> Slide 14 SDG&E will look more into the CAISO's thermal loading concern on the remaining Sycamore-Suncrest 230kV line, in order to develop a proposed mitigation for this limiting facility.	A current mitigation involving Remedial Action Scheme that was recently implemented by SDG&E for generation curtailment to reduce contingency loading is currently used for the analysis. However, the ISO would be interested in any other cost effective mitigations for the long term, other than the use of an existing RAS, that SDG&E may have.
13n	<u>Presentation: 2028 Long-Term LCR Study Draft Results San Diego-Imperial Valley Non-Bulk Subareas</u> Slide 8 (El Cajon Subarea LCR)	The CAISO will consider this alternative in its analysis.

No	Comment Submitted	CAISO Response
	SDG&E has studied this subarea and we are proposing an upgrade of TL631 to a minimum continuous rating of 77MVA. This project will mitigate the LCR requirement in this subarea. For more information on our proposal, please see our presentation and supporting documents on: “El Cajon Subarea LCR Reduction”.	
13o	Slide 11 (Esco Subarea LCR) During the stakeholder meeting, SDG&E asked why all three Palomar units are on-line in the 2028 LCR case but only one unit is on-line in the 2023 LCR study. SDG&E is proposing a second 230/69 kV transformer bank at Artesian. This would mitigate the LCR requirement in the subarea. For more information on our proposed project, please see our presentation and supporting documents on: “ESCO Sub Area LCR Reduction”.	The CAISO will consider this alternative in its analysis
13p	Slide 14 (Pala Subarea LCR) SDG&E has studied this subarea and we are proposing an upgrade of TL694A to a minimum continuous rating of 127MVA and TL694B to a minimum continuous rating of 114MVA. This project will mitigate the LCR requirement in this subarea. For more information on our proposal, please see our presentation and supporting documents on: “Pala Subarea LCR Reduction”.	The CAISO will consider this alternative in its analysis.
13q	Slide 17 (Border Subarea LCR) SDG&E has studied this subarea and we are proposing an upgrade of TL647 to a minimum continuous rating of 110MVA. This project will mitigate the LCR requirement in this subarea. For more information on our proposal, please see our presentation and supporting documents on: “Border Subarea LCR Reduction”.	The CAISO will consider this alternative in its analysis.

14. Silicon Valley Power (SVP)
Submitted by:

No	Comment Submitted	CAISO Response
14a	Silicon Valley Power (SVP) is a municipal electric utility owned and operated by the City of Santa Clara. Our customer composition is over 90% industrial and only 6.6% residential. While our future residential consumption is forecast to be generally flat, SVP has recently experienced a strong interest from new, high load factor, data center projects. We expect these new customers to raise SVP's load factor from the current low 80% range to the upper 80% range. Some of these new loads are already on-line and others are in various stages of development. Our experience has been that these data center loads materialize quickly. As such, SVP has an internal capital plan to expand its internal system to connect these new customers. We understand that the PG&E service area in the South Bay is also receiving requests for interconnection of some data centers. SVP's load forecasts are reviewed by the CEC and are included in the new 2018-2019 TPP series base cases. The impacts on the transmission system in San Francisco Bay Area, and especially the San Jose Division, are beginning to appear in the CAISO's Preliminary Transmission Assessment results. Fortunately, there are few issues in the near-term 2020 case. However, by the mid-term 2023 case, loading issues on the 115 kV circuits south of Newark appear. Additionally, the NRS-SRS 115 kV circuits, which are currently being reconductored, will again become overloaded. Furthermore, we understand that the assessment actually dispatched a major local resource, the ~300 MW NQC Los Esteros Critical Energy Facility (LECEF), off-line during a summer 1-in-10 load condition to reduce other 115 kV transmission contingency loadings. Then by the long-term 2028 case, many of the local 115 kV circuits are seeing overloads in the 30% to 60% range. Also linked to the load growth in the South Bay, the CAISO long-term Local Capacity Requirement (LCR) studies are showing an increase in the Greater Bay Area LCR of almost 2,200 MW in the 2028 study compared to the previous 2023 study. The San Jose sub-area shows a 204 MW deficit due to the loading of the same 115 kV circuits south of Newark. This increase in the Greater Bay Area LCR reduces the margin between the Total Generation and the LCR need	The ISO encourage SVP to participate in the CEC's demand forecast process and make sure that the CEC's forecast accurately captures future demand growth in the SVP area. In regards to the reliability concerns identified in this cycle, the ISO will closely monitor the load increase in future CEC demand forecast and will also coordinate discussion with parties for potential mitigation development.

No	Comment Submitted	CAISO Response
	to 275 MW, or less than the NQC of the LECEF that is being dispatched off-line in some of the assessment analyses. While SVP understands that this new projected loading is a significant increase from prior year's assessments, we are concerned that the identified mitigation is simply to "Continue to monitor future load forecast." The South Bay is a highly-developed area within a CAISO high density urban area, where the timeline to expand the electric transmission infrastructure can be very lengthy. Such a wait-and-see approach risks local capacity constraints that could either restrict economic development, reduce system reliability, or both. While it may be premature to approve a specific capacity expansion project without further planning studies, those studies should be initiated in parallel with monitoring the future load forecasts. Once a plan has been developed, critical lead times and decision points can be identified. In closing, SVP appreciates the inclusion of the higher forecast loads in the 2018-2019 TPP base cases so that these potential transmission capacity limitations can be identified. We encourage all parties to recognize the need for a long-term transmission plan for the South Bay that can accommodate the current and future economic development.	

