The ISO received comments on the topics discussed at the November 16, 2018 stakeholder meeting from the following:

1. American Wind Energy Association California Caucus (ACC)
2. Bay Area Municipal Transmission (BAMx)
3. California Public Utilities Commission – Staff (CPUC-Staff)
4. California Energy Storage Association (CESA)
5. California Transmission Project Corp (CTP)
6. Center for Energy Efficiency and Renewable Technologies and Natural Resources Defense Council (CEERT & NRDC)
7. EDF-Renewables (EDF-R) and SPower
8. GridLiance
9. Imperial Irrigation District (IID)
10. Large-scale Solar Association (LSA)
11. LS Power
12. Nevada Hydro Company (Nevada Hydro)
13. NextEra Energy Transmission West (NEET West)
14. North Gila Imperial Valley 2 (NGIV2)
15. Pacific Gas & Electric (PG&E)
16. Public Advocates Office
17. San Diego Gas & Electric (SDG&E)
18. Transmission Agency of Northern California (TANC)
19. University of California Office of the President (UCOP)

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	First and foremost, it is critical that the CAISO provide additional process and opportunity for stakeholder discussion on the newly proposed deliverability assessment methodology. While AWEA California appreciates the time and effort that CAISO has put into the proposal, and believes the proposed methodology may be an improvement over the current methodology, stakeholders need additional time and opportunity for discussion to fully understand the implications of this new proposal before it is adopted. The impacts of the CAISO deliverability assessment methodology could be far reaching, including potentially substantial commercial implications, and the CAISO should set up one or more workshops, which include additional documentation of the methodology to provide stakeholders with more input and a better understanding of the proposal. This request for additional process was reiterated by many stakeholders during the November 16th meeting. Many parties impacted by this proposal, including existing generators which may be subject to increased curtailment as a result of its adoption, are not aware of the proposed change and its potential implications. As discussed more below, the CAISO should provide additional stakeholder process and analysis prior to moving forward with the new methodology.	A stakeholder webinar to present additional details and for stakeholders to provide additional input on the proposed modifications to the CAISO deliverability methodology and to discuss comments on a revised version of the deliverability methodology documentation was held on December 18, 2018. Based on feedback received, the ISO will conduct additional stakeholder consultation in 2019 before implementing revisions to the methodology.
1b	Additionally, AWEA California reiterates many of the issues that were brought up in the last set of comments submitted in the TPP. Previously, AWEA California commented on the substantial quantity of Energy Only Deliverability Status (EODS) resources in the 42 MMT portfolio and the host of problems this assumption creates in both the TPP and related processes, such as the Integrated Resources Planning (IRP) process. We continue to express deep concern about this assumption and its potential implications for reaching the state's long-term climate objectives. It would be prudent for the CAISO to study the impact of all 42 MMT portfolio resources studied as Full Capacity Deliverability Status (FCDS) under the proposed deliverability methodology as quickly as possible, to begin to understand the transmission that might be necessary to deliver the 42 MMT portfolio. As in previous comments, AWEA California continues to urge the CAISO to ensure that the 2019-20 TPP finally	The 42 MMT portfolio was designed to include both energy only and full capacity generation. It is not reasonable to speculate that a portfolio targeting 100% full capacity deliverability status would be the same as the portfolio produced based on both FCDS and energy only resources, as resources could be relocated to avoid upgrades driven by deliverability requirements. Given this, there would be little value in studying the "42 MMT" portfolio and unilaterally modifying this critical assumption. The CPUC IRP and RPS proceedings would be the appropriate forums for AWEA to advocate for a portfolio that consists of 100 % full capacity.

No	Comment Submitted	CAISO Response
	studies (and provides for approval) of transmission necessary for California to achieve its public policy requirements. AWEA California continues to seek a more substantive stakeholder process on the TPP to address outstanding issues within the TPP and the increasingly complex interaction between the ISO's various study processes, especially the interaction between economic assessments and public policy-driven assessments.	
1c	Additional Stakeholder Process on the Deliverability Assessment Methodology is Required, including a Written Description of the Methodology As many stakeholders pointed out during the November 16th meeting, the impacts of the CAISO's deliverability assessment are wide ranging. The deliverability assessment may impact the Resource Adequacy (RA) program and resources' Net Qualifying Capacity (NQC) determinations, the interconnection process, the TPP, the IRP, and the amount of curtailment experienced on the ISO's system in the future (for existing and new generators). Therefore, the stakeholder process for changing the methodology should be more comprehensive than a single discussion lumped into a TPP stakeholder meeting. Many of the parties that could be impacted by this proposal may not even be aware of its existence, as they may not generally participate in the TPP. There should be an opportunity for broader awareness and participation for all impacted parties. While the proposal will certainly impact new resources through the TPP and the Generator Interconnection Process (GIP), the ISO also indicated it may lead to additional curtailment within the ISO. This has the potential to negatively affect existing generators, especially those generators with contracts that do not provide for full compensation for all curtailment. The ISO should consider these commercial implications and existing generators should be given an opportunity to comment on the proposal and better understand its potential impacts. Additional specificity and, preferably a written summary of the methodology, should be reviewed with stakeholders in a dedicated workshop prior to adopting	Please refer to the response to 1a. Transmission upgrades to mitigate curtailment caused by transmission constraints can be identified in the ISO's annual transmission planning process as part of the economic-driven transmission analysis or in combination with the generation deliverability policy analysis. Please refer to the response to 1a.

No	Comment Submitted	CAISO Response
	this methodology. This will give stakeholders an opportunity to propose potential revisions and also give the ISO a chance to better understand, and plan for, the potential implications of the new methodology.	
1d	Additional Studies Should be Performed and Consideration be Given to the Impacts of this Proposal on the IRP and Future Curtailment The new deliverability assessment methodology will likely impact the IRP process and will certainly impact future TPPs and GIPs. Historically, the CAISO has provided information into the IRP on the capability of the system to accommodate FCDS resources in various renewable energy zones. Presumably the deliverability assessment plays an important role in the analysis and the figures that are provided to the CPUC. The ISO should work with the CPUC and stakeholders to consider how the new deliverability proposal will impact the transmission availability figures provided to the CPUC for the IRP and the potential impacts that may have on the IRP and, subsequently, future TPPs. It is critical for the ISO to understand how the new deliverability proposal will impact the FCDS capacity that the CAISO communicates to the CPUC for use in the IRP. If the deliverability proposal allows more resources to be accommodated as FCDS on the same transmission system, that may be beneficial for a number of reasons, but it may also lead to significant curtailments (as are expected under the 42 MMT portfolio, even though 40% of those resources are EODS). Therefore, the ISO should perform a study using the proposed deliverability methodology to see how it impacts the amount of FCDS available in each renewable energy zone. This will help the ISO, and stakeholders, better understand whether the proposal will potentially allow more FCDS for the 42 MMT portfolio while still seeing significant levels of curtailment that are being expected in the current 42 MMT portfolio. Alternatively, the CAISO could study, as a sensitivity in the TPP, the 42 MMT portfolio, using the new deliverability methodology and assuming that all the resources in the portfolio are FCDS. This would also help the ISO, CPUC and other interested parties to better understand the transmission implications that may be associated with the 42 MMT case (if most resources are FCDS, consistent with commercial preferences) and the need for transmission projects	The purpose of the CAISO presentations on November 16 was to begin the work with the CPUC and stakeholders to consider how the new deliverability proposal will impact the CAISO TPP and transmission availability figures provided to the CPUC for the IRP. The CAISO deliverability studies for the generation interconnection process largely provides information regarding the amount of available FCDS in each renewable energy zone. The comparison provided by the ISO was between the studies conducted in the GIP under the existing methodology and study assumptions, and the same interconnection requests with the proposed methodology and assumptions. As the queue volumes exceed portfolio volumes, this provides a better test of the system's capabilities and when additional reinforcements would be required to reach higher levels of renewable generation development in a given area. Please refer to the response to 1b.

No	Comment Submitted	CAISO Response
	to achieve policy goals in the coming decade. This level of analysis is critical to ensuring California is on track to meet its public policy requirements.	
1e	The ISO Needs to do the Above to Ensure it is Ready to Study and Approve Transmission to Meet Policy Goals in the 2019-20 TPP AWEA California 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. In order to ensure that the need for transmission isn't perpetually kicked from one proceeding (the IRP) to another (the TPP) with no new policy-driven transmission being undertaken, the ISO needs to conduct some "pre-testing" of the new deliverability methodology and the 42 MMT case (as fully deliverable), as discussed above. It is imperative that the ISO begin to study and evaluate what transmission might be necessary to reach a 60% RPS, so that the state can start evaluating how it will move beyond 60% to the 100% clean energy goal established in SB 100. The delay in meaningful policy-driven 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 ISO supports the development of actionable renewable generation portfolios in the CPUC's IRP process for use in the ISO's transmission planning process, and has communicated this in comments submitted to the CPUC in the course of the IRP proceedings. At the same time, the special study work performed over the last several planning cycles, including the analysis developed in support of the RETI 2.0 effort and the information provided each year to the CPUC regarding transmission system capabilities indicate considerable availability of deliverability. Resource planning beyond the 2030 horizon will need to advance on both renewable generation resources and renewable integration resources before additional transmission studies would be germane or helpful.
1f	CAISO should open a stakeholder initiative to address the outstanding issues in the TPP As suggested by AWEA California in the CAISO Stakeholder Policy Initiatives Catalog Process, the needs of the electric grid have changed considerably over the last several years, but the TPP has not evolved in a way to meaningfully address 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. The ISO itself dedicated part of its TPP meeting to discussing the increasing complexity and iterative nature of the TPP assessments. Specially, the	These comments seem to comingle the planning process with the assumptions relied upon in each year's process. The ISO is not aware of shortcomings identified by stakeholders regarding the process itself, and encourages stakeholders to express concerns with the assumptions in the appropriate venue – either with the CPUC regarding resource assumptions, the CEC regarding load forecast and load modifier forecasts, and the ISO regarding other planning and study assumptions. The ISO agrees that considering solutions that are more multi-faceted can make presentation of the results more complex than if each

No	Comment Submitted	CAISO Response
	delineation between economic and public policy transmission needs is becoming increasingly blurred. There are multiple other areas the ISO should consider in a TPP stakeholder initiative, including better defining how the ISO considers renewable generation additions and new transmission projects to deliver those resources that are not inside of the CAISO Balancing Authority Area (BAA). AWEA California urges the CAISO to open a broad stakeholder process to address potential modifications and clarifications to the TPP (including the CAISO's evaluation of transmission that reaches outside its boundaries, economic benefits of transmission lines that deliver renewable energy, etc.)	proposed transmission solution only addressed a specific issue at a time – and drawing stakeholders' attention to that point was the intent of the discussion being referred to. However, the methodological approach in considering the benefits that various proposals provide by first ascertaining needs and then sequentially considering the benefits of proposed solutions has proven to be a robust and invaluable approach to these studies – which was also noted in the presentation material. Regarding resources outside of the ISO footprint, the ISO encourages stakeholders to raise those concerns both in the interregional coordination process the ISO conducts with its planning region neighbors, as well as with the CPUC in resource planning processes. Also, the ISO expects some of the issues raised in these comments can be touched on in the stakeholder consultation to be conducted regarding the deliverability methodology proposal.

2. Bay Area Municipal Transmission (BAMx) Submitted by: Moises Melgoza		
No	Comment Submitted	CAISO Response
2a	<u>Deliverability Methodology</u> The shift in the time of peak demand due to the high penetration of Behind The Meter (BTM) solar PV has given rise to issues with the current Deliverability methodology used to assess whether a given generator's Qualifying Capacity (QC) can reach the aggregate of system load at the time of system peak. Historically, there have been a number of stakeholder questions concerning the existing CAISO Deliverability calculation methodology. So much so that in 2013, the CAISO published a Technical Paper and held a stakeholder meeting on the methodology. While there was not a consensus among the stakeholders on the merits of the current methodology, it was clear that this topic is a sensitive issue among generators, regulators and TAC ratepayers. Therefore, given this history, BAMx supports initiating a separate stakeholder initiative to vet the proposed modifications in the Deliverability calculation methodology. A brief presentation over a few PowerPoint slides embedded in a discussion of Policy-driven transmission and a two-week comment period over the holiday season is not sufficient stakeholder engagement given the interest and impact of this topic. A subject of this importance merits more thorough stakeholder engagement. Concerning the proposed modifications described at the stakeholder meeting, the CAISO proposal has attractive aspects, such as potentially driving fewer transmission upgrades and supporting higher renewable penetrations on the existing transmission system. However, there are elements that need to be more fully discussed and understood. Such elements include (1) how the transmission capacity requirement identified by the methodology compares to the CPUC-adopted Effective Load Carrying Capability (ELCC) values of the generators that its supports, (2) how the resultant shift towards economic analysis being used to size transmission capacity from renewable generation pockets will be managed, and (3) how the transition for generators that are currently in the CAISO generation interconnection process will be managed.	Please refer to the response to 1a. These elements were discussed during the December 18th stakeholder webinar, and please refer to the response to 1a.

No	Comment Submitted	CAISO Response
2b	<u>Policy Assessment</u> The CPUC Integrated Resource Plan (IRP) 42 MMT Scenario portfolio and the CPUC IRP Reference System Plan were studied as a sensitivity in the 2018-2019 TPP policy-driven assessment to identify potential Category 2 informational transmission projects. The study found that while Full Capacity Deliverability Status (FCDS) resources are deliverable based on the CAISO new proposed Deliverability calculation methodology, higher curtailment of renewable generation could result. The finding supports the previously noted need for a greater understanding of the proposed Deliverability calculation methodology and how impacted parties can understand the potential for curtailment, the process for how such curtailment is quantified and, if economically justified, how mitigation will take place in a timely manner. As we had indicated in our prior comments in the 2018-2019 TPP, we have some serious concerns about the sufficiency of the feedback loop concerning transmission constraint information between the CAISO reliability and deliverability assessment and the CPUC's renewable portfolios. In those comments, we had provided an example that demonstrated a need to establish a more effective and timely feedback loop within the same cycle to avoid potential approval of an unneeded policy-driven transmission project. In Figure 1 below, we suggest a timeline for CAISO's consideration entailing an exchange of data and information among CAISO TPP, CPUC IRP, and involved stakeholders. In particular, we request the CAISO to provide its draft transmission capability estimates to the CPUC's IRP comprising the stakeholder feedback in mid-December 2018. This would allow the CPUC adequate time to include those estimates in the RESOLVE model and provide the resulting draft "Conforming Hybrid" resource portfolio - to be used in the 2019-2020 reliability and policy-driven assessment - to the CAISO by mid-January 2019.	The ISO must reiterate that the purpose of the deliverability analysis has been limited to ensuring that sufficient transmission is available to provide reasonable assurance that resource adequacy capacity can be delivered to load at times of need. However, the deliverability analysis has resulted in identifying a few policy-driven transmission projects needed for a large amount of renewable generation in situations where the resource adequacy deliverability and policy-driven needs overlapped. Going forward there may be less overlap between these two separate types of needs. The ISO expect some of these issues can be discussed further during the stakeholder consultation the ISO expects to initiate in Q2 regarding the deliverability methodology. The ISO does not agree with the characterization of the circumstances of the example provided in previous comments. The timelines proposed are generally unrealistic given the resource requirements necessary to conduct these studies and other planning activities that either have to precede these studies or run concurrently. In any event, the key information updating the transmission system capabilities come from GIP phase-1 study results, first available in mid-January of each year. Finally, the ISO tariff addressing policy-driven transmission (section 24.4.6.6, Policy-Driven Transmission Solutions) states: "*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*

