The ISO received comments on the topics discussed at the May 2, 2019 stakeholder call from the following:

1. American Wind Energy Association - California (AWEA-California)
2. Bay Area Municipal Transmission group (BAMx)
3. BayWa r.e. Solar Projects LLC
4. Clearway Energy
5. California Public Utilities Commission – Staff (CPUC-Staff)
6. California Wind Energy Association (CalWEA)
7. EDF-Renewables (EDF-R)
8. EDP Renewables North America LLC (EDPR NA)
9. First Solar
10. Golden State Clean Energy (GSCE)
11. Independent Energy Producers Association (IEP)
12. Pacific Gas & Electric (PG&E)
13. The Cities of Anaheim, Azusa, Banning, Colton, Pasadena and Riverside (Six Cities)

Copies of the comments submitted are located on the generation deliverability assessment page at:

http://www.caiso.com/informed/Pages/StakeholderProcesses/GenerationDeliverabilityAssessment.aspx

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

1. American Wind Energy Association – California (AWEA-California) Submitted by: Caitlin Liotiris		
No	**Comment Submitted**	**CAISO Response**
1a	**Comment Summary** AWEA-California appreciates that the CAISO opted to open a stakeholder initiative to address potential changes to the Generation Deliverability Assessment Methodology. Given the wide-ranging impacts of changing this methodology, the time for additional stakeholder input and consideration is worthwhile for all those impacted by this change and is very much appreciated. AWEA-California generally supports the changes to the Generation Deliverability Assessment Methodology that were discussed during the end of 2018, but believes the increased curtailment risk to all generators which would result from its implementation warrants additional exploration of various options. In these comments, AWEA-California outlines some additional questions that CAISO should consider as part of this initiative, and provides some comments on areas that should be addressed going forward. Additionally, one potential methodology for considering transmission upgrades to mitigate excessive curtailments which may result from the change in methodology for deliverability assessments is outlined at a high-level. While, AWEA-California looks forward to additional stakeholder process and consideration of these comments, we reiterate that we recognize the importance of allowing the new deliverability methodology to be implemented expeditiously. Therefore, AWEA-California supports implementation of the new deliverability methodology as soon as practicable, while also working to develop solutions to the associated increased curtailment risk, and looks forward to working with the CAISO to determine the best way to successfully implement this change.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
1b	**Excessive Curtailments Should be Addressed as Part of the Implementation of a New Deliverability Methodology** As the CAISO and stakeholders have pointed out, the implementation of the new deliverability methodology is likely to increase renewable curtailments, as more generation (especially solar generation) is added to the grid and capable of achieving Full Capacity Deliverability Status (FCDS) on existing and currently planned transmission. This dynamic will increase the likelihood of renewable	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	energy curtailments during peak production periods, which could have adverse impacts on existing (and advanced development) generation resources of all types. Notably, because in many instances under existing contracts, the output lost due to economic curtailment is still paid for by the load serving entity, the cost of excessive curtailments may ultimately be paid for by ratepayers. Therefore, to provide the most benefits to ratepayers, cost-effective transmission solutions to mitigate excessive curtailment should be analyzed by the CAISO. Furthermore, addressing the possibility for high levels of renewable energy curtailments may be important for prospective generators to obtain project financing and, thus, addressing and evaluating potential curtailment issues is an important component to ensuring California's load serving entities can continue to contract with renewable generation developers to achieve the state's policy goals. Therefore, ensuring excessive curtailment will be addressed and, when appropriate, mitigated should continue to be an important goal of this initiative. Given the wide-ranging impacts, AWEA-California supports full and thorough exploration of all options to approve transmission to mitigate excessive curtailments, which may include approval of transmission through the Transmission Planning Process (TPP) and, consequently, should also include review of potential modifications to the current TPP procedures, including the Transmission Economic Assessment Methodology (TEAM). At this junction, we do not take a position on whether upgrades to mitigate excessive curtailment should ultimately be approved through the TPP or the interconnection process. There are pros and cons to each approach and, given the potential cost of meeting California's policy-goals with increased levels of curtailment, we encourage thorough exploration of all the options. There are different ways to look and cost/benefits and cost responsibility as they relate to policy, deliverability and economic congestion benefits associated with upgrades to mitigate excessive curtailment. They all deserve further consideration and discussion. One important consideration should be the costs and benefits of building additional transmission compared to the cost of	

No	Comment Submitted	CAISO Response
	additional curtailment. For this assessment, the CAISO should consider a process that follows these general, high-level steps: Through the generator interconnection process, transmission upgrades would be identified to accommodate interconnection requests utilizing the "new" generation deliverability assessment methodology1 • Next, CAISO would perform an assessment of what additional transmission upgrades would be necessary to accommodate interconnection requests if the generation deliverability assessment methodology that exists today were in effect • CAISO would next perform production cost simulations under both sets of potential transmission build outs (e.g. under the new deliverability methodology and under the old methodology) to analyze how much renewable curtailment would be avoided if all the transmission upgrades necessary under the generation deliverability assessment methodology that exists today were to be constructed • The cost of the transmission upgrades identified under the generation deliverability assessment methodology that exists today should be compared to the benefit of avoided curtailments o The benefit of avoided renewable curtailment used in this assessment should be valued at an expected cost of renewable generation (e.g. $20-30/MWh or another reasonable range of expected contract prices for renewable generation)2 o If, the full set of transmission upgrades has a benefit-cost ratio greater than or equal to one under most cases evaluated, then the transmission upgrades should be approved • Additionally, CAISO would perform more production cost simulations and cost-benefit analyses for individual transmission upgrades or sets of transmission upgrades deemed, based on the CAISO's judgement and input from interconnection customers, to potentially offer high value, in terms of reduced curtailment o If any of the transmission upgrades, or set of upgrades, has a benefit-cost ratio greater than or equal to one under most cases evaluated, then the transmission upgrades should be approved	

No	Comment Submitted	CAISO Response
	AWEA-California recognizes that, under this proposed study and approval approach there remain a number of questions that would need to be answered and the exact mechanisms used for approving the upgrades remain to be developed. AWEA-California does not offer specific solutions or recommendations at this time, but looks forward to working with CAISO and other stakeholders to develop a workable solution to ensure transmission upgrades needed to cost-effectively mitigate excessive curtailment can be constructed. Given the potential magnitude of the impacts on existing and future generators, CAISO should conduct a thorough exploration of the full suite of options that might be available to address excessive curtailments. AWEA-California continues to believe that a limited review of TEAM could be helpful and effective in addressing these concerns and should be considered as part of this stakeholder initiative.	
1c	**This Process Should Consider Methods to Address Impacts to Existing Generators and Transfer of Deliverability (for existing generators) as a Result of this Transition should be Addressed** In the Issue Paper, CAISO indicated that "once the revision to the methodology are finalized, then the details on how transfers of deliverability would be impacted can be addressed." However, as was pointed out during the stakeholder call, if deliverability transfers are not addressed early on in this initiative, it is possible that there will be a rush to transfer deliverability in an effort to initiate the transfers under the current methodology (which would allow for more transfers for many resources than the new methodology will allow). CAISO should try to avoid this rush by outlining the impacts of deliverability transfers early in this stakeholder initiative. Also, CAISO should consider a process that would provide generators an opportunity to indicate a deliverability transfer is being considered. If those submissions are made, CAISO might provide a length of time for deliverability transfers to occur with deliverability transfers able to occur up to the max deliverability output that was analyzed under the OLD methodology.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
1d	**As Part of this Initiative CAISO Should Explore the Implications of Qualifying Capacity (QC) Exceeding the Capacity Studied in Deliverability Assessments and Explain the Development of the Secondary System Needs Case**	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	Under the current structure of today's Resource Adequacy (RA) program and the current deliverability assessment methodology, there are times when a solar resource (for example), the QC is generally much lower than the amount that is studied for deliverability (so the resource's full QC should always be deliverable). But the proposal considered by the CAISO in late 2018, could result in the opposite problem: a resource's QC may be higher than the amount it was studied for under the Highest System Need case. AWEA-California asks CAISO to consider whether this situation could cause any reliability concerns and, if CAISO believes there might be a potential for reliability implications due to this disconnect, to add an additional layer of analysis to the deliverability assessment methodology to address those potential impacts. CAISO should consider dispatching wind and solar resources at the higher of the currently applicable QC figures and the level that would otherwise apply in the deliverability methodology as a means of addressing this disconnect between the Deliverability Assessment and the CPUC's RA requirements. The use of the Secondary System Needs case may help to address this issue. But it would be helpful for CAISO to document why it does not believe there are potential reliability impacts due to this disconnect between the RA program and the deliverability methodology. Additionally, as the process goes forward CAISO should provide details on its selection of the Secondary System Needs case and the conditions which it feels should be addressed through this case.	

