

***Stakeholder Comments
2012-2013 Transmission Planning Process
Preliminary Policy-Driven & Economic Assessments
December 11-12, 2012***

No	Submitter (Name & Company)	Comment Submitted	ISO Response
1	Robert D. Smith and Brian D. Weber, Arizona Public Service Company and MidAmerican Transmission, LLC	<p>Based upon our preliminary review, the analysis performed by the CAISO appears to be reflective of the existing market constructs, regulatory framework, and current transmission topology. The added depth of analysis, facilitates a robust and holistic perspective of procurement and transmission of energy which should ultimately benefit the CAISO customers. We are encouraged by, and concur with, the CAISO's preliminary assessment of the Delaney to Colorado River 500 kV Line ("DCR Line") which indicates that the project provides substantial net benefits to California customers.</p> <p>While we feel the project merits approval based on its economic production benefits alone, it's also worth noting the added benefits the project can bring the CAISO – reliability, standby and regulation capacity, contingency response, economic development and resource optionality.</p> <p>One of the next steps as discussed at the Stakeholder Meeting is to address the appropriate capacity benefit to ascribe to existing out-of-state generation. We agree that further studies may be needed to appropriately quantify the capacity value.</p>	Thank you for your input, these comments will be taken into consideration.

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		<p>In conclusion, we reiterate our appreciation for the opportunity to provide comments on the Preliminary Results and commend the CAISO for their thorough analysis. With regards to the DCR Line, we support the direction of the CAISOs initial economic assessment and look forward to seeing the next iteration of results when the CAISO posts its draft transmission plan. We view the DCR Line as providing multiple benefit streams and as a practical first step toward a long-term strategic build-out of regional transmission infrastructure in the Western Interconnection.</p>	
2	<p>Barry Flynn and Pushkar Wagle, Bay Area Municipal Transmission Group</p>	<p>We are concerned about the level of stakeholder engagement for the large transmission projects that may be considered for inclusion in the draft transmission plan. There currently are a number of open items including the consideration of the alternate scenarios in the deliverability projects, completing the economic, sensitivity and water analysis on the Central California studies, and modeling enhancements and sensitivity analysis for the economic studies. Given these open items that were not available for discussion with stakeholders, we request that an additional stakeholder meeting (or conference call) be scheduled for the second or third week of January to focus on the larger (greater than \$50 million) projects that are under active consideration for inclusion in the draft transmission plan and the progress in completing these open issues. It also makes sense for an exchange of ideas and opinions to take place between the CAISO and its Stakeholders before the CAISO decides what positions</p>	<p>An additional layer of consultation in mid-January was not feasible from an ISO perspective due to the ISO and industry resources that such a consultation would require while work efforts are focused on completing the documentation of the draft plan. However, the draft plan is released at the end of January with an additional consultation opportunity scheduled in February. Further, if the ISO considered a project to have merit, but that the analysis did not provide the ISO sufficient certainty to approve the project, then projects can (and have in the past) been held over to the next planning cycle for completion.</p>

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		<p>to take, especially on large potential Category 1 projects, in its draft transmission plan. We also request that, prior to the requested meeting (or conference call) CAISO provides, to the extent possible, any additional information requested by stakeholders such as those requested by BAMx below.</p>	
3	<p>Barry Flynn and Pushkar Wagle, Bay Area Municipal Transmission Group</p>	<p><u>General Comments</u> BAMX supports that CAISO Stakeholder process and finds the presentation materials and the interaction with the CAISO engineers extremely valuable in understanding the analyses prepared by the CAISO. However, there was much information, not only the study findings, but also the underlying assumptions, that the Stakeholders were exposed to for the first time during the December 11---12th meeting. To better understand the CAISO findings, more information is needed, especially:</p> <ul style="list-style-type: none"> • A complete list of the renewable projects, by each area (CREZ) modeled in the reliability assessment cases so that they can be systematically compared to the data the CAISO has provided for the four portfolios. • The rationale as well as a description of the peak and off---peak of hours selected for the policy---driven studies. • The modeled peak and off---peak injections of the RPS Generation modeled in the 4 RPS portfolios. (The documentation only reflects the nameplate capacity.) We feel that this information may help stakeholders understand why the Commercial Interest portfolio has most of the overloads. 	<ul style="list-style-type: none"> • The information on the renewable projects that are modeled in the reliability assessment cases can be obtained from these cases. All power flow cases, including the cases used in the reliability assessment and in the policy-driven studies are posted on the ISO Market Participants portal. In addition, all modeling assumptions will be included in the ISO 2012/2013 Transmission Plan. • The rationale and description of the peak and off-peak hours selected for the studies will be included in the ISO 2012/2013 Transmission Plan • All information about the generation projects modeled in four RPS portfolios including dispatch of the renewable generation can be obtained from the power flow cases that are posted on the ISO Market Participants portal. Why Commercial Interest portfolio has most of the overloads can be seen from the power flow cases for this and other renewable portfolios. • Assumptions on the level of Once-through-cooling generation modeled in the studies will be described in the ISO 2012/2013 Transmission Plan report. Generation dispatch of these units can be obtained from the power flow cases that are posted on the Market Participants portal.

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	<ul style="list-style-type: none"> • Clearly lay out the assumptions on the level of Once-Through-Cooling generation modeled. • Post the Request Window Applications. Posting of these applications only after the draft transmission plan is released prevents the stakeholders from providing timely input into how such upgrades could be valuable to the transmission plan. <p>Currently both the Policy Driven Planning Deliverability Assessment and the Economic Planning studies are only based on the base (Commercial Interest) portfolio. These studies give an impression that some additional projects are needed to meet the policy goals and/or economically justifiable. However before decisions are made for recommendations for Category 1 policy driven upgrades, all four RPS scenarios must be considered with similar findings for a significant percentage of the stressed scenarios before proceeding. Therefore the analyses as presented at the stakeholder meeting are insufficient to make a Category 1 policy driven upgrade recommendation.</p> <p>While BAMx has raised the issue in other CAISO forums, we feel that it is important to restate that we question the need to model all renewable resources as Full Capacity Delivery in order to meet California's RPS policy goals. As the 33% RPS goal is an energy requirement, not an RA one, as a minimum requirement, the CAISO should perform an economic</p>	
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		<p>test on the benefit of transmission to receive the RA from these low RA value resources before recommending any transmission upgrade as part of the analysis completed to date for the Policy Driven Upgrades.</p>	
4	<p>Barry Flynn and Pushkar Wagle, Bay Area Municipal Transmission Group</p>	<p><u>Coolwater---Lugo/AV Clearview Comparison</u> We appreciate the CAISO considering alternatives to the proposed Coolwater---Lugo transmission line. This line, estimated by SCE to cost in excess of \$500M, deserves serious scrutiny of its value proposition as well as investigating the adequacy of less costly alternatives. The 765 MW of solar, geothermal and wind resources that support this line only appear in the Commercial Interest RPS portfolio. The Cost Constrained, Environmentally Constrained and High DG portfolios have a maximum of 64 MW that would be served by this line. As such, this upgrade should, at best, be considered a Category 2 project and not included in the policy driven upgrades presented for Board approval in this planning cycle.</p> <p>Also with respect to the alternatives to the Coolwater---Lugo Project, the CAISO notes that expansion of the Kramer RAS may not be feasible. Given the high cost and risk reflected in the limited portfolio drivers for this project, the nature of the feasibility of expanding the RAS needs to be better understood. If the barrier is the technical capability of the RAS, the cost of the alternatives provides a high economic incentive to better understand why the existing equipment cannot be upgraded or replaced.</p> <p>The CAISO provided a comparison of Coolwater---Lugo 230 kV Project</p>	<p>The commenters have perhaps misunderstood the ISO's intent in studying the AV Clearview project as an alternative. The Coolwater-Lugo project is proceeding through the generator interconnection process, and the ISO anticipates the filing of an application by SCE in the first half of 2013 for CPCN for this project. The analysis here does not suggest that the ISO is reconsidering its obligations under executed LGIAs. However, the ISO has studied the AV Clearview project with the expectation that this project would be seen to be a possible alternative, and that the viability as an alternative will need to be considered by the CPUC in the CPCN regulatory proceeding. The ISO conducted its evaluation in the course of the 2012/2013 planning cycle for consistency and efficiency of analysis, and transparency for stakeholders. If that analysis indicated that the AV Clearview project was in fact superior and met the needs of the generator interconnection process, then a reconsideration of the path forward would have been necessary, while the ISO is open reviewing stakeholder comments and studies, the ISOS's results have not identified such benefits.</p> <p>The Coolwater-Lugo 230 kV transmission line was triggered by the CAISO generation project #125 with an executed LGIA in the Serial Group as a Delivery Network Upgrade to mitigate the precontingency</p>

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		<p>to the AV Clearview Transmission Project and concluded that the Coolwater---Lugo 230 kV Project serves the needs of the area at less cost. It also indicated that the AV Clearview Transmission Project provided additional capability to accommodate renewable generation in excess of that needed for the Commercial Interest case. While these alternatives accommodate the full development reflected in this area for the Commercial Interest portfolio, we think the CAISO needs to also examine less expensive alternatives to Coolwater---Lugo even if they cannot accommodate the full 765 MW represented in one possible future scenario.</p> <p>As noted above, despite the above request for further analysis, the CAISO's analysis with and without the Coolwater---Lugo project is quite valuable. BAMx urges the CAISO perform similar analyses for all such LGIA---related projects identified to be needed to meet 33% RPS in the next planning cycles, including the West of Devers upgrades, South of Contra Costa upgrades, Borden---Gregg reconductoring, etc.</p>	<p>overloads on the Kramer-Lugo No.1 & No.2 230 kV Lines. The base cases for the policy driven assessment was constructed with high import and high renewable resource production levels across the ISO system and some local gas fired generation in the north of Lugo area was economically dispatched at minimum levels or off-line. Under other less optimistic scenarios where the capacity from this gas generation is needed, the precontingency overloads on the Kramer-Lugo No.1 & No.2 230 kV Lines would result in capacity needed for resource adequacy being unavailable</p>
5	Barry Flynn and Pushkar Wagle, Bay Area Municipal Transmission Group	<p><u>Sycamore---Penasquitos 230 kV line</u> This line, with an estimated cost of \$111M---\$221M, is identified in the potential policy driven solutions for a number of SDG&E area overloads. However many of the overloads are relatively minor and all have multiple relatively inexpensive solutions. Therefore the major expense of this line has not been sufficiently justified in light of these alternatives. Given this lack of foundation, it is surprising to see that in the presentation to the CAISO Board a couple of days later on the</p>	<p>In the presentation to the Board of Governors referred to by the commenters, the term "advance" was used in the context of bringing forward a proposal for consideration. Other potential mitigations were similarly referred to, which have not been discussed in other forums as potential policy-driven projects. In the course of the presentation, it was mentioned that the Sycamore-Penasquitos line was also identified as a possible mitigation of policy-driven needs – at no time was it suggested in the discussion that the line was already a foregone</p>

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		<p>Briefing on Nuclear Generation Studies, the Sycamore---Penasquitos 230 kV line is included in the “Management’s preliminary conclusions reflect least regret considerations” as simply an advancement. While the return of SONGS is uncertain and planning for flexibility of the transmission system to continue to reliably serve load in the face of such SONGS uncertainty is an immediate challenge, considering the Sycamore--- Penasquitos 230 kV line as forgone conclusion and simply advancing it to support the needed flexibility may be masking other, lower cost solutions than building this line in the first place.</p> <p>Therefore we request that the CAISO first determine whether the multitude of relatively less expensive upgrades will address the transmission capacity issue and this serve as the foundation of the assessment for any additional system flexibility needs to accommodate the SONGS uncertainty.</p>	<p>conclusion.</p> <p>However, in the selection of the preferred alternative to address policy-driven needs, the ISO will consider all potential benefits and disadvantages of various alternatives. Cost is an important consideration in the selection of a preferred alternative, but not the only consideration.</p>
6	Barry Flynn and Pushkar Wagle, Bay Area Municipal Transmission Group	<p><u>Central California Study</u> The analyses presented at the stakeholder meeting provided good insights into the nature of the issues in the Central California area. We support this type of in---depth long---term look at needs for an area of the grid. We understand that the whole grid cannot get this type of in---depth treatment every year but we encourage the CAISO to complete take this type of assessment with an area specific study plan in each yearly planning cycle. We understand that this year’s effort for the Central California area is</p>	<p>The ISO will present additional Central California findings and results in upcoming stakeholder meeting(s) as more analysis become available. The comprehensive study will look at a high number of reliability, economic and renewable integration issues including Helms water availability during dry hydro years as well as additional use of peakers in a non-attainment San Joaquin air quality district. The ISO will also look at a multitude of possible transmission mitigating alternatives including re-rates, line reactors, SPS, reconductoring of existing elements and/or new transmission elements. Depending on the results a combination of some of the above may be required in</p>

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		<p>still a “work in progress” and look forward to the CAISO’s further analysis – hopefully at another stakeholder meeting (or conference call) as requested above. While there are a number of transmission overloads identified in the scenarios, the issues appear to be around economic operation of the system as opposed to the ability of the system to reliably serve the load in the area. As such, the value of any upgrades is likely to be non---linear with the larger benefits being associated with the first capacity increases. We encourage the CAISO to first consider the economics of upgrading the existing transmission lines that appear in many scenarios, such as the Warnerville to Gregg sections of the Bellota---Gregg 230 kV line. With only 250 hours of congestion in the area and a higher priority being placed on upgrades to existing infrastructure, we would expect that there would be insufficient reliability and/or economic justification for large projects such as the Greater Fresno Area Upgrade Project presented at the September stakeholders meeting. We are particularly concerned about some of the assumptions for Helms dry year pumping and generating assumptions. There should be a baseline of (minimum) upgrades driven by real reliability issues. Any increase in scope of upgrades beyond this baseline, such as for increased Helms operating flexibility, should be subject to a separate economic analysis.</p>	<p>order to come up with the best solution; again please follow our stakeholder process for related details.</p>
7	Barry Flynn and Pushkar Wagle, Bay	<p><u>Economic Planning Study</u> This year’s economic planning studies indicate a significantly higher amount of congestion in the CAISO---controlled grid relative to the prior</p>	<p>There are numerous reasons for the difference of the economic study results of the last planning cycle and this one. Firstly, input assumptions change from year to year and contribute to the shifts of</p>