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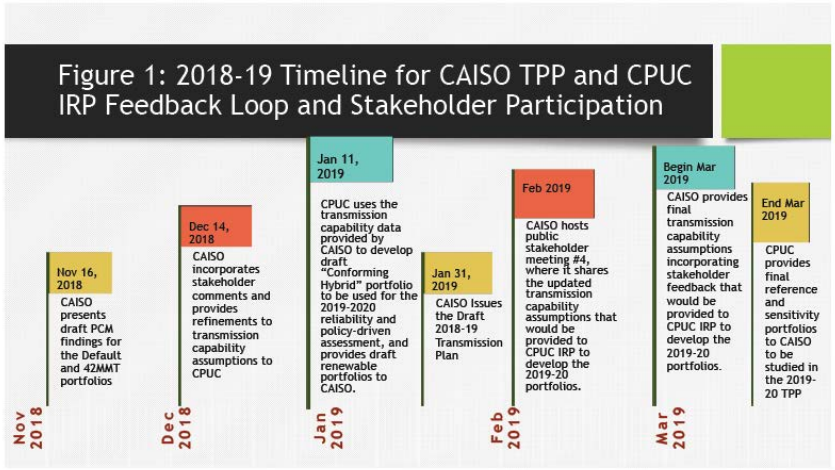
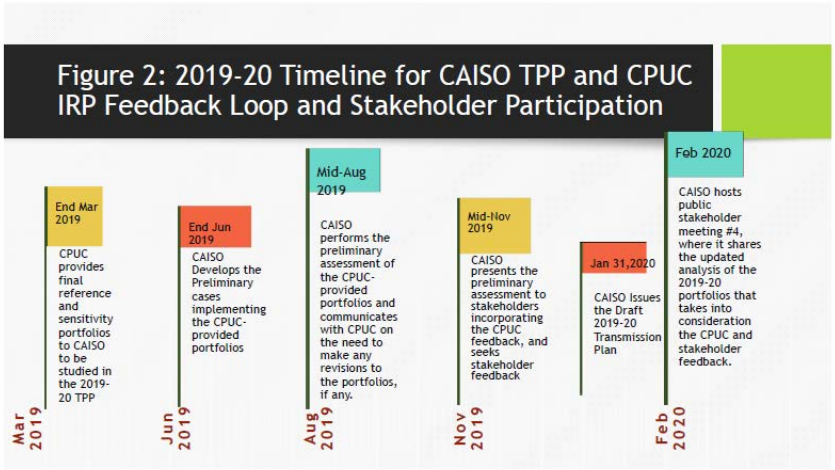
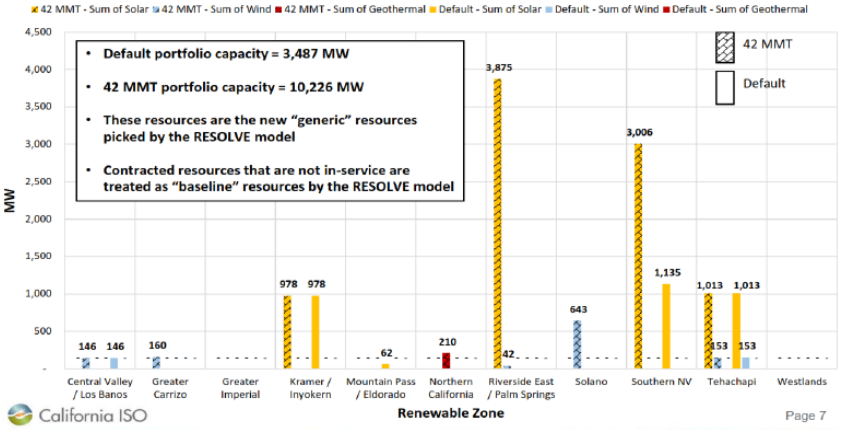
	 The CAISO could then utilize its updated Production Cost Modeling (PCM) analysis and the CPUC's draft portfolios to further refine the transmission capability estimates, and present it during the February 2019 stakeholder meeting. Subsequently, the CAISO would then incorporate the stakeholder feedback in the "final" transmission capability estimates it would provide to the CPUC beginning of March 2019. This would provide CPUC with adequate time for developing and providing the final base (reference) and sensitivity portfolios for the 2019-2020 TPP. The above BAMx-proposed timeline will ensure that the 2019-20 TPP portfolios used to determine the reliability and policy-driven projects are vetted by stakeholders and would minimize the likelihood any inefficient and unneeded Area Delivery Network Upgrades (ADNU) being approved under the 2019-2020 TPP. If for some reason, the CAISO and CPUC cannot implement the feedback loops outlined in Figure 1, we suggest the timeline shown in Figure 2 during the 2019-20 TPP.	*the CAISO finds that sufficient analytic justification exists to designate them as Category 1 transmission solutions."*

No	Comment Submitted	CAISO Response
		
2c	<u>Economic Assessment</u> The presentation on the economic assessment lacks the level of detail presented at this time during prior TPP cycles. The recent CAISO presentation lacked information on the economic value of simulated transmission congestion. BAMx understands that the local congestion identified in the study resulted in a large number of curtailment hours associated with the assumed interconnection of new renewable generation generally identified in the portfolios. The CAISO identified that further work is needed on this modeling issue. However, stakeholders are not able to judge whether the identified curtailment is likely, and if so, what is the associated economic impact. Providing meaningful feedback is not possible without further detail. We look forward to the CAISO's updated assessment in the Draft Transmission Plan to provide feedback on the transmission congestion and related mitigations. Resolving these issues along with evaluating the various planning study requests identified by the CAISO may be difficult to complete within this TPP cycle. BAMx urges the CAISO to take measured steps in improving the modeling and turning the large amount of data into actionable information before identifying any economic transmission in this TPP cycle.	The comment has been noted. The results of the studies have been included in the draft transmission plan. Further, only one relatively modest economic-driven transmission project is recommended for approval in this planning cycle.

No	Comment Submitted	CAISO Response
2d	<u>Special Study – LCR Reduction Transmission Alternatives</u> The CAISO has made significant progress in the development of conceptual transmission projects to reduce or eliminate the LCR in various areas or sub-areas. BAMx understands these to be informational studies to support the review of the options to maintain local reliability. Upon review of the materials presented, BAMx offers a couple of comments: • The consideration of slow response Demand Response seems uneven across the areas studied. In particular, slow demand response for pre-contingency purposes was considered in the San Diego Imperial Valley Area and San Diego subarea, but not in the remaining LCR areas/sub-areas. BAMx requests that such demand side options be considered in all areas where such measures would address the identified reliability constraints. • The information presented across a large number of slides is difficult to digest. BAMx recommends that information on all the areas/sub-areas studied be summarized into a single table that includes, among other data, information on the LCR for the area (need, current available resources, capacity margin, largest resource risk, etc) as well as information about relaxing the requirement (cost, capacity, $/MW, time to implement, etc.).	The volumes and concentration of these resources provide meaningful assistance in addressing requirements in some areas but not in others. Given the various uses that stakeholders may have for the information, and the need to consider the nuances in the documentation, oversimplifying the presentation of the results may not be helpful. Please refer to the response to 3e below.
2e	<u>Reliability Projects on Hold</u> BAMx generally supports the CAISO's recommendation to cancel the identified transmission projects that are on hold. As for the Midway-Andrew Project alternatives, BAMx again requests that any project ultimately proposed as a reliability project include an economic benefit-cost ratio calculation.	Such calculations will be considered if benefit to cost assessments are necessary to select between different alternatives or to consider potential scope increases to capture further benefits as an economic-driven upgrade. However, the ISO declines to calculate the benefit to cost of not adhering to planning standards.

3. California Public Utilities Commission – Staff (CPUC Staff) Submitted by: Karolina Maslanka		
No	Comment Submitted	CAISO Response
3a	1. CPUC Staff requests that CAISO share with stakeholders additional details regarding the proposed production cost modeling of large storage. CAISO states in slide 10/312 that, "Production cost modeling benefits of large storage was being considered as a potential sensitivity – but now required to address certain (system) economic study requirements." CPUC staff acknowledges that additional study of storage can demonstrate new meaningful results. However, CPUC staff seeks to better understand the objective of this production cost modeling work and how the study results are intended to be used in this or future TPP process or various procurement process. CPUC staff requests that CAISO share additional information regarding this PCM work with stakeholders prior to the finalization of draft TPP results, which are to be presented at the January 31, 2019 CAISO TPP stakeholder meeting. Specifically, CPUC staff request that the information address modeling assumptions, type of outputs that will be produced, the timeline of the effort, and the purpose/use cases of this work. Additionally, it is unclear to CPUC staff whether this study is intended only for planning purposes or for procurement authorization.	Given the study cycle, there was not an opportunity for further consultation on this issue before the release of the draft transmission plan. The ISO will look for comments on the draft transmission plan results, however. For clarity, the ISO had initially indicated the intend to update the system-level analysis conducted in the past, assessing the benefits of large storage, which was produced as informational work and builds on the PLEXOS analysis the ISO undertakes to support its participation in CPUC resource planning processes. That work is undertaken on a zonal basis, and has been repeated in this planning cycle. This is documented as a special study in the 2018-2019 transmission plan. The comments about economic study requirements refer to a number of stakeholder proposals for the ISO to consider various pumped hydro and battery storage projects as either economic study requests or as potential economic-driven solutions to addressing reliability needs that could otherwise be addressed through lower cost alternatives. Adequate study of those proposals entailed considerably more economic study than initially envisioned, and required locational analysis. Many of these proposals were based on the assumption that market revenues could be earned by the resources to reduce the cost to ratepayers. The ISO notes that while the SATA initiative is on hold, there is considerable uncertainty about how facilities seeking cost of service recovery through transmission rates could also access market revenues, the benefits of these projects could be studied on the basis of resources providing a local capacity-type benefit through an appropriately structured PPA. The ISO does not approve non-

No	Comment Submitted	CAISO Response
		transmission alternatives, but can identify them as a preferred solution to an issue and work with the appropriate regulatory agency to encourage their development. Therefore, the analysis was considered helpful in any event.
3b	2. CPUC Staff looks forward to coordinating with CAISO on allocating to specific locations the 2000 MW of energy storage included in the CPUC transmitted IRP 42 MMT portfolio to allow for its inclusion in future TPP analysis. CAISO states in slide 17/312 that, "2,000 MW of energy storage selected in the portfolio is not modeled in the initial PCM run due to lack of locational information; the results are expected to inform us about optimal locations that could help reduce renewable curtailment." CPUC Staff requests that CAISO speak to the potential methodologies that may be used to allocate the energy storage geographically for production cost modeling. Would the allocation be based on curtailment, system or local needs, or other factors? CPUC Staff also asks that CAISO clarify whether it plans to conduct additional PCM runs within the 2018-19 TPP cycle with the addition of the 2000 MW of energy storage. If so, to what extent does CAISO plan to use the results produced to inform the busbar allocation of energy storage for the 2019-20 TPP cycle?	Different options have been contemplated to mitigate local constraints and the associated curtailments. However, the ISO will need to coordinate further with the CPUC on allocating the 2000 MW energy storage to specific locations to better understand the purposes envisioned for these resources.
3c	3. CPUC Staff would like to bring to CAISO's attention that slide 18 contains an inaccurate statement regarding the portfolios provided by IRP to CAISO for TPP purposes. The following slide title found on slide 18/312 is inaccurate, "Default portfolio modeled in the year-10 TPP reliability case is a subset of the 42 MMT portfolio which includes FCDS and EODS resources." The Default portfolio is not necessarily a subset of the 42 MMT portfolio. Although the 42 MMT portfolio does reduce GHG emissions beyond the emission reductions resulting from the Default (50% RPS), the 42 MMT portfolio does not start with the resources selected under the Default portfolio and build on that with incremental resources. Instead, it starts from scratch and includes resources that best meet numerous constraints. For this reason, in a few renewable zones, the amount of certain generic resource types decreases when moving from the Default	The ISO recognizes that the portfolios were not crafted by building one as an extension of the other, and did not mean to imply that, but the end result largely aligned with one being a subset of the other. This simplified the modeling and study process. The Mountain Pass/Eldorado zone in the CPUC's portfolio is considered to be a part of the Southern NV zone in the ISO modeling. The 62 MW at Mountain Pass/Eldorado in the Default portfolio and the much greater amount of renewables in Southern NV are both modeled at Eldorado in the 42 MMT portfolio. So from the perspective of

No	Comment Submitted	CAISO Response
	portfolio to the 42 MMT portfolio. For example, Mountain Pass/Eldorado contains 62 MW of new generic solar resources under the Default Scenarios but 0 MW under the 42 MMT Scenario. This is visible in the graph contained on that slide, included below for convenience. 	modeling "generic" portfolio resources, the ISO considered the Default portfolio to be a subset of 42 MMT portfolio. For the purpose of containing the modeling effort to reasonable timelines, the ISO had to rely on the assumption that the same baseline resources would be selected in both portfolios. This is another reason for the statement.
3d	4. CPUC Staff would like to highlight that the MIC data used to represent import levels is temporally inconsistent with the Highest System Need Scenario under the new deliverability assessment methodology. In the Highest System Need Scenario (slide 30/312) intermittent generators are set to a relatively high level of output (80th percentile), to "ensure higher certainty of wind and solar being deliverable during the time window." Could the CAISO explain in more detail why this is more appropriate than using 50% exceedance as a more likely level of output from intermittent generation? This Scenario also uses MIC data to represent import levels. This may be inconsistent since MIC levels are developed based on the hours of 1pm to 5pm, which does not align with the 5pm to 10pm of the Highest System Need Scenario. CPUC Staff suggest that CAISO consider potentially using a 50% exceedance at the selected hours for import levels. Additionally, CPUC Staff requests that CAISO clearly define "exceedance" in future written materials.	The ISO addressed these comments in December 18th webinar, and will test if further discussion is necessary.

No	Comment Submitted	CAISO Response
3e	5. CPUC Staff greatly appreciates CAISO's expansive effort on studying LCR areas and congratulates CAISO on producing an impressive amount of insightful analysis. The local capacity requirements potential reduction study results are very insightful and are a key first step to determining the value of reducing local capacity requirements. In order to make this analysis more transparent and actionable, CPUC staff requests that the CAISO provide a summary of the results, potentially using a table that highlights trends across the LCR areas and subareas. CPUC Staff look forward to working with CAISO on moving this effort forward.	The comment has been noted. The results of the study have been included in the draft 2018-2019 Transmission Plan and the ISO will consider options for presentation of the results through further discussion and through its participation in the IRP process. There are nuances in the analysis that do not lend themselves to simple tabulation, however, especially in the consideration of options for reducing reliance on local gas-fired generation capacity.

4. California Energy Storage Alliance (CESA) Submitted by: Alex Morris and Jin Noh		
No	Comment Submitted	CAISO Response
4a	Local Capacity Requirements (LCR) Potential Reduction Study CESA supports the efforts of the CAISO to proactively and more comprehensively identify cases where conventional transmission and preferred resources such as energy storage could serve as economic local capacity alternatives to gas-fired generation in certain priority locations. This study effort will better ensure that cost-effective solutions are selected to meet local capacity requirement (LCR) needs, as well as to focus on mitigating local pollutant impacts (e.g., NOx) on disadvantaged communities (DACs) – an important focus of resource planning here in California. CESA supports the continued study process and looks forward to reviewing the final results that will be published in the Draft 2018-2019 Transmission Plan on January 31, 2019. However, CESA offers a few areas of comments on the update provided at the stakeholder meeting for further clarification and/or key considerations for the CAISO to ensure a robust study. First, CESA recommends that the CAISO not just focus on gas-fired generation plants that are greater than 40 years old in this study but to also consider a nuanced but easy evaluation of gas retirement factors, such as where a resource will be within its 10-year major maintenance cycle. Gas plants younger than 30 years old in age should potentially be evaluated if a major maintenance decision could lead to or factor into a retirement decision within the study time frame. CESA believes this approach may yield more pragmatic information, and could prevent the CAISO from overlooking other key opportunities for the procurement of transmission or preferred resource alternatives. CESA bases these views on anecdotal discussions of how major-maintenance decisions, even for younger plants, can materially inform the retirement of such plants. CESA welcomes discussion on if this criterion is applicable, and generally asserts it will be more nuanced than the 40-year only threshold. In addition, there may be opportunities to assess the capacity factor of gas plants to determine the likelihood and cost-effectiveness of retirements or hybridization.	For clarity, the ISO applied the 40 year assumption to test where reliability issues would emerge in its reliability analysis. The study of local capacity area resource requirements, and potential mitigations for alleviating dependence on gas-fired resources to meet those requirements, was not restricted to the 40 year old generation.