2. Bay Area Municipal Transmission group (BAMx) **Submitted by: Moisés Melgoza**		
No	**Comment Submitted**	**CAISO Response**
2a	The Bay Area Municipal Transmission group (BAMx) appreciates the opprtunity to comment on the CAISO Deliverability Assessment Methodology Issue Paper discussed during the May 2, 2019 stakeholder call. BAMx supports the CAISO having a separate Stakeholder process on its proposal to revise their deliverability methodology. Revisions are clearly needed to keep the CAISO studies correlated to the maximum extent with the implementation of the effective load carrying capability (ELCC) methodology by the CPUC that are being adopted by them in conformance with State law. The proposed solar and wind output assumptions for the revised on-peak deliverability assessment are expected to result in fewer transmission upgrades required for the generators to achieve FCDS. However, these proposed solar and wind output assumptions do not adequately reflect the ELCC based qualifying capacity (QC) values.2 Modeling the solar and wind output levels consistent with the ELCC based QC values should further minimize the excessive and unneeded transmission upgrades identified from the deliverability assessment in both the generation interconnection study process and TPP process. BAMx believes that the CAISO proposal is headed in the right direction with its revisions to the deliverability methodology. It should provide a better indication of the capability of the existing transmission system to accommodate the renewables necessary to achieve California's policy goals.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
2b	**<u>There is no need for additional studies to be added to the interconnection study process to meet the objective of avoiding excessive curtailment</u>** Some Stakeholders have expressed concern about the new methodology leading to increasing levels of generation curtailment due to congestion. BAMx agrees with the CAISO that its existing TEAM methodology provides a decent framework for that to be studied thoroughly, which would lead to transmission upgrades if they are economically justified. BAMx believes that the TEAM methodology is well suited to determine the need for any transmission additions that can be justified on the basis of reducing generation curtailments. The challenge will be to anticipate such potential congestion impacts, if any, prior to the resources coming on-line.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	It is important to note that curtailment is not a resource adequacy issue for which the deliverability assessment is designed for, but rather an operational issue. Since any increase in curtailments can be addressed by identifying needed policy and economic driven transmission upgrades in the Transmission Planning Process (TPP), we do not believe there is any need for such assessment in the Generation Interconnection Process (GIP). Such studies will likely put unnecessary additional pressure for completing the GIP studies in a timely manner. Should the CAISO choose to perform additional studies to assess excessive curtailments (or "curtailment" studies) in the interconnection study process, any identified delivery network upgrades (DNU) should be funded by the generator owner for its generation project to obtain Full Capacity Delivery Status (FCDS). This approach would be consistent with the generators selecting "Option B" under the Generator Interconnection Deliverability Allocation Procedures (GIDAP) Cluster process. If a generator chooses not to fund the DNUs identified under the "curtailment" studies, then it would need to rely on those DNUs to be identified as the policy or economic driven transmission upgrades in the TPP. This concept would be similar to the generators selecting "Option A" as they solely rely on Transmission Plan Deliverability (TPD) for their deliverability.	
2c	**<u>Conclusion</u>** BAMx would encourage the CAISO to implement their proposed methodology without any further delay but to make a commitment to refine it further at a future date. One such area to revisit the deliverability assessment would be to align the solar and wind output assumptions with the ELCC based QC values. There is no need to conduct additional "curtailment" studies as part of the generation interconnection studies as the TPP is a more appropriate forum to consider network upgrades to address potential excessive generation curtailments.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

3. BayWa r.e. Solar Projects LLC **Submitted by: JB Lee**		
No	**Comment Submitted**	**CAISO Response**
3a	• BayWa appreciates CAISO's assessment of the QC Phase I report, especially slide 21. Would it be possible for CAISO to publish this table again (shown below) and include MW amounts so that developers have an understanding of the additional capability in each area by constraint?	The study results summarized on slide 21 were for informational purposes to generally demonstrate the results that could be expected from applying the potential methodology revisions described. The results were not meant for purposes of making business decisions at this time. Adding more detail in the summary of results could be interpreted to imply that these results can be utilized for generation interconnection customers in their development decisions.
3b	• In the straw proposal, can CAISO clearly document how under the new deliverability methodology the resources in Cluster 10, 11, and 12 will be able to access this additional deliverability, including the interplay between existing and queued generation? An illustrative example would be helpful.	In general, the way to access deliverability on the ISO system is for an interconnection customer to submit an interconnection request, pursuant to the ISO tariff, for the amounts and locations that they need.
3c	• The solar paired with storage proposal appears reasonable, but for clarity, can CAISO redo the example with further details on the storage facility that include MW/MWh and duration (and any consecutive day requirements)? It was unclear whether the 100 MW storage facility was 100 MWh or 400 MWh. Also, how would you treat a hybrid resource that has storage that has smaller MW than solar name plate (e.g. 30 or 50 MW storage paired with 100 MW solar)?	The straw proposal clarifies the methodology for modeling energy storage and hybrid facilities. Below are examples of modeling hybrid facilities under different configurations: 1) Additive configuration: the total requested output is the sum of outputs from each technology. Each technology is modeled by one generator in accordance with the deliverability methodology. For example, 100 MW solar plus 100 MW/400 MWh BESS with total output of 200 MW is modeled by two generators, one for the solar and one for the BESS. The study amount for the solar generator is

PG&E South area	SCE-VEA-GWT area	SDG&E area
LDNU: Warnerville-Wilson 230 kV	RNU: Lugo – Victorville RAS expansion	RNU: Sycamore-Penasquitos 230 kV RAS
LDNU: Borden-Wilson Corridor 230 kV OLs	RNU: Bob RAS	RNU: Mission-San Luis Rey 230 kV RAS
LDNU: ElCapitan-Wilson 115 kV	RNU: Innovation RAS	
LDNU: Panoche-Mendota 115 kV Line	ADNU: Desert Area Deliverability Constraint substantially alleviated	LDNU: Silvergate-Bay Boulevard 230 kV series reactor
LDNU: GWF-Kingsburg 115 kV line	ADNU: North of Lugo Area Deliverability Constraint substantially alleviated	ADNU: East of Miguel Area Deliverability Constraint (IV – Valley 500 kV line)
LDNU: Helm-Crescent SW Station 70 kV line	ADNU: Barre-Lewis 230 kV Area Deliverability Constraint (Talega-Santiago 230 kV line)	
RNU: 4 RAS (3 in Fresno and 1 in Kern) not needed		

No	Comment Submitted	CAISO Response
		based on the exceedance level in the methodology and the study amount of BESS generator is 100 MW. 2) Supplemental configuration: the total requested output is less than the sum of outputs from each technology. The hybrid resource is modeled by one generator with the maximum study amount set to the sum of each technology, but not exceeding the requested total output. For example, 100 MW solar plus 100 MW/400 MWh BESS with total output of 100 MW is modeled by one generator with a study amount of 100 MW. But if the hybrid generating facility consists of 100 MW solar plus 10 MW/20 MWh BESS, assuming the study amount for solar is 45%, the generating facility is modeled by one generator of a study amount equal to 100x45%+20 MWh/4 hr=50 MW.