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<p>Area Municipal Transmission Group</p>	<p>two annual assessments. The benefits associated with certain transmission projects, in particular, the Delany---Colorado River 500kV project, have nearly tripled relative the last year’s assessment. The \$325M total cost and ~\$1,000M benefit is significantly different findings in the 2011---12 planning cycle of a \$319M total cost and on \$237M benefit. Although we applaud the efforts to make the economic analysis more accurate by making improvements such as the better representation of individual control areas, we encourage the CAISO to take an in---depth look at their studies before concluding that this years assessment is the correct one when it differs so dramatically from previous years. Such volatility in the economic benefits for one year to the next merits a much deeper investigation before any decisions are made on the merits of moving forward with this project.</p> <p>Additionally we are unclear on how this project meshes with the generator interconnection activities in the Riverside area. There are over 5,300 MW of generators in the Transition through Cluster 4 of the CAISO Interconnection Queue in the Riverside area that are awaiting transmission upgrades to move forward. The CAISO’s Technical Bulletin on Generation Interconnection Procedures: Deliverability Requirements for Clusters 1---4 acknowledges that many of the projects in these Clusters are not likely to be needed based on the amount of new generation expected to actually receive PPAs and</p>	<p>results. For example, the RPS data have changed and load forecasts have been revised. A specific example is that Arizona load forecast are significantly lower than the last year’s assumptions while the new California load data (i.e. CEC forecast) is not so much lower. This is one factor to drive the economic benefits higher for the proposed AZ-CA line. Secondly, in the last planning cycle, the database was based on an older TEPPC dataset (“2020 PC0”) developed in November 2010. In this planning cycle, the database is based on the latest TEPPC dataset (“2022 PC1”) released in May 2012. Based on the collective work of WECC-wide members and WECC staffs, the new database was a major improvement over the last one and the built-in study assumptions went through extensive reviews and reached acceptance. Thirdly, either with the older and the latest version of the TEPPC datasets are deficient in control area modeling. Also, the datasets do not have GHG emission model. These deficiencies have significant adverse impacts on the accuracy of the economic planning studies. In this planning cycle, the ISO made major modifications and enhancements to the TEPPC database and modeled WECC control areas (i.e. BAAs). Also, the ISO also added the GHG emission model pertinent to California AB32. These important modeling were made based on the generic need of the ISO’s economic planning study platform and not specially-related to any particular study subject. In the end effect, these modeling enhancements have some positive effects on the benefits of the proposed Delany – Colorado River 500 kV line. Overall, the ISO has have confidence in the database model and the economic studies. If any single study result turns out to be “economic”,</p>
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		<p>become commercially viable. Therefore the CAISO has removed the upgrades identified in this area for Clusters 1&2 from their LGIAs. These include a new 500 kV line from Colorado River to Red Bluff to Valley Substation. While BAMx supports that these upgrades are unlikely to be needed in the current plan, we are concerned that the economic analysis of a new Delaney--- Colorado River 500 kV line has not fully considered the CAISO program to allow for an oversubscription of Full Capacity Deliverability Service in this area in anticipation of generator attrition. The ultimate addition of this generation may result in greater congestion and corresponding economic impacts for which the current studies do not account.</p> <p>Therefore we request a more detailed assessment of this project's impacts and greater sharing of the underlying assumptions and model inputs before proceeding any further with this project.</p>	<p>the single-point of result will not be used to make any decision (i.e. project approvals). Instead, the ISO will conduct more extensive analysis to account for planning uncertainties. The extended analysis is accomplished by sensitivity analysis by varying a number of study assumptions. Only if the proposed network upgrade shows robust economic benefits under all (or most) study assumptions, the ISO will consider the proposed network upgrade as a candidate for economically-driven project.</p> <p>Suggest replacing this (now) with: The ISO's planning efforts are based on the renewable portfolios developed by the CPUC, which were taken into account both in the technical bulletin referred to and these planning studies.</p>
8	Barry Flynn and Pushkar Wagle, Bay Area Municipal Transmission Group	<p><u>North PG&E Policy Driven Power Flow and Stability Results</u> The Greater Bay Area Summer Peak results identifies overloads of up to 25% on eight 115 kV transmission circuits that serve the East Bay as well as a 13% overload on the Moraga 230/115 kV transformer. This result is unexpected as the reliability studies did not show these overloads and there are few, if any, renewable generation projects in the East Bay that would vary among the resource scenarios. The identified mitigation for these overloads is pre---dispatch the Oakland generation to mitigate the potential overloads.</p>	<p>With the Oakland generation pattern (95.2MW) in the reliability studies, these overloads - overloads of up to 25% on eight 115 kV transmission circuits that serve the East Bay as well as a 13% overload on the Moraga 230/115 kV transformer do not show up in the reliability studies.</p> <p>With the renewable generation profile, Oakland generation was reduced to zero. And the renewable generation projects in the East Bay do not mitigate the similar contingency as the Oakland generation does.</p>

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		<p>Any plan to pre---dispatch of these Oakland CTs should be considered very cautiously. There are no statements as to the number of hours that the system would in a state requiring such re---dispatch. However given the high levels of the overload and the more moderate temperature variations in this area, the number of hours is likely significant. Additionally, not only are the Oakland CTs inefficient to pre--dispatch, such units often have environmental limitations on their total annual hours of operations that should be checked. In any event, such pre---dispatch of these units should only be considered a stopgap measure until a long---term solution can be identified.</p> <p>As noted in Alameda's October comments on the reliability assessment, a separate but related forum should be developed that would assist the CAISO in selecting the long---term transmission solution for the Oakland/Alameda area.</p>	<p>The identified mitigation for these overloads with pre-dispatching the Oakland generation was meant to match, but not to exceed the Oakland generation pattern (95.2MW) in the reliability studies.</p>
9	Jaleh Firooz consultant to California Consumers Alliance (CCA)	<p>In general, the transmission planning process used for the CAISO's 2012/2013 transmission plan appears to be similar to the studies the CAISO has done in previous years. The process follows the same approach of looking at local reliability areas under stressed conditions, identifying reliability standard violations and recommending mitigation solutions for each violation.</p> <p>It is evident in all three types of transmission planning studies performed by the CAISO: reliability, meeting RPS goals, and interconnecting generators, that the CAISO has failed to identify and</p>	<p>In performing transmission planning studies, the CAISO considers all mitigation solutions to identified problems, including operational and non-wires solutions. After considering all alternatives, the optimal alternative is selected based on the cost and the benefits to consumers. For more discussion on non-wires alternatives, please see ISO response to Clean Coalition below.</p> <p>In considering alternatives for transmission upgrades, the ISO follows its tariff. On January 31, 2013, the ISO will publish our annual draft Transmission Plan report documenting all of the transmission</p>

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	<p>vet a reasonable range of feasible alternatives, including operational solutions. If the reason for not considering all viable solutions is a lack of resources to conduct the necessary studies, the CAISO should consider hiring consulting services to allow a deeper and broader evaluation of feasible alternatives for mitigating identified reliability standard violations. Consideration of a broader range of wires- and non-wires alternatives is necessary in order to determine which mitigation option is least cost for consumers. Spending a little more money upfront on the evaluation process can save a lot of money down the road in terms of identifying the lowest cost solution. These solutions may be transmission expansion projects or they may be non-wires approaches such as pre-contingency generator redispatch.</p> <p>The CAISO is reminded that the CAISO's own tariff obligates it to consider alternatives for all proposed transmission upgrades, including "reliability" projects. These obligations are set forth in the CAISO tariff:</p> <p>24.2 The Transmission Planning Process shall, at a minimum: (a) Coordinate and consolidate in a single plan the transmission needs of the CAISO Balancing Authority Area for into a single plan, which will be assessed on the basis of maintaining the reliability of the CAISO Controlled Grid in accordance with Applicable Reliability Criteria and CAISO Planning Standards, in a manner that promotes the economic efficiency of the CAISO Controlled Grid. [emphasis added]</p> <p>24.3.1 (j) Generation and other non-transmission projects that are</p>	<p>deficiencies identified and alternatives considered. Please review this report and provide specific comments on where there is concern that the ISO has not vetted a reasonable range of feasible alternatives.</p>
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	<p>proposed for inclusion in long-term planning studies as alternatives to transmission additions or upgrades; [emphasis added]</p> <p>24.4.6.2 Reliability Driven Projects The CAISO, in coordination with each Participating TO with a PTO Service Territory will, as part of the Transmission Planning Process and consistent with the procedures set forth in the Business Practice Manual, identify the need for any transmission additions or upgrades required to ensure System Reliability consistent with all Applicable Reliability Criteria and CAISO Planning Standards. In making this determination, the CAISO, in coordination with each Participating TO with a PTO Service Territory and other Market Participants, shall consider lower cost alternatives to the construction of transmission additions or upgrades, such as acceleration or expansion of existing projects, Demand-side management, Remedial Action Schemes, appropriate Generation, interruptible Loads, storage facilities or reactive support... [emphasis added]</p> <p>In nearly all instances where a reliability standard violation is identified, the CAISO should assess whether pre-contingency generation redispatch would avoid the thermal overloads or unacceptable voltage deviations that would otherwise occur under the posited contingency event. If it is determined that pre-contingency generator dispatch would avoid the reliability standard violation, the CAISO would then need to estimate the costs of such generation redispatch and compare this cost to the cost of other mitigating solutions (such as expanding the</p>	<p>In the transmission planning studies, the ISO performs market simulation and economic studies that, among other solutions consider pre-contingency generation re-dispatch. As a result, economics are considered in selecting an alternative.</p>
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	<p>transmission grid). Pre-contingency generator dispatch has the advantage that it minimizes the need to trip generation for contingencies.</p> <p>Finally, tripping generation should be a potential solution that is considered for nearly all contingency events. Generation tripping is generally low cost and, considering the infrequency of transmission contingencies, will not occur often. For example, the cost of tripping renewable generation and replacing this generation with additional purchases of renewable energy to reach the required 33%, should be examined against the cost of building additional network upgrades that would avoid having to trip any renewable generation under the contingency event.</p> <p>Renewable developers generally support building more transmission because they want to minimize the risk of losing Resource Adequacy (RA) deliverability. However, the CAISO should compare the economic value of RA deliverability against the cost of the network upgrades that provide such deliverability. At some point consumers will be better off if the network upgrade is not built and RA deliverability is secured from generators located at points on the grid where RA deliverability is not at risk. The CAISO's current deliverability study process uses extreme and, in most cases unrealistic, assumptions as regards generation dispatch patterns, both in the area around the generator under study as well as elsewhere on the WECC grid. For example, it is illogical to assume gas-fired generation in the area around the generator under</p>	<p>ISO considers installations of SPS to trip generation with contingencies as potential mitigation solutions. Each SPS is evaluated for its cost, complexity and impact on other SPS in the area. Alternatives of SPS to trip generation are compared with other alternatives, including transmission upgrades, and the overall most effective alternative is selected.</p> <p>In transmission planning, the most critical conditions are considered according to the Transmission Planning Standards. In deliverability studies, the ISO Deliverability Assessment Methodology is used. This methodology can be found on the CAISO website at http://www.aiso.com/Documents/On-</p>
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	<p>study is running at full output while gas-fired generation of similar variable cost characteristics in other locations is off-line or running at less than full output.</p> <p>Building network expansion to assure full deliverability of any generation located any place resembles building freeways anywhere housing developers decide to build. This transmission expansion approach removes the last semblance of locational price signals since customers are now going to pay for the network expansion to provide full deliverability for the 33% RPS goal. A market design based on the will of a segment of the participants at the expense of others, and not based on any sound economic methodology, is bound to cause problems and eventually fail. This is evident from the first ten years of the CAISO's operation with a zonal market design, as well as issues with the CAISO's generation interconnection process.</p> <p>The deliverability methodology and its connection to the RA counting and payment is the main push behind full deliverability at any cost to the customers and needs to be reexamined. We urge the CAISO to promptly begin a new stakeholder process to reevaluate their deliverability assessment methodology given its significant impact on generation and transmission resource development in the future.</p> <p>From the CAISO's study results it is not clear if the addition of Distributed Generation (DG) helps to mitigate thermal overloads or low voltages that, if the DG were not added, would otherwise be present under contingency conditions. The CAISO has not performed any studies for the High DG case under peak load conditions. The High</p>	<p>PeakDeliverabilityAssessmentMethodology.pdf. We understand the methodology is complex and not well understood, and the ISO will be taking further steps to improve industry understanding in 2013.</p> <p>The ISO has recently revised our Generation Interconnection and Deliverability Allocation Procedures. One of the objectives of these changes is to strengthen cost considerations in the process of developing transmission driven by potential generation development.</p> <p>The Nuclear backup studies included a sensitivity study on a peak load base case which included the High DG portfolio modeling.</p> <p>The purpose of the policy driven studies is to assess the ability of the</p>
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		<p>DG case has only been studied for off-peak load conditions. Therefore it is not clear if the High DG case removes or improves any problems in the peak hours, such as low voltage problems identified in the CAISO other studies of peak load conditions.</p> <p>The amount of DG in the High DG case examined by the CAISO seems conservative as compared to the amounts of DG in the filings of many parties in the LTPP and other proceedings. It is recommended that CAISO study one High DG sensitivity that includes a much larger amount of behind-the-load meter DG. This sensitivity would reflect a lower level of net load at the transmission substation level. It will provide an opportunity to examine the impact of High DG on the reliability of the system and on each of the 33% RPS portfolio cases. If the High DG sensitivity is pursued then, according to the least regret principal, it may be preferable to defer or eliminate certain proposed transmission expansion projects, thereby reducing the risk of stranded investment.</p>	<p>transmission system to accommodate generation needed to meet the 33% RPS under various scenarios. The ISO essentially stipulated that the High DG portfolio is not likely to drive any transmission needs beyond what was seen in the other portfolios, and is likely to need less transmission than the other portfolios.</p> <p>High DG is studied for off-peak load conditions because in this case, the off-peak conditions are more critical. Potentially lower transmission needs of the High DG portfolio during peak load conditions would not eliminate the need for transmission due to the High DG portfolio during during off-peak conditions.</p> <p>Thanks for the comment. It would be helpful if you submitted this comment to the CPUC for consideration in the development of renewable portfolios and during the development of study assumptions in the next ISO planning cycle.</p>
10	Jaleh Firooz consultant to California Consumers Alliance (CCA)	<p>As part of its 2012-2013 Transmission Planning Process (TPP), the CAISO performed a “33% RPS Sensitivity Case Assessment Modeling a High Out of State Import Scenario.” This peak load case was structured by removing 3000 MW of generation in the Commercial Interest renewable resource portfolio “starting from the bottom of the portfolio’s supply curve,” and replacing this generation with 3000 MW connected to the Eldorado 500 kV bus. Path flows were then adjusted “to be within limits.”</p>	<p>Please refer to the response to Bay Area Municipal Transmission Group, Comment #4. The scenario studied was presented as a sensitivity to demonstrate boundary conditions, and is not an exhaustive analysis of another portfolio. The potential solutions identified are conceptual, and the ISO is not recommending approval of the alternatives discussed in this analysis. That being said, the conditions studied in this sensitivity were by design beyond historically-experienced flows – which was the purpose of the sensitivity in</p>