No	Comment Submitted	CAISO Response
4b	Second, CESA requests greater detail on the preferred resource composition and characteristics for alternative solutions proposed by the CAISO. Some of this can be informed by the publication of hourly load profiles and limiting factors across different contingencies in the local capacity areas and sub-areas studied, but some detail on the mix of preferred resources assumed to address the underlying local capacity need would support stakeholder review of the forthcoming full study. Key stakeholder review may be needed to assess the assumed present and future costs, the operational profile and characteristics, and the potential hybrid configurations of preferred resources. For example, a key area of improvement for the Moorpark Sub-Area Local Capacity Alternative Study, published on August 16, 2017, was around the outdated energy storage cost assumptions used to conduct the economic assessment of different alternative solutions. Similarly, while the economic assessment was generally not shared at the November 16, 2018 stakeholder meeting, some of these underlying assumption details would help stakeholders understand the resulting assessment and potentially provide constructive and reasonable feedback on potential adjustments needed.	The CAISO provided detail in the draft transmission plan on the alternatives and cost assumptions considered in the analysis in the areas and sub-areas selected for additional analysis. The profiles of the need itself in all areas and sub-areas has also been provided, which is helpful to stakeholders wishing to consider the effectiveness of preferred resources.
4c	Third, CESA appreciates that the CAISO will include hybrid solutions in this study, but it is unclear from this analysis on whether the CAISO will also consider the hybridization of the gas plants being assessed. To address LCR needs and reduce local emission impacts to DACs, the CAISO should not only consider transmission and preferred resource alternatives but also hybrid gas plant alternatives (i.e., gas plus energy storage). As demonstrated through Southern California Edison's (SCE) procurement and installation of a hybrid enhanced gas turbine (EGT) in response to Aliso Canyon reliability issues in December 2016, such a resource is able to significantly reduce particulate emissions and water usage from fewer starts and run hours while also providing critical operational reserves and frequency response. Furthermore, in the 2016-2017 TPP cycle, the CAISO conducted a supplemental analysis of the risks of early economic retirement of the gas fleet. This analysis highlighted the critical reliability issues in the near term, including the potential deficiencies in operating reserves (e.g., spinning reserves). Energy storage resources, including hybrid gas-storage resources, can play a critical role in addressing some of these possible deficiencies.	The CAISO can consider specific alternatives such as hybrid battery and natural gas resources for the informational local capacity study, but the level of detail required to perform detailed analysis and assessments of such resources was beyond the scope of this informational study, at this time. The study is focusing on providing information defining the characteristics of the need, against which preferred resources including storage, can be compared. As mitigations for N-1-1 contingency requirement standards allow for time for system readjustment between contingencies, the hybrid gas-

No	Comment Submitted	CAISO Response
	Hybrid gas-storage systems can be modeled with a 0 Pmin when "offline" and providing reserves, while the paired energy storage system would be providing Local RA capacity and provide the "runway" needed to bring the gas plant online when needed to provide capacity during critical contingencies. In the context of examining not only the first or second contingencies but also the "worst limits" in this study, hybrid gas-storage systems have the potential to address each level of need while also reducing local pollutant impacts in DACs. CESA thus recommends that the CAISO include hybrid gas-storage alternatives as part of the potential resource mix and quantify the value of providing not just LCR benefits but also other ancillary service benefits of resource alternatives in this study. CESA is happy to provide feedback on how these resources can be configured and operationally represented for the purposes of this study.2 In addition, to the extent possible, CESA encourages the CAISO to identify potential operational reserve needs from retiring gas plants and to consider the potential operational reserve benefits of energy storage replacement and/or gas-storage hybridization.	storage feature appears to provide most of its value in addressing system ramping constraints and flexibility needs, rather than local transmission planning contingency needs. However, this concept will be considered going forward for potential applications. Regarding overall fleet requirements for flexibility, the ISO sees those issues best addressed in the CPUC's IRP process looking at fleet performance more holistically, and the ISO will look to incorporate the longer-term fleet perspective into local planning decisions.
4d	Fourth, CESA seeks clarification from the CAISO on the assessment of the Santa Clara sub-area, which was noted as being selected because all of the gas-fired generation in the area is needed. CESA is unclear on the interplay between assessment of the Santa Clara sub-area and the most critical contingency tied to the loss of the Pardee-Santa Clara 230 kV line followed by the loss of the Moorpark-Santa Clara 230 kV Lines #1 and #2, which creates a 102 MW local capacity deficiency in 2023, according to the 2023 Long-Term Local Capacity Technical Report. While the voltage collapse issue was highlighted as the issue in the 2023 report and the overload on the remaining line was identified as driving the LCR need, CESA seeks greater understanding of this grid need. In particular, as CESA understands it, the California Public Utilities Commission (CPUC) has already adopted the LCR needs for this area, so it is unclear on how this identified LCR need will come into play in the CAISO-CPUC process. Further explanation would be very helpful.	The RFO process that SCE is conducting is intended to address load growth through 2021 and the loss of the Mandalay and Elwood gas generating facilities that have already retired or are about to retire. The Santa Clara LCR reduction discussion on November 16th was focused on the remaining 184 MW of gas fired resources in the area that could potentially be retired and cause a local capacity deficiency.
4e	Finally, CESA requests a small modification to characterization that the Pardee-Moorpark 230 kV Transmission Project (approved by the CAISO Board in March 2018 and expected to be inservice by 2021) avoided the need for a new	The ISO agrees with CESA's characterization that the Pardee-Moorpark 230 kV Transmission Project reduced LCR need in the area and that the combined portfolio of preferred resources is needed to

No	Comment Submitted	CAISO Response
	262 MW gas-fired facility in the Moorpark area from the stakeholder meeting presentation. CESA would just like to add that the transmission line reduced LCR need but the combined portfolio of preferred resources is expected to help meet the rest of the LCR deficiency and avoid the 262-MW Puente Plant.	meet the rest of the LCR deficiency and avoid the 262-MW Puente Plant. The ISO characterizes the remaining LCR need as the Santa Clara sub-area LCR need rather than a Moorpark sub-area LCR need because only resources located within the Santa Clara sub-area can meet the remaining LCR need.

5. California Transmission Project Corp (CTP) Submitted by: Martin Walicki		
No	Comment Submitted	CAISO Response
5a	As you know, in February 2018, we submitted an economic study request for the CTP and submitted supplemental reliability and economic benefits for the project during the 2018-2019 Open Window in October 2018. The proposed offshore HVDC submarine transmission project provides several benefits to the electric grids of Pacific Gas & Electric (PG&E) and Southern California Edison (SCE) operated by the CAISO. These benefits include reductions in the Local Capacity Requirements within the Ventura/Big Creek and LA Basin in SCE's service area and increased transmission capacity between Northern and Southern California. These capacity benefits will be particularly valuable as gas fired plants are retired under the recently approved Senate Bill No. 100, which requires the State to move towards a 100% clean energy standard. Indeed, CTP is also a significant step forward in enabling the interconnection of offshore wind generation which we believe can be an important component for achieving a 100% renewable portfolio for California. Thus, CTP, which is entirely supported by other economic benefits, will also lower the cost of offshore wind and enhance its timely development. We also fully support the CAISO's affirmation on slides 2 and 3 of Mr. Millar's presentation, that the CAISO economic study process will continue to utilize production cost modeling and the CAISO's TEAM analysis to further evaluate the broader economic benefits of projects like CTP that deliver reliability solutions and provide other ratepayer benefits including the elimination of local capacity deficiencies and the creation of production cost or other savings. It is critically important for the CAISO to calculate and consider ***all*** economic benefits in determining whether ratepayers receive a net benefit from CAISO planning decisions. Doing so for all projects being studied also ensures fair and equal treatment of all alternatives. This is consistent with, and required by, the CAISO's TEAM approach which provides on page 2. "In the current ISO's planning practice, benefits can be categorized into: • *Production benefits: Benefits resulting from changes in the net ratepayer payment based on production cost simulation as a consequence of the proposed transmission upgrade.*	The ISO conducted detailed congestion analysis and evaluated economic study requests following the ISO's tariff. Based on the analysis and evaluation results, the ISO selected high priority studies for further detailed economic assessment. All study results have been included in the draft transmission plan.

No	Comment Submitted	CAISO Response
	• *Capacity benefits: Benefits resulting from increased importing capability into the CAISO BAA or into an LCR area. Decreased transmission losses and increased generator deliverability contribute to capacity benefits as well.* • *Public-policy benefit: Transmission projects can help to reduce the cost of reaching renewable energy targets by facilitating the integration of lower cost renewable resources located in remote area, or by avoiding over-build.* • *Renewable integration benefit: Interregional transmission upgrades help mitigate integration challenges, such as over-supply and curtailment, by allowing sharing energy and ancillary services (A/S) among multiple BAAs.* *Avoided cost of other projects: If a reliability or policy project can be avoided because of the economic project under study, then the avoided cost contribute to the benefit of the economic project."* In our October 15th open window submittal, CTP calculated and presented the benefits it provides under several of these TEAM categories. In addition, the CAISO's preliminary economic results presented at the November 16th meeting identified 1,284 hours of congestion that will be alleviated by CTP. We request that the CAISO use its TEAM analysis and perform a detailed evaluation of CTP to confirm and quantify all of CTP's reliability and economic benefits under the TEAM benefit categories consistent with your statement on slide 42 of Mr. Zhang's presentation. We also request that the CAISO calculate and present the resulting Benefit to Cost Ratio for CTP. In particular, CTP requests that CAISO confirm and quantify CTP's ability to reduce Local Capacity Requirements in Big Creek/Ventura and LA Basin. This is a particularly important category of benefits under both the TEAM approach and the CAISO's historic evaluation process. We note that CAISO did not select either the greater Big Creek/Ventura or LA Basin areas for assessment in its special LCR Reduction Assessment for this 2018-2019 cycle. CTP respectfully requests that CAISO quantify CTP's ability to reduce and/or eliminate the LCR requirements in either or both of those LCAs and to include these benefits in the CTP Benefit to Cost Ratio. As noted in our Open Window submittal, our	The CTP proposal to connect to the Ormond Beach switchyard would not reduce the LCR in the Moorpark or the Santa Clara sub-areas, both of which are in the Big Creek/Ventura LCR area. The previously approved Pardee-Moorpark #4 230 line eliminates the local capacity requirement in the Moorpark sub-area, and the Ormond connection would not be effective for the Santa Clara sub-area – the connection is outside for the Santa Clara sub-area. The remainder of the Big Creek area need is primarily met by hydroelectric and other renewable generating resources. Please see slides 4-5 of the Big Creek/Ventura area gas-fired generation LCR reduction presentation from November

No	Comment Submitted	CAISO Response
	assessment is that CTP can greatly reduce local capacity requirements and provide significant procurement cost savings to California ratepayers. By performing a comprehensive economic analysis in this 2018-2019 TPP cycle, including with respect to LCR benefits, the CAISO will also provide valuable insight to all California agencies as they assess solutions to LCR and other State energy needs consistent with the forward-looking policies reflected in SB 100. The CAISO's Benefit to Cost Ratio for CTP will provide the CPUC and others with important input for their own deliberations. In particular, it will assist the CPUC with respect to IRP decisions, including with respect to LCR issues and SB 100 related gas fired generation reduction plans. Following the CAISO's calculation of all CTP benefits under its TEAM approach, we are confident that the CAISO will conclude that inclusion of CTP in the CAISO Transmission Plan as part of the 2018-19 TPP planning cycle is in the best interests of California electricity customers both from a reliability and economic standpoint.	16. It can be seen from the slides that, based on the current load forecast for year 2028 and current technology factors for solar and wind, the amount of gas-fired LCR need in the area excluding the Santa Clara sub-area is expected to be approximately 94 MW-136 MW. While the Western LA Basin sub-area is not part of the current informational study at this time and was not examined comprehensively for potential mitigations, the ISO has assessed the potential benefit of several project proposals for informational purposes in the draft transmission plan.

6. Center for Energy Efficiency and Renewable Technologies and Natural Resources Defense Council (CEERT & NRDC) Submitted by: Liz Anthony, Jim Caldwell and Julia Prochnik		
No	Comment Submitted	CAISO Response
6a	Policy Assessment There is a clear need for a faster and more iterative process between the CAISO and the California Public Utilities Commission (CPUC). While the CPUC utilizes a carbon target in its Integrated Resource Plan (IRP) process, the California Legislature has accelerated the 50% RPS to 2026 and increased the 2030 RPS target to 66%, the CAISO was asked to only study a 50% RPS case for the default portfolio and the more relevant 42 MMT case (roughly equivalent to a ~55% RPS) only for sensitivities in this TPP cycle. Given the long lead time for new transmission and the fast pace of transformation in the electric sector, it is clear that the slow pace of transmitting relevant portfolios results in missed opportunities for projects that may be needed for the most economical and reliable path to meeting California's greenhouse gas (GHG) reduction goals. Additionally, it would be valuable for multiple sensitivity portfolios to be transmitted to the CAISO for study, as different combinations of resources may have reliability or deliverability differences that were not accounted for in CPUC modelling that will affect the "optimal portfolio." The results of the 2018-19 policy and economic modelling should be formally transmitted back to the CPUC with specific suggestions to develop better methodologies for selecting the "Reference System Plan" and "Preferred System Plan" in this CPUC IRP cycle. There are new insights into the CPUC's portfolios that have implications for selecting the best portfolio mix to meet California's GHG goals. In the IRP process, the 42 MMT case was found to have roughly 4% curtailment with the RESOLVE model, a capacity expansion model developed by E3, and roughly 10% curtailment with the SERVM model, a production cost model run by CPUC staff. However, the CAISO modelling shows nearly 40% curtailment of wind and solar in the 42 MMT scenario. This stark difference in modelling results suggests there are major deficiencies in the tools being utilized to develop the policy portfolios. CEERT and NRDC recommend a faster, more iterative approach between the CPUC and CAISO to resolve these differences and develop the most cost effective and reliable portfolios to reach California's GHG and energy goals.	The ISO's analysis in the transmission planning process of various portfolios does provide a snapshot of a particular combination of resources and enable the holistic assessment of various transmission planning considerations. This is helpful in being fed back to the CPUC for helping inform future portfolio development and providing comfort that the portfolio development is on the right path. However, it should not be misconstrued that this is the only information or source of information that the ISO relies on in providing input into the CPUC IRP processes. Transmission system capabilities for accommodating increased amounts of renewable generation more generally come from the review of generator interconnection process studies, that are generally based on higher volumes of generation in various areas than are required to achieve RPS objectives in the transmission planning horizon. Also, the ISO supports the IRP process with production cost modeling on a zonal basis that informs the ISO's input into the IRP processes. Those latter studies are reported in the transmission plan – generally as "special study" material – but are not obliged to adhere to the timelines of the transmission planning processes. Regarding the levels of renewable curtailment, the CPUC material of November 15 appears to show renewable curtailment of up to 13.75% based on SERVM results. The results in the ISO's draft transmission plan are now below 18%, markedly lower than the preliminary results. It should be noted that the ISO's analysis continued to apply a 2000 MW net export limit rather than the 5000 MW net export limit used in SERVM. Also the PCM model contained two other critical differences because it is focused primarily on transmission congestion. Accordingly, the GridView model did not model 2000 MW of storage due to uncertainties about the location of the storage, and also includes transmission constraints inside the ISO footprint not reflected in SERVM. These constraints can result in overall larger volumes of

No	Comment Submitted	CAISO Response
		energy curtailment if they constrain renewables in hours where there is not also system curtailment.
6b	Economic Assessment CEERT and NRDC are supportive of the ISO expanding the economic evaluation process and vetting of economic study requests focus on production cost modeling to include benefits of EDAM (considering capacity costs) and consideration of interregional solutions. We support expanding the scenarios to capture a broader range of modeling quantities and combination of resources adequacy changes as well as market influences (like EIM and EDAM) to test multiple system conditions.	The comment has been noted. It is also noted that while providing good reasonable approximations, production cost modeling software cannot reasonably capture all of the nuances of the ISO market and WECC-wide transactions.
6c	Local Capacity Potential Reduction Study CEERT and NRDC are supportive of the effort undertaken in this round of the TPP to identify transmission upgrades that reduce the dependence on natural gas-fired generators in local capacity areas. Local capacity reduction is essential to reducing dependence on gas in order to each goals set by Senate Bill 100 and Executive Order B-55-18 and to phase out Aliso Canyon natural gas storage facility as intended by the California Energy Commission and CPUC3. The question remains how this informational study will be used and what form the results should be presented to be most valuable for CAISO, the CPUC, and other policymakers to make informed decisions to find the most cost effective path to reducing gas dependency. While what was presented in the stakeholder meeting was largely technical analysis, it's likely necessary to "translate" the results into a broader policy context for the multi-agency process to decide which projects are beneficial. Additionally, it is unclear how these results will be integrated in the current Resource Adequacy proceeding at the CPUC. It is clear that there must be comparison of transmission upgrades, which is CAISO jurisdictional, with existing gas generator and new preferred resource costs, which is CPUC jurisdictional. CEERT and NRDC recommend the results of the Local Capacity Potential Reduction Study be submitted in the Resource Adequacy proceeding as a proposal for compliance with recently passed SB 1136, which requires the	The ISO considers that providing better information about the opportunities and associated costs to reduce local capacity requirements for gas-fired generation will be helpful to the CPUC's IRP process in considering future fleet requirements. The local capacity technical study report in the draft transmission plan provides additional discussion of the results. It is not clear how the information looking out 10 years would be helpful in the Resource Adequacy proceeding, but will consider the suggestion going forward.