4. Clearway Energy Submitted by: Susan Schneider - Consultant to Clearway Energy, Inc.		
No	**Comment Submitted**	**CAISO Response**
4a	**Interconnection Studies enhancements** The new methodology would dispatch solar projects at significantly lower levels than their nameplate capacity, reflecting output levels for later hours in the day. Thus, the number and extent of Deliverability Network Upgrades (DNUs) would be reduced, as shown in the Cluster 10 comparison analysis done by CAISO, and new resources can receive FCDS quicker and cheaper, and with fewer DNUs. As noted by the CAISO and others, this approach has the potential to significantly increase congestion and curtailment risk, for both new and existing resources. Historically, existing solar projects could assume that new projects seeking Full Capacity Deliverability Status (FCDS) would fund upgrades to effectively relieve congestion, since Deliverability Assessments focused on peak output hours (which coincided with hours of peak demand/consumption). Thus, increased congestion from new generation was a temporary condition, at best, pending completion of DNUs for the new projects. The CAISO should not revise its Deliverability Assessment methodology without additional changes to keep curtailment at reasonable levels, as the current deliverability methodology has done to date, for the following reasons. • The likelihood that new generation projects will pay for upgrades to alleviate resulting increased congestion is a strong incentive for developers to build/invest in California renewables, and for Load-Serving Entities (LSEs – IOUs, munis, CCAs, ESPs) to buy at the POI. This protection mitigates risks and therefore helps offset high costs and other hurdles to developing in California. • The new methodology would be inequitable. It would result in use of DNUs originally financed by earlier-queued projects to provide deliverability to later-queued projects that could severely impair operations and financial viability of the earlier projects. Clearway supports the CAISO's ideas about requiring new-generation projects seeking deliverability to fund upgrades to relieve congestion they cause, i.e., to preserve peak-production deliverability of the area. This proposal would likely	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	yield similar results as studies today, at least for solar projects. The study would examine conditions of peak flows in the local area (for solar projects, mid-day hours. maybe close to the 1-6pm currently used) and identify upgrades to relieve any incremental congestion – in other words, basically the same analysis now performed. Thus, the Interconnection Studies for projects seeking deliverability would consist of: (1) Reliability Assessments; (2) RA Deliverability Assessments; and (3) "Congestion Deliverability" Assessments. This framework would be better aligned with a concept of "deliverability" that ensures deliverability for peak flows in local areas and not only on peak flows in the system. The cost of these "Congestion Deliverability Upgrades" should be reimbursable, just like other upgrades, on both economic and policy-driven bases, for these reasons: • They would help ensure the ability of already existing and approved projects, and their LSE off-takers, to help meet state Renewables Portfolio Standards (RPS). In the absence of these upgrades, new-generation projects could damage the operating ability and economic viability of existing renewables projects, and also cause harm to Load-Serving Entities (LSEs) that contracted with those projects and expected them to provide renewable energy to meet their RPS requirements. • Once those Network Upgrades are in place, like other transmission upgrades, they will be available for use by others for other purposes. Potential application of this congestion-relief framework to Energy Only (EO) projects should also be considered in this initiative. Those projects increase congestion just as much as those seeking FCDS. Recent CPUC renewables portfolios provided for study in the TPP show a large expected increase in EO projects, and thus their negative congestion impacts may greatly increase in the future. Therefore, the CAISO could consider requiring a form of the "Congestion Deliverability Assessment" for new EO projects, and not just those seeking FCDS.	
4b	**<u>Limited consideration of TEAM methodology</u>** Clearway understands the CAISO's wish to limit consideration of changes to the TEAM methodology to the TPP process. However, as the CAISO itself	The CAISO does assume the development at least to the level indicated in CPUC-provided renewables portfolios, in exploring

No	Comment Submitted	CAISO Response
	noted in the stakeholder meeting discussion, aspects of the TEAM methodology may prevent it from acting as the mitigation tool that the CAISO originally assumed. Stakeholder support for Deliverability Assessment changes may depend on TEAM revisions that would help make it a viable and effective economic congestion-mitigation tool. Currently, TEAM only considers upgrades in areas where generation projects in the queue are likely to proceed to construction and operation – specifically: • Generators owned by the utilities serving CAISO load; • Wind and solar projects with LSE PPAs; and • "Other generators under contracts of which the information is available for public may be reviewed for consideration of the type and the length of contract." Developers and off-takers need assurance that expected severe congestion in a promising or proven renewables area would be mitigated before committing to PPAs, and areas that are or are expected to be congested are those where congestion-mitigation upgrades are most likely to be economic. However, those very PPAs would be needed in order to justify the transmission expansion needed to support the contracts. This "chicken and egg" problem indicates that at least some limited aspects of the TEAM methodology should be included in the scope of this initiative, i.e., expanding the kinds of generation projects included in the analyses. Rational generation developers are highly likely to gravitate to areas where they know congestion will not impair their projects, and LSEs are more likely to contract with such projects in those areas. The methodology should thus rely less on the status of specific projects and more on maintaining and increasing the ability of projects generally to develop in promising areas, e.g., by assuming development at least to the level indicated in CPUC-provided renewables portfolios, and perhaps incorporating public information about LSE procurement plans.	economic driven transmission, and aligns the policy direction for supporting development in certain areas via policy-driven transmission upgrades with the parameters used for considering economic driven upgrades. The concern referred to by the CAISO was that economic-driven projects based on the portfolios will primarily focus on larger developments more synonymous with area delivery network upgrades, as opposed to the smaller developments that may mitigate congestion based on the very specific selection of projects in an area that actually proceed. The CAISO does not see expanding this stakeholder consultation to include TEAM at this time to be a reasonable step to addressing the situation. Rather, this has been considered in the development of the Straw Proposal.

5. California Public Utilities Commission – Staff (CPUC-Staff) Submitted by: Donald Brooks		
No	**Comment Submitted**	**CAISO Response**
5a	**CPUC staff broadly supports conducting peak deliverability assessments with both the Highest System Need scenario and the Secondary System Need scenario in recognition of the changing electric demand and generation patterns on the CAISO grid.** The CAISO appropriately discusses the changing nature of the electric grid, with increasing solar and wind generation covering electric demand in the middle of the day, what used to be the peak reliability time. Now reliability risk occurs later in the day when solar generation decreases. CPUC staff agree with the CAISO's position in the issue paper that assessing peak deliverability during the High System Need period minimizes required reliability and deliverability network upgrades identified in the interconnection process, but that this approach may lead to increased curtailment from generators in the Secondary System Need period. Were the CAISO to continue assessing deliverability at the Secondary System Need period as they have in the past, this would promote transmission investment to preserve generation delivery when it is not really needed for reliability. CPUC staff agrees that investments simply to mitigate curtailment may not be a cost effective.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
5b	**However, CPUC staff is concerned with the apparent implementation of the deliverability assessment to calculate Net Qualifying Capacity (NQC) for Resource Adequacy (RA) illustrated by the example shown in section 7.3.2 of the Issue Paper. That example shows possible misinterpretation of the CPUC's Effective Load Carrying Capability (ELCC) study results.** The CAISO summarizes the CPUC's efforts to develop and implement an ELCC methodology, in light of the large growth in wind and solar electric generation occurring over the last few years, and includes information resulting from CPUC's work that identifies hours of the day and months of the year when reliability (Loss of Load) events are likely to occur. Based on this analysis, the High System Need scenario is supported by CPUC's results. However, it is not accurate to suggest, as the example in section 7.3.2 does, that the ELCC of a particular generator or resource class depends on it being deliverable at full capacity during the Secondary System Need period. Whenever there is curtailment at the Secondary System Need period, that generation does not usually contribute to reliability and would not alleviate Loss of Load events.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	Clearly a resource must be deliverable at some level between its ELCC level and full capacity, but it is unlikely a resource must be deliverable at full capacity in order to be given an ELCC or to meet the Highest System Need scenario. As to how to use the curtailment information to determine NQC of a generator in RA, CPUC staff suggest that the Secondary System Need scenario identify and quantify curtailment or non-deliverability that a generator faces, then compare the deliverable level to ELCC percentages.	
5c	**CPUC staff agree that CAISO should perform studies of deliverability at Secondary System Need periods as part of the interconnection process to identify upgrades that could mitigate the curtailment and share CAISO's skepticism that deliverability network upgrades aimed to mitigate curtailment in the middle of a spring day (or other times when curtailed generation is not providing reliability benefit) are cost effective.** CPUC staff agrees with the CAISO's assessment that the High System Need scenario should be the primary means of identifying reliability network upgrades. We also agree that it is important for the CAISO to study and identify expected magnitude and mitigation for curtailment as part of the interconnection process, so the Secondary System Need scenario is important. If there are some minor upgrades that can mitigate curtailment, it would be good to identify those, and if there are some resources that are not curtailed at all, it would be good to identify those as well. However, there will certainly be upgrades to mitigate curtailment that will not be cost effective and thus should be considered optional. It is expected there will be a range of curtailment and mitigation identified on a case by case basis.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
5d	**However, CPUC staff does not agree that the generator's investment in deliverability upgrades identified to mitigate curtailment should be required to attain Full Capacity Deliverability Status (FCDS). This is because the overall system likely would not generally benefit in terms of reliability from investment in those upgrades, and ELCC determinations are not reliant on deliverability at levels higher than the ELCC value during high generation periods when there is often curtailment on a system level.**	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	FCDS status should be given to generators by comparing deliverability amounts to ELCC amounts, and FCDS status restricted to partial deliverability only in events when the deliverability of a resource in the High System Need scenario and Secondary System Need scenario is LOWER than the ELCC amount (MW installed capacity times ELCC percentage) of a resource. This is due to the methodology used in performing ELCC studies. In particular, when a resource or group of resources is tested, it is removed and replaced with Perfect Capacity, which is roughly equivalent to a CT that is operable 24/7 at full capacity. As a practical matter, the ELCC value then translates to the MW capacity of presumably deliverable Perfect Capacity generation that must be installed to balance the potentially partially deliverable MW of the resource being tested. While this is a bit of a crude translation, it is likely true that not all intermittent wind and solar generators would need to be deliverable at a level higher than ELCC level during the Secondary System Need period in order to alleviate Loss of Load events. The ELCC model already identifies significant curtailment at a system level during the Secondary System Need period when there is no Loss of Load events in the ELCC model, thus it is not critical for the CAISO to preserve deliverability at that Secondary System Need period for FCDS the way it may have been needed when exceedance calculations needed higher MW amounts to average with lower MW amounts to calculate the QC value. In the case of ELCC, a resource generally only needs to be deliverable to the ELCC level for reliability. CPUC staff expect that non-deliverability of ELCC amounts at either the highest System Need period or the Secondary System Need period would be a rare event, and occur on a resource by resource basis so CPUC staff would disagree with any proposal to impose a uniform rule about deliverability at full capacity for FCDS, rather than deliverability at lower ELCC capacity levels.	