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	<p>The CAISO's December 11, 2012 presentation indicates that with the above modifications 10,950 MW are flowing into California on the West of River path simultaneously with 4,800 MW on the Pacific AC intertie and 3,100 MW on the Pacific DC Intertie. Simultaneous imports into California on these three paths total 18,850 MW. This level of imports considerably exceeds the highest level of simultaneous imports into California that has been recorded during peak load conditions.</p> <p>The CAISO subjected this case to N-2 contingency conditions and identified thermal overloads. The CAISO also found that a power flow solution was not possible for the simultaneous loss of 3000 MW of generation at Eldorado as a result of voltage instability in the Pacific Northwest. The CAISO presentation indicates that there are several "potential mitigations east of Eldorado."</p> <p>These mitigations are either (a) a new 500 kV line between Eldorado and Rancho Vista substations, series capacitor upgrades, and reconfiguring an existing 500 kV line, or (b) converting the existing 500 kV Mead-Adelanto line to a direct current line.</p> <p>The usefulness of the CAISO's assessment is highly questionable because the system conditions being studied are highly unrealistic. Indeed, the CAISO assessment provides no indication of how</p>	<p>replacing forecast in-state renewable generation with out-of-state renewable generation.</p>
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	<p>frequently the simulated system condition, or similar system conditions, are expected to exist.¹ While it is theoretically possible to reach a condition where power flows on the West of River path, the Pacific AC Intertie, and the Pacific DC intertie are simultaneously at the respective path ratings, such a condition cannot be used to support mitigation measures which involve new transmission of significant scope and cost.²</p> <p>It does not make sense to propose mitigation measures which will cost hundreds of millions of dollars without first considering a broader range of feasible mitigation solutions. This broader range should include actions such as pre-contingency redispatch of generation and/or remedial action schemes which automatically trip certain amounts of generation for specific contingency conditions. Given the relatively extreme conditions which the CAISO has assumed for this assessment, it is likely that pre-contingency redispatch of thermal generation would be needed very infrequently, if ever. Accordingly, the cost of this redispatch would be far less than the cost of the new infrastructure</p>	
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¹ The CAISO’s assessment literally cries out for hourly economic grid simulation analysis using a DC power flow program that can estimate, for a given set of economic assumptions, expected grid power flows for every hour of a year. This type of analysis would lend credibility to system conditions which may then be subjected to more rigorous AC power flow analysis. It does not appear that the CAISO attempted such an analysis as part of the assessment that is the subject of these comments.

² The addition of 3,000 MW of new generation at Eldorado, especially if it is assumed to be low variable cost renewable generation, would likely have the effect of reducing thermal generation in southern Nevada and other desert southwest regions, thereby reducing West of River path flows below what they might otherwise be.

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		<p>identified by the CAISO in its presentation. Similarly, the likelihood that a large amount of generation would have to be tripped under a remedial action scheme is very low given that the level of flows modeled by the CAISO are rarely, if ever, encountered.</p> <p>CAISO transmission assessments, such as the assessment discussed in these comments, should, at a minimum, include (a) a discussion of the frequency with which the simulated system condition (or similar system conditions) are expected to occur, and (b) an evaluation of a reasonable range of feasible mitigation solutions for identified reliability standard violations. These solutions should include pre-contingency generation redispatch, remedial action schemes and, where warranted, infrastructure upgrades. Regrettably, the only mitigation solutions presented in the CAISO's December 11, 2012 presentation are infrastructure upgrades.</p>	
11	<p>John Yarbrough and Aseem Bhatia, California Department of Water Resources - State Water Project</p>	<p>CDWR believes the planning process; including inputs, studies, and results; needs to be consistent with the guiding principles of transparency, stakeholder participation, and clarity and appreciates CAISO's attempt to apply these principles in the current planning process.</p> <p>CDWR also supports CAISO's efforts to improve grid reliability through consideration of both physical transmission and transmission alternatives, such as Special Protection Schemes/ Remedial Action Schemes (SPS/RAS), in certain cases. With either alternative, CAISO should evaluate the short-term and long-term impacts to the affected</p>	<p>Overloading of the Table Mountain 500/230 kV transformer in the off-peak High DG portfolio is caused by high generation at the time when the load is relatively low. The direction of flow on this transformer in the off-peak cases is from 230 kV towards 500 kV (reverse flow). In addition to hydro generation in the Table Mountain area, the high DG case also has significant amount of small renewable generation plants that inject power at Table Mountain. Under normal conditions in the 2022 off-peak High DG case, loading of the Table Mountain 500/230 kV transformer was around 99%. With an outage of the Round Mountain 500/230 kV transformer, Table Mountain transformer was</p>

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<p>(CDWR)</p>	<p>systems, entities, and paths in order to assess and inform stakeholders of the benefits of each alternative. Also, in consideration of transmission alternatives, CAISO should explore compensation mechanisms to support such alternatives.</p> <p>During the December stakeholder meeting presentation for the Policy Driven Power flow and Stability Study for the PG&E Area Bulk System, CAISO staff identified concerns with overload of the Table Mountain 500/230 kV transformer in the results of the 2022 Off-Peak Load, High DG portfolio scenario. CDWR requests clarification as to what CAISO has identified are the major contributing causes, pre-contingency, of this potential overload. Since the proposed mitigation for Categories B and C includes tripping of generation at CDWR's Hyatt facility (via SPS) or reducing the Table Mountain 500/230 kV transformer flow, CDWR requests confirmation from CAISO that this Category B, T-1 scenario shown on slide 45 of the presentation is not intended to be part of the <i>existing</i> SPS indicated on slide 46.</p> <p>If CAISO has assumed that part of the <i>existing</i> SPS is to trip Hyatt and Thermalito facilities, then CDWR believes this assumption has been incorrectly applied. If CAISO has identified this potential mitigation as needed in addition to the <i>existing</i> SPS whether for short-term or long-term reliability, CDWR requests CAISO explain how implementation of this additional scheme could be properly compensated.</p>	<p>identified as 2% overloaded. It may also overload with Category C contingencies, such as double outages of both Malin-Round Mountain or Round Mountain-Table Mountain 500 kV lines under off-peak conditions in the high DG case. To mitigate the overload, generation that is injected to the 230 kV bus of the Table Mountain needs to be reduced either by congestion management to reduce flow through the transformer under normal conditions or by installing an SPS to trip generation in case of contingencies. Hyatt and Thermalito units that are directly connected to the 230 kV Table Mountain bus appears to be the most effective in reducing the congestion.</p> <p>Existing SPS shown on slide 46 is intended to mitigate transmission line overload caused by an outage of the Table Mountain 500/230 kV transformer, not overload on the transformer itself. It monitors the status of the Table Mountain transformer and opens circuit breakers that connect Hyatt and Thermalito to Table Mountain if the Table Mountain transformer is out. The SPS is cut-in manually and is not flow-based. Scenario shown on slide 45 is not intended to be a part of the existing SPS because the existing SPS is designed for different conditions (Table Mountain transformer out, versus this transformer in and overloaded for the proposed SPS to operate).</p> <p>It is not clear yet if the SPS to trip Hyatt and Thermalito generation for overload on the Table Mountain transformer will be installed because the overload was observed only in one RPS portfolio and it can be mitigated by congestion management. Congestion management to</p>
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			<p>reduce the reverse flow on the Table Mountain transformer was also identified as needed to mitigate transient stability concerns in all off-peak scenarios.</p> <p>The overload was observed only in one RPS portfolio. Potential mitigation was identified as SPS to trip Hyatt and Thermalito generation for overload on the Table Mountain transformer or could be mitigated by congestion management. Congestion management to reduce the reverse flow on the Table Mountain transformer was also identified as needed to mitigate transient stability concerns in all off-peak scenarios.</p>
12	<p>Tam Hunt and Kenneth Sahm White, Clean Coalition</p>	<p>The Clean Coalition remains concerned that CAISO is not fully complying with the requirements of FERC Order 1000 with respect to considering NTA. Order 1000 (para. 148) states in relevant part: "When evaluating the merits of ...alternative transmission solutions, public utility transmission providers in the transmission planning region also must consider proposed non-transmission alternatives on a comparable basis." The Clean Coalition and other parties have urged CAISO to, as a general matter, consider the ability of NTA to meet regional transmission needs.</p> <p>Moreover, the state's long-established Loading Order, from Energy Action Plan I and II1, require that all state energy agencies, including CAISO, fully consider preferred resources for meeting new energy needs, and in related planning procedures. Preferred resources are</p>	<p>[1] The ISO has indicated where and how it would explore non-transmission alternatives in the 2012/2013 program. We have not yet been able to identify viable alternatives to this point and, except for one generation alternative, both requests (in the study plan stage and in the consultation regarding alternatives) no programs have been brought forward for consideration. The ISO is currently working with load serving entities to better define the requirements non-transmission alternatives would need to meet in order to be viable alternatives for consideration, and is also developing a broader plan for engaging industry to help with the development of demand response programs such that future planning cycles can consider these programs.</p> <p>[2] The ISO fully supports the state's Loading Order.</p>

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	<p>well-aligned with NTA in that the Loading Order prioritizes energy efficiency, demand response and renewable energy over fossil fuel generation.</p> <p>Page 4 of the Dec. 7 slide deck mentions an NTA study but this study is not discussed anywhere else in the slide deck. Is this an oversight or is this study underway, to be presented at a later date?</p> <p>Similarly, it appears that that NTA were not considered in the economic planning studies, which presentation begins on slide 182. Slide 201, specifically, lists three alternatives studied for relieving congestion on Path 26 (see Figure 1). It doesn't appear that NTA were considered in this analysis and we urge CAISO to remedy this oversight. The degree to which CAISO must consider NTA after parties like the Clean Coalition have urged such consideration is the gray area with respect to Order 1000. In the particular case of Path 26 congestion, our view is that the Clean Coalition's assertion that NTA should be considered in this context requires that CAISO do so. We look forward to further discussion on this issue and we will be able to provide additional details as this proceeding develops.</p> <p>Slide 202 states, with respect to congestion relief for Path 26: "It has been a challenge to find economic justification to relieve this congestion bottleneck. In this situation, we shall also explore other justifications,</p>	<p>[3] In the 2012/13 planning cycle, no viable non-wires alternatives were brought forward for consideration. As noted earlier, the ISO will be undertaking activities in 2013 to assist in the development of viable alternatives such that they may be considered in the 2013/2014 cycle.</p> <p>[4] The economic planning study considers "total cost" rather than just the capital cost of studied network upgrades. The total cost is the revenue requirement that includes the impacts of capital costs, taxes and variable O&M. The principle of using "total cost" has been documented in the ISO transmission plans and prior presentations. However, at the Dec 11-12 stakeholder meeting, the economic planning studstarted results were preliminary, where the Dec 11-12 presentation listed estimated capital costs alongside with economic benefits. That form of presentation caused this confusion. In the presentation of final results, the stakeholders will see that economic assessment weighs the "total cost" (i.e. revenue requirements, not just capital costs) against the computed economic benefits.</p> <p>[5] The ISO agrees that considerable industry effort will be necessary to explore viable alternatives in the future.</p>
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	<p>such as policy and reliability needs.” We note that the economic assessment appears to only look at the capital expenditure and fails to consider the full ratepayer impact of the ratebased ROI over the extended depreciation schedule, nor does it appear to consider O&M costs. Again, we urge CAISO to fully consider NTA as an alternative for relieving the congestion bottleneck. It is unclear from the CAISO presentation where the revenues and benefits are attributed. Following a goal of reducing ratepayer impacts, a reduction in congestion charges would be generally considered a benefit. It is far better if this goal can be achieved in coordination with the implementation of other State policies such as the Loading 5 Order, GHG and other emissions reductions, and system resilience. As such, CAISO should include in its economic analysis an alternative that invests at least the amount required for Alternative 1 toward NTA, and analyze the relative merits of this alternative to California’s grid, policy goals, and ratepayers.</p> <p>We do not at this time, and nor does any party, know with any certainty whether NTA are up to the task by themselves, or if congestion can be relieved economically through NTA alone. Nevertheless, it is incumbent upon CAISO to fully consider NTA in this and other transmission planning efforts. While projected improvements in energy efficiency, local Energy Storage, and Demand Response include “uncommitted” programs, and such projects present challenges in modeling, broadly distributed projects may be reasonably assumed at appropriately discounted levels based on trends in development and procurement. The fact that the ISO has no ability or authority to ensure that any</p>	
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	<p>proposed NTA are actually implemented does not mean that NTA should be discounted or ignored.</p> <p>The Clean Coalition has been advocating a “DG + IG” (Intelligent Grid) solution for California and other jurisdictions. The DG + IG suite of solutions falls squarely within the FERC rubric of non-transmission alternatives. The technical means are available, with advanced inverters, high penetration of DG (wholesale and retail), energy storage, and other IG components, to meet all future energy, capacity and voltage and reactive power regulation needs. CAISO has stated in prior workshops that it is looking to examine NTA from other jurisdictions and we look forward to CAISO’s updates and conclusions in this regard.</p> <p>In a parallel effort, we have also been concerned by the conservativeness of CAISO’s assumptions in the LTPP (R.10-05-006 and R.12-03-014) modeling that CAISO completed in partnership with the CPUC, particularly with respect to energy efficiency, demand response and DG. Current procurement programs and active interconnection queues (GIP, WDAT/WDT, and Rule 21) indicate markedly higher DG development than CAISO has adopted in its modeling. The CPUC’s Dec. 24th Proposed Decision in LTPP Track 1 includes procurement of substantial energy storage and other resources in order to support local capacity requirements.</p> <p>In the present context, preferred resource assumptions are not made explicit in the CAISO presentation and we urge these assumptions to</p>	
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		be made explicit. We further note that the CPUC's High-DG planning development scenario (in the LTPP) incorporates the same cost weighting as the cost-constrained scenario adopted as the Base Case. This incorporation increases the likelihood of additional DG deployment consistent with this scenario. We will comment further regarding our views on the appropriate assumptions once CAISO makes its economic analysis assumptions explicit in the present context.	
13	Keith White and William Dietrich, CPUC	<p><i>1. High Priority Should be Given to Developing Mutual Understanding Regarding How Characteristics, Locations and Timing of Demand-Side Measures Need to Be Established, in Order to Qualify as Substitutes for Transmission.</i></p> <p>CPUC Staff understand that no demand-side measures were submitted as alternatives to transmission in the present planning cycle. It is critical that we have a clear understanding of how demand-side measures such as demand response should be configured and designed, such that they can be appropriately factored into transmission planning and LCR studies, and be fully considered as substitutes for transmission in future planning cycles. We welcome the CAISO's intent stated during the December 11 stakeholder meeting to work on developing the needed information and communication on this issue, and look forward to working with the CAISO in this regard.</p>	Agreed.
14	Keith White and William Dietrich, CPUC	<p><i>2. For the Policy Driven Powerflow and Stability Studies, Assumed Generator Injection (Dispatch) Levels and Load Scenarios Should be Clearly Identified</i></p> <p>The December 11 presentation identifies peak and off-peak studies as</p>	All assumptions regarding the power flow cases for the RPS studies will be summarized in the 2012/2013 Transmission Plan report. Also, the generation dispatch for each unit, as well as load and generation from other units can be obtained from the base cases that are posted