No	Comment Submitted	CAISO Response
	CPUC, in consultation with the CAISO, "shall ensure the reliability of electrical service in California while advancing, to the extent possible, the state's goals for clean energy, reducing air pollution, and reducing emissions of greenhouse gases". It is also clear that the composition of the renewable resource generation portfolio has critical implications for relatively near term LCR needs in Southern California. The Local Capacity Potential Reduction Study in the San Diego area graphically demonstrates that the composition of renewable resources in the Imperial Valley has a major impact on LCR needs in San Diego. Now that significant penetration of solar resources in coastal urban regions has pushed the area peak load past sunset, the lack of generation in Imperial County after sunset significantly reduces transfer capacity on the 500 kv system from the East. This significantly increases LCR needs and leads directly to a resource deficit that must be mitigated soon. The value of geothermal or some form of storage in Imperial County is thus significantly understated in RESOLVE/SERVM modeling at the CPUC. While the study suggests short term mitigation measures, it is clear that a long term solution to reduce gas fired LCR requirements in Southern California, reduce the market power of existing generation in the region, and improve the resiliency of the electric grid in light of pressures to phase out Aliso Canyon gas storage and deal with weaknesses in interstate gas transmission infrastructure will be required in the very near future.	The ISO notes that the load levels in the early evening were a reliability concern and dependent on local gas-fired generation to provide reliable service, even when the solar generation in the area had not yet reached levels such that the mid-day net sales load levels dropped below the evening load levels. The evening load levels and dependence on gas-fired generation are now more clearly an issue.

7. EDF-Renewables (EDF-R) and SPower Submitted by: Susan		
No	Comment Submitted	CAISO Response
7a	<u>Process issues</u> EDF-R and SPower strongly support the requests from other developer representatives at the stakeholder meeting for a more extensive stakeholder process, once complete explanatory written materials are available and stakeholders can better consider the assumptions and implications. As with other parts of the TPP, there is no written documentation explaining the new methodology. The Study Plan for this TPP cycle did not include any explanation or consideration of this new framework, and the only written material provided so far is the cursory explanation in the 300+ slide deck for the November 16th meeting. As a result of the lack of written materials thus far, key details are missing for this methodology and its major elements, including alternatives considered by the CAISO and the rationale for the CAISO choices made. The CAISO and stakeholders would both benefit from a more careful and considered process that leads to better and more robust methodology and assumptions.	The ISO held a stakeholder call on December 18, 2018 to offer a more in-depth review of the proposed revisions to the generation deliverability assessment methodology originally discussed in the 2018-2019 transmission planning process meeting on November 16, 2018. Stakeholders' written comments were generally supportive of the proposed changes, but raised various concerns regarding impacts to other processes and existing generation, and recommended that the ISO take more time to address these concerns. The ISO has considered those comments and decided to delay implementation of the revised methodology and instead continue to apply the current methodology in studies required by the Generation Interconnection and Deliverability Allocation Procedures for Cluster 11 phase 2 and Cluster 12 phase 1 efforts. Further stakeholder engagement on this topic is planned for the second quarter of 2019.
7b	<u>Portfolio deliverability requirement assumptions</u> EDF-R and SPower share Large-scale Solar Association (LSA) concerns about the lack of alternative renewables portfolio assumptions – in particular, use of CPUC portfolios in TPP studies where the Energy-Only (EO) portion (e.g., the 42MMT portfolio assumption of ~40% EO) is unrealistically low. Several large Load-Serving Entities (LSEs) claim to have contracted enough renewable supply to meet the 50% Renewables Portfolio Standard (RPS) requirement, and virtually all LSE competitive solicitations to date have required full deliverability. EDF-R and SPower suspects that the EO portion of the C10/Ph1 portfolio was extremely small. That difference partly explains the additional upgrades under the C10/Ph1 portfolio results not triggered with the 42MMT portfolio, even though the latter assumed a higher (~58%) renewables share.	Please see response 1b.
	<u>Variable Energy Resource (VER – solar and wind) output assumptions</u>	

<table>
<tr><th>No</th><th>Comment Submitted</th><th>CAISO Response</th></tr>
<tr><td></td><td>In TPP and GIP/GIDAP Deliverability Assessments, the CAISO proposes to assume VER output at 20% and 50% of nameplate for the Highest System and Secondary System Need scenarios, respectively – an approximate blend of output percentages for wind and solar-project output in different geographic areas during the identified peak hours for those two load scenarios. (See the table below, based on data in the TPP meeting slides.)
Wind and Solar Output Percentile (% of Nameplate) for Defined Scenario Hours & UCM<6%
<table><tr><th>RESOURCE TYPE</th><th>AREA</th><th>HIGHEST SYSTEM NEED
(HE18-HE22)</th><th>SECONDARY SYSTEM NEED
(HE15-HE17)</th></tr><tr><td rowspan="3">Wind</td><td>SDG&E</td><td>33.7%</td><td>11.2%</td></tr><tr><td>SCE</td><td>55.7%</td><td>20.8%</td></tr><tr><td>PG&E</td><td>66.5%</td><td>16.3%</td></tr><tr><td rowspan="3">Solar</td><td>SDG&E</td><td>3.0%</td><td>35.9%</td></tr><tr><td>SCE</td><td>10.6%</td><td>42.7%</td></tr><tr><td>PG&E</td><td>10.0%</td><td>55.6%</td></tr><tr><td>VER STUDY ASSUMPTION</td><td>→</td><td>20%</td><td>50%</td></tr></table>
Concerns include (but are not limited to) the following:
• Relationship of Deliverability Assessment VER output assumptions to CPUC-adopted Qualifying Capacity (QC) figures. The CAISO should consider using VER output estimates that better reflect the resource RA values.

The proposed output assumptions seem unrelated to the Technology Factors adopted by the CPUC. For example, the ELCC-based QC for CPUC-jurisdictional solar resources is about 30-45% of nameplate in April-September, but TPP and GIP/GIDAP Deliverability Assessments would dispatch those resources under the Highest System Need scenario at only 20% of nameplate.

Upgrades needed to support the CPUC-approved QC level may thus not be triggered in CAISO studies where Deliverability Assessment dispatch percentages are much lower. The very large VER curtailment estimates (15-20% in most areas for the Cluster 10 Phase 1 portfolio) in the TPP slides strongly indicate that this may happen under the proposed methodology.</td><td>As explained in the December 18th presentation, the monthly QC for wind and solar resources are calculated by the CPUC based on their ELCC methodology which is a stochastic simulation methodology identifying the probabilistic risk of resource shortages. The QC of the wind and solar represents the equivalent capacity value of those resources during the hours that are most likely to experience a resource shortage. The ISO's proposed revisions to the deliverability methodology utilize wind and solar resource production levels during resource shortage conditions determined by a similar stochastic simulation methodology to that utilized in the CPUC ELCC methodology.

The highest system need study production levels for wind are higher than the QC values.

The secondary system need study production levels for solar are approximately the same as the August NQC values and higher than the September NQC values.</td></tr>
<tr><td></td><td>• Use of blended/uniform VER output estimates: As explained below, there are large technology and geographic differences in expected</td><td></td></tr>
</table>

No	Comment Submitted	CAISO Response
	VER output levels under the two load scenarios. The CAISO should dispatch the resources based on the type and area to test deliverability and not attempt to use blended/uniform production levels. o Use of blended/uniform technology output estimates: Wind and solar output during the indicated hours are very different. Use of the blended figures may thus under- or over-estimate the upgrades needed. For example, use of the 20% figure for the Highest System Need scenario in a wind-heavy area would greatly underestimate the expected output of 30-70% of nameplate capacity, thus greatly underestimating the upgrades needed for deliverability. o Use of blended LSE-area output estimates: SCE-area output percentages are generally the largest for both wind and solar, while SDG&E-area figures are far smaller for the respective technologies. Thus, use of uniform output percentage estimates can be expected to fail to trigger needed upgrades for deliverability in the SCE area and to trigger unneeded upgrades in the SDG&E area.	The ISO provided wind and solar output values for each California PTO area and intends to use the corresponding values in each area in the analysis.
	<u>NQC for individual resources</u> The CAISO proposes to calculate deliverability as a percentage of QC for each resource under both load scenarios; the scenario results with the lowest deliverable percentage would determine the NQC. However, there is no explanation of why the lowest deliverability percentage would be used, or why the Highest System Need scenario (the primary scenario) should not be used even if it yields the higher deliverability percentage. Also, there is no information about how the proposed methodology would impact NQC for individual resources or LSE portfolios generally. It is unreasonable to ask stakeholders to comment on the new methodology without any indication of these impacts.	The resources should be deliverable under both scenarios to ensure that all load can be served during a resource shortage that could occur under either scenario. Because the proposed revisions to the on-peak generation deliverability methodology are reducing the generation output assumptions in the assessment, they can be expected to have no impact or a positive impact on the NQC of individual resources and LSE portfolios relative to the current methodology.

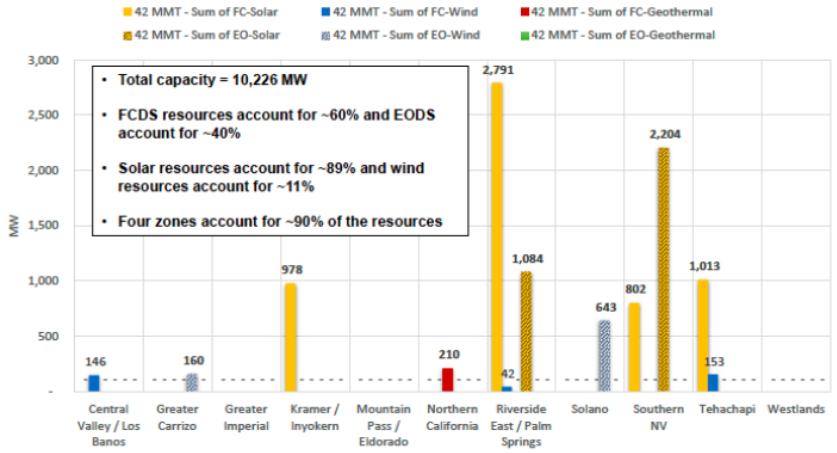
8. GridLiance Submitted by: Jody Holland		
No	Comment Submitted	CAISO Response
8a	First, GLW seeks clarification on the material CAISO presented related to its 2018-2019 TPP Policy-Driven Assessment, specifically on slide 45, "Key observations: Renewable curtailment, Further investigation of PCM simulations and exploration of options" (page 56 of the PDF) and on slide 46, "Next Steps" (page 57 of the PDF). Specifically, GLW would like to understand whether CAISO believes it an appropriate and ordinary outcome of the TPP that constraints would be identified, and whether these constraints would then be targeted for policy projects or economic projects. The language on these slides seems to suggest that the constraints identified were not ordinary, but instead are "distortions" or are in some other way anomalies that need to be managed in the modeling process rather than in TPP solutions. GLW also would like to understand if the constraints are to be managed in the modeling process, and if so, what mechanism would be used and how that would be accomplished. GLW is concerned that CAISO may intend to reduce the energy-only deliverability capacity with the CPUC's IRP process rather than considering constraint resolutions through the TPP. GLW would appreciate clarification on whether that is CAISO's intent and, if so, requests further information about why CAISO believes the constraints that are arising are outside of what is expected to occur through the study of the portfolios in the TPP. GLW seeks further explanation and clarification from CAISO about the intended process and any special consideration that is being applied to the VEA-area constraints and if they are in some way warranting treatment which is outside of the expected process.	The planning PCM was developed to capture transmission constraints and their impacts on renewable curtailments. Modeling the portfolios with transmission system limitations included in the production cost model allows constraints and their associated curtailment to be identified. As pointed out in the presentation, the implementation of calculating curtailment in the Production Cost Simulation software impacts curtailments results, especially for the planning model that include both system (zonal type) constraints and transmission constraints (nodal type). The results presented in this stakeholder meeting were preliminary, and were subject to change. In the review of the preliminary results, anomalous results were noted. It is common to need to refine production cost models based on preliminary results. In particular, the ISO reviewed the preliminary results and adjusted the precise interconnection points of generic resources to eliminate unnecessary curtailment while still achieving the renewable generation capacity goals for the particular zone. This choice of more practical interconnection points for the generic resources provides an overall more effective and practical production cost model, and is more aligned with the objective of studying the need for major area reinforcements, not transmission that would be triggered by individual generic resource interconnection points. Another change made for renewable generation modeling was to add future resources to the SPS under certain contingency conditions, which is an acceptable alternative and further reduced the renewable curtailment resulted from transmission congestions. The software vendor also addressed a modeling issue by providing a revised version of the software. Updated results have been included in the draft transmission plan and will be presented in the next stakeholder meeting.

No	Comment Submitted	CAISO Response
		The ISO provides transmission capacity information to the CPUC for consideration in developing renewable generation portfolios, and, when those portfolios are provided as base cases – with sensitivities – for policy-driven transmission needs identification, are the basis for policy-driven transmission as set out in the ISO tariff. The ISO provided full capacity and energy transmission capability estimates to the CPUC for use in the IRP portfolios developed and provided for the 2018-2019 CAISO TPP process. The CPUC provided portfolios for reliability planning, and only sensitivities for policy-driven analysis, but not a basis for approval of policy-driven transmission. However, the renewable area designations used in providing this information included nested constraints in identifying the transmission constraints limiting the export of resources from the VEA area, but it was not feasible to model these complex nested constraints in the portfolio development tool used by the CPUC. The ISO and CPUC are working closely together to ensure these constraints are properly considered in the portfolio development process going forward. However, as part of this policy-driven transmission analysis the ISO sought to identify conceptual transmission upgrades potentially needed by the 42 MMT portfolio.
8b	Second, GLW believes stakeholders would benefit from more explanation on the Deliverability Assessment Methodology Proposal outlined on slides 9 through 41 (pages 20 to 52 of the PDF). For example, GLW believes it would be useful if CAISO provided additional information regarding the proposed calculation and assumptions underlying the new proposal. GLW would be able to use such information to assess any impacts to its planning and operations, which would assist in its overall assessment of the new methodology. As other stakeholders expressed in the TPP stakeholder meeting held on November 16, 2018, GLW respectfully requests that CAISO hold a separate workshop to give a more in-depth explanation of the proposed methodology, including an additional opportunity for comment, prior to implementation.	Please refer to the response to 1a.