6. California Wind Energy Association (CalWEA) Submitted by: Nancy Rader and Dariush Shirmohammadi		
No	**Comment Submitted**	**CAISO Response**
6a	Over the past decade, CalWEA has been a vocal critic of the CAISO's current deliverability assessment methodology, considering it to be overly conservative, in every respect, for its purpose. Recently, CAISO developed a reformed deliverability assessment methodology in response to the CPUC adopting an effective load carrying capability (ELCC) methodology for determining the RA capacity of variable energy resources. CalWEA considers the CAISO's proposal to reform its deliverability assessment methodology to be a step in the right direction. That being said, we remain concerned about the use of double contingencies in determining the deliverability of generation resources. Nevertheless, we are pleased to support the CAISO proposal, because it is needed to more accurately determine the deliverability status of new resources in light of the CPUC's adoption of the ELCC methodology for calculating the RA capacity of variable energy resources. We reserve our discussion of ELCC methodology for another day.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
6b	Unfortunately, we have observed that some stakeholders have caused delays in the implementation of these reforms by prolonging the process -- not because of the reforms' effectiveness for its purpose (qualifying a resource to provide RA capacity), but due to the stakeholders' concerns regarding an unrelated economic issue, that being the potential for increased transmission congestion within certain generation pockets. CalWEA acknowledges that there is a possibility, albeit very remote, that real congestion issues may arise in the future for certain generation pockets under the CAISO's reformed deliverability assessment methodology. However, such a possible outcome would only occur if resource developers and load-serving entities (LSEs) fail to take into account this new deliverability assessment methodology. We believe such a failure is highly unlikely since the resource development community (particularly investors) and load serving entities are quite sensitive to transmission congestion and would avoid development in, and procurement from, areas where congestion issues may arise. Furthermore, CalWEA believes that CAISO already has the tools and tariffs at its disposal to resolve any congestion issues that could arise via the Economic Planning track of its annual TPP process where it can resolve congestion for the benefit of the	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	ratepayers in its footprint. Finally, CAISO should consider studying and publishing additional congestion studies aimed primarily at resource development zones which are at risk of such "overflow" as part of its annual TPP process to alert the resource development and procurement communities to potential future transmission congestion concerns.	
6c	In conclusion, CalWEA makes the following recommendations: • CAISO should immediately implement its reformed deliverability assessment methodology, as part of Phase 2 of Cluster 11 and Phase 1 of Cluster 12 interconnection studies and any TPP study that it undertakes in response to the CPUC's IRP process; • CAISO should work with stakeholders to develop a template for new congestion studies and reports for its TPP process to share with the development and procurement communities in order to avoid the potential economic issues that may arise from the implementation of its reformed deliverability assessment methodology; and • CAISO should avoid addressing congestion risk as part of the generation interconnection process because it would make an already complex process even more complex and potentially further delay the implementation of its reformed deliverability assessment methodology.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

7. EDF-Renewables (EDF-R) Submitted by: Susan Schneider – Consultant to EDF-R		
No	**Comment Submitted**	**CAISO Response**
7a	EDF-R supports PG&E's stakeholder meeting request for the CAISO to include more examples in the upcoming Straw Proposal of how the methodology would work for different project types. It was very clear from the discussion that there is widespread confusion about how both the current and TPP proposal methodology apply/would apply to individual projects.	Examples applying the existing on-peak deliverability methodology were proved in an ISO Technical Paper issue in 2013: http://www.caiso.com/Documents/TechnicalPaper-GeneratorInterconnection-DeliverabilityStudyMethodology.pdf#search=deliverability%20methodology%20technical%20paper The revisions to the on-peak deliverability methodology discussed previously are focused on changes to the output represented in the study for intermittent generation (i.e. wind and solar). The output represented for other generation technologies was not expected to be changed in the on-peak deliverability methodology.
7b	**Disconnects between study dispatch and NQC** These disconnects exist also under the current methodology, but there could be reliability impacts of that disconnect under the proposed methodology. To illustrate these issues, assume a sample solar project with 100 MW Pmax (maximum output at the Point of Interconnection (POI)) in the SCE area, dispatched in the Deliverability Assessment under the current methodology at a representative 90% of Pmax, with the off-taker under CPUC jurisdiction. If the project is found to be fully deliverable, it can count for 100% of the CPUC-specified Qualifying Capacity (QC), i.e., the monthly Net Qualifying Capacity (NQC) would peak at 44.8% of nameplate (44.8 MW) under the 2019 Solar Technology Factors. So, currently that project must finance upgrades to provide 90 MW of deliverability but can only provide 44.8 MW of NQC. This could be an issue for the developer, but the CAISO can rely on at least the amount of NQC that the project counts for, because its studies have verified that it is actually deliverable up to 90 MW. Under the new methodology, under the HSN scenario, it would be dispatched in Deliverability Assessments at about 11% of Pmax, i.e., 11 MW. If the project is found to be fully deliverable, based on the CAISO's clarifications at the	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	stakeholder meeting, it can still count for 100% of the CPUC-specified QC, i.e., the monthly NQC would still peak at 44.8% of nameplate (44.8 MW) under the 2019 Solar Technology Factors, So, the project would only be studied at 11 MW, its deliverability would be verified up to that amount, but it would actually count for 44.8 MW of NQC. This is nice for the developer, which only must finance upgrades to provide 11 MW of deliverability. However, the CAISO would not have studied the project at 44.8 MW and would really have no idea whether any capacity over 11 MW would be deliverable, yet it would technically rely on that level of NQC from the project. One way to mitigate this problem would be for the CAISO to dispatch projects in deliverability studies at the higher of the current applicable QC and the otherwise applicable output level for the new adopted methodology. Though QC methodologies can change going forward, this approach could better ensure that the CAISO can count on deliverable capacity equal to the NQC it needs.	
7c	**<u>Congestion impacts on existing/prior projects</u>** The new methodology would dispatch solar projects at significantly lower levels than their nameplate capacity, reflecting output levels for later hours in the day. Thus, the number and extent of Deliverability Network Upgrades (DNUs) would be reduced, as shown in the Cluster 10 comparison analysis done by CAISO, and new resources can receive FCDS quicker and cheaper, and with fewer DNUs. During high-output hours for those resources, the congestion risk will apply to both new and existing resources, with both potentially facing high levels of curtailment. Historically, existing projects at least could assume that new projects seeking Full Capacity Deliverability Status (FCDS) would have to fund enough upgrades to relieve congestion under stressed system conditions that reflected peak output hours (coinciding with hours of peak demand/consumption). Thus, increased congestion was a temporary condition, at best, pending completion of DNUs for the new projects. The process by which new generation pays for upgrades needed to alleviate congestion they cause is a fundamental part of the decision-making process for	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	developers to build/invest in California renewables, and for Load- Serving Entities (LSEs – IOUs, munis, CCAs, ESPs) to buy at the POI. This helps to create a reasonable risk profile for developers that helps offset the high costs and hurdles to developing in California. Moreover, some PPAs require hub delivery, in which case the developer bears the cost and risk of increased congestion between the project location and the settlement location (i.e., "basis"). In addition, most PPAs have 15-25 year terms, while project life is 30-35 years, i.e., after the PPA term, congestion risk reverts to the developer. Buyers with long-term busbar PPAs count on the current DNU allocation process in their assessment of costs and risks related to basis and curtailment – costs that will be ultimately born by the ratepayer. All this means that CAISO should not revise its Deliverability Assessment methodology without additional changes to keep congestion and curtailment at reasonable levels, as the current deliverability methodology has done to date. Finally, the new methodology is inequitable. DNUs originally financed by earlier-queued projects would be used to provide deliverability to later-queued projects that could severely impair operations and financial viability of the former. EDF-R is interested in the CAISO's ideas about requiring new-generation projects seeking deliverability to fund upgrades to relieve congestion, i.e., preserve peak-production deliverability of the area. Though that may sound like a new requirement, in reality this proposal would likely yield similar results as studies today, at least for solar projects. The study would examine conditions of peak flows in the local area (for solar projects, mid-day hours maybe close to the 1-6pm currently used) and identify upgrades to relieve any incremental congestion – in other words, basically the same analysis now performed. Thus, the Interconnection Studies for projects seeking deliverability would consist of: (1) Reliability Assessments; (2) RA Deliverability Assessments; and (3) "Congestion Deliverability" Assessments. This framework would be better aligned with a concept of "deliverability" that ensures deliverability for peak flows in local areas and not only on peak flows in the system.	