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	<p>assuming 1-in-5 coincident peak forecast conditions and 50% of peak, respectively. It also identified aggregate amounts of “new” RPS generation modeled for peak and off-peak³, as well as nameplate RPS generation modeled, by CREZ⁴. As described below, the subsequent writeup of these studies for the 2012-2013 Plan should include: (1) additional information on what conditions the peak and off-peak studies represent, (2) the assumed level of total (not just new) renewable output, and (3) the assumed renewable generation injection levels, by CREZ, for peak and off-peak studies.</p> <p>First, the CAISO’s writeup of these studies should include explicit description of what the peak and off-peak study cases represent in terms of both load and generation. For example, did on-peak study cases incorporating 1-in-5 coincident peak load also include wind and solar generation levels expected for the time (e.g., July or August afternoon?) of system peak, or were these modeled wind and solar generation levels more typical of some other conditions, and if so, what specific conditions? Similarly, for off-peak study cases incorporating loads at 50% of the 1-in-5 coincident peak level (or 50% of the 1-in-2 peak?), what specific conditions did the assumed off-peak wind and solar generation levels represent? The assumed “new renewable output” was higher for the off-peak studies than for the peak studies⁵ and the new renewables include substantial amounts of solar</p>	<p>on the ISO Market Participants portal.</p> <p>Wind and solar generation levels modeled generally reflect the season and time of the day that the base cases represent, based on production simulation modeling input data described in the economic planning study assumptions.</p>
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³ See slide 19 of the presentation summarizing policy driven planning base cases and study assumptions.

⁴ For example, see slide 4 for the SCE area presentation.

⁵ See slide 19 of the presentation summarizing policy driven planning base cases and study assumptions.

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		<p>generation. Therefore, it appears that the off-peak studies must represent conditions under which insolation is high, but loads are relatively low, such as mid-day in the spring or summer. The conditions that are actually represented by the assumed off-peak levels of renewable generation, for purposes of these studies, should be clarified.</p> <p>Second, there are substantial amounts of existing wind generation and significant although lesser amounts of existing solar generation. Therefore, rather than presenting only assumed levels of “new” renewable output for the policy driven powerflow and stability studies, the CAISO’s subsequent writeup of these studies for the 2012-2013 Plan should also present the assumed levels of peak and off-peak output for existing renewable generation.</p> <p>Third, as CAISO staff indicated willingness to provide additional information, the subsequent write-up of these studies should identify not only nameplate amounts of renewable generation assumed within each CREZ (where different from CPUC-provided portfolios, if any), but also the assumed (modeled) injection (dispatch) levels, within each CREZ, separately for the peak and off-peak policy driven powerflow and stability studies.</p>	
15	Keith White and William Dietrich, CPUC	<p>3. For the Policy Driven Deliverability Assessments, the CAISO Should Provide Information on the Generator Injection (Dispatch) Levels Being Assumed within Study Areas (Generation Pockets), and the Rationale for This.</p> <p>The December 11 presentation shows nameplate renewable generation</p>	<p>The Deliverability Study methodology is posted on the CAISO website. The studies were performed according to this methodology. Please refer to the response to comments of Jaleh Firooz.</p> <p>Generation dispatch for each unit can be obtained from the power flow</p>

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		<p>capacity within different renewable zones⁶ but not the assumed generator injection levels that drive the deliverability assessment. We understand that the deliverability assessment methodology, including logic and the limits for ratcheting up assumed dispatch levels in a studied load pocket, is complex or at least non-intuitive. We also understand that under the deliverability study methodology what generators are included in a modeled generation pocket and how their output is ratcheted up may vary according to what overloaded facility (and thus what set of generators impacting that overload) is being studied. We understand that this complexity makes it difficult to present illuminating information regarding key generator dispatch assumptions driving a deliverability assessment. At the same time, it also makes it essential to provide greater transparency and understanding regarding the methodology, assumptions and key drivers of deliverability assessments. This situation clearly illustrates the importance of discussing and demonstrating the deliverability assessment methodology and its rationale via a new stakeholder initiative that CPUC staff and others have requested. It is also important to pursue a more structured, comprehensive and accessible documentation of the deliverability study methodology, such as via a BPM whose salient points can be cited or quoted when deliverability studies are presented, such as in the TPP.</p>	<p>cases for deliverability studies that are posted on the ISO Market Participant portal.</p>
16	Keith White and William	<p><i>4. It is Important to Have Information on the Transmission Infrastructure Benefits of Planning Scenarios Emphasizing</i></p>	<p>The High DG portfolio has been assessed in policy driven deliverability study. DG deliverability also has a separate process currently.</p>

⁶ See, e.g., slide 7 of “Policy Driven Planning Deliverability Assessment Results – SCE Area.”

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<p>Dietrich, CPUC</p>	<p><i>Distributed Generation (DG).</i></p> <p>The renewable generation case being utilized as the CAISO’s planning base case is the “commercial interest” portfolio which includes significant amounts of distributed renewable generation, but not as much as would be expected under a more DG-intensive future such as represented by the “high DG” portfolio which was also provided by the CPUC and also studied by the CAISO. The extent to which a more DG-intensive future will develop or be preferred is still uncertain. However, it is essential to have useful information on the transmission implications of such a future, such as regarding reduced need for transmission investment, reduced congestion, or freeing up of existing and planned transmission for future uses.</p> <p>We understand that with finite time and staff hours, the CAISO’s policy driven (RPS portfolio) deliverability assessments were limited to the CAISO’s base case including the “commercial interest” RPS portfolio. However, CPUC staff request that the CAISO leverage what studies it <u>has</u> conducted, including economic (congestion and curtailment) studies and powerflow/stability studies, of all four RPS portfolios, to provide valuable information and insight in the 2012-2013 Plan regarding the impact of a DG-intensive future on transmission needs, costs, and congestion. We expect that this will help build a foundation for improving our assessment and understanding of a possible DG-intensive future going forward into future planning cycles, as the amounts, locations, characteristics and infrastructure requirements of DG become more clear. For example, if high penetration of DG would likely require far more additional transmission network upgrades in</p>	<p>Meanwhile, the ISO is continuously working with CPUC and CEC to develop future portfolios to reflect the progress in DG development.</p> <p>In addition, the ISO included in the draft TPP report a high DG sensitivity study in the LA Basin and San Diego LCR areas in the absence of nuclear generation studies.</p>
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		particular areas (but without any additional modeling to determine how likely or determine the upgrades), it would be useful to draw stakeholders' attention to those areas.	
17	Keith White and William Dietrich, CPUC	<p><i>5. There Needs to be Clarification of When Network Upgrades for New Generation are Identified in the TPP Versus Being Deferred to the Generation Interconnection Procedures (GIP).</i></p> <p>With recent CAISO planning reforms, there is greater ability to proactively and holistically assess and plan reliability and delivery network upgrades for new generation via the TPP, rather than more incrementally, and less flexibly or transparently, via the GIP. On the other hand, certain kinds of interconnection-related transmission planning may require clarification of the specific circumstances of individual or a few specific interconnecting generators. The consequences of planning new generation-related transmission upgrades via the TPP versus via the GIP can be substantial. TPP-driven transmission additions are generally TAC-funded whereas GIP-driven additions are generally up-front financed by generators. Also, TPP-driven additions are open to competitive solicitation if meeting "regional" (200+ kV) and other conditions, whereas GIP-driven additions up to this point been reserved for development by incumbent transmission owners only.</p> <p>It is a problem if too much transmission is planned via the TPP before its value to actual interconnecting generators is clear, as this could harm economic efficiency and consumer costs, and perhaps environmental values as well. But, it is also a problem if transmission</p>	<p>The ISO agrees with the CPUC's concerns</p> <p><i>It is a problem if too much transmission is planned via the TPP before its value to actual interconnecting generators is clear, as this could harm economic efficiency and consumer costs, and perhaps environmental values as well. But, it is also a problem if transmission that could have been identified via the TPP (and potentially made available for TAC cost recovery and/or competitive development) is deferred to the GIP, such that there is overly piecemeal development, or if generators (and their customers) experience unpredictable or high costs when incremental GIP study results eventually emerge.</i></p> <p>To address these concerns, the ISO applies a least regrets approach to identifying policy driven upgrades. Renewable portfolios are developed by the CPUC which represent MW quantities of specific types of renewable generation development in generally defined geographic and electrical subareas. These portfolios are represented in transmission system models using a combination of generation projects which have varying levels of certainty. The development status of the specific project range from under construction to</p>

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		<p>that could have been identified via the TPP (and potentially made available for TAC cost recovery and/or competitive development) is deferred to the GIP, such that there is overly piecemeal development, or if generators (and their customers) experience unpredictable or high costs when incremental GIP study results eventually emerge. For these reasons, it is essential to have more clear understanding and expectations regarding when (and which) transmission to accommodate new generators will be planned via the TPP versus the GIP. One could say that this just involves common sense. However, that common sense, or whatever criteria are used, needs to be more transparently specified. For example, if the TPP will identify “area” delivery network upgrades (area DNU, or ADNU) and the GIP will identify “local” DNU, this should be explicitly stated, and the definition of area vs. local upgrades must be very clear. Or, if all reliability and delivery network upgrades that qualify as “regional” in the language of the CAISO’s recent intraregional Order 1000 filing (thus being eligible for TAC cost recovery and competitive development) will be planned via the TPP, this should be explicitly stated.</p> <p>Thus, to recap, stakeholders need to have a clear explanation and expectation regarding how planning, sponsorship and cost allocation decisions for generation-driven transmission additions are apportioned between the <u>TPP versus the GIP</u>. This could be done via tariff, BPM, or other mechanism, but needs to be done.</p>	<p>completely conceptual. All of the firm projects are already in the ISO interconnection queue and the transmission project costs associated with these projects are well known to the projects and the purchasers of their renewable generation output. On the other extreme, the conceptual generation projects may not be feasible and the transmission costs associated with these projects is unknown. Assuming that the quantities of renewable generation portfolios are ultimately accurate, the locations of the generation projects assumed to represent the portfolios in the models are almost certainly not completely accurate. There are a number of different combinations of potential generation projects within each subarea that could represent the portfolio. If a transmission project need is identified as needed for a reasonable number of the potential combinations of generation projects within the sub-area, then it would be reasonable to consider that project in the TPP. This subset of transmission projects tend to be bulk system upgrades with significant lead times and costs.</p>
18	Keith White and William	<p><i>6. Additional Analysis and Information Regarding the Relative Benefits of the Proposed AV Clearview and Coolwater-Lugo</i></p>	<p>Thanks you for the comment. Additional analysis was performed and is documented in the draft transmission plan report.</p>

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	Dietrich, CPUC	<p><i>Transmission Projects Would be a Valuable Inclusion in the 2012-2013 Plan.</i></p> <p>The December 11 presentation provided limited information on assessment of the proposed AV Clearview transmission project, apparently in two different configurations. This information appears to indicate that the AV Clearview project would have a much higher cost than the Coolwater-Lugo project for which it might substitute, without identified additional benefits <u>under the planning cases studied</u>. However, the CAISO also indicated that these studies are only preliminary and that additional studies may be forthcoming, both before and after the 2012-2013 Plan is finalized.</p> <p>Any additional information or study results that the CAISO could provide, such as regarding benefits unique to the AV Clearview project or benefits contingent on types of planning scenarios not included in the 2012-2013 TPP or its RPS cases, would be very helpful. Of course, we recognize that any such analyses could be supplanted by further information and analyses between time of Plan finalization and the time when any relevant transmission project(s) might apply and be assessed for a CPCN.</p>	
19	Keith White and William Dietrich, CPUC	<p><i>7. The High Out of State Import Study Could Provide Greater Insight, If Aspects of the Study Are Clarified.</i></p> <p>The high out of state import scenario represents a resource planning situation not emphasized by the CAISO or by the CPUC. However, it can provide broad but valuable insight into circumstances or options that could arise at some point in the future. In particular, several</p>	The study assumptions for the sensitivity analysis are documented in the draft transmission plan.