9. Imperial Irrigation District (IID) Submitted by: Jesus Martinez		
No	Comment Submitted	CAISO Response
9a	In regards to the San Diego – Imperial Valley area potential LCR reduction options, was a parallel El Centro 230:92kV transformer to the existing transformer considered in lieu of the series reactors on the S-line?	A parallel or upgraded El Centro 230/92 kV transformer was also considered. However, this option was found to be less effective than the line series reactor option. The incremental local capacity reduction benefits to the overall San Diego-Imperial Valley area of the transformer upgrade were found to be much smaller than the benefits of the series reactor, e.g., a 100 MW LCR reduction benefit associated with the transformer upgrade option compared to an approximately 600 MW LCR reduction benefit associated with the line series reactor alternative.
9b	What was the next most limiting facility found beyond the El Centro 230:92kV transformer?	Various underlying facilities, such as Niland-Niland SS 92 kV line, MWTap-Leathers 92 kV line, El Centro 230/92 kV transformer, Yucca 161/69 kV, and Pilot TP-El Centro 161 kV line, are the next limiting elements, depending on generation dispatch within IID as well as from APS Yuma area, to stay within IID's transmission facility ratings.
8c	What other LCR reduction options were analyzed but not considered due to cost-effectiveness in lieu of the 230kV S-line series reactors?	Other proposed transmission projects, which were submitted by transmission developers, were presented on slides 189 to 197 of the presentation material reviewed at the November 16 stakeholder session. The following is the list of the proposed transmission and preferred resource (i.e., battery energy storage) project submittals that the ISO received for evaluation of potential LCR reduction benefits: • SDG&E's Renewable Energy Express HVDC Conversion • SDG&E's Southern California Regional LCR Reduction • Nevada Hydro's LEAPS (Lake Elsinore Advanced Pump Storage) • City of San Diego's San Vicente Energy Storage Facility • ITC Grid Development and Southwest Transmission Partners, LLC's North Gila – Imperial Valley #2 500kV Line • NextEra Energy Transmission West's Red Bluff-Mira Loma 500kV Line • Tenaska's Sycamore Reliability Energy Storage project

10. Large-scale Solar Association (LSA) Submitted by: Tim Mason		
No	Comment Submitted	CAISO Response
10a	CAISO Must Provide Detailed Resources Adequacy Methodology Prior to TPP Modeling The CAISO presented a summary of a new methodology for assessing RA on the November 16 call, which it intends to implement in the 2018-2019 TPP plan development. While the methodology appears to be reasonable, the "devil is in the details" and CAISO has provided insufficient information in the presentation to determine if this methodology is robust. To illustrate this concern, the CAISO identifies as a data source for the analysis "CPUC ELCC data." This is a critical input into the RA assessment, but this has not been vetted to determine whether the CPUC data is appropriate for use in the TPP. CPUC calculates an ELCC value for solar in several different proceedings, including IRP, RA, and RPS, and these values are updated annually. The TPP presentation does not specify which CPUC proceeding the data is from, nor the vintage of the data. This is very concerning because the CPUC uses a variety of ELCC methodologies and different assumptions are used in each proceeding, making it is impossible for a TPP participant to understand if the ELCC methodology is appropriate for the TPP, and if the assumptions are consistent with CAISO TPP assumptions.	This information was provided during the stakeholder webinar on December 18th.
10b	TPP Should use CPUC IRP Reference System Plan as Base Portfolio LSA reiterates its concerns, originally expressed in comments on the TPP submitted on October 5, 2018, that the 2018-2019 TPP does not present a realistic CAISO operating future and substantially understates the need for additional transmission in the CAISO. Per the CAISO, the CPUC IRP 50% portfolio is used for the TPP reliability assessment. The CAISO states "No base portfolio was transmitted for the policy-driven assessment" though the "CPUC IRP Reference System Plan is being studied as a sensitivity in the 2018-2019 TPP policy-driven assessment to identify Category 2 transmission." LSA is unclear why the CAISO does not consider the IRP Reference System Plan as the "base portfolio" and recommends it treat this as the base portfolio rather than a sensitivity. As the Reference System plan, this is the CPUC "base case". LSA understands that the point of CAISO using the CPUC IRP portfolio	The CPUC decision selecting the 50% RPS default scenario portfolio for reliability analysis, and the 42 MMT reference scenario portfolio as a sensitivity case specifically stated that no base case would be provided

No	Comment Submitted	CAISO Response
	in the TPP process is to have greater coordination between resource procurement and transmission planning, and not using the Reference System Plan as the base portfolio undermines the goal and the process.	for policy-driven transmission planning purposes. This is set out in the draft transmission plan.
10c	TPP Assumptions on EODS Resources are Unrealistic 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 it in no way reflects the market for RPS-complaint resources. The CPUC portfolio of EODS resources was developed solely on the basis of total system economics, ignoring any market signals or individual LSE resource preferences. This is a fundamental flaw with the RSP and LSEA believes it will provide misleading information to market participants and policy-makers about the need for new transmission. Market buyers have no appetite for long-term contracts with EODS resources, as borne out by recent RFPs from Community Choice Aggregation (CCA) entities. Further, developers are not seeking to interconnect resources as EODS, a fact confirmed in the CAISO interconnection queue. Only one of the 29 solar resources seeking interconnection in 2018 selected EODS as the preferred interconnection. Unless there is a substantial market alteration, is unlikely that we will see the assumed contracting and development of EODS 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.	The CAISO has posted this comment and will ensure that CPUC staff have access to the comment to consider in the IRP portfolio development process.
10d	Energy Delivery from EODS Resources will Require New Transmission The TPP Default Portfolio includes 3,487 MW of new variable resources added by 2030, and the 42 MMT sensitivity portfolio includes 10,266 MW of new resources. In both cases CAISO assumes that 40% of the solar resources will be EODS. Per the reliability assessment discussed on the November 16 call, no additional transmission is needed since EODS resources are not required for reliability. This however, understates the need for transmission for these resources. While the EODS resources do not require new transmission for capacity delivery, it is highly likely that without new transmission there will be substantial curtailments due to transmission constraints. Most of the new EODS resources are located in areas of Southern California that already face critical	During the November 16th stakeholder meeting there were no Policy Driven scenario reliability results provided. These results will be included in the draft 2018-2019 Transmission Plan for stakeholder review and comment. The ISO notes that the portfolio used for reliability planning purposes in the transmission planning process was also used for economic-driven transmission planning purposes, and congestion – and potential mitigations to reduce that congestion - are studied at that time.

No	Comment Submitted	CAISO Response
	transmission constraints and, indicated on the CAISO chart below, the addition of these resources without new transmission will only exacerbate this.  It is impossible to provide more specific comments on the resource curtailment, or at what point additional transmission for EODS is justified by either economics or the need to comply with the SB100 requirements, since the CAISO TPP analysis to date has not included the production cost modeling of the portfolios. We are concerned however, that the production cost modeling will show a level of transmission- caused curtailments from the solar resources in these areas that will render these resources commercially infeasible.	
10e	Recommendations: Moving forward with the 1028-2019 TPP LSA recommends that the CAISO: • Provide comprehensive documentation of the new Resource Adequacy methodology and assumptions and allow stakeholders the opportunity to review and comment on this information prior to implementation in the TPP process. • To identify Category 2 transmission needs, conduct a reliability analysis assuming all incremental solar resources are FCDS resources and a case with all EODS solar. Compare the cost difference between these cases to the value of curtailment from a production cost model from the same quantity of solar resources.	The ISO assumes that the reference to "Resource Adequacy methodology" is referring to the generation deliverability methodology, and on that basis, please refer to the response to 1a. A reliability analysis will be provided in the draft 2018-2019 Transmission Plan. EODS and FCDS are treated the same in a reliability analysis.

No	Comment Submitted	CAISO Response
	• • For the production cost model results in the TPP Economic Assessment, provide aggregated monthly and detailed hourly curtailment data for individual resources modeled for all resources in each area where EODS resources are located. This will allow for the identification of specific areas of transmission constraint and quantify the value of reliving these constraints.	

11. LS Power Development, LLC Submitted by: Sandeep Arora		
No	Comment Submitted	CAISO Response
11a	(1) Economic Studies: CAISO staff presented its analysis highlighting the discrepancy between Day Ahead and Real Time congestion on the PACI interface. LS Power encourages the CAISO to redouble efforts to understand, accurately model, and develop a solution to this worsening problem. The analysis does help show how the congestion between the two markets can vary due to several reasons highlighted. While this is an effort in the right direction, unfortunately CAISO's presentation fell short in clearly articulating (1) how CAISO will be making modelling enhancements to its production cost models so it can accurately capture the Day Ahead congestion and (2) the timeline to make such enhancements. We recommend that CAISO work on these two items between now and release of the Draft Transmission Plan in January so stakeholders will have the opportunity to review and provide meaningful inputs before the Plan is finalized. LS Power reiterates the importance of correctly modelling PACI/NOB congestion. This congestion has been one of the top congestion issues in CAISO's Day Ahead Markets for last several years and CAISO ratepayers experienced a lost opportunity cost to the effect of $50 to $100 million each of the past 3 years. This signals the need for additional transmission capacity that should pay for itself by allowing more economic transfers from the Pacific NW into California. Since this congestion doesn't get correctly quantified in the current planning models, CAISO's Transmission Planning Process does not properly identify the need for additional transmission capacity to relieve the reported congestion and reduce ratepayer costs. LS Power submitted modelling recommendations to CAISO in the 2017/18 TPP through work that the Brattle Group conducted for LS Power. LS Power requests CAISO to respond and confirm whether those recommendations will be included in the 2018/19 Economic studies. Correctly capturing this congestion issue in its Economic studies should be CAISO's top priority for the following reasons: (1) As shown in Table 1, congestion has been increasing year over year despite the growth of renewables in California (which CAISO previously projected would cause a	In the presentation in this stakeholder meeting, the ISO has discussed the main reasons for the day-ahead Malin500 scheduling limits to be binding. Transmission capability can be a reason in certain circumstances. The primary cause of differences between the reported day ahead market results and both real time market and production cost modeling is access to existing and largely unused transmission scheduling capacity on neighboring systems. Accordingly, the ISO's focus is to first look for opportunities to access to that capacity, at least in this planning cycle. Further, the ISO planning PCM and simulation results have identified some level of transmission congestion in COI corridor, and in the same presentation, the ISO outlined potential modeling enhancements in order to capture the impact of Ancillary Service (A/S) on COI congestion. The ISO will continue to explore other possible reasons of day-ahead congestion.

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<tr><th>No</th><th>Comment Submitted</th><th>CAISO Response</th></tr>
<tr><td></td><td>reduction in this congestion); (2) Without accurately capturing this congestion in TPP studies, CAISO and entities in the Pacific NW will not be able to make informed planning decisions with respect to resolving the shortfall of transfer capability from the Pacific NW into California.
As shown in Table 1 below, over 75% of CAISO's import congestion charges are attributed to the two paths that connect the Pacific NW to California (PACI and NOB), which is a strong signal to CAISO that transfer capability on this path must be increased.
Table 1: Summary of Intertie Import Congestion (source: CAISO 2017 DMM Annual Report)
<table>
<tr><th rowspan="2">Import region</th><th rowspan="2">Intertie</th><th colspan="3">Frequency of import congestion</th><th colspan="3">Average congestion charge ($/MW)</th><th colspan="3">Import congestion charges (thousands)</th></tr>
<tr><th>2015</th><th>2016</th><th>2017</th><th>2015</th><th>2016</th><th>2017</th><th>2015</th><th>2016</th><th>2017</th></tr>
<tr><td>Northwest</td><td>PACI/Malin 500</td><td>26%</td><td>32%</td><td>28%</td><td>$6.2</td><td>$7.4</td><td>$12.2</td><td>$37,687</td><td>$51,139</td><td>$60,716</td></tr>
<tr><td></td><td>NOB</td><td>22%</td><td>27%</td><td>26%</td><td>$6.4</td><td>$6.7</td><td>$11.6</td><td>$12,375</td><td>$24,346</td><td>$40,503</td></tr>
<tr><td></td><td>Tracy 500</td><td>0.1%</td><td></td><td>0.1%</td><td>$6.2</td><td></td><td>$19.8</td><td>$20</td><td></td><td>$125</td></tr>
<tr><td></td><td>COTPISO</td><td>1%</td><td>6%</td><td>2%</td><td>$36.2</td><td>$12.7</td><td>$25.8</td><td>$97</td><td>$158</td><td>$117</td></tr>
<tr><td></td><td>Cascade</td><td>2%</td><td>2%</td><td>1%</td><td>$7.5</td><td>$19.5</td><td>$21.4</td><td>$101</td><td>$244</td><td>$67</td></tr>
<tr><td></td><td>Summit</td><td>0.2%</td><td></td><td>0.3%</td><td>$2.8</td><td></td><td>$9.4</td><td>$3</td><td></td><td>$8</td></tr>
<tr><td>Southwest</td><td>Palo Verde</td><td>3%</td><td>5%</td><td>2%</td><td>$13.2</td><td>$19.5</td><td>$22.3</td><td>$9,261</td><td>$12,942</td><td>$8,234</td></tr>
<tr><td></td><td>IPP Utah</td><td>22%</td><td>13%</td><td>18%</td><td>$2.9</td><td>$3.6</td><td>$7.9</td><td>$1,079</td><td>$803</td><td>$2,362</td></tr>
<tr><td></td><td>IPP DC Adelanto</td><td>1%</td><td></td><td>3%</td><td>$3.7</td><td></td><td>$9.2</td><td>$77</td><td></td><td>$950</td></tr>
<tr><td></td><td>Mead</td><td>1%</td><td>1%</td><td>0%</td><td>$14.4</td><td>$12.2</td><td>$21.5</td><td>$1,278</td><td>$1,023</td><td>$808</td></tr>
<tr><td></td><td>Market Place Adelanto</td><td>0.3%</td><td></td><td>0.2%</td><td>$18.9</td><td></td><td>$16</td><td>$330</td><td></td><td>$139</td></tr>
<tr><td></td><td>West Wing Mead</td><td>1%</td><td>3%</td><td></td><td>$34.3</td><td>$34.4</td><td></td><td>$330</td><td>$865</td><td></td></tr>
<tr><td></td><td>CFE_ITC</td><td></td><td>0%</td><td></td><td></td><td>$138</td><td></td><td></td><td>$56</td><td></td></tr>
<tr><td></td><td>Sylmar AC</td><td></td><td>0.2%</td><td></td><td></td><td>$4.8</td><td></td><td></td><td>$70</td><td></td></tr>
<tr><td></td><td>El Dorado</td><td>0.1%</td><td></td><td></td><td>$3.0</td><td></td><td></td><td>$14</td><td></td><td></td></tr>
<tr><td></td><td>Other</td><td></td><td></td><td></td><td></td><td></td><td></td><td>$3</td><td>$92</td><td>$308</td></tr>
<tr><td>Total</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>$66,381</td><td>$91,939</td><td>$114,336</td></tr>
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<tr><td>11b</td><td>(2) LCR Reduction Analysis:
LS Power appreciates the detailed analysis CAISO staff conducted in looking at options to reduce/replace gas generation in LCR pockets. We understand that the analysis conducted under this year's cycle is informational for the most part and going forward CAISO will likely conduct more analysis for the next Planning cycle. We note that the implications of implementing any recommendations from this analysis, whether it is new transmission and/or energy storage to reduce LCR, will likely have a material impact on Competitive Energy Markets and Transmission. Hence we encourage CAISO to conduct a robust policy discussion with the stakeholders on this. The discussion should be about criteria CAISO will use to determine whether LCR should be reduced within a</td><td>The comment has been noted. To clarify previous ISO remarks, the ISO indicated that the ISO expected the results to be largely informational as it was unlikely that many of the alternatives to reduce reliance on gas-fired generation for local capacity purposes would be economic. This was due to past efforts focusing on reducing local capacity requirements, and especially given the uncertainty about the need to retain some level of gas-fired generation for system and flexible purposes and the resulting conservative assumptions being used to assess the value of a reduction. However, the ISO noted that any opportunities that seemed reasonably viable would be considered and</td></tr>
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No	Comment Submitted	CAISO Response
	local pocket by building new transmission, impacts of such on the energy markets, and the use of competitive solicitation to minimize cost.	studied as potential economic-driven transmission solutions as per section 24.4.6.7 of the ISO tariff. This discussion is set out in chapter 4 of the draft 2018-2019 Transmission Plan.
11c	(3) Interregional Projects: While CAISO has not yet completed its studies for Interregional transmission projects, it generally presented its approach on how these projects will be reviewed. CAISO plans to continue to assess Interregional projects against Regional needs – policy, economic, reliability. LS Power generally supports CAISO's proposed approach on this and agrees that all three aspects should be evaluated for the Interregional projects. With respect to policy needs, we understand that CAISO will not be conducting a detailed modelling of out of state renewables for the 2018/19 TPP analysis; however, if Interregional projects can help improve import capability of renewables into California, the amount by which each project improves this should be captured. This will help guide CPUC IRP work for 2019/2020 cycle under which SB-100 recommendations will be studied. Also, CAISO should look at whether any Interregional projects can help address Aliso Canyon issues and/or can improve transfer capability from Pacific Northwest and reduce over-supply conditions that lead to renewable curtailment in California. Further, if an Interregional project can help reduce the procurement (MW) or overall cost of System Resource Adequacy that should be incorporated into the analysis as well. For economic analysis purposes, Interregional projects should be tested against the top congestion issues that CAISO noted at its Nov 16 presentation to see if these provide an effective solution. Further, unless CAISO correctly models Day Ahead scheduling limit based congestion that takes place for most CAISO interties, it will be significantly understating the need for an economic solution which Interregional projects can offer.	The comment has been noted and please refer to the response to 11a. The ISO considers that the "special study" efforts conducted in recent transmission planning cycles, in part to support both the RETI 2.0 initiative, provided a sound study basis to inform IRP efforts. Further, the ISO does not agree that resource planning decisions that belong with the CPUC's IRP process should be made in the ISO's transmission planning process. The ISO's focus has been to ensure the IRP process is informed with reasonable information about the implications and costs of considering out of state resources. Interregional projects that were potential alternatives for economic studies in the 2018-2019 transmission planning process were tested using the ISO's production cost modeling. As discussed in the past, the ISO's focus is to address the scheduling issues currently creating a gap between day ahead and real time market results, rather than moving to consider transmission solutions.