No	Comment Submitted	CAISO Response
	These upgrades should be reimbursable, just like other upgrades, on both economic and policy-driven bases. New-generation projects that damage the operating ability of existing renewables projects, and undermine their economics, cause harm to Load-Serving Entities (LSEs) that contracted with those projects and expected them to provide renewable energy to meet their Renewables Portfolio Standard (RPS) requirements. It is in the interest of the state as a whole to help ensure the ability of already existing and approved projects to meet that objective without huge congestion risk or unexpected cost increases. The case for applying this approach to Energy Only (EO) projects is less clear and requires more consideration. Today, new EO projects locating in renewables-rich areas do not have to fund DNUs and, therefore, could cause congestion and impair the viability of existing/earlier-queued projects there. Because there have been relatively few EO projects, however, that impact has been limited thus far. That aspect of EO interconnection would not be changed under the TPP Methodology, so arguments for applying the third study above (and upgrade-funding obligations) to EO projects are not as obvious. However, recent CPUC renewables portfolios provided for study in the TPP exhibit a large expected increase in EO projects, and thus negative congestion impacts may greatly increase in the future. Therefore, the CAISO could consider requiring a form of the "Congestion Deliverability Assessment" for new EO projects, and not just those seeking FCDS.	
7d	**<u>"Behind-the-interconnection" (BTI) deliverability transfers</u>** The CAISO stated in the meeting discussion that it wants to postpone consideration of the impact of any new deliverability methodology on its framework for transferring deliverability between different parts of a project (assuming multiple Resource IDs) until details of the new methodology are determined. EDF-R asks that the CAISO reconsider this position, and include that topic in this initiative, for two reasons. First, Deliverability Assessment dispatch levels currently set the "starting point" for any such deliverability transfers; a 100 MW solar project studied at 90% of	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	Pmax, for example, would expect to be able to transfer up to 90 MW of deliverability to other portions of the project (e.g., added energy storage); however, if the new methodology then lowers the study dispatch of this project to something like 11 MW, would the project then have only 11 MW to transfer? This is not a reasonable outcome if the project funded upgrades sufficient to provide 90 MW of deliverability, and made business and contractual decisions based on that expectation. Second, if the CAISO decides to significantly lower the deliverability dispatch levels for solar (and wind) projects, that could trigger a "gold rush" to preserve project RA value by quickly adding storage and/or transferring deliverability to already-added/approved storage. Our hypothetical 100 MW solar project studied at 90 MW for deliverability could transfer up to 90 MW to added 90 MW/360 MWh energy storage (12 months a year, i.e., without the "shaping" from the CPUC solar QC figures), while it would retain only 11 MW of deliverability under the TPP methodology. Thus, EDF-R believes that deliverability transfer should be within the scope of this initiative.	
7e	**<u>Interactions with the TPP and the TEAM methodology</u>** EDF-R appreciates the CAISO's further consideration of its position that TPP economic assessments could help address potential congestion impacts of the TPP proposal and similar approaches. However, while EDF-R understands the CAISO's desire to confine discussion of the TEAM methodology to the TPP, it is clear that aspects of the TEAM methodology may prevent it from acting as the mitigation tool that the CAISO originally assumed. Specifically, as the CAISO stated in its meeting presentation, TEAM only considers upgrades in areas where generation projects in the queue are demonstrably likely to proceed to construction and operation. Currently, the TEAM methodology analyses include: • Generators owned by the utilities serving CAISO load • Wind and solar projects with an LSE PPA	The CAISO assumes the development of generation at least to the level indicated in CPUC-provided renewables portfolios.

No	Comment Submitted	CAISO Response
	• "Other generators under contracts of which the information is available for public may be reviewed for consideration of the type and the length of contract" The problem is that: (1) Developers and off-takers would want assurance that any expected severe congestion in a promising or already-proven renewables area would be mitigated before committing to a PPA; but (2) the PPAs would be needed in order to justify the transmission expansion needed to support the contracts. Moreover, even where the current criteria might identify economic upgrades, given lead times for developing and building new transmission, those upgrades would lag behind future generation buildout; the resulting increased congestion and curtailment levels, and overall higher risk for developing new generation, will be reflected in the PPA prices (and ultimately borne by ratepayers). This "chicken and egg" problem indicates that at least some limited aspects of the TEAM methodology should be included in the scope of this initiative. The methodology should rely less on the status of specific projects and more on maintaining and increasing the ability of projects generally to develop in promising areas, e.g., by assuming development at least to the level indicated in CPUC-provided renewables portfolios. Generally, it is reasonable to expect that generation developers would gravitate to areas where they know that congestion will not impair their projects. In addition, they and their off-takers are more likely to support CAISO deliverability-methodology changes that could increase congestion if they have some assurance that a realistic tool exists that will not impair their already-contracted projects.	
7f	**<u>Recommendations</u>** Based on the discussion above, EDF-R recommends that the CAISO do the following: • Dispatch solar and wind projects in its Deliverability Assessments at the higher of the current applicable QC figures and the level otherwise	Please see responses above.

No	Comment Submitted	CAISO Response
	indicated in its adopted methodology, to help ensure that the NQC relied on by the CAISO for reliability is actually deliverable. • Add a "Congestion Deliverability" Assessment to the current Interconnection Studies framework, at least for proposed projects seeking deliverability (and perhaps for new Energy Only projects as well), to preserve peak-production ability in affected areas. • Include the following topics in the scope of this initiative: o "Behind-the-Interconnection deliverability transfers o Relevant aspects of the TEAM methodology.	