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	<p>proposals to transport distant renewable generation into southern Nevada are largely aimed at supplying California to help meet its current or future renewable generation goals.</p> <p>We understand that at this time the CAISO does not intend to proceed with studying and evaluating the high out of state import scenario in great depth. However additional clarification of assumptions and results for the study in its present form would be valuable. If the study was based on the policy driven powerflow and stability study inputs under the commercial interest portfolio, as apparently stated, clarification of those input as requested under topic 2 above are also relevant here. This would include clarifying what particular situation the assumed set of systemwide on-peak generator injection (dispatch) levels represents (summer afternoon, or something else), as well as presenting the renewable generator injection levels by CREZ.</p> <p>Furthermore, it is important to identify which 3000 MW of renewable generation was <u>removed</u> from the CAISO basecase (the commercial interest RPS portfolio) for purposes of the high out of state import scenario, what annual GWh this represents, and how this removed in-state renewable generation is located with respect to (and how it impacts) the transmission paths (e.g., west of river) bringing the added 3000 MW of import generation (at El Dorado) into California load centers. The CAISO should also identify which other sources of supply, if any, were redispatched down to accommodate the 3000 MW of imports sourced at El Dorado, such as by decreasing imports (other than the added 3000 MW) from the desert southwest that were assumed in the CAISO's basecase for powerflow/stability studies.</p>	
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		<p>Additionally, it is unclear if the CAISO conducted powerflow/stability but not deliverability studies for the added 3000 MW of import generation sourced at El Dorado. This should be clarified, and the implications of making the 3000 MW deliverable should be discussed.</p> <p>Finally, the costs, feasibility, efficacy and other implications of the “potential mitigations” for issues created under the high out of state import scenarios should be more fully discussed in the final writeup for the 2012-2013 Plan. This should include identification of key uncertainties and kinds of additional analyses required to more fully assess solutions.</p>	
20	Keith White and William Dietrich, CPUC	<p>8. <i>Where Voltage Support Needs Have Been Identified, Quantification Will Assist the CPUC (for example, Greater Southern PG&E Area -- Voltage Support).</i></p> <p>CAISO presented analysis for the southern PG&E area in a table entitled, "Fresno & Kern Peak Voltage Results & Mitigation" (slide 35, PDF page 102). Please include a similar table in the draft 2012-2013 Plan, with this addition: In the column labeled "ISO recommended solution," please add CAISO's point estimate (Qmax and Qmin), or range, of megavars of reactive power needed, where adding reactive power equipment is the recommended solution. Staff requests this information be added to the similar tables for SCE, SDG&E, and PG&E's northern area.</p> <p>As noted by Stephen Berberich, President and CEO of CAISO, vars</p>	<p>Voltage support typically involves short-lead time upgrades. In addition, the location and amounts of voltage support depends on the location and amount of generation that ultimately gets developed, and whether or not that generation provides voltage support. The portfolios are modeled on a micro level as one possible set of specific generation models at interconnection points for purposes of identifying upgrades that would apply to most of the potential scenarios on a macro level. Quantifying specific locations and amounts of voltage support for one possible modeling of the portfolio on a micro level would not create a sufficiently useful result.</p>

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		and voltage support are almost more important than generation, in the context of meeting summer needs. ⁷ Quantifying voltage support needs (in terms of reactive power, Qmax/Qmin) will assist the CPUC in its Long Term Procurement Planning and generation procurement and its Resource Adequacy process. The request above pertains to the southern PG&E area and similar tables, but please add the requested information globally in the Draft 2012-2013 Transmission Plan, where adding reactive power is the CAISO's recommended solution.	
21	Keith White and William Dietrich, CPUC	9. Clarification of Policy-Driven Planning Deliverability Assessment Results Will Better Inform Stakeholders The three Powerpoint presentations regarding CAISO's policy-driven planning deliverability assessment results, contain a column labeled "Undeliverable Renewable Zone." ⁸ As requested by CPUC Staff at the stakeholder meeting, please add to these tables the number of megawatts estimated to be undeliverable in each row for each zone.	Producing the requested information would have added additional work that was not in the original work scope and could not be accommodated in the available time frame.
22	Keith White and William Dietrich, CPUC	10. The Depth of the Central California Study Is Laudable; the Draft Transmission Plan Should also Explore a Longer-Term View; and the Results Should Be Presented in Greater Detail than Typically. The Central California study is laudable for studying robust sets of	The ISO will present additional Central California findings and results in upcoming stakeholder meeting(s) as more analysis become available. The comprehensive study will look at a high number of reliability, economic and renewable integration issues including Helms water availability during dry hydro years as well as additional use of

⁷ Statement made at California Energy Commission workshop, June 22, 2012.

⁸ See "Policy Driven Planning Deliverability Assessment Results – SCE Area", slides 8 -11, PDF pages 134 - 137; "Policy Driven Planning Deliverability Assessment Results – SDG&E Area", slides 3 -10, PDF pages 140 - 147; also slides 13-15, PDF pages 150-153; "Policy Driven Planning Deliverability Assessment Results – PG&E Area", slides 3 -10, PDF pages 156 - 163. CAISO has previously shown such results; see, e.g., CAISO's Dec. 8, 2011 presentation for the 2011-2012 TPP, PDF page 51 (providing Mvars at particular substations where analysis showed reactive power needed).

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		<p>assumptions and conditions. CAISO indicated that more sensitivity analyses and work are to be done, and CPUC Staff looks forward to the results from further refinement and sensitivity studies. Because the issues are complex and involve reliability issues along with renewable power delivery and congestion issues, CPUC Staff requests that part of CAISO's discussion of results explore whether the least expensive risk-adjusted path for the ratepayers over time is many smaller upgrades or is one or more larger transmission projects. The CPUC staff, and stakeholders in general, would like to see inputs and results for the various scenarios in an extra level of detail using tables, figures, and narratives. CAISO's study will be part of the foundation for potentially large policy decisions, including PG&E's proposed 230 kV upgrades and possibly one or more 500 kV projects.</p>	<p>peakers in a non-attainment San Joaquin air quality district. The ISO will also look at a multitude of possible transmission mitigating alternatives including re-rates, line reactors, SPS, reconductoring of existing elements and/or new transmission elements. Depending on the results a combination of some of the above may be required in order to come up with the best solution; again please follow our stakeholder process for related details.</p>
23	Keith White and William Dietrich, CPUC	<p><i>11. Potential Mitigation Solutions Identified for Central California Needs Include Increased Use of Peakers and Helms in Resource Mode; Air Pollution and Helms Constraints Should Be Considered Carefully.</i></p> <p>Slide 13 of the "Central California Study" (PDF page 178) indicates that potential mitigations for congestion thus far include increased use of peaking units and Helms as a resource. The air basin has serious non-attainment issues, and the increased use of peakers may frustrate air pollution reduction goals. As discussed in the stakeholder meeting, time windows for water pumping to replenish the Helms reservoir have been growing smaller. Staff is concerned about these two issues, and requests explicit and detailed discussion of assumptions and results in</p>	<p>The comprehensive study will look at a high number of reliability, economic and renewable integration issues including Helms water availability during dry hydro years as well as additional use of peakers in a non-attainment San Joaquin air quality district.</p>

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		light of these issues. In addition, the use and value of Helms for integration of renewables, in the past, present, and future, should be thoroughly discussed.	
24	Keith White and William Dietrich, CPUC	<p><i>12. In the SDG&E Policy Driven Deliverability Planning Studies, the Sycamore-Penasquitos 230 kV Project Is Shown as Mitigation for Many Contingencies, and the Draft 2012-2013 Transmission Plan Should Further Explain, and Explore Alternative Mitigation.</i></p> <p>In the "Policy Driven Planning Deliverability Assessment Results – SDG&E Area," the Sycamore-Penasquitos 230 kV Project is shown as potential mitigation for many contingencies.⁹ The Draft Transmission Plan should explain this result, and whether, and at what cost, combinations of other wires and non-wires alternatives could serve as mitigation, if any. (During the stakeholder meeting, CAISO indicated one reason for the projected need for Sycamore-Penasquitos [or an alternative solution] was increased renewable generation in this area, compared to the last TPP cycle.) The CPUC's analysis and California Environmental Quality Act review of such a substantial transmission project would benefit from this information.</p>	The need for this line will be addressed in the draft comprehensive plan with due consideration given to the policy-driven study and the nuclear back-up study.
25	Keith White and William Dietrich, CPUC	<p><i>13. Considerable Efforts to Improve the Economic Planning Studies Are Commendable, and the Changes Should Be Fully Explained in the Draft Transmission Plan.</i></p> <p>CAISO's considerable efforts to improve the economic planning studies are commendable. The scope and depth of changes appear to be a major step up. So that these studies may inform stakeholders and the</p>	<p>The ISO agrees with this comments that the database changes shall be documented.</p> <p>However, it would be too lengthy, too detailed and too technical if the 200+ database changes are fully explained in the Draft Transmission Plan, even in the Appendix. Instead, the ISO's plan is to document the</p>

⁹ See, e.g., slides 4-8 (PDF pages 141-145).

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		CPUC, and be useful in CPUC analysis, the over 200 changes should be fully explained in the Draft Transmission Plan, perhaps in a sufficiently detailed appendix. Similarly, the impact of these changes on the results of the economic studies should be described. Staff is looking forward to CAISO's combined analysis of flexible resource needs and economics.	changes in a database release notes. The release notes will be published together the finalized economic planning database.
26	Keith White and William Dietrich, CPUC	<p>14. Changed Analytic Circumstances Relating to the Delany-Colorado River 500 kV Project (Compared to Last Year's Studies) , which Dramatically Increase the Benefit / Cost Ratio, Should Be Clearly Explained</p> <p>The economic analysis of the Delany-Colorado River 500 kV project has shown a dramatically improved benefit/cost ratio compared to last year's analysis. The Draft 2012-2013 Transmission Plan should explain in detail the factors behind this improvement, including the input assumptions and methods used.</p> <p>During the stakeholder meeting, CAISO mentioned the assumption that per mile costs of building transmission were assumed to be higher (e.g., times two) compared to construction in other States. The basis for this and other assumptions should be supported and cited. The cost estimate for the Delany-Colorado River 500 kV should be explicitly provided.</p>	<p>For the study of Delany – Colorado River 500 kV line, regarding the explanations of the differences of the economic benefits calculated in the last and this planning cycle, please refer to the Stakeholder Comment #6 and ISO's responses.</p> <p>During the Dec 12th stakeholder meeting, ISO staff mentioned the assumption that per mile costs of building transmission were higher in California than other state – this comment was based on cost estimates provided to the ISO. The basis were the relative cost comparison of the proposed North Gila – Imperial Valley 500 line #2 and the proposed the Delany – Colorado River 500 kV line. The former is largely a California-territory line. The latter is largely an out-of-state-territory line. For the former, the per-mile cost is \$6M/mile (= \$490M / 80 miles) based on LS Power's data. For latter, the per-mile cost is \$3M/mile (= \$325M / 110 miles) based on APS's data. The ratio of per-mile costs is 2:1 for in-state versus out-of-state. Both data are public available from the ISO stakeholder requests.</p>
27	Kevin Davis, Critical Path	AV Clearview's project sponsors are sensitive to the fact that CAISO planners seek to constrain their considerations to projects that meet the	Comment 1: Comparing the AV Clearview Project vs. SCE South of Kramer / Coolwater-Lugo Project

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	<p>Transmission</p> <p>minimum reliability and deliverability needs identified within the base case analyses. We also recognize that the proposed cost of the minimally adequate upgrade is one viable metric for evaluating alternatives.</p> <p>Simultaneously, we expect that those who must adjudge the efficacy of the CAISO planning process, either formally (e.g. the CPUC through the CPCN and rate case processes), or informally (e.g. the CEC, industry groups, ratepayer advocates, and the Legislature) will be expecting the CAISO to select grid upgrades which best serve interests of the grid and the ratepayer in terms of reliability, deliverability, RPS goals, jobs, growth, and long-term costs. In these considerations, the proposed cost of a minimally adequate upgrade is only one of a multitude of considerations in the net benefit of a proposed upgrade.</p> <p>It is with this understanding that we provide the comments below, suggesting a balanced approach to comparative evaluation consistent with the CAISO tariff. These comments preview many of the technical analyses that AV Clearview's project sponsors will be providing to CAISO and CPUC staff in the coming days.</p> <p>Critical Path's Comments can be summarized into the following topic areas and are detailed starting on the following page:</p> <p><u>Evaluation Metrics</u></p>	<p>The Coolwater Lugo project is capable of creating approximately 700 MW of incremental generation deliverability without the addition of a third Lugo 500/230 kV transformer.</p> <p>The ISO draft TPP report will consider all input received in a timely manner. Additional comments can be provided by AV Clearview project sponsors on the draft ISO report.</p> <p>Comment 2: List of Economic Benefits to be included in Evaluation/Comparison and suggested methodology for quantifying their value</p> <p>As described during the TPP stakeholder process and will be described in the draft TPP report, the ISO has evaluated all reliability, policy and economic driven transmission needs. Generally, reliability, policy, and economic transmission benefits are measured relative to these identified needs. The ISO has considered all timely comments from stakeholders on these needs and benefits. However, there will be one last opportunity for stakeholder comments and the ISO will consider these comments as well.</p> <p>Comment 3: Corrections to Data presented at the CAISO Stakeholder Meeting</p>
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		<ol style="list-style-type: none"> 1. Basis of comparison between Coolwater-Lugo and AV Clearview 2. Comments regarding criteria for comparison of transmission elements and suggested methodology to derive their value <p><u>Assumptions</u></p> <ol style="list-style-type: none"> 3. Comments on the data shown in the CAISO presentation: 4. Comments regarding the incumbent PTO's ability to construct the South of Kramer Project in a timely manner 5. Comments regarding history of PTO cost overruns. <p>Conclusion: It is evident from the CAISO planning process that South of Kramer upgrades will be required in order for California to meet its RPS goals. As detailed on the following pages, based on the CAISO tariff, it is our assertion that an analysis that incorporates true ratepayer benefits and costs clearly favors the AV Clearview Transmission Project for inclusion in the 2012/2013 draft statewide plan as a Category 1 transmission element, and as the preferred South of Kramer solution.</p>	<p>The ISO will incorporate the updated AV Clearview project cost estimates provided in the comments. We will also include more information about the scope of work associated with the Coolwater Lugo project.</p> <p>The renewable portfolios used in the 2012/2013 TPP were developed by the CPUC, CEC and ISO in an open stakeholder process. AV Clearview project sponsors comments were considered during the development of these portfolios.</p> <p>The ISO has incorporated the opening of the 115 kV line as suggested.</p> <p>Comment 4 and 5: Coolwater-Lugo Timelines and Costs Underestimated</p> <p>The potential financial and permitting challenges that the incumbent PTO faces with the Coolwater-Lugo project are better addressed during the CPCN process, than in the CAISO TPP or LGIA process at this particular point in the processes.</p> <p>As noted earlier, the ISO remains open to reviewing input and study results as we move forward.</p>
28	Susan Schneider	LSA has several concerns about the analysis and conclusions. These concerns are listed below and further explained in the remainder of this	The responsibilities are shared with the ISO and PTOs to ensure that Special Protection Schemes (SPSs) are properly designed when they