12. Nevada Hydro Company Submitted by: David Kates		
No	Comment Submitted	CAISO Response
12a	The Nevada Hydro Company ("Nevada Hydro") appreciates the opportunity to provide the following comments with regard to the November 16, 2018 presentation and discussion of the California Independent System Operator's ("CAISO") TPP process. As an initial matter, Nevada Hydro appreciates the confirmation on Slide 42 of Yi Zhang's presentation that CAISO will be studying LEAPS as an economic project. We also fully support the CAISO's affirmation on slides 2 and 3 of Neil Millar's presentation, that the CAISO economic study process will continue to utilize production cost modeling and the CAISO's TEAM analysis to further evaluate the broader economic benefits of projects that deliver reliability solutions and provide other ratepayer benefits such as meeting local capacity deficiencies and other cost savings. It is important for the CAISO to calculate and consider all economic benefits in determining whether ratepayers receive a net benefit from CAISO planning decisions. Doing so for all projects being studied also helps to ensure fair and equal treatment of all alternatives. Indeed, this is consistent with, and required by, the CAISO's TEAM approach which provides on page 2: "In the current ISO's planning practice, benefits can be categorized into: • *Production benefits: Benefits resulting from changes in the net ratepayer payment based on production cost simulation as a consequence of the proposed transmission upgrade.* • *Capacity benefits: Benefits resulting from increased importing capability into the CAISO BAA or into an LCR area. Decreased transmission losses and increased generator deliverability contribute to capacity benefits as well.* • *Public-policy benefit: Transmission projects can help to reduce the cost of reaching renewable energy targets by facilitating the integration of lower cost renewable resources located in remote area, or by avoiding over-build.* • *Renewable integration benefit: Interregional transmission upgrades help mitigate integration challenges, such as over-supply and curtailment, by allowing sharing energy and ancillary services (A/S) among multiple BAAs.*	The comment has been noted.

No	Comment Submitted	CAISO Response
	• *Avoided cost of other projects: If a reliability or policy project can be avoided because of the economic project under study, then the avoided cost contribute to the benefit of the economic project."*	
12b	Nevada Hydro also supports the CAISO's decision summarized on page 12 of Mr. Millar's presentation that: *Therefore, at this time…for the 2018-2019 cycle, the ISO:* • Will continue evaluating preferred resources including storage as possible solutions and considering "ratepayer benefits" on a case-by-case • Will calculate ratepayer benefits on both on production costs as well as potential market revenues • Will continue to rely on GridView modeling for assessing transmission congestion benefits and may supplement with PLEXOS analysis for system –e.g. market –benefits. • Will assess preferred resources and storage –whether storage is considered an RA resource or transmission asset –on an equal basis, in selecting preferred solutions in Phase 2 • Potential market revenue benefits to ratepayers of storage as a transmission asset may be taken into account and only if similar benefits to ratepayers can be attributed to preferred resources including storage procured as a market resource Importantly, the CAISO's intent to calculate and consider potential market revenues is critical to comply with the FERC's policy statement, where a storage project can receive cost-based rates and also participate in the market provided it reduces its rates to reflect any market revenues it receives. It is noteworthy that the CAISO SATA Proposal appropriately incorporates this rate treatment as an option. If a project agrees to reduce its rates to reflect market revenues, the resulting net impact on rates charged to customers must also be used to evaluate the Benefit to Cost Ratio for that project in determining the net economic impact on ratepayers of various transmission solutions. Any other approach would harm ratepayers by potentially selecting a higher cost solution. Nevada Hydro fully supports that part of the CAISO's approach in the SATA proposal that allows Projects to select different options for rate recovery and the crediting of market revenues. We would like to take advantage of this	The comment has been noted. Please contact the ISO team directly – Neil Millar or Robert Sparks - if you wish to arrange follow up discussions.

No	Comment Submitted	CAISO Response
	opportunity with respect to LEAPS in the current planning cycle and would like to discuss this further with planning staff.	
12c	Mr. Miller, on both slide 7 and slide 11, refers to the use of "conservative" assumptions and approaches to be used in evaluating storage proposals. Nevada Hydro suggests that these "assumptions and approaches" be made explicit to assure that at minimum they do not discount actual values.	Details have been provided in the draft 2018-2019 Transmission Plan. For clarity, those conservative assumptions are being used in the consideration of all alternatives studied for the purposes of reducing reliance on gas-fired generation in local capacity areas as indicated on slide 7, not just storage.
12d	Finally, Nevada Hydro understands that the CAISO believes that it can meet NERC reliability standards under an N-1/N-1 contingency by using RAS and operating procedures. However, it is important to consider other alternatives to addressing the pressing reliability issues in the San Diego areas, particularly long-term solutions. This is particularly important in light of the passage of SB 100 which calls for a move to zero carbon resources. The LEAPS Project can reduce or eliminate the need to drop generation and load at no additional cost to CAISO ratepayers because of the other economic benefits LEAPS provides. We trust that the CAISO will consider the reliability benefits of LEAPS as required by its TPP process both as a reliability solution and also as an economic benefit in the CAISO's study of LEAPS as an economic project.	The reliability benefits of LEAPS have been considered in the ISO analysis of this project.

13. NextEra Energy Transmission West, LLC (NEET West) Submitted by: Brian McDonald		
No	Comment Submitted	CAISO Response
13a	Economic Planning-Preliminary Results of Congestion and Economic Assessments Traditionally, the CAISO's vetting of economic study requests included detailed production cost modeling studies, while reliability projects have been primarily focused on identifying the least cost solution required to meet reliability. In recent TPP cycles, the CAISO has expanded the economic study efforts to a growing number of projects that in the past would have strictly been deemed reliability driven. NEET West appreciates the CAISO's study framework particularly the economic evaluation of transmission to reduce Local Capacity Requirements (LCR), as well as the evaluation of reliability driven transmission to determine any economic justification to upscaling a reliability project. NEET West supports these efforts and believes this approach will lead to projects that maintain reliability in the most economic fashion. The preliminary economic analysis of the key congestion found on slide 74 of the "Preliminary Results of Congestion and Economic Assessment" slide deck presented at the November 16, 2018 Stakeholder Meeting indicated three top congestion areas observed in the Default Portfolio: "SCE NOL-Kramer-Inyokern-Contol", "VEA", and "PG&E Westland-Fresno-Kern". Furthermore, the renewable curtailment analysis as discussed on slides 84-104, indicated three top curtailment areas in the Default portfolio as: "Tehachapi approximately 10%", "PG&E Westland's approximately 16%", and "SCE Eastern approximately 14%". Additionally, the 42 MMT scenarios show the following top three curtailment areas: "Tehachapi approximately 30%", "PG&E Westland's approximately 50%", and "SCE Eastern approximately 50%". The CAISO reported that transmission constraints are the main driver of renewable curtailment and that these constraints may mask other system issues. As the CAISO does not specify nor provide information on what specific transmission elements are causing the curtailments/congestion, NEET West respectfully requests an explanation of these specific transmission elements that are expected to cause curtailments in both the default and 42 MMT scenarios and to also include this information in the 2018-19 Draft Transmission Plan.	The ISO conducted detailed congestion analysis and evaluated all economic study requests following the ISO's tariff. Based on the analysis and evaluation results, and consideration of the benefits of other proposals, the ISO selected high priority studies for further detailed economic assessment. Updated and final results for congestion, curtailment, and economic assessment were included in the draft transmission plan and will be present in the next stakeholder meeting. The preliminary results identified and reported the major transmission congestions that caused the large part of the total renewable curtailment, as the stakeholder comment states. The ISO has reviewed and modified the assumption of renewable modeling, including moving generic resources to the receiving ends of the congested lines and adding future resources to the SPS model under contingencies. In the updated results with all these changes, which have been included in the draft transmission plan, to the contrary, system congestion is the primary reason for renewable curtailment. The ISO occasionally relaxes

No	Comment Submitted	CAISO Response
	To better study potential system constraints, NEET West is looking forward to receiving the economic planning study results for the evaluation of the Red Bluff – Mira Loma 500 kV Project. If time allows, CAISO should also look into evaluating the additional economic benefits of the Red Bluff – Mira Loma 500 kV Project and its impacts to the Eastern LA Basin Local Capacity Requirement (LCR) Sub-Area process. As outlined in the Local Capacity Requirements Potential Reduction Study - Greater Bay Area presentation, the recap of Eastern LA Basin Subarea 2028 LCR is driven by post-transient voltage stability resulting from the loss of Serrano-Valley 500 kV line followed by an N-2 of Red Bluff-Devers #1 and #2 500 kV lines. The LCR need to mitigate this post-transient voltage instability concern is determined to be approximately 2,678 MW. The economic evaluation of the Red Bluff – Mira Loma 500 kV Project should capture the additional economic benefits that the Project brings to the Eastern LA Basin LCR.	the export limit in production cost modeling simulations to assess the impact of reduced system-related congestion.
13b	Deliverability Assessment Methodology Proposal The CAISO's proposed deliverability assessment methodology includes reduced dispatch levels for intermittent resources down to 20% exceedance levels in the Highest System Need Scenario which roughly equates to a dispatch level of 10% of Pmax for Solar resources in PG&E and SCE, and 66.5% and 55.7% for wind resources in PG&E and SCE respectively. When compared to the current methodology, the CAISO estimates the proposed methodology will result in less deliverability transmission upgrades when applied to Queue Cluster 10 study results (slide 39). While NEET West is encouraged by the CAISO's commitment to making accurate decisions with regards to the state's transmission needs, NEET West recommends CAISO to explore: 1. The financial impact that this methodology has on generation owners due to future extreme congestion. The immediate result of this methodology will be a benefit to generation development by enabling more generation to achieve Full Capacity Deliverability Status without building additional transmission; however the CAISO should explore the long term impact that extreme curtailment will have on generation during the non-studied hours when generation exceeds the assumed 20% exceedance levels. For example, the SCE Tehachapi, SCE Eastern, and PG&E Westland's areas	The ISO assessed the expected curtailment of generation in the 42 MMT portfolio and the need for Category 2 Policy Driven transmission upgrades. Please refer to the draft 2018-2019 Transmission Plan. The ISO has agreed to provide additional stakeholder consultation on the proposed methodology, but as noted in response to comment 2b, the purpose of the deliverability analysis has been limited to ensuring that sufficient transmission is available to provide reasonable assurance that resource adequacy capacity can be delivered to load at times of need. However, the deliverability analysis has resulted in identifying a few policy-driven transmission projects needed for a large amount of renewable generation in situations where the resource adequacy deliverability and policy-driven needs overlapped. Going forward there may be less overlap between these two separate types of needs. The ISO expects some of these issues can be discussed during the stakeholder consultation that is expected to be initiate in Q2 regarding the deliverability methodology. .

No	Comment Submitted	CAISO Response
	show curtailment values in the 42 MMT scenario of roughly 34.7%, 47.6%, and 55.5% respectively (slide 21). NEET West encourages the CAISO to explore how curtailment at this level would impact the future development and financial viability of renewable resources. In particular, NEET West is concerned about the financial implications that curtailment has on generator owners in instances where the renewable generation is not compensated for during hours of curtailment.	
13c	2. That the States Renewable Portfolio Standards (RPS) can be met with this new methodology given the level of curtailments. 50% of retail electricity sales must be met with renewable energy by 2030. The proposed methodology will lead to the curtailment of renewable generation during hours where the generation exceeds the assumed 20% exceedance levels and curtailed energy does not count toward the 50% RPS. NEET West encourages the CAISO to determine if 50% of the energy sales can be met by renewable resources under the proposed methodology which includes extreme curtailment.	The ISO will consider the comment in determining next steps in stakeholder consultation on the proposed methodology. The ISO notes, however, that area network upgrades were not anticipated to be required even under the current more demanding existing methodology, and, if that continues to be the case, transitioning to the proposed methodology would not result in a materially different topology. More local deliverability network upgrades would also have to be considered, however.
13d	Local Capacity Requirements – Potential Reduction Study Results The CAISO committed to complete the LCR analysis for the current Request Window project submittals to quantify local capacity reduction benefits. To this point, NEET West would appreciate the CAISO's analysis of all previously submitted NEET West projects into the LCR analysis. We believe several of these project proposals could provide potential LCR reduction benefits. For example, the Sycamore 230 kV Energy Storage Project and the Sycamore – Suncrest 230 kV Transmission System Project submitted by NEET West into the 2018 Request Window can help reduce the San Diego Subarea, which is limited by a thermal overload to the Sycamore – Suncrest 230 kV line. Similarly, the Red Bluff – Mira Loma 500 kV Transmission Project could help reduce LCR for Eastern LA Basin subarea which is post-transient voltage stability limited resulting from the loss of Serrano-Valley 500 kV line followed by an N-2 of Red Bluff-Devers #1 and #2 500 kV lines. Similarly, the Cayetano BESS alternatives may provide benefits for the PG&E Greater Bay Area LCR. The CAISO will complete the LCR analyses (for "informational purposes only") for Request Window project submittals and will include results in the draft 2018-	The ISO studied all projects submitted for the purpose of reducing local capacity requirements in the areas and sub-areas that were selected in this round for study, as well as the reliability request window submissions, economic study requests and interregional transmission projects that purported to have benefits in reducing local capacity requirements in those areas and sub-areas. There were several reliability request window projects submitted into the request window that were focused on areas or sub-areas that were not selected for detailed analysis in this cycle, and those did not receive further consideration beyond the reliability analysis. Please refer to the draft transmission plan section 4.8.8.