8. EDP Renewables North America LLC (EDPR NA) Submitted by: Will Talbott		
No	**Comment Submitted**	**CAISO Response**
8a	The CPUC adopted the Effective Load Carrying Capability ("ELCC") methodology for qualifying Resource Adequacy ("RA") capacity for wind and solar resources almost 2 years ago.1 CAISO's deliverability assessment methodology was expressly created for ascertaining generator deliverability for RA resources, but the methodology has not been updated to reflect the changes made by the CPUC. Further delay in the updating of CAISO's methodology will negatively impact the developer / generator community and impede competition to the detriment of the customers of Load Serving Entities ("LSEs"). Although certain aspects of CAISO's proposal need further explanation or documentation (discussed below), its proposed methodology is better aligned with the CPUC methodology and industry practice. EDPR NA supports CAISO diligently pursuing a stakeholder process in Q2 and Q3 2019 that allows for timely approval by CAISO management so that any new deliverability methodology can be adopted in time for the 2020 Transmission Planning Deliverability ("TPD") allocation. There are important benefits to California that would come from a timely change in the CAISO's methodology. EDPR NA estimates that there are over 10 GW of projects that will be seeking TPD allocations in 2020.2 The use of an outdated methodology in CAISO's TPD allocation will reduce the number of projects that can obtain Full Capacity status at a critical juncture. There will be increased procurement activity in California in the near future due to the more stringent renewable and low-carbon goals contained in SB 100, passed in 2018, and because non-utility LSE's (such as Community Choice Aggregators or "CCAs") are now actively conducting solicitations to procure resources to meet SB 350's requirement that 65% of Compliance Period IV RPS procurement be fulfilled with long-term contracts.3 Artificially limiting the number of viable Full Capacity renewable projects will diminish competition at a time when it would otherwise bring significant benefits to customers of California LSEs.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
8b	EDPR NA expects that the current stakeholder process will allow for a better documentation of CAISO's proposed changes to the deliverability assessment methodology. EDPR NA supports the basic methodological change which assesses generation deliverability in hours where system or area Unloaded	Please see section 5 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	Capacity Margin is below a threshold indicative of a capacity need. Such a methodology is consistent with ELCC and standard industry practice. This said, EDPR NA requests that CAISO use the stakeholder process to explain its proposed deliverability assessment methodology in further detail. In particular, CAISO should provide better documentation of its Secondary System Need ("SSN") scenario. The SSN appears to arbitrarily adjust system net load in hours ending 15 to 17 by "the ratio of highest consumption to highest sale."4 CAISO has not provided adequate justification for this adjustment or why it is better than alternative measures, such as sticking to "sales" forecast data (used the Highest System Need scenario) but with higher-probability thresholds (e.g. P75 or P90) in subareas that have less load or generation diversity. The need to understand the basis for SSN is particularly important as SSN, per CAISO's statement made on the May 2, 2019 stakeholder call, is the binding scenario for all Area Delivery Network Upgrades, which, in turn, drive TPD allocations.	
8c	CAISO specifically requested feedback on whether (1) additional studies be added to the interconnection study process to meet the objective of avoiding excessive curtailment; and (2), if such studies are performed and identify delivery network upgrades, the interconnection customer be required to be fund additional upgrades as a condition of retaining FCDS. EDPR NA supports CAISO providing additional studies to provide information to generators on potential congestion or curtailment. EDPR NA believes, however, that CAISO has prematurely narrowed the potential venues for conducting such studies. CAISO should explore whether such studies can be performed on a regular basis as part of the Transmission Planning Process ("TPP"). In the TPP, CAISO and stakeholders can examine the systemwide benefits of upgrades that reduce congestion or curtailment. If the studies are limited to a generation interconnection study group or cluster, certain beneficiaries, such as existing generators or load may be excluded, and it thus may be harder to justify economic upgrades. Furthermore, EDPR NA disagrees that network upgrades that relieve that congestion or curtailment as identified in additional studies should automatically become a cost obligation for obtaining FCDS. Full Capacity status, by definition, is deliverability secured to provide RA, not transmission service that is free of congestion or curtailment. EDPR NA supports exploring ways where generators could optionally fund or co-fund upgrades to relieve congestion or curtailment. Again, such studies are likely	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	best pursued in the TPP rather than within the generator interconnection study process.	

9. First Solar **Submitted by: Vladimir Chadliev**		
No	**Comment Submitted**	**CAISO Response**
9a	**Sensitivities, "off-peak" studies, and studies identifying transmission upgrades needed to support gross consumption conditions** The CAISO asserts that transmission upgrades to support deliverability of additional solar resources under peak gross consumption conditions is a matter of economics or policy rather than a transmission or reliability decision. Given the importance of developing and designing a transmission grid to accommodate California's policy goals, and the potential impacts of the new methodology on existing and new solar development to meet energy needs, First Solar believes this perspective should be modified. As parties have indicated in prior comments, the current transmission planning process simply won't work, for a number of reasons, to relieve constraints and congestion caused by CAISO's shift in methodology. CAISO has indicated a willingness to examine its transmission planning process in a separate initiative. First Solar believes that any changes made to the methodology should be done as a comprehensive package if the CAISO plans to rely on its transmission planning process as part of the solution. Otherwise, there will be a significant time lag between the increased curtailment and the transmission solution to mitigate it, given the current process. If the transmission planning process is not reformed, then the generator interconnection process should continue to be used to require that upgrades be constructed to mitigate curtailment and congestion by the time the new interconnecting generator is operational. Otherwise, there is a substantial risk of harm to renewable generators and state policy goals. We suggest that CAISO perform studies to evaluate sensitivities, off-peak conditions and gross load consumption conditions to demonstrate impacts on energy deliveries and incorporate the results into the generator interconnection process, or a reformed transmission planning process.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
9b	We also suggest that to the extent the studies we suggest above do not cover it, the CAISO should conduct a congestion and curtailment analysis during each planning cycle and develop a plan to mitigate congestion. This could be done either through obligations imposed on new interconnecting generators or through the current transmission plan. However, if done via the transmission planning process, anticipated congestion and curtailment associated with new	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	interconnecting facilities should be mitigated by the time the facility is anticipated to come on line. This analysis should be conducted for both energy-only facilities and those requesting deliverability.	
9c	First Solar also requests that the CAISO elaborate on why studying capacity under the current methodology no longer yields valuable results for deliverability, for identifying transmission needs or for meeting the state's increased renewables portfolio goals. We request that the CAISO provide greater clarity around the purpose of the change in methodology, explain how the new methodology will not degrade or impair the deliverability of solar that provides resource adequacy under current power purchase agreements, and provide examples illustrating how solar would be counted for resource adequacy purposes.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
9d	Finally, we believe that stakeholders would benefit from step-by-step examples illustrating how solar and wind generation is studied in the CAISO's current methodology and how it would be studied under the revised methodology. As is apparent from the stakeholder calls, a lot of confusion arises from not understanding CAISO's basic deliverability methodology today. If this is better understood, it will make it easier to evaluate the revised methodology. Therefore, we request examples to better understand 1) how the exceedance values are applied in areas of high solar or combined renewable areas; 2) how the capacity values were generated or applied in the High and Secondary Needs hours; and 3) what seasonal snapshots in time would be studied.	Please see response to 7a.
9e	**Energy-only issues** CAISO makes a number of observations about energy-only projects and study implications in its issue paper. We believe the issue of increasing development of energy-only projects needs to be examined and doing it as part of this stakeholder process is in line with the important issues being discussed. We suggest that studies be done to assess impact of current energy-only projects in the queue on anticipated congestion and curtailment and that this process evaluate whether upgrades are needed to accommodate energy deliveries for these projects.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	The CAISO's decision to tighten and increasingly limit the ability of projects to obtain and retain deliverability has caused important and viable projects to be cast into the energyonly category. While energy-only status still poses significant barriers to contracting, energyonly projects continue to be developed because interconnection customers have invested significant amounts in land, permitting and interconnection costs. Those interconnection customers are hoping for a deliverability allocation under the CAISO recently-reformed rules, but there's a chance that these projects will proceed to commercial operation as energy-only projects. CAISO notes that in its proposed deliverability assessment methodology it will assume that energy-only generators are off-line unless needed to balance load. We request that the CAISO provide additional clarity about this assumption and why it is reasonable, as well as how it plans to manage the infrastructure upgrades to accommodate increased energy deliveries as it pushes more projects into the energy-only category.	
9f	**Payment for network upgrades identified to minimize curtailment** The CAISO requested stakeholder feedback on how upgrades identified through studies designed to evaluate and minimize the impact on curtailment be funded. First Solar's initial reaction to this question is that these upgrades would be funded the same way they are today – by the interconnection customer and reimbursed once the interconnection customer is operational. Since the transmission infrastructure development is supporting compliance with state policy goals and supporting the growth of a transmission grid capable of incorporating greater amounts of renewable resources without excessive curtailment, it follows that the reimbursement framework should be consistent with current practice. Finally, with respect to the upgrades triggered by these studies to mitigate "excessive curtailment," we request that the CAISO offer some clarity around what it considers "excessive curtailment" and what triggers it would consider around curtailment levels before requiring upgrades to mitigate it.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
9g	**Process of identifying system upgrades needed to relieve congestion & nexus with the CAISO's transmission planning process** We request greater clarification around the anticipated nexus between the generator interconnection process and the transmission planning process and how the new methodology will be incorporated to drive network upgrades that may be addressed through the transmission planning process. Given the limitations of the TEAM methodology noted in prior comments from stakeholders and the CAISO's observation that refinements to TEAM are out of scope, how does the CAISO anticipate delivery network upgrades showing up in the transmission planning process for consideration and how will that approval process work? CAISO notes that the locational marginal price is typically low during periods where solar resources are being curtailed, so how does the CAISO anticipate approving economic transmission projects to mitigate curtailment?	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
9h	**Transferability of deliverability** First Solar agrees with the comments and requests for clarification submitted by EDFRenewables related to this topic.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