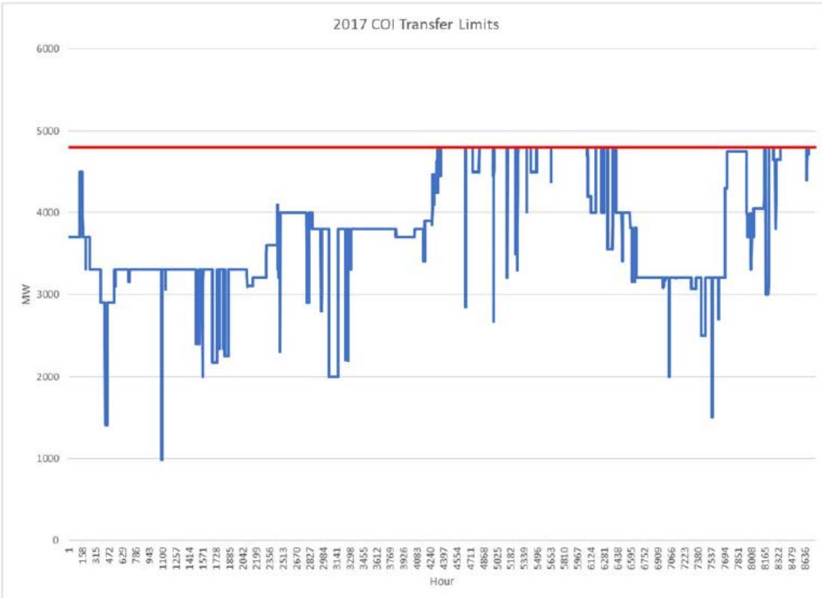
15. Transmission Agency of Northern California (TANC)
Submitted by:

No	Comment Submitted	CAISO Response
15a	1) TANC supports the proposed voltage support upgrades to the Northern and Central California 500 kV Transmission System to control high voltages. TANC fully supports the proposal to implement a new RAS on the Round Mountain -Table Mountain 500 kV lines #1 and #2 that will automate the bypassing of the line's series capacitors. As early as the 2011 TPP cycle, this RAS has been identified as an effective option to mitigation the overload resulting on one of the Round Mountain -Table Mountain 500 kV lines following an outage of the other Round Mountain -Table Mountain 500 kV line. Additionally, the Round Mountain -Table Mountain 500-kV limitation has become one of the most severe limitations to COI since the most recent operational changes were made in April 2018. This proposed project would improve the COI transfer capability in the near-term and long-term planning horizons. While TANC fully supports the technical benefits of this proposal, we currently do not have sufficient information to support the proposed economic costs of this proposal.	The comment has been noted.
15b	2) TANC supports the proposed voltage support upgrades to the Northern and Central California 500 kV Transmission System to control high voltages. TANC supports the proposed voltage support upgrades to mitigate the high voltages on the 500 kV transmission system in Northern and Central California. The CAISO has identified similar high voltage issues in previous PG&E Bulk studies for several TPP cycles now. Additionally, PG&E has shown that the high voltage issues are not just a forecast condition, but a condition that has occurred in real-time over the past year at Round Mountain and Table Mountain. While TANC fully supports the technical benefits of this proposal, we look forward to seeing additional information regarding proposed economic costs of this proposal.	The comment has been noted.
15c	3) TANC supports upgrading the Round Mt -Cottonwood 230-kV Lines to mitigate the P6 and P7 overloads resulting on the adjacent Round Mt - Cottonwood 230-kV Lines in the five-year and ten-year peak load cases.	Overload on the Round Mountain –Cottonwood 230 kV lines depends on the flow on COI and on hydro generation level in Northern California. The studies showed that these transmission lines may overload with contingencies involving double line outages with high flow