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<p>consultant to Large-scale Solar Association on this matter</p>	<p>document.</p> <ul style="list-style-type: none"> • The CAISO should ensure that the proposed Special Protection Schemes (SPSs) are properly designed to NERC standards. • Existing reliability problems (i.e., upgrades triggered in the studies before the addition of new generation), and those primarily driven by factors other than new-generator interconnection, should be addressed in the TPP, not the GIP. • The CAISO should clarify the criteria used to classify overloads (and resulting mitigation measures) as area-wide (and addressed in the TPP) vs. localized (and deferred to the Generator Interconnection Process (GIP)). • Similarly, the CAISO should clarify the criteria used to classify GIP Delivery Network Upgrades (DNU) as Area DNU (ADNU) vs. Local DNU (LDNU). • The CAISO should review the assumptions in the Import Sensitivity Scenario to ensure that the scenario is feasible. • The CAISO should conduct further analyses of the conceptual transmission projects identified in this planning cycle to reflect 	<p>are implemented. (“Design” is perhaps overly broad to attribute to solely the ISO – at one extreme, this could be taken to mean relay selection, etc.)</p> <p>The ISO agrees existing reliability problems are to be addressed in the TPP.</p> <p>Please see clarification provided in response to CPUC comment on TPP versus GIP upgrades.</p> <p>The import sensitivity scenario results are provided for informational purposes and no transmission expansion recommendations are resulting from it.</p>
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		the new overall framework (e.g., parties responsible for funding and owning transmission under the new GIDAP rules).	
29	Susan Schneider consultant to Large-scale Solar Association on this matter	<p><u>SPS design</u></p> <p>SPSs were identified as the mitigation for most of the thermal overloads. LSA strongly supports use of SPSs wherever feasible, since they enable more efficient use of existing/approved transmission and avoid unnecessary costs of new transmission that will rarely, if even, be needed.</p> <p>However, the CAISO should ensure that the SPSs are coordinated with relay settings (as specified in NERC Standards PRC-023-1 and PRC-023-2) on overloaded lines. That way, the lines will only trip after the SPSs are activated.</p>	The ISO and its transmission owners must ensure that Special Protection Schemes (SPSs) are properly designed to NERC standards when they are implemented.
30	Susan Schneider consultant to Large-scale Solar Association on this matter	<p><u>Reliability problems caused by factors besides new generation</u></p> <p>The studies identified several reliability issues that appear to be problems existing even <u>before</u> the addition of new generation, or that are driven primarily by reliability or load-serving issues, and assigning responsibility for mitigation measures to interconnection customers through the GIP. LSA believes that mitigation of such overloads should be addressed in the TPP, and not assigned to interconnection customers through the GIP.</p>	Existing reliability problems <u>must</u> be addressed in the TPP. To the extent that these overloads can be managed by congestion management and reductions in net qualified capacity, they are not necessarily existing reliability problems. However, the ISO plans to propose upgrades to mitigate overloads on the Lugo-Victorville 500 kV line. Please see draft TPP report.

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	<p>For example, the Lugo – Victorville 500 kV line is overloaded in three portfolios by the N-2 outages of: (1) Eldorado-Lugo and Mohave-Eldorado 500 kV lines; and (2) Eldorado–Lugo and Lugo–Mohave 500 kV lines (slide 6 of “SCE Policy Driven Powerflow and Stability Results”). This overload seems to exist even in the Environmental portfolio, which has 0 MW of RPS generation modeled in the Eldorado area (slide 4 of the same presentation). Although this portfolio also modeled 365 MW of RPS generators in the nearby Mountain Pass CREZ, the overload would probably still exist even without that generation as well.</p> <p>However, it appears that this upgrade has been assigned to the Eastern Group in Clusters 3-4. LSA believes that the Tariff does not permit CAISO to assign the cost of upgrades needed to mitigate existing problems (before new generation is added) to interconnection customers, in this or other similar situations. In other words, the new generation does not trigger the need for the upgrade, so that upgrade should be handled through the TPP, and not the GIP.</p> <p>In other areas (particularly on PG&E’s system), the CAISO and PTO propose to address thermal overloads in the system – including those heavily driven by factors other than new-generation interconnections – through Special Protection Schemes (SPSs), with costs assigned to interconnection customers through the GIP. The CAISO should also be exploring alternatives to address these issues through the TPP process, and not automatically assuming that SPSs to curtail renewable</p>	
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		resources are the optimal solutions.	
31	Susan Schneider consultant to Large-scale Solar Association on this matter	<p><u>Area (TPP) vs. localized (GIP) classification</u></p> <p>Many overloads triggered by the addition of new generation were classified as “localized concerns.” Their proposed mitigations were thus deferred from the TPP to the GIP (particularly in the PG&E-area Deliverability Assessment).</p> <p>The need for certain upgrades may depend on the specific placement of generation in the model, and perhaps those upgrades should be addressed in the GIP process. However, it is not clear how a potential problem would be classified as a localized (GIP) concern as opposed to a wide-area (TPP) concern. For example:</p> <ul style="list-style-type: none"> • Overloads of the 230 kV Los Banos – Westley line are classified as localized concerns. This line affects both central-station and distributed generation in the Central Coast/Los Padres, Greater Fresno, Los Banos, Merced, and Westlands areas. It also supports power transfers on the 500 kV system between Tesla and Los Banos, and it serves as interface between the CAISO BAA and the TID and SMUD BAAs. • Overloads on several SDG&E 69 kV lines are not classified 	Please see clarification provided in response to CPUC comment on TPP versus GIP upgrades.

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		<p>as localized concerns, even though flows and overloads on those lines have much more limited impacts.</p> <p>The CAISO should explicitly detail the criteria used to determine the classification of transmission-facility overloads and explain how each of the identified overloads (and proposed mitigation) was evaluated against these criteria.</p>	
32	Susan Schneider consultant to Large-scale Solar Association on this matter	<p><u>ADNU vs. LDNU classification</u></p> <p>During the meeting, stakeholders noted the continuing ambiguity concerning the criteria used to distinguish ADNUs from LDNUs. They expressed concern that this ambiguity might leave too much room for engineering judgment, rather than using measurable and specific criteria.</p> <p>This is not a new issue, as it was raised several times during the GIDAP stakeholder process. However, the TPP results offer a clear demonstration of this ambiguity.</p> <p>The CAISO has stated before that an upgrade is classified as ADNU if it alleviates a problem affecting more than one cluster-study area. To increase stakeholder understanding of the proposed ADNU/LDNU classifications, and ensure that these criteria are applied uniformly, the CAISO should provide more information about which study areas contribute to the problems that trigger each ADNU, in the next</p>	Please see clarification provided in response to CPUC comment on TPP versus GIP upgrades.

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		stakeholder meeting or in the transmission plan.	
	Susan Schneider consultant to Large-scale Solar Association on this matter	<p><u>Import Sensitivity Scenario issues</u></p> <p>This scenario contains several assumptions that may render it infeasible. The CAISO should review it further to ensure that the conditions modeled make sense in combination.</p> <p>For example, 3000MW was added at El Dorado Substation in this scenario, and 3000MW of CAISO-area generation was removed from the LA Basin and other areas. The removed generation included projects with Power Purchase Agreements (PPAs) that are already under construction in eastern Riverside County. The analysis also seems to assume that other paths into California (such as Path 66) are also stressed at the same time.</p> <p>In addition, the proposed new 500kV line from El Dorado to Rancho Vista would likely require tremendous reactive power support. However, that requirement was not studied in the sensitivity case.</p>	The import sensitivity scenario results are provided for informational purposes and no transmission expansion recommendations are resulting from it.
33	Susan Schneider consultant to Large-scale Solar	<p><u>Further analysis of conceptual transmission projects</u></p> <p>LSA supports the CAISO/PTO identification of certain conceptual transmission projects. This is a very important planning tool, especially given the long lead time for major transmission projects.</p>	It is not clear to the ISO what conceptual projects are being referred to.

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	Association on this matter	However, the criteria and methodology used for classification of the problems that would be mitigated by these projects be further vetted through the stakeholder process. In particular, the parties that would be funding and owning the new transmission projects under the new GIDAP framework should be identified, and the benefits and costs to each of these entities should be better understood.	
34	Sandeep Arora, LS Power Transmission, LLC	<p>CAISO presented its preliminary findings for the 5 areas in which staff performed economic analysis. LS Power commends CAISO's time and efforts in fine tuning the WECC TEPPC database and performing a detailed economic analysis. We, however feel that additional analysis is needed to fully compute the economic benefits of new transmission. In this regard, we are submitting the following comments and would be happy to work with CAISO staff in addressing these and/or supporting the proposed additional analysis.</p> <p><u>Additional Economic Benefits exist</u></p> <p>As LS Power understands, CAISO's economic analysis focused on production cost savings to CAISO ratepayers from new transmission projects. It however did not quantify several other benefits that a new transmission project will offer to CAISO ratepayers. One new transmission line that was studied by CAISO was a new 500 kV line between Harry Allen substation (in NV Energy BAA) and El Dorado substation (CAISO BAA). CAISO study found \$150mm economic benefits from this new transmission line to CAISO ratepayers, primarily from production cost savings. It however, did not take into account the following additional benefits that CAISO ratepayers would receive from</p>	<p>At the time of the Dec 11-12 stakeholder meeting, the economic planning study results were preliminary with further testing and refinements and testing of the database ongoing. As stated in the Dec 11-12 presentation, the preliminary results will be overridden by the final results when database modeling is complete. In the forthcoming Feb 11th stakeholder meeting, final results will be presented including detailed information about the economic assessment of the Harry Allen – Eldorado 500 kV line.</p> <p>Re: Additional Economic Benefits exist</p> <ol style="list-style-type: none"> (1) In the final results, not only production benefits (sometimes referred as energy benefits) but also capacity benefits will be accounted for. (2) In the area of capacity benefits (for resource adequacy), flexible ramping capacity is an emerging type; and currently there is no established rules and methods to quantify the economic benefits.

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	<p>this new transmission line:</p> <p>(1) The new line will allow access to additional Resource Adequacy type capacity to CAISO. Existing conventional and renewable resources that are connected at/near Harry Allen substation will be able to offer new RA capacity to CAISO. Also, new line will encourage development of cheaper generation at/near Harry Allen that can be offered to CAISO markets.</p> <p>(2) The new line will allow CAISO to access more Flexible ramping capability that it requires for 33% RPS integration.</p> <p>(3) The new line will also benefit other Regions in the Western Interconnection, especially NV Energy, and will help both CAISO and NV Energy achieve its joint planning objective¹ of "...jointly studying the potential for development of transmission facilities between the two systems, as well as sharing conventional and renewable energy resources for the benefit of the respective customer groups...".</p> <p>CAISO's preliminary findings for this new line concluded that while the benefits identified were not enough to outweigh the cost for this new line, but since the benefits were significant, CAISO staff may perform further study on this. We strongly encourage CAISO to perform further analysis on this, with an objective to quantify the above additional benefits that this new transmission line would bring to CAISO (and California) ratepayers.</p> <p><u>Sensitivity Study</u></p> <p>LS Power believes that there is a need to perform a few sensitivity studies, in order to fully ascertain the economic benefits of the new Harry Allen – El Dorado line. The two sensitivity studies that LS Power</p>	<p>(3) In addition to the impacts to the ISO control area, the broader impacts will receive further evaluation in the future as part of an ongoing joint study with NV Energy.</p> <p>Re: Sensitivity Study</p> <p>For the studied Harry Allen – Eldorado 500 kV line, the economic analysis found notable economic benefits in both preliminary and final results. Thus, the ISO conducted detailed sensitivity analysis for a number of different system conditions, including the SONGS nuclear unavailability and uncertainties of other transmission upgrades.</p>
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		<p>believes should be done are:</p> <p>(1) Nuclear generation sensitivity: CAISO study basecase assumed both SONGS units base loaded for the economic analysis. While it is not clear, but likely both Diablo units were assumed the same. We recommend that CAISO staff perform a sensitivity study with some combination of nuclear units offline, consistent with the long term nuclear studies that were recently presented to CAISO Board. Economic benefits for the new transmission line should be reevaluated for this sensitivity study.</p> <p>(2) Placeholder transmission projects: CAISO included several Generation Interconnection driven transmission planning projects in the study basecase for this economic analysis. All these projects have either not been approved by CAISO Board/Management, or by CPUC. CAISO explained they needed to model these projects so that the basecase could converge. While LS Power understands this, but is concerned that preloading the basecase with several new transmission projects that have not yet been approved could significantly “under estimate” the benefits of the new economic projects that CAISO was analyzing. We recommend CAISO to perform additional sensitivity studies, as appropriate, such that the benefits for the economic projects (without the relevant Placeholder transmission project) is quantified.</p>	
35	Ann Finley, Metropolitan Water District of Southern	The Metropolitan Water District of Southern California (MWD) appreciates the opportunity to provide these brief comments on the CAISO 2012/2013 Transmission Planning Process Stakeholder Meeting on December 11, 2012 and the associated posted results	<p>1. Corrected kV designations in TPP write-up and results and the Devers-Mirage 230kV #1 & #2 contingency results were updated accordingly.</p> <p>2. Mitigation column updated as suggested.</p>