10. Golden State Clean Energy (GSCE) Submitted by: Daniel Kim		
No	**Comment Submitted**	**CAISO Response**
10a	We appreciate the CAISO starting this stakeholder initiative in response to the many comments filed by stakeholders after the CAISO proposed a new generation deliverability assessment methodology last year. In light of stakeholder comments, the CAISO initiated this more comprehensive review. GSCE urges the CAISO to continue to provide the opportunity for stakeholders and the CAISO to fully understand the consequences of any proposal emerging from this initiative before any decision is finalized. We believe that additional analysis needs to be conducted to support the understanding of the impacts of the shift in methodology and to mitigate the adverse impacts. GSCE believes this initiative should proceed cautiously because there are significant negative consequences that could results from the CAISO's proposed change in its deliverability assessment methodology. GSCE appreciates the complexity of simultaneously managing system planning with a shifting peak while incorporating new resources into the grid. We also understand that the CAISO is using a methodology that has remained unchanged for several years. However, it is unclear to us exactly what problem the CAISO is trying to solve and how the system is helped with the proposed changes to the deliverability assessment methodology. Before the CAISO proceeds to implement the changes, we believe stakeholders should clearly understand the CAISO's reasons for making the changes and why the CAISO believes that these changes help make the grid more reliable. The consequences associated with congestion and curtailment also need to be thoroughly explored before any changes are made to the current methodology. The CAISO notes in its issue paper that increased congestion and curtailment are expected to result from this shift in methodology, and it is not clear to us why this choice is a reasonable trade off. We believe that the potential impacts on renewable generation project developers who have already made significant investment in transmission upgrades to support the State's GHG reduction goals could be severe. It is important to design any change in the CAISO methodology to avoid causing	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	harm to renewable generators that are key to achieving the renewables portfolio standard and GHG reduction targets.	
10b	As noted above, GSCE believes this initiative should proceed cautiously. This initiative is one piece of a larger picture that fits together to support the State's development of a renewable portfolio to meet its GHG reduction goals. There are a number of areas where we believe analysis, examples and scenarios would support stakeholders' understanding of the consequences of the proposed change in deliverability allocation methodology. <u>Understanding congestion and curtailment</u> The CAISO notes that transmission constraints and curtailment would result from the shift in deliverability methodology for existing and future projects in the queue. We request that the CAISO provide more detailed information for stakeholders to understand these congestion and curtailment impacts. It would be valuable for the CAISO to provide information illustrating these impacts by resource zone, season and time of day, as well as by year, making assumptions for generation and transmission build out and using sensitivities to test those assumptions. We also believe the CAISO should analyze the impact on carbon reduction under different scenarios, including where increased curtailment means fewer hours of production for renewable resources.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
10c	<u>Timelines for solution</u> The CAISO discusses the possibility that its transmission planning process (TPP) could be relied upon for solutions to the curtailment and congestion caused by the shift in deliverability methodology. However, if the consequences of increased congestion and curtailment are not managed up front, developers may experience years of severe curtailment and congestion before a transmission solution is developed. And it is not clear that the CAISO's current transmission planning methodology would result in finding new transmission solutions are needed. We urge the CAISO to develop a plan to mitigate the impact on congestion and curtailment so the solution is in place at the time the new interconnecting generator comes on line. In addition, we suggest that the CAISO initiate reforms to its TPP so that those reforms are implemented at the same time as any change in the deliverability methodology. These changes need to be made in tandem if one process is to rely on the other for mitigating	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	adverse impacts. As part of this review of the TPP, the CAISO should revisit the triggers for a transmission solution under the TPP. The CAISO notes on page 17 of the issue paper that the project would need to have a PPA and be permitted or already constructed before its delivery-related transmission costs may be identified in the TPP. The CAISO should consider modifying its requirements to include all projects that have entered the construction phase. Once that occurs, the project will have posted the full interconnection financial security and should be considered sufficiently viable. With the alternatives offered to projects in the interconnection process to proceed without a PPA, having a PPA should not be used as a prerequisite for consideration in the TPP process. How the TPP will interact with this initiative and timing considerations of the TPP and corresponding build out should be further detailed in this initiative.	
10d	Coordination with CPUC processes and timelines The CAISO should provide more information about how this process will dovetail with planning needed to meet new procurement under the California Public Utilities Commission's Integrated Resource Planning proceeding. In addition, the CAISO should provide more clarity on how the ELCC process fits with the CAISO methodology and what the implications are for a project's net qualifying capacity.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
10e	Understanding tradeoffs This initiative has the potential to reduce network upgrade costs for some generators, but we believe more should be done to understand the tradeoffs associated with potentially underutilized generation facilities and the cost of curtailment. Does additional curtailment of renewables lead to more thermal dispatch? How do the anticipated savings in costs associated with transmission upgrades match up against the potential reduction in achieving GHG reduction targets? It appears that we are already seeing a reduction in the value of the Energy Imbalance Market to reduce curtailments and believe it is worth evaluating whether this trend could be mitigated with strategic transmission investments.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
10f	Reliability GSCE appreciates that it is prudent to avoid transmission build outs that would be underutilized. However, we question the tradeoff and costs to reliability if not building network upgrades means managing with more curtailment. GSCE would like more information regarding the connection between the upgrades triggered under the current methodology and curtailment–how much curtailment are we avoiding by continuing to build network upgrades? Further, with the CAISO's request that solar generation facilities improve their response to dispatch and curtailment instructions, is the CAISO concerned about triggering more reliance on curtailment? Finally, it is not clear to GSCE how the proposed change in methodology actually supports a more reliable grid, and GSCE would appreciate the CAISO elaborating on why it believes it is making the grid more reliable with these proposed changes.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
10g	**III. Response to the CAISO's questions** As a final point in GSCE's comments, we would like to respond directly to the two questions the CAISO posed in its paper and presentation. *(1) Should additional studies be added to the interconnection study process to meet the objective of avoiding excessive curtailment?* Yes. The CAISO has indicated that curtailment will result if it changes its deliverability methodology as proposed, and we are very concerned about the impacts on renewable developers that have already invested significant sums in upgrades for deliverability. We suggest that the CAISO perform studies to identify impacts on solar generation during the hours when solar production is at its highest levels, such as the hours of 10 or 11 through 2 p.m. In addition, the CAISO should evaluate whether all interconnecting projects, whether they request FCDS or Energy Only, should be evaluated for their potential to cause excessive congestion or curtailment.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
10h	*(2) If such studies are performed in the interconnection study process, then should the identified delivery network upgrades be required to be funded by the generator owner for its generation project to obtain FCDS?*	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	Probably, but GSCE believes this subject should be discussed further. The arguments in support of new interconnecting generators retaining the obligation to fund upgrades to mitigate for curtailment and congestion include the value of queue management and maintaining the equity between new and earlier interconnection customers where earlier customers funded significant upgrades to the transmission grid. Since transmission upgrades provide for general grid reliability, the cost reimbursements are justified.	