No	Comment Submitted	CAISO Response
	The CAISO preliminary study results for the PG&E bulk system identified several P6 overloads on the remaining Round Mt -Cottonwood 230-kV Lines when the one of the three Round Mt -Cottonwood 230-kV Lines was offline in the five-year and ten-year peak load cases. In addition, the study identified a P7 overload on the Round Mt -Cottonwood 230- kV #3 Line in all peak load cases by as much as 124% following the outage of the Table Mountain -Tesla 500-kV Line and Table Mountain -Vaca Dixon 500-kV Line. The results indicate a trend that the thermal impacts on that the Round Mt -Cottonwood 230-kV Lines increase from each preceding planning year. The thermal limitations of the Round Mt -Cottonwood 230-kV Lines have limited COI north-to-south transfer capability in the past and as indicated in the preliminary studies, it can be expected that these limitations will worsen in the long-term horizon unless the lines are upgraded. While TANC fully supports the technical benefits of this proposal, we currently do not have sufficient information regarding the costs of this proposal.	on COI and high hydro generation in northern California. The ISO will need to assess the economic benefit of the proposed upgrades.
15d	4) TANC suggests changing the proposed mitigation for the Cascade -Oregon Trail 60-kV line P0, P3, P6, and P7 overloads to adjusting the Weed Phase Shifter rather than reducing COI. The CAISO preliminary study results for the PG&E bulk system identified P0, P3, P6, and P7 thermal overloads on the Cascade -Oregon Trail 60-kV line for the near-term and longterm summer peak load studies. The proposed mitigation for these overloads is to limit COI within the seasonal Nomogram. TANC believes that limiting COI is not an effective solution because the overload is primarily driven by the transfers across the Weed Phase Shifter. As such, it would be a much more effective mitigation option to adjust the Weed 115-kV Phase Shifter (reducing flows by 5 to 10 MW) to mitigate the Cascade -Oregon Trail 60-kV line overload.	The comment has been noted.
15e	5) TANC supports the CAISO COI Day-Ahead Congestion study. TANC is pleased that the CAISO has indicated it will be undertaking an investigation into the potential transmission issues that may be the cause of approximately $50 million of dayahead congestion per year at the Malin Intertie.	The comment has been noted.

<table>
<tr><th>No</th><th>Comment Submitted</th><th>CAISO Response</th></tr>
<tr><td></td><td>TANC has highlighted through many CAISO transmission planning cycles that the economic studies have failed to correctly model the actual level of congestion at COI. The CASIO has responded variously that the congestion is the result of market issues as opposed to limitations on the grid and/or that the CAISO conservatively models a full capacity grid. These limitations have meant that there was no real avenue to determine if any transmission improvements could lead to lower congestion costs for California ratepayers. The CAISO noted at the stakeholder meeting that it is still attempting to determine the shape of this study. TANC recommends that the CAISO conduct an economic study with recent historic capacity profiles in its 2023 model as at least one sensitivity. This will allow the CAISO to assess how much of the congestion is due to the market and how much is due to physical limitations upon the COI. Chart 1 below shows the COI transfer from 2017. We believe that it is critical to utilize actual experienced COI transfer capabilities, rather than path rating or seasonal nomogram values.

Table 1
<table>
<tr><th>Year</th><th>Congestion Costs ($million)</th><th>Number of congested hours</th><th>Average COI Capacity when less than 4,800 MW</th><th>Number of hours COI Capacity less than 4,800 MW</th></tr>
<tr><td>2012</td><td>$84.66</td><td>3,682</td><td>3,377</td><td>7,619</td></tr>
<tr><td>2013</td><td>$33.59</td><td>1,827</td><td>3,640</td><td>6,813</td></tr>
<tr><td>2014</td><td>$90.54</td><td>2,424</td><td>3,614</td><td>6,013</td></tr>
<tr><td>2015</td><td>$37.68</td><td>2,303</td><td>4,176</td><td>5,365</td></tr>
<tr><td>2016</td><td>$51.14</td><td>2,791</td><td>3,987</td><td>5,677</td></tr>
<tr><td>2017</td><td>$60.70</td><td>2,449</td><td>3,532</td><td>6,593</td></tr>
<tr><td>Average</td><td>$59.71</td><td>2,579</td><td>3,720</td><td>6,347</td></tr>
</table>
</td><td>Regarding Chart 1 in the comment, it is worth noting that there were some major maintenance activities on both PACI and COTP lines in 2017. In the ISO’s economic planning PCM, annual repeatable maintenance outages on COI corridor have been modeled based the data submitted by the facility owners.</td></tr>
</table>

No	Comment Submitted	CAISO Response
	CHART 1 	

16. Tenaska
Submitted by: Tim Hemig

No	Comment Submitted	CAISO Response
16a	Tenaska suggests that as reliability, economic, and policy based regional transmission needs are evaluated in the TPP, consideration for how Storage as a Transmission Asset (SATA) solutions could potentially mitigate regional transmission needs should be included in any proposed or contemplated solutions in the current 2018-2019 TPP. Further, that regional transmission needs that could be resolved with either conventional transmission solutions or SATA solutions, should be brought to the market for the most cost effective and environmentally preferable solutions for CAISO consideration through the 2018-2019 TPP Phase 3 process. We note that the CAISO did indicate it is planning to proceed in this fashion based on comments in the SATA presentation slides discussed at the recent TPP meetings (reference the third bullet of page 263 of the Day 1 TPP presentations). One example of the above general comment is an SDG&E proposal for a new $100-$200 Million 230 kV transmission solution called "Southern California Regional LCR Reduction" and described on slide 5 of the SDG&E presentation delivered on Day 2 of the TPP process meetings. This type of project is a good representative example where the CAISO Phase 3 competitive solicitation process could yield cost effective alternative solutions that also have significantly lower environmental impacts, such as a potential SATA solution. There were other regional transmission needs discussed at the TPP meetings where a SATA solution could mitigate the problem cost effectively, so this comment applies generally to any regional project that is also subject to the competitive process.	The comment has been noted.