No	Comment Submitted	CAISO Response
	2019 Transmission Plan. NEET West encourages CAISO to consider finalizing the assessment of less complex LCR areas/subareas and release the final project solutions into the 2018-19 TPP.	
13e	Consideration of Energy Storage as a Transmission Asset (SATA) NEET West is encouraged to see that Energy Storage alternatives were highlighted as potential solution(s) to address local capacity resource issues in the 2018-19 assessment as discussed on November 16th. To further support this process, NEET West encourages CAISO to consider several energy storage solutions in the local capacity reduction benefit analysis: Suncrest/SDG&E area (BESS SATA 210 MW connecting to Sycamore 230 kV), Cayetano/PG&E area (4 BESS SATA connecting to 230 kV system ranging from 100-300 MW).	The comment has been noted. Please refer to the response to 13d above.
13f	2018-19 TPP Reliability Projects on Hold – PG&E Area - Review of Previously Approved Transmission Projects and consideration of NEET West's proposed Lopez – Divide 230 kV reliability solution as replacement for Midway – Andrew Project NEET West appreciates the diligence that the CAISO has demonstrated in its review (including need and cost) of both previously approved and new projects proposed by the Participating Transmission Owners (PTO's). In reviewing the Midway – Andrew project, the CAISO has consistently reported a reliability assessment need which consists of multiple severe thermal P2 and P6 contingent overloads in the 115 kV system from/around the Mesa Substation. The CAISO has also reported that there is no reasonable time to take outages for maintenance and that long term mitigation is still required. The CAISO is continuing further assessment of the Midway – Andrew Project and is considering conversion of one of the 500 kV lines from Midway to Diablo to 230 kV, increasing the winter ratings on the Sisquoc-Santa Ynez, installing a 20 Mvar capacitor at Cabrillo, and an SPS to shed load under P6 contingencies. While NEET West appreciates CAISO's detailed due diligence on this project, we would like to discourage non-consequential load dropping in lieu of expanding transmission to mitigate P1-P7 contingencies on the 115 kV or higher voltage systems. This recommendation is consistent with the CAISO's planning standards which are intended to continue avoiding the need to drop load in high density urban load areas due to, among other reasons, high	The Midway-Andrew project has been renamed the North of Mesa upgrade and remains on hold. The south of Mesa component has been separated into a standalone project named the South of Mesa Upgrade, which is not addressed byte h NEE West proposal, and approval of that project is recommended in this 2018-2019 Transmission Plan.

No	Comment Submitted	CAISO Response
	impacts to the community from hospitals and elevators to traffic lights and potential crime. Santa Maria (pop. 130,4471), Lompoc (pop 51,509), and Arroyo Grande-Grover Beach (52,000) are all identified on the 2010 Census identified Urban Areas (UA's) of 50,000 of more. A post contingency load dropping SPS alternative project at any of these locations is undesirable and should be avoided in lieu of building transmission. Instead, NEET West encourages CAISO to select the most viable, long term, transmission alternative that will solve comprehensive reliability needs for both South and North of Mesa areas. To address the overall need in this area, NEET West proposes a new reliability transmission solution that consists of a new Lopez – Divide 230 kV transmission line, a new Divide 230/115 kV substation, and a new 115 kV Divide – Sisquoc 115 kV line. The inclusion of the NEET West's proposed Lopez-Divide 500/230 kV Project resolves the same potential overloads to the Central Coast Los Padres (CCLP) system identified in this year's Preliminary Reliability Assessment that are resolved by similar transmission alternatives considered by the CAISO; however, it does it at a much lower capital cost. The NEET West Lopez-Divide Project also eliminates the significant reliance on the Mesa/Santa Maria RAS and Divide RAS. NEET West recommends the CAISO's 2018-19 TPP cycle include a special assessment of the Mesa/Santa Maria area and to evaluate and rank all of the considered alternatives, including the NEET West project alternative, while focusing on recommending the most cost effective solution that will be included in the 2018-19 TPP. A table of comparisons of all alternatives along with the specific costs and benefits should be reported and included into the draft TPP.	

14. North Gila Imperial Valley 2 (NGIV2) Submitted by: Jeffrey Wyman		
No	Comment Submitted	CAISO Response
14a	NGIV2 is encouraged that the CAISO has used the CPUC integrated resource plan (IRP) 50% RPS portfolio for both the reliability and economic assessments in the 2018-2019 TPP. Furthermore, NGIV2 believes CAISO is justified in looking at sensitivities of using the IRP 42 MMT portfolio, and removing the 2000 MW net export limit for the economic analysis. Internal studies have shown that the NGIV2 project provides increased production cost savings, and local capacity requirement (LCR) reduction benefits in scenarios of increased carbon reduction.	The comment has been noted. For clarity, the sensitivity of removing the net export limit is solely to assess the amount of system versus transmission-related congestion inside the ISO footprint, not to suggest that the 2000 MW limit is not needed.
14b	With the NGIV2 project submittal in the 2018-19 Western Planning Regions Interregional Coordination Process, the consideration of Interregional Transmission Projects to meet CAISO regional needs – and specifically, the study results showing the economic benefits provided by the NGIV2 project to the CAISO region – is of great interest to the NGIV2 project team. At the update meeting, the CAISO indicated that the Interregional Project results would be shared in the next phase of the TPP. NGIV2 would like some clarification on when it might see the results, and whether NGIV2 would be able to review and comment on those findings ahead of them being posted in the January Draft TPP Report. NGIV2 would also like clarification as to whether the CAISO would look at the same sensitivities in assessing Interregional Transmission Projects as were applied to the baseline economic analysis (42 MMT portfolio and removing 2000 MW export limit). Finally, when the results are provided, the NGIV2 team would like to see the LCR reduction for the San Diego-Imperial Valley Area with NGIV2 and without the potential LCR reduction options identified by the CAISO in the November 16 TPP update meeting.	The ISO has completed its detailed congestion analysis and evaluation of economic study requests – including local capacity benefit consideration where relevant – and posted the results in the draft transmission plan. The ISO's aggressive study cycle does not provide time for additional stakeholder consultation opportunities between completion of the results and documentation in the draft transmission plan. For clarity, the ISO's sensitivity analysis of removing the 2000 MW export limit is a tool to help delineate between system-wide congestion and intra-ISO transmission congestion, and not that the removal of the export limit is appropriate for considering congestion affecting import and export paths for decision-making purposes. Similarly, the use of the 42 MMT scenario in this transmission planning cycle was exclusively as a sensitivity in the policy-driven transmission analysis, and is not the basis for considering approvals.
14c	In addition, NGIV2 is very interested in the 2000 MW of storage identified in the IRP portfolio, and looks forward to CAISO's analysis of the optimal locations of the storage to reduce renewable curtailment. If results are shared in the January Draft Report, NGIV2 recommends that the CAISO explain how they will be implemented into study cycles moving forward, and how they may go about soliciting projects – which could include both transmission projects and storage – to meet the identified need for reduced curtailment of renewable resources.	This comment has been noted. The ISO does not have a methodology for unilaterally siting generic storage resources selected in CPUC resource planning exercises, and further discussion with the CPUC will be required to address this in future planning cycles.

No	Comment Submitted	CAISO Response
14d	NGIV2 would like clarification on if/how remedial action schemes (RAS) are accounted for in the production cost models. RASs can also have impacts on the LCR reduction and renewable curtailment studies, and NGIV2 recommends that any relevant RASs are accounted for in those studies as well.	Existing and proposed RAS are incorporated in the LCR and production cost simulations.
14e	NGIV2 thanks CAISO for evaluating the project for LCR reduction benefits in the San Diego- Imperial Valley (SD-IV) Region, and believes that when coupled with the production cost savings and reductions in renewable curtailments, the project will perform well against the other options presented, especially in the greater carbon reduction portfolios. As indicated in previous comments, NGIV2 and SDG&E are also continuing to coordinate studies to look at the Renewable Energy Express Transmission Project (REX) to explore possible capital cost, operational, and system optimization synergies between the two projects that may result in increased benefits provided to the SD-IV Region. NGIV2 understands that with five solution options to evaluate, LCR reduction results and recommendations were not available for the SDIV Region on November 16. NGIV2 requests an opportunity to review and comment on those results once posted in the Draft TPP Report or in an additional TPP Stakeholder meeting, and that the CAISO build in sufficient time to consider and respond to the feedback provided.	There will be an opportunity to comment on the draft Transmission Plan as shown in the study plan posted on the ISO website. Note that the stakeholder meeting to review the draft transmission plan is now scheduled on February 14.

15. Pacific Gas & Electric (PGaE) Submitted by: Matt Lecar		
No	Comment Submitted	CAISO Response
15a	Deliverability Methodology During the stakeholder meeting, CAISO presented for the first time a new proposed Deliverability Assessment Methodology Proposal, applicable to intermittent wind and solar resources. In the discussion, several stakeholders voiced interest in a further technical workshop to explore the details of this methodology. PG&E concurs that such a workshop would be helpful. PG&E understands that the proposed methodology will assume lower dispatch levels of wind and solar resources compared to the current dispatch levels that are used within the existing deliverability methodology for resources that count towards Resource Adequacy (RA). This change may allow more resources to obtain deliverability with fewer deliverability network upgrades but it may also cause resource curtailments to become even more frequent. As CAISO further develops the new methodology, PG&E recommends that CAISO differentiate between curtailments for Energy Only (EO) versus Full Capacity Deliverability Status (FCDS) resources. In actual operating conditions, EO resources may displace FCDS resources in the economic dispatch. EO resources are interconnected without Deliverability Network Upgrades (DNU) and curtailment is assumed to mitigate any other reliability problems. FCDS resources are interconnected with DNU to enable the resource to deliver its output to the grid under specific study assumptions. Currently, the CAISO's studies treat economic curtailment and reliability curtailment identically for both EO and FCDS resources. However, they can have different economic consequences. Economic curtailment represents a direct cost (in terms of lost output availability of the resource) only to those customers that hold the contract with a given resource. Reliability curtailment, by contrast, is not compensated, and EO resources are not assumed curtailed consistent with the terms of their interconnection. This creates costs that are not directed to the EO resources that interconnected under specific conditions. Additionally, the CAISO's proposed methodology recommends a shift in the assessment hours to the new evening hours (H18-H22) under the "peak sale" scenario. This shift results in a 20% exceedance level to ensure higher certainty	Please refer to the response to 1a. Wind and solar curtailments are grouped in three categories: economic, self-schedule reductions, and exceptional dispatch. The economic curtailments apply only to generators that bid into the ISO Market. The other two categories apply to sources that do not provide bids, although resources that submit bids may also receive exceptional dispatch instructions in exceptional circumstances. None of the categories are based on FCDS or EODS – the deliverability status of the resource is not a factor in market operation.

No	Comment Submitted	CAISO Response
	of renewable resources but any assumption of solar deliverability in H20-H22 does not fit the period when the resource would provide energy to the grid.	
15b	Economic Assessment PG&E supports the economic studies performed by the CAISO for this TPP cycle. The CAISO identified a number of facilities that resulted in congestion for the Westland-Fresno-Kern Area and we encourage the CAISO to continue evaluating this area for potential upgrades that can be identified to effectively relieve the congestion. The economic studies presented also identified a single facility in the PG&E system, Giffen 70 kV Line, that alone has an expected congestion duration of 1,912 hours due to the solar generation. PG&E requests that the CAISO consider reconductoring of the Giffen 70 kV line and, if found to be an effective solution, approve it as an economically driven project as a part of this TPP cycle.	The ISO has conducted detailed congestion analysis, after selecting high priority studies and all study results have been included in the draft transmission plan.
15c	LCR Special Study PG&E appreciates the CAISO's economic evaluation of the potential solutions that would reduce the capacity requirements in local areas. Based on the load shapes provided previously, there appear to be a number of LCR areas and sub-areas that would be ideal candidates for preferred resource solutions to replace uneconomic gas-fired generation. PG&E originally requested that the CAISO confirm the specific estimate as to whether energy-limited resource characteristics for a number of areas were feasible. PG&E requests additional guidance on the potential for the areas originally submitted in order to determine the suitability of preferred resource solutions.	The ISO has provided a significant amount of information in the 10-year local capacity technical study provided in the draft transmission plan that should assist PG&E in those considerations.
15d	Assessment of Previously Approved Projects On-Hold PG&E continues to appreciate and support the CAISO's efforts to re-evaluate previously approved projects in the PG&E service territory with "on-hold" status from 2017-2018 TPP Re-Assessment. PG&E has comments for the following two "on-hold" projects: • Diablo Canyon Voltage Support Project: CAISO intends to cancel the Diablo Canyon SVC project which was proposed primarily to meet Nuclear Power Interface Requirements (NPIR) and NUC-001-3 reliability standard. As part of this project reassessment CAISO, instead, proposes to solely	The comment has been noted, and the ISO will work with PG&E on these issues.

No	Comment Submitted	CAISO Response
	rely on local protection schemes such as the Divide or Paso Robles UVLS to meet the NPIR and NUC-001-3 until Diablo Canyon retires in 2025. PG&E will need to work closely with CAISO to evaluate this recommendation and its potential impact to compliance with the reliability requirements. As currently designed, the existing local UVLS are not intended to monitor the voltage at Diablo 230 kV bus, thus such expansion of the local scheme would need to be investigated. In addition, the settings of these UVLS are not designed to meet NPIR, so new settings may need to be developed and tested to ensure the NIPR and NUC-001-3 requirements are met.	
15e	• Midway – Andrew Project: PG&E agrees with the alternatives that CAISO presented and which are now being considered. However, since repurposing of one of the Diablo Canyon-Midway 500 kV lines to 230kV line is part of the new proposed scope, such change would have to fully evaluate the impact on the Path 15 flows as well as any potential impacts on its rating.	The comment has been noted and will be considered in future evaluations.

16. Public Advocates Office Submitted by: Kanya Dorland		
No	Comment Submitted	CAISO Response
16a	Revised Deliverability Methodology • The CAISO should periodically revisit the qualifying capacity of wind and solar for deliverability because the resulting capacity assumptions directly influence procurement decisions as well as new transmission and interconnection investments that may be needed to meet the state's Renewable Portfolio Standard (RPS) targets. Also, wind and solar renewable resource technologies are constantly advancing their capacity capabilities.	The ISO plans to periodically update the solar and wind production level assumptions in the deliverability study based on the latest available data. For clarity, the CPUC determines qualifying capacity levels.
16b	• The CAISO should convene a separate stakeholder initiative to examine the implications of the proposed deliverability methodology changes, and how they would be implemented to ensure resource capacity accounting matches with transmission capacity. Specifically, how the export capability from renewable generation pockets will be determined with the proposed reduction of solar capacity to 10% in the evening, and the proposed solar capacity ranging between 35-55% during the day. The CAISO should develop an Issue Paper and Straw Proposal that explains how the deliverability methodology would be used to determine transmission needs and allow stakeholder discussion on the proposed deliverability methodology implementation.	Please refer to the response to 1a. For clarity, the deliverability methodology affects the results of generator interconnection requests through the ISO's generator interconnection process. The CAISO relies on production cost modeling combined with powerflow analysis, as well as the generation deliverability methodology, in the transmission planning process to determine the need for economically and policy driven transmission needs.
16c	CAISO Production Costs Results • The CAISO's Production Cost Modeling results presentation identified the load areas within the CAISO footprint with existing significant congestion and renewable curtailment and expected new renewable development. The CAISO should provide its Production Cost (GridView) Modeling data to the California Public Utilities Commission's (CPUC) to inform the Integrated Resource Planning (IRP) process. This data could be used to refine the transmission capability estimates for use in the RESOLVE model. The results from the RESOLVE model could then be used to further inform the policy and economic assessments in the following TPP cycle. The results would also assist with determining the preferred locations for storage procurement that would address the areas with significant congestion and renewable curtailment. The congestion and renewable curtailment in these	The comment has been noted. The ISO expects to continue coordinating with the CPUC in providing transmission capability information and actively participating in the CPUC's IRP process.