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California	<p>reports.</p> <p>1. MWD noted during the web conference that two slides needed to be corrected in the CAISO's presentation titled: "SCE's Policy Driven Powerflow and Stability Results":</p> <p>a. For the Slides 7 and 11:</p> <p>i. Please replace the "115kV" designations with "230kV" in references to "JHINDMWD – EAGLEMTN 115 KV" and "JHINDMWD-JHINDS 115KV"</p> <p>ii. Request all thermal overloads be listed - at least for the converged cases, i.e. it is understood from a discussion with CAISO that SCE's J.Hinds-Mirage 220kV line is also overloaded and should be listed for Devers-Mirage 230kV #1 & #2 contingency.</p> <p>2. Upon review of the CAISO results files posted October 31, 2012 that have a heading of "2012/2013 ISO Reliability Assessment – Final Study Results":</p> <p>a. For the two SCE Eastern Area reports posted with and without renewables: Please replace the potential mitigation column entries on page 7 and 8 of both reports that read: "SCE/MWD accept transient frequency dip and will submit to WECC less stringent frequency criteria for the 6.9 kV buses" To the following: "SCE/MWD established a less stringent frequency criteria to 59.3 Hz at certain 6.9 kV buses in a letter submitted to WECC and accepted by the SRWG Compliance Committee Chair "</p>	
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36	Christopher T. Ellison, Pathfinder Renewable Wind Energy, LLC and Zephyr Power Transmission, LLC	<p>I. Introduction</p> <p>Pathfinder and Zephyr appreciate the opportunity to comment on topics addressed at the CAISO's 2012/13 TPP stakeholder meeting held on December 11-12, 2012. Specifically, Pathfinder and Zephyr would like to comment on the "33% RPS Sensitivity Case Assessment Modeling a High Out of State Import Scenario" presentation made on December 11, 2012.</p> <p>Zephyr is currently developing its Zephyr Transmission Project, a 500 kV high-voltage direct current ("HVDC") line, to bring high capacity factor wind energy from Wyoming to Southern California through the Eldorado Valley. In early 2012 at the beginning of this TPP, both Pathfinder and Zephyr, as well as several other parties, expressed interest in the development of a resource portfolio that included significantly more renewable energy from out-of-state resources, specifically from resources trying to import to the CAISO at Eldorado. However, the resultant portfolios were still narrowly tailored around in-state renewable energy development even though recent studies from the Western Electricity Coordinating Council ("WECC") suggest that delivering Wyoming wind to California may be economically viable and could provide substantial savings to California customers.</p> <p>Although significant amounts of out-of-state renewable resources were not part of the Final Study Plan, Pathfinder and Zephyr are pleased that the CAISO undertook a sensitivity study to better understand and evaluate the benefits of developing and importing out-of-state</p>	<p>The renewable portfolios used in the 2012/2013 TPP were developed by the CPUC, CEC and ISO in an open stakeholder process. Pathfinder project sponsors comments were considered during the development of these portfolios, but based on the portfolio development methodology did not result in the outcome desired by Pathfinder project sponsors.</p> <p>The import sensitivity scenario results are provided for informational purposes and given that they are not based on a fully adopted portfolio scenario, were never intended to include the detailed analysis requested by Pathfinder.</p>
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	<p>renewable resources to help California meet its Renewable Portfolio Standard (“RPS”) target. However, Pathfinder and Zephyr find that the High Out of State Import Scenario is too preliminary to represent much more than a starting point. Pathfinder and Zephyr are confident that projects that provide access to out-of-state renewable resources such as the Zephyr Transmission Project can provide cost effective resources for California, but the recent analysis as presented provides little tangible or actionable information regarding the efficacy of such a project.</p> <p>II. Additional Detail is Necessary on the High Out of State Import Scenario</p> <p>The stakeholder presentation provided some detail regarding the study results, but was not adequately specific regarding its underlying assumptions. In particular, the study lacked specificity about the makeup of the energy that is being delivered to Eldorado and the locations and nature of the generation that has been removed from the in-state generation portfolio to accommodate the generation being injected at Eldorado. The presentation discusses removing generation from the bottom of the portfolio’s supply curve, but does not provide any additional detail on the location and type of generation that is being taken out of the Commercial Interest portfolio nor the characteristics of the generation added. Pathfinder and Zephyr request that such detail be included in the Transmission Plan.</p>	
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	<p>III. The Transmission Plan Should Include a Discussion of Downstream Benefits</p> <p>Potential downstream benefits are not discussed or even explored in the High Out of State Import Scenario. The analysis showing considerable transmission overloading on the system downstream of Eldorado seems reasonable and within the bounds of previous cluster studies.</p> <p>However, the removal of 3,000 MW of in-state generation, depending on its location, could mitigate issues identified in the base reliability and policy driven studies elsewhere on the CAISO's controlled transmission system. A discussion of the potential economic benefits of such should be included in the Transmission Plan's discussion of this study, even absent any formal modeling. No such discussion was provided in the presentation or during the stakeholder meeting, but clearly the relocation of such a large amount of renewable generation capacity would likely have significant effects elsewhere on the CAISO's controlled transmission system.</p> <p>IV. Need for Referenced Mitigation Cost Information in the Transmission Plan</p> <p>No indication of costs for the potential mitigation was presented and the mitigation options provided were not intended to be anything more than possibilities. It would be helpful for stakeholders to gain additional information regarding the cost of these mitigation strategies and have this information detailed in the Transmission Plan.</p>	
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	<p>V. Build Upon Initial High Out of State Import Scenario Study Pathfinder and Zephyr recommend that the CAISO continue to build upon the High Out of State Import Scenario initiated in this TPP, and study in a more comprehensive manner during the upcoming cycle of the TPP the planning implications from out-of-state resources providing a meaningful solution to California’s RPS goals. Consistent with FERC Order 1000, the CAISO has the responsibility to seriously consider regional alternatives that could provide significant cost and reliability benefits to California energy customers. Specifically, Pathfinder and Zephyr request that the CAISO conduct or provide:</p> <ul style="list-style-type: none"> a. A study of the out-of-state renewable generation case that is similar in scope to the various in-state cases (i.e. resource portfolios) including but not limited to contingency analysis, mitigation analysis and production cost savings. This will allow a better understanding of the full system benefits. This will also allow the CAISO to place into better context the results of the analysis relative to the standard in-state cases; and b. Provide a basic level of cost analysis regarding the impacts of significant increases in the amount out-of-state renewable generation. <p>VI. Conclusion The CAISO should further evaluate a broad range of transmission planning options to consider the diversity of renewable resource development alternatives, including planning for significant imports of out-of-state renewable resources into California. Such an approach</p>	
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		would increase the State's ability to satisfy its RPS objectives in the most cost effective manner, and allow the CAISO to plan a transmission system in a manner that is robust enough to address the uncertainty associated with resource development.	
37	Christian Hackett, Christopher McCune and David Parquet, Pattern Transmission, LP	<p>Comments: In connection with its consideration of the need for any transmission additions or upgrades required to ensure System Reliability consistent with all Applicable Reliability Criteria and CAISO Planning Standards, the CAISO is obligated by Section 24.4.6.2 of the CAISO Fifth Replacement FERC Electric Tariff to consider "lower cost alternatives to the construction of transmission additions or upgrades, such as acceleration or expansion of existing projects, Demand-side management, Remedial Action Schemes, appropriate Generation, interruptible Loads, storage facilities or reactive power".</p> <p>Consequently, pursuant to Section 24.4.6.2, Pattern respectfully submits that the CAISO should re-examine the Bay Area Power Link ("BAPL") project, which was previously submitted to the CAISO in the 2009 Request Window, as a lower cost / higher economic value alternative to the PG&E Proposal (particularly in light of the other proposed reliability projects that may no longer be required if the BAPL project goes forward). BAPL would be a public private partnership transmission line project between an affiliate of Pattern and the City of Pittsburg and its municipal utility, the Pittsburg Power Company ("Pittsburg"). It would include a 400MW (or greater) High Voltage Direct</p>	The ISO comprehensive transmission plan will provide additional information on reliability concerns of the San Francisco Peninsula area and the ISO will be continuing to assess these concerns.

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	<p>Current (“HVDC”) transmission line that would connect the PG&E Contra Costa substation to a PG&E substation in the San Francisco Peninsula (Potrero, Hunters Point or another appropriate substation).</p> <p>As part of the submission of the BAPL project in the 2009 Request Window, Pattern prepared and provided to the CAISO considerable information and analyses of the project which detailed the significant economic, policy and reliability benefits for California ratepayers based on the assumptions at the time. If desired, Pattern would be willing to re-submit that information to the CAISO to assist in its consideration of lower cost / higher economic value alternatives to the PG&E Proposal.</p> <p>While numerous CAISO assumptions and projections have changed since we submitted the BAPL project into the CAISO, we believe it likely that the BAPL project would still not only have significant economic benefits but also meet the reliability goals identified by PG&E in its proposal (particularly in light of the recent CPUC approval of the 586MW Oakley Generating Station Project). In addition, we believe that it is likely that the BAPL may well solve some of the other transmission issues identified in the <i>2012-2013 Reliability Assessment: Preliminary Study Results</i>¹ further increasing the economic and reliability benefits of the project.</p> <p>According to Section 24.4.6.2, reliability projects that have economic benefits exceeding an amount of the costs will be evaluated under section 24.4.6.7 of the Tariff. Specifically the Tariff states:</p>	
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	<p><i>A reliability-driven upgrade or addition found to be needed pursuant to this section shall be subject to the provisions of Section 24.5 if such addition or upgrade also provides demonstrable economic or public policy benefits as described below. The CAISO will find that a needed reliability-driven transmission upgrade or addition also provides economic benefits if its economic benefits exceed ten (10) percent of its costs, consistent with the determination of costs and benefits for economically-driven projects under section 24.4.6.7 and in accordance with the procedures set forth in the Business Practice Manual.</i></p> <p>Based on Pattern's prior evaluation of the BAPL, our understanding of the PG&E Proposal, and the recent CPUC approval of the 586MW Oakley Generating Station Project the BAPL is a transmission solution that may not only ensure System Reliability but also provide substantial additional benefits to rate payers in excess of the 10% requirement identified in 24.4.6.2 of Tariff.</p> <p>Requests: Pattern requests that the CAISO, in its evaluation of the PG&E Proposal, consider other lower-cost / higher economic value alternatives that may meet any identified reliability needs, including the BAPL project. Further, we request the CAISO review the economic benefits of the such an upgrade to see if the project selected (if any) meets the hurdle set for in 24.4.6.2 and should be subject to the provisions of section 24.5 of the Tariff.</p>	
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38	Mark Higgins, Pacific Gas & Electric	<p>General PG&E appreciates the detail provided by the CAISO on the process, methodology, and study assumptions used in this year's studies. That said, PG&E has the following general comments about the presentations:</p> <ul style="list-style-type: none"> • PG&E believes that in many cases the presentation does not provide sufficient details on the renewable generation (and associated network upgrades) modeled in the study base cases to fully understand the study results and the proposed mitigations. PG&E would like to request more details on the base case modeling assumptions. • For PG&E areas, the CAISO has proposed a number of solutions including SPS's to trip existing generation and congestion management. PG&E is concerned with the proliferation of SPS's to curtail existing generation and the use of congestion management as a long term planning solution, as we believe these are frequently suboptimal solutions. We seek to have a dialogue with the CAISO and its stakeholders on ways to improve planning such that these tools are used less frequently. • For PG&E areas, several violations have been categorized as "Localized concerns" and the proposed mitigation points to GIP for solutions. The presentation does not provide clarity on whether the network upgrades associated with the renewable generators have been modeled in the cases. PG&E would like 	<p>The renewable generation capacity by renewable zones in each of four portfolios has been illustrated in Yi Zhang's presentation and the will be included in the report. From these breakdown tables, the geographic location of renewable resources can be found. In addition, the detail renewable generation modeling can be found in the basecases for policy driven planning study that have been posted on the ISO's Portal.</p> <p>ISO considers installations of SPS to trip generation with contingencies as potential mitigation solutions. Each SPS is evaluated for its cost, complexity and impact on other SPS in the area. Alternatives of SPS to trip generation are compared with other alternatives, including transmission upgrades, and the most cost effective alternative is selected.</p> <p>Localized concerns: As explained during the stakeholder meeting, issues were classified as localized concerns if the it was seen that the violation was being seen can be attributed to a specific RPS generator modeled in the cases. The intent of the study was to identify upgrades to the system that can be classified as category 1 upgrades (ie. Upgrades that are seen as being needed in the baseline scenario as well as a significant percentage of the stressed scenarios). These are the upgrades that will be needed by the renewable projects in a large area covering multiple projects. On the other hand any violations that can be attributed to being caused by a specific project will be dependent on that project alone and will not impact any other projects</p>
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		<p>to request clarity on the CAISO's criteria for identifying violation as "Localized concerns."</p> <p>Questions, comments and recommendations specific to individual studies follow</p>	<p>in the system. Such violations have been classified as localized concerns which will be mitigated as a part of the GIP process.</p>
39	Mark Higgins, Pacific Gas & Electric	<p>Economic Planning Study (by Xiaobo Wang)</p> <p>Certain assumptions remain unclear to PG&E, particularly in light of the CAISO's preliminary finding that the Delany-Colorado River Project appears economic. While we understand that additional study still needs to be done in order for the CAISO to make a final determination on this project, PG&E has the following requests with respect to the preliminary findings:</p> <ul style="list-style-type: none"> • PG&E understands that the TEAM method was utilized to determine benefits for each project. The benefits presented in the preliminary results should provide additional granularity to stakeholders as to the specific dollar amounts of each type of benefit identified for the project. • The CAISO should clearly outline what specific assumptions (both in-state and out-ofstate) were adjusted in the TEPPC cases for the economic study and production simulation. This will help stakeholders understand the basis for the identified congestion. For example, loads and net interchange assumptions could heavily influence the results. • The CAISO should provide greater transparency to stakeholders as to the specific sensitivities that were conducted, and which of the assumptions were tested. 	<p>The ISO fully agrees with this comment.</p> <p>During presentation of the preliminary results, the database was still under development and studies were still on-going. Therefore, the preliminary findings were fairly general or even vague. Going forward, when the study results are finalized, a lot more details will be presented and documented in the open stakeholder environment. In other words, the information will be detailed and shared just as suggested in this comment.</p>