11. Independent Energy Producers Association (IEP) Submitted by: Steven Kelly		
No	**Comment Submitted**	**CAISO Response**
11a	**Summary/Overview:** The Independent Energy Producers Association (IEP) appreciates the CAISO's focus on improving the Deliverability Assessment Methodology. While supporting changes in the Deliverability Assessment Methodology that make sense, we agree with the CAISO that the need to consider changes to the current methodology is driven primarily by changing load shape. Yet, we also observe that the primary affects may be felt by the commercial interests of resource developers (generation and transmission). We note too that regulatory and market certainty drive the commercial investment that is critical to achieving the state's public policy objectives (e.g. GHG reduction, RPS) while ensuring grid reliability. While supporting this stakeholder initiative, we recognize that the scope/scale of the initiative potentially is very broad. Thus, we have concerns that this initiative may morph in a manner that imposes unwarranted and unreasonable risks on resources seeking to interconnect to the CAISO grid. Thus, we recommend that the CAISO, up-front in this initiative, consider developing a set of Guiding Principles to govern expectations and help frame expected outcomes.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
11b	**IEP Comments on Deliverability Assessment Initiative/Issue Paper:** The CAISO Issue Paper (and accompanying Presentation) notes that the evolving load shape necessitates a more deliberate study of the output of intermittent resources to serve load matched with the load level at the time of output. Moreover, the CAISO states that this initiative is driven by the same factors that led the California Public Utilities Commission (CPUC) to adopt an Effective Load Carrying Capability (ELCC) methodology for assessing the qualifying capacity values of intermittent resources (e.g. wind, solar) in the context of resource adequacy. IEP recognizes the value of considering reforms in the Deliverability Assessment Methodology given these factors. We note, however, that the risk of unintended consequences is significant when considering broad changes to the Deliverability Assessment Methodology, including potential impacts on the	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	determination of Qualifying Capacity associated with existing resources interconnected to the CAISO grid; the scope/scale and timing of Network Upgrades; and, the scope/scale and timing of transmission upgrades in the Transmission Planning Process (TPP). While generally supporting the direction of this stakeholder initiative, IEP recommends that the CAISO take an initial, yet critical step in this process and develop a set of Guiding Principles that will help frame the discussion(s) and scope/scale of potential outcomes. We recognize the difficulty in accomplishing this important task, but the potential for this stakeholder initiative to broaden and morph beyond expectations is significant absent a set of Guiding Principles to help govern the process.	
11c	In the context of considering a set of Guiding Principles, we offer the following suggestions for stakeholder consideration: • Coordination/Consistency with Other Agencies (e.g. CPUC, CEC). Coordination and consistency among the various entities that affect resource decisions in California (e.g. the CAISO, CPUC, CEC) is essential to ensure timely infrastructure investment needed to meet state policy goals. As noted in the Issue Paper, the CPUC has adopted the ELCC methodology for assessing the RA value of intermittent resources. Here, the CAISO is proposing a similar approach to the Deliverability Assessment used for all intermittent resources. We recommend that coordination/consistency with other agencies be treated as a Guiding Principle for this initiative.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
11d	• Hold Harmless. Currently, resources interconnecting at the transmission level of the electric grid have the choice of obtaining Full Deliverability Status. To achieve this status, the resource must pay for Network System Upgrades (subject to refund) to ensure that resources already on the system are not harmed by the interconnection of the new resource. Full Deliverability Status remains with the unit for the life of the resource. This approach help provide a measure of regulatory/commercial certainty to infrastructure investment and, as a result, lowers the cost of that investment. The principle that existing resources be held harmless for	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	future changes in the Deliverability Assessment Methodology to the extent feasible and practical ought to be applied in this initiative.	
11e	• Setting Clear Market Signals for Investment. The Deliverability Assessment is used to inform resources interconnecting to the electric grid the costs of such interconnection assuming the desire to obtain Full Deliverability Status (and Partial Deliverability) versus, for example, Energy-only status. The Deliverability Assessment Methodology should not undermine the market signals that drive needed, cost-effective investment in a timely manner, particularly with regards to who is doing what, when, and where.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
11f	• Rely on Markets. California's energy landscape is driven in part by market signals and in part by administrative fiat. In the tension between the two, the CAISO should rely first on market-based solutions to incent and facilitate new infrastructure investment	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

12. Pacific Gas & Electric (PG&E) Submitted by: Matt Lecar		
No	**Comment Submitted**	**CAISO Response**
12a	Overall, PG&E believes the focus of this process is to give resource developers the appropriate economic incentives to ensure that new resources interconnect at the best locations that provide the highest benefit to serving load and meeting the capacity needs of the system, at the least cost mix of both transmission upgrades and curtailment/congestion. An example that clearly describes the existing process and the proposed changes would be helpful to facilitating a more robust discussion with all involved stakeholders.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
12b	**1. Should additional studies be added to the interconnection study process to meet the objective of avoiding excessive curtailment?** PG&E believes that additional studies do need to be undertaken, with the objective to quantify the trade-offs of potential network upgrades to accommodate additional deliverability from new resources, versus the additional congestion created by new resources interconnecting without additional upgrades. As a starting point, CAISO would need to establish a baseline model of curtailment by local area/subarea. It is important to assess both a baseline rate of economic curtailment of renewable resources (during hours of negative pricing), congestion-related curtailment (during hours of locally-constrained deliverability), and the utilization of "congestion management" as a solution within the existing Transmission Planning Process. A baseline curtailment study could be conducted initially as a special study, but might eventually become a regular, recurring feature of the economic study portion of the TPP or Local Capacity Technical Study Process, encouraging the development of economically beneficial transmission projects to reduce overall congestion costs. During the interconnection study process, individual resources seeking interconnection would be assessed against the baseline rate of congestion to determine their incremental contribution to increasing curtailment costs. These studies would seek to identify cases in which network upgrades might be cost-effective, as compared to the alternative of increased curtailment and congestion cost. CAISO could then evaluate and approve additional network	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	upgrade projects, either under the current RNU/LDNU framework for cost responsibility, or under a new framework (see answer to question 2 below). PG&E believes that there would be multiple advantages of such a two-tiered study approach. First, with an informational baseline available as a regular part of the TPP, resource developers would have greater transparency as to where to site new projects, in order to target areas of the system that are less congested and less likely to experience curtailment, thereby incenting new capacity to locate where it contributes the greatest value to serving load. Second, by studying network upgrades as a potential mitigation for congestion during the interconnection study process, there is also a significant timing benefit. Transmission projects have a long lead time to permit and construct. The current economic study approach requires building and bringing new resources on-line, incurring several years of higher prices in order to create a historical congestion record that may then allow CAISO to consider and approve new economic projects in the TPP. By studying the likely congestion and curtailment costs up-front, during the interconnection study process, CAISO will allow economic transmission projects to be built much sooner, reducing by several years the lag time during which customers would experience higher prices.	
12c	**2. If such studies are performed in the interconnection study process, then should the identified delivery network upgrades be required to be funded by the generator owner for its generation project to obtain FCDS?** PG&E believes that resources should have appropriate incentives to identify locations for interconnection with existing transmission capacity. The CAISO currently caps the repayment of amounts advanced for reliability network upgrades up to $60,000 per MW of generating capacity as specified in the Generator Interconnection Agreement. A similar provision should be considered for transmission upgrades that could be essential to relieving congestion and identified within the interconnection process. Additional analysis is needed to understand the value of this provision to all impacted parties. PG&E believes that this paradigm, while fundamentally sound, may require further evolution, in light of the renewables transition underway and the increasing curtailment caused by an over-reliance on resources that largely	Please see responses to stakeholder comments in section 4 of the Straw Proposal.

No	Comment Submitted	CAISO Response
	follow the same hourly profile. PG&E does not propose any specific changes at this time.	

13. The Cities of Anaheim, Azusa, Banning, Colton, Pasadena and Riverside (Six Cities) Submitted by: Meg McNaul		
No	**Comment Submitted**	**CAISO Response**
13a	With respect to the CAISO's question on the inclusion of additional studies in the interconnection study process to meet the objective of avoiding "excessive curtailment," the Six Cities are not opposed to such studies, but the CAISO should ensure that the studies will be fully funded by the interconnection customer consistent with Sections 3.2(d) and 3.5.1.2 of the Generator Interconnection and Deliverability Allocation Procedures and that the inclusion of these studies will not unduly delay the interconnection process. Substantively, how would the CAISO evaluate the results of these studies to determine the quantity of curtailment that would qualify as "excessive" and therefore potentially require mitigation through upgrades? There are criteria and methodologies for identifying whether to proceed with economic and policy projects in the transmission planning process; how would these principles translate into the interconnection process?	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
13b	As to the question of whether delivery network upgrades needed to address curtailment should be "funded" by interconnection customers, is the question whether interconnection customers should provide up-front financing for such upgrades, subject to subsequent repayment by Participation Transmission Owners (who then include the costs for the upgrades in their Transmission Revenue Requirements), or is the question whether interconnection customers should be responsible for paying the costs of the network upgrades, without any subsequent repayment funded by transmission customers? The Six Cities' preliminary view is that if upgrades are needed in order to avoid an undesirable level of curtailment for a particular interconnecting resource, then the interconnecting resource, and not transmission customers, should be responsible for paying the network upgrade costs.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.
13c	Particularly in light of the foregoing questions, there appears to be a need to carefully coordinate any changes to study processes that are part of the transmission planning process with the interconnection process and requirements, including the deliverability allocation procedures.	Please see responses to stakeholder comments in section 4 of the Straw Proposal.