No	Comment Submitted	CAISO Response
	areas will likely increase with the expected new procurement in these areas to meet the state's RPS targets.	
16d	• To achieve a reasonable resource portfolio recommendation, a feedback loop between the proposed CPUC's IRP procurement determinations and the CAISO TPP transmission capacity determination is essential. This feedback loop should also involve public presentations to stakeholders that explain the preliminary determinations that led to the recommended renewable generation locations and should seek stakeholder input before finalizing these locations.	The preliminary determinations that lead to a feedback into CPUC's IRP process are shared with the stakeholders as part of the TPP stakeholder meetings and the draft transmission plan. The way TPP timelines are designed, before this information is formally relayed to the CPUC, the ISO stakeholders get the opportunity to provide input and comments on the information. Renewable resource location selection (resource mapping) is carried out by the CPUC and CEC staff with some assistance from the ISO. IRP proceedings would be an appropriate forum to provide input regarding resource mapping.
16e	• The Public Advocates Office supports the CAISO's proposal to study options to address local transmission congestion that results in curtailment. To this end, the Public Advocates Office recommends the CAISO update the energy-only deliverability status transmission capability estimates. The Public Advocates Office also requests detailed information regarding the Production Cost Modeling results. Specifically, we request information on the costs associated with the reported cumulative congestion hours for each area, branch group, or constraints. This cost information should be included in the draft final 2018-2019 Transmission Plan.	The ISO has provided considerable curtailment information in the draft transmission plan.
16f	Local Capacity Requirements and Potential Reduction Solutions As stated in comments submitted on the 2018-2019 TPP Preliminary Results, the Public Advocates Office requests that the CAISO assist in determining the economic value of proposed mitigations to reduce Local Capacity Requirements (LCR) and in comparing the costs of possible reduction solutions. To facilitate this exchange of information, the Public Advocates Office requests that the CAISO provide a summary table with all the proposed LCR reduction and mitigation solutions, the amount of LCR relief the solutions provide, and both the total solution costs and the solution costs per megawatt. This table would allow stakeholders to compare solution costs and should be included in the draft final 2018-2019 Transmission Plan. This LCR reduction solution cost summary table should also be provided for consideration in the CPUC's IRP proceeding.	Regarding the requested table, please refer to the responses to 2d and 3e above. The results of the study have been included in the draft 2018-2019 Transmission Plan and the ISO will consider options for presentation of the results through further discussion and through its participation in the IRP process. There are nuances in the analysis that do not lend themselves to simple tabulation, however, especially in the consideration of options for reducing reliance on local gas-fired generation capacity.

No	Comment Submitted	CAISO Response
	The CAISO, in coordination with the Department of Market Monitoring (DMM), should determine whether generation owners in each LCR area have market power. The CAISO should also determine where Load Serving Entities (LSEs) can meet local area needs without specific resources or set of resources owned by one entity. The CAISO and the DMM should analyze whether each proposed LCR reduction solution will resolve the market power issue. Once LCR needs are reduced to the point where a resource does not have market power, the generation in the area should be able to compete to meet the remaining LCR needs. Information on how LCR reduction solutions reduce market power should guide cost comparisons between the proposed solutions and alternatives, such as continued procurement among competitive local area resources. The Public Advocates Office also requests information on the necessity of any of the LCR reduction solutions in the near term.	The ISO assumes by "market power" the PAO is referring to cases where there is no more generation in a local capacity area or sub-area than is needed to meet the need; i.e. all the generation in the area is required. The ISO's annual local capacity technical studies provide the information about needs and available resources, as does the 10-year local capacity technical study undertaken in this transmission planning cycle. As market power concerns are mitigated by the presence of the reliability must-run framework in the ISO tariff, the question is then of the value of local capacity requirement reductions. The ISO has considered valuing local capacity requirement reduction measures differently in areas where there are RMR arrangements in place, versus not, and the ISO expect more discussion on this issue. Please refer to section 4.3.4 of the draft transmission plan.
16g	<u>Slow Demand Response</u> The CAISO presented the available megawatts of "slow" demand response in the San Diego Imperial Valley Area and San Diego subarea, but not in the Eastern Los Angeles Basin subarea. The Public Advocates Office requests that the CAISO assess the available megawatts of slow demand response for pre-contingency purposes in all load areas and provide information by each LCR area. Such information would assist the CAISO and stakeholders in understanding how slow demand response could assist with reducing LCR needs and potentially avoid the need for additional LCR reduction solutions in each area.	The comment has been noted. The CAISO would certainly evaluate the effectiveness of existing slow demand response that has the necessary characteristics before recommending approval of a new transmission upgrade or resource procurement.
16h	Storage as a Transmission Asset The CAISO stated that it does not anticipate that the Storage as a Transmission Asset (SATA) initiative will receive Federal Energy Regulatory Commission (FERC) approval in time for the completion of the 2018-2019 TPP, but it will still evaluate storage as the preferred solution on a case by case basis. The Public Advocates Office continues to support the consideration of SATA to meet identified reliability and economic transmission needs in the 2018-2019 TPP.	Storage was evaluated in the transmission plan in reliability and economic-driven planning analysis, recognizing that the assessment of performance could also be made on the basis of a local capacity resource under an appropriately-structured contract, notwithstanding the delays in the SATA stakeholder initiative.

No	Comment Submitted	CAISO Response
	As stated above, the Production Cost Modeling (Grid View) data could be used to inform future mandated storage procurement locations that could reduce congestion and renewable curtailment as well as provide other grid benefits. Given that new storage procurement is underway, the Public Advocates Office recommends allowing existing storage projects to bid on SATA projects following a FERC decision on the CAISO's SATA cost recovery mechanism proposal.	It is not clear to the ISO what is meant by having existing resources "bid on SATA projects" – as existing resources, whether conventional or preferred (including storage) are already considered in assessing local area needs. This is an issue that can be further explored when the SATA initiative is re-engaged.
16i	Reliability Transmission Projects On-Hold Support Further Review or Cancellation of the Midway-Andrew Project The Midway-Andrew project is among the seven projects that the CAISO recommends putting on-hold or canceling in the Pacific Gas and Electric Company's (PG&E) service area of the CAISO-controlled grid. As stated in the Public Advocates Office's November 30, 201712 comments on the Midway-Andrew Project, the Public Advocates Office generally supports further analysis of the need for the Midway-Andrew project. This analysis should consider the existing transmission lines in the project area and their ability to solve remaining reliability issues, if any, after the retirement of the Diablo Canyon Power Plant. As noted, there are a number of 500 kilovolt (kV) lines and 230 kV lines in the Diablo Canyon-Midway-Andrew project area that may be under-utilized or experience lower demand after the retirement of the Diablo Canyon Power Plant. Additionally, there are load shedding schemes in the project area that should be taken into consideration when evaluating the Midway-Andrew project. The Public Advocates Office also recommended that any additional presentations on this project and its analysis include the current cost estimates and benefit-cost ratio (BCR) calculations for the project as well as the possible alternatives. The Public Advocates Office made this request because the Midway-Andrew project costs have increased since presented in 2012. To illustrate, PG&E's original cost estimate from the 2012-13 TPP for the Midway-Andrew project was $120 to $150 million. The project cost estimate in a PG&E 2016 FERC filing was $414 million. In subsequent 2017 PG&E Assembly Bill (AB) 97017 reports, the cost ranged from $215 million to $700 million. This broad range of cost estimates makes it difficult to assess the value of removing the existing Special Protection System from the project area and proceeding with the Midway-Andrew project as proposed. No costs have been provided for	The project is recommended to remain on hold, as set out in the draft transmission plan. Regarding benefit to cost ratio calculations, these can be considered when necessary to consider economic-driven projects or to select among options to address reliability or policy needs. However, the ISO declines to calculate the benefit to cost ratio of not complying with mandatory standards.

No	Comment Submitted	CAISO Response
	any of the other alternatives under consideration. While this is a project to increase system reliability above the minimum required by North American Electric Reliability Corporation (NERC) or CAISO standards, a BCR for this project has never been presented publicly. While the Midway-Andrew project is on-hold, the Public Advocates Office also recommends that PG&E not conduct any engineering design or environmental studies to support this project to avoid accruing any unnecessary costs for a project that may later be cancelled.	
16j	Support Cancellation of the Gates-Gregg 230 kV Line Project The Gates-Gregg 230 kV line project is also among the seven projects that CAISO recommends putting on-hold or cancelling in PG&E's service area within the CAISO controlled grid. As stated in the Public Advocates Office November 30, 201721 comments on the CAISO 2017-2018 TPP and February 22, 2018 comments on the final CAISO 2017-2018 Plan, the Public Advocates Office recommends canceling the Gates-Gregg project as soon as possible to avoid incurring any unnecessary carrying costs. The cost of this project has increased significantly since approved in the 2012-2013 TPP from $145 million to $200-$250 million in 2018. Therefore, the project no longer meets the BCR threshold per the CAISO's determination. The CAISO has also determined that the project is no longer needed for reliability or transient stability.	The comment has been noted. The ISO notes that, per prior comments from PG&E in past transmission planning cycles regarding the project being on hold, ratepayers have not been experiencing costs associated with the project having been kept on hold.
16k	Economic Planning Study Requests The Public Advocates Office recommends the CAISO provide the BCR for the proposed economic planning study projects. The proposed projects have significant costs, and the benefits should be quantified. For example, the Lake Elsinore Advanced Pump Storage (LEAPS) project has a cost estimate of $2 billion. As stated in the Public Advocates Office comments on the 2018-2019 TPP preliminary reliability results, the Southwest Intertie Project-North28 has been identified by its proponent as an economic, policy and reliability project. The Public Advocates Office recommends that the CAISO provide more information on the entities that would benefit from this project with respect to policy targets,	The comments have been noted. The ISO's economic study results for these projects have been provided in the draft transmission plan.

No	Comment Submitted	CAISO Response
	reliability issues, and economic outcomes. If this project is considered further, cost allocation should be based on load served and who benefits, consistent with FERC Order No. 1000, which requires that transmission costs be allocated commensurate with the benefits received.	

17. San Diego Gas & Electric (SDG&E) Submitted by: Habibou Maiga		
No	Comment Submitted	CAISO Response
17a	San Diego Gas & Electric Company (SDG&E) appreciates this opportunity to provide comments on the 2018-2019 Transmission Planning Process stakeholder meeting held on November 16, 2018. SDG&E's is requesting clarification on the methodology behind the net qualifying capacity (NQC) calculation. It is SDG&E's understanding that the new NQC proposed methodology will only apply on GI deliverability studies and will not apply on any other CAISO studies. SDG&E shares the same concerns expressed by other stakeholders during the meeting that it would be helpful if the CAISO has a webinar that is solely focused on their new NQC methodology and explores its ramifications and impact on GI deliverability studies and other reliability studies such as LCR and System Reliability Assessment studies.	The assumes that by the "new NQC proposed methodology", SDG&E is referring to the proposed revisions to the generation deliverability methodology that the ISO presented. The generation deliverability methodology is utilized in both the generation interconnection study process as well as the policy driven analysis in the transmission planning process. Please refer to the response to 1a.

18. Transmission Agency of Northern California (TANC) Submitted by: David Oliver		
No	Comment Submitted	CAISO Response
18a	The Transmission Agency of Northern California (TANC) appreciates this opportunity to provide comments on the California Independent System Operator's (CAISO) 2018-2019 Transmission Plan Process (TPP) November 14, 2018 stakeholder meetings to discuss economic and policy studies. TANC's primary focus is for the protection of and the maximization of the transfer capability on the California-Oregon Intertie (COI) or Path 66. TANC is encouraged that the CAISO has initiated additional studies into the disconnect between the historic annual Day-Ahead congestion costs (averaging over $50 million for the last several years) that occurs on the PACI portion of the COI and the de minimis congestion that is shown in the economic studies performed each year for the TPP. We believe that these additional studies and the CAISO's initial look at the structural differences to be an excellent step in the correct direction. TANC encourages the CAISO to continue looking at the causes of Day-Ahead congestion, both operational and analytically within the TPP modeling, and identify potential mitigation measures to help alleviate the congestion burden on ratepayers. TANC is willing to assist the CAISO in this endeavor, as appropriate.	The comment has been noted. Please refer to section 4.9.1 of the draft transmission plan.

19. University of California Office of the President (UCOP) Submitted by: Mark Byron		
No	Comment Submitted	CAISO Response
19a	The CAISO's "Economic Planning - Preliminary Production Cost Simulation Results" presentation indicated that the GFFNJCT-GIFFEN 70.0 kV line #1 constraint resulted in 1912 hours of congestion. CAISO notes that the production cost model (PCM) default 50% RPS scenario modeled 55 MW of existing and future solar generation in the Giffen area which are radially connected to the system over this congested line. The congested line is only 5 miles long and the congestion is serious; UCOP strongly encourages CAISO to prioritize exploring low cost opportunities for an economic upgrade to the line. CAISO's economic planning study highlights that this congestion is not temporary. Unless and until an upgrade or re-rating of the line is implemented, CAISO's study indicates that this congestion will persist indefinitely. The CAISO study correctly highlighted the congestion on this particular constraint at Giffen. This line is already congested today, before any new resources are added. This current congestion represents both: 1) a significant cost of more than $700,000 per year to the University of California (the long-term off-taker of the project output); and 2) a reduction of approximately 16,000 MWh in clean energy production for California customers from the Giffen project (due to ~30% curtailment of the plant output) For the reasons enumerated above, we strongly encourage CAISO to prioritize exploring opportunities for an economic upgrade to the line. Such upgrades can include (but are not limited to) both dynamic-rating of the line as a short-term solution, as well as reconductoring of the line as a longer-term solution. UCOP requests that all studies and solutions be fast-tracked to mitigate the negative economic impacts of the congestion to California ratepayers. Additional supporting detail is provided below: • <u>Existing congestion</u>: Between January 2018 and October 2018, the constraint has been binding in 1,546 hours, or 37.6% of the 4112 ON-	The ISO has studied the economic benefits of the proposed upgrade, and the draft transmission plan includes the recommendation to approve the reconductoring project. Please refer to section 4.9.2 of the draft transmission plan.

No	Comment Submitted	CAISO Response
	PEAK hours in the day-ahead market. This is without any additional future solar additions modeled by CAISO in the PCM, but rather with only the 39 MW of today's existing solar which is radially connected through the GFFNJCT-GIFFEN 70.0 kV line #1. • Economic impact of existing congestion: Through significant curtailment of solar power, loss of renewable energy credits (RECs), as well as reduced energy value, the economic cost of this congestion is significant and will continue to be until changes are made. Over the one-year period of November 2017 through October 2018, overall costs attributable to congestion on this line have been over $700,000 (in reduced DA energy market revenue compared to the price that would have occurred but for the congestion) for the 20 MW Giffen project. This lost revenue represents a direct increase in the cost of energy to the University of California's Direct Access load. • Environmental impact of existing congestion: Over this period, approximately 30% of Giffen solar output has been curtailed, meaning there is 16,000 MWh less renewable energy generated in the heartland of California. Likely much of this curtailed solar generation must be replaced with gas resources or imports from beyond the constraint, creating additional energy costs and carbon emissions for California customers. Assuming that imported generation is replacing this generation the curtailment is likely causing over 6,800 tons of additional carbon emissions.1 • Economic impact to other projects: It is expected that the constraint also imposes additional significant cost (or lost revenue) to two other existing solar projects at Giffen totaling 19 MW, which are owned or contracted to PG&E. This constraint thereby also negatively impacts other ratepayers in California in addition to the University of California. • Long-term economic impact: Given the similar size of the projects (19 MW vs. 20 MW), it is likely that the total congestion cost is in excess of $1.4 million for all existing projects at Giffen, which would represent over $18 million for a 40-year period at a 7% discount rate. Such high cost would likely make a low-cost upgrade to the constraint a strong candidate to provide long-term economic benefits for CAISO's customers.	