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		<ul style="list-style-type: none"> The CAISO should indicate the flexible reserve requirement assumptions for the study. The CAISO should provide greater transparency to stakeholders as to the criteria are for determining that something “appears economic.” PG&E would like to know the planning horizon over which costs and benefits were evaluated. 	
40	Mark Higgins, Pacific Gas & Electric	<p>Policy Driven Planning Base Cases and Study Assumptions (by Yi Zhang): PG&E requests that the CAISO provide the following clarifications:</p> <ul style="list-style-type: none"> On slide #16, please include dispatch factor for renewable resources that were modeled in peak and off-peak base cases. Also on slide #16, please describe the methodology of modeling DG in PF base cases that include location and MW of DG. On slide #18, please describe the hour/date/month in production cost simulation results that were used to model renewable output and import level in peak and off-peak base cases. 	All assumptions regarding the power flow cases for the RPS studies will be summarized in the 2012/2013 Transmission Plan report. Also, the generation dispatch for each renewable generator, as well as load and generation from other units can be obtained from the base cases that are posted on the ISO Market Participants portal. There is not a uniform dispatch factor for all renewable units. Instead, different stress patterns that were identified in both production cost simulations and historical data analysis were used to determine how the generators were dispatched and what the import levels were modeled. DGs were modeled as generators at the buses where the portfolios indicated.
41	Mark Higgins, Pacific Gas & Electric	<p>North PG&E Policy Driven Power Flow and Stability Results (by Rajeev Annaluru) PG&E offers the following clarification requests, comments, and recommended corrections to the North PG&E Policy Driven Power Flow and Stability Results:</p> <ul style="list-style-type: none"> On slide #3, please provide the renewable dispatch modeled in 	<p>Slide #3 Please refer to the section 4.7 of the transmission plan for details on the renewable dispatch in the peak and off-peak cases classified for each of the study areas.</p> <p>Slide #8</p>

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	<p>peak and off-peak base cases.</p> <ul style="list-style-type: none"> • On slide #8, PG&E strongly recommends changing the potential mitigation for Delevan-Vaca Dixon 2&3 230kV lines outage from “SPS to curtail Colusa generation” to “Reconductor the Delevan-Cortina 230kV line.” There are more than 6 contingencies that would require tripping or curtailing Colusa generation and would therefore violate the CAISO’s Planning Standard SPS6. • On slide #44, the SPS to trip Colusa generation is not an acceptable mitigation because there are more than 6 contingencies that would require tripping the generator. The potential mitigation should be to upgrade the line. • On slide #45, PG&E strongly suggests deleting “Trip Hyatt generation” as potential mitigation to relieve Table Mt 500/230kV transformer overload for (1) Round Mt 500/230kV bank outage, (2) Malin-Round Mt 500kV DLO, and (3) Round Mt – Table Mt. 500kV DLO. It is not a viable solution. • Also on slide #45, the SPS to trip Colusa generation to relieve Round Mt 500/230kV bank and Olinda 500/230kV bank emergency overloads is not an acceptable mitigation because there are more than 6 contingencies that would require tripping the generator therefore violate the CAISO’s SPS6. • On slides #45 and #46, PG&E advises deleting the Table Mt 500/230kV transformer outage without SPS because it is a Category “D” contingency, not a “B” contingency. In addition, it 	<p>ISO studies identified three category C contingencies to cause overload on this line. As such, SPS appears to be a feasible mitigation solution.</p> <p>Slide #44 The studies showed that there were fewer than 6 contingencies that require tripping of Colusa generation by this SPS; therefore the SPS was proposed. Reconductoring of Delevan-Cortina 230 kV line may be an alternative to the SPS.</p> <p>Slide #45 Since the Hyatt power plant is directly connected to the 230 kV bus of the Table Mountain substation, reducing generation from Hyatt is the most effective solution to reduce flow through the Table Mountain transformer, which in the off-peak cases is in the reverse direction: from 230 kV to 500 kV. For example, with an outage of the Round Mountain 500/230 kV bank, Table Mountain transformer is expected to load at 102% in the High DG off-peak case. Tripping only one Hyatt unit (108 MW as modeled in the case) reduces flow through this transformer to 94%.</p> <p>The SPS to trip Colusa generation is existing (Colusa SPS). It protects Olinda transformer from overload with two potential contingencies. The proposal was to add monitoring Round Mountain bank for the same contingencies, as well as to monitor not only loading but also status of the Olinda and Round Mountain transformers. This way, there are four contingencies and two facilities that need to be included in the SPS.</p>
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	<p>is not a viable solution to modify the SPS to trip additional existing generation; however, it may be possible to trip future new generators in the area.</p> <ul style="list-style-type: none"> • On slide #47, please check the Table Mt 500/230kV bank overload for “B&C” contingencies in high DG case. How much DG and Feather River hydro generation were dispatched in the high DG off-peak case? • On slides #47 and 48, “modify existing Colusa SPS” is not a potential mitigation for reasons stated above. • On slide #49, PG&E advises to delete “Table Mt 500/230kV outage if no SPS.” 	<p>Considering that the SPS is existing and it already monitors Olinda transformer, adding one more facility (Round Mountain 500/230 kV bank) to the SPS is not expected to substantially increase its complexity. In addition, the probability of this SPS to operate is low because it is needed only if Colusa generation is dispatched at full capacity under off-peak conditions which is rather unlikely.</p> <p>Slide #47 Table Mountain 500/230kV transformer was overloaded by up to 2% with Category B and C contingencies in the High DG case (see slide 45). This case had 1400 MW of generation dispatched from Feather River and 3836 MW of renewable generation dispatched in PG&E area.</p> <p>Slide #48 Modifying existing Colusa SPS to add monitoring of the Round Mountain transformer was explained above. Monitoring the loading of the Delevan-Cortina 230 kV line can be added to the existing SPS, or a new SPS to monitor this loading can be installed. Another solution is to upgrade the Delevan-Cortina line.</p> <p>Slide #49 We agree that results of the Table Mountain 500/230 kV bank outage without SPS in the high DG off-peak case can be omitted because the SPS most likely will be armed under these conditions. The results were provided mostly for information to show that contrary to other</p>
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			cases, in the high DG case, absence of the SPS can cause transient voltage concerns.
42	Mark Higgins, Pacific Gas & Electric	<p>Policy Driven Planning Deliverability Assessment Results – PG&E Area (by Binaya Shrestha)</p> <p>PG&E offers the following requested clarifications and recommended corrections to the Policy Driven Planning Deliverability Assessment Results – PG&E Area:</p> <ul style="list-style-type: none"> • The CAISO's determination of which mitigation measures are localized concerns lacks necessary details for stakeholders to understand the criteria used to determine their classification as local versus area. PG&E believes this clarity is particularly important due to the markedly different classification results between the PTOs. For example, only two (2) of the 26 mitigation measures in SDG&E territory were identified as localized concerns to be addressed by GIP measures, while 19 of the 21 mitigation measures in PG&E's territory were identified as localized concerns. This is especially relevant for PG&E given the impact such decisions will have on the substantial number of interconnection driven upgrades in the Central Valley due to the proliferation of new RPS generation in the region. • On slide #5, the Normal overload identified on the Los Banos – Westley 230kV line is not a localized issue because a 500kV contingency on Path 15 would also cause emergency overloads. The potential mitigation should be upgrading the 	<p>As explained during the stakeholder meeting, the classification as local issue is not only based on the area(s) impacted by the constraint, but is also based on what caused the constraint. In case of the PG&E area deliverability assessment results, most of the constraints either impacted very small number of resources in a local area or are caused by a single resource having significantly high contribution to the constraint and hence categorized as a localized issue for the purpose of developing a least regret policy upgrade.</p> <p>On Slide #5 – Same explanation as above.</p> <p>As explained during the stakeholder meeting, deliverability assessment starting basecase has all resources in the study area dispatched to 80% of NQC. Final dispatch of resources within the 5% DFAX circle is constraint specific and is not feasible to be documented. Branch group import levels will be included in the report.</p>

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		<p>line.</p> <ul style="list-style-type: none"> With respect to the CAISO's study assumptions, PG&E believes additional information should be provided to stakeholders. On slide #2 specifically, PG&E requests that the CAISO provide the specific assumptions with respect to the MWs of generation dispatched and imports from the base case are provided. 	
43	<p>Karen Shea, Garry Chinn & Rabiindra Kiran, Southern California Edison</p>	<p>Policy Driven Planning Base Cases & Study Assumptions - Yi Zhang Presentation</p> <p><u>Page 9 Commercial Interest Portfolio</u></p> <p>While SCE understands these values to be fixed, SCE would like to point out that the values in certain zones appear to be understated based on actual resources interconnected and/or executed Generator Interconnection Agreements. Perhaps the table excludes relatively new resources, which have already been interconnected as of the end of 2011 and is only accounting for resources that were not yet interconnected? SCE recommends a table be created that reflects relatively new megawatts already interconnected and to have such table updated annually to reflect the amount of new resources interconnected since 2010. Please note, however, that if this were to happen, there would be a lag given the actual commercial interest activity. An example is the Tehachapi Area which reflects 1988 MW of wind but as of 12/31/2012, a total of 2010 MW of wind would have</p>	<p>All renewable resources in the portfolios represent the resources that have not been interconnected by the 2013. The recently interconnected renewable resources are deemed existing units and are modeled consistently between the policy driven and NERC compliance reliability assessments.</p> <p>The portfolios were developed by CPUC, CEC and the ISO, and apparently the LGIA status was not a key factor for the Riverside East area. Portfolios for the future year's study have not been finalized yet.</p>

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		<p>already been installed with more wind megawatts scheduled to be placed into service during 2013 and 2014.</p> <p>We also observe that updates are needed for total generation for Riverside East, which is indicated, in this presentation, to be 1,506 MW. As of the date of these comments, the total megawatts for executed Large Generator Interconnection Agreements (LGIA's) is 2,550 MW, and the total for executed PPA's is 1,650 MW. We note that the CEC and CPUC's December 9th presentation appears to reduce the total to 964 MW. SCE requests of the CAISO to clarify the reason as to why this number is so low. Based on the cluster studies, the Riverside area can interconnect and deliver up to 4,000 MW of renewable generation without any additional transmission lines.</p> <p>Also, the total generation for Eldorado area indicated in this presentation is 750 MW. However, the Eldorado area has been omitted in the CPUC's presentation from December 19th, and SCE requests clarification on this from the CAISO.</p> <p>As exemplified above, there is an understatement of megawatts in certain zones and an overstatement in others. SCE looks forward to participating in the upcoming efforts to redefine appropriate RPS portfolios based on real data available.</p>	
44	Karen Shea, Garry Chinn &	<p>Alternatives Considered to the Coolwater-Lugo Project: AV Clearview Transmission Project – Luba Kravchuck Presentation</p>	Thank you for your input on the specific technical issues. It is not clear

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<p>Rabiindra Kiran, Southern California Edison</p>	<p>In the presentation PDF on page 47, the CAISO comments that the "AV Clearview Transmission Project" has been previously suggested as a potential alternative in previous transmission planning cycles". A previous version of this project was considered by the CAISO in the 2010/2011 Transmission Plan.¹⁰ In this report on p. 444 the CAISO said:</p> <p>Overall Assessment <i>The cost of this project is estimated at about \$900 million with annual carrying charges estimated at \$135 million. The annual carrying charges were approximated to be 15% of the total capital cost of the project. The marginal benefits are not material relative to the annual carrying costs of the project. The project is also not policy-driven since it is not needed in order to meet 33% RPS goals based on application of the tariff section 24.4.6.6. In particular, the project is not identified as needed in the ISO's hybrid portfolio. The ISO has therefore concluded that this project is not needed. (CAISO 2010/11 Transmission Plan).</i></p> <p>Studies for alternatives to SCE's Coolwater-Lugo Transmission Project should be better coordinated to ensure proposals that cannot be implemented are not evaluated. For example, the baseline option for the AV Clearview Transmission Project involves two 230 kV</p>	<p>to the ISO what SCE means by stating that the alternative should be "dismissed". As the ISO has indicated, we understand that a comparison of alternatives such as this an expectation in the CPCN process for the Coolwater-Lugo project, and the ISO has worked proactively in a transparent process to study this comparison.</p>
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¹⁰ <http://www.caiso.com/Documents/Board-approvedISO2010-2011TransmissionPlan.pdf>

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	<p>connections to the Windhub Substation. This option is infeasible without further expansion of the 230 kV switchrack at Windhub due to substation design and unavailable positions. Currently, all positions at Windhub have been assigned to support a generation tie-line, 500/230 kV transformer bank, or 230/66 kV transformer bank. Further expansion of the substation is physically impossible without tearing out wind turbines that have already been installed or without eliminating turbines that will be installed all around the Windhub Substation. Such a conclusion would have been known early in the process if better coordination were implemented from the onset of the evaluation. In any case, the base line option should be eliminated from further consideration for the reasons stated above, leaving the expanded option as the option for which all cost comparisons should be based.</p> <p>The AV Clearview Project presentation suggests more work is necessary before concluding that the project does not fit as an alternative to the Coolwater-Lugo 230 kV (aka SCE South of Kramer Project) project. Based on the above discussion, and based on the fact that the expanded case will be more expansive than the base line case, this project should be dismissed from further consideration as an alternative to the Coolwater-Lugo Project. Furthermore, alternatives considered should ensure all aspects of the Coolwater-Lugo Project are properly addressed. As an example, the Coolwater-Lugo Project has additional objectives beyond improving South of Kramer transfer capability. These additional project objectives include: to facilitate interconnection of new resources in the Lucerne Valley area and to</p>	
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		<p>facilitate future load serving in the Apple Valley area. As presented, the AV Clearview Project baseline and expanded options do not satisfy these project objectives. This indicates that the AV Clearview Project is not a suitable alternative to the Coolwater-Lugo Project. Additional scope would have to be added to the AV Clearview Project in order to consider it an appropriate alternative. For these reasons, the project as is should be dismissed as an alternative, and as such, the CAISO should conclude that this alternative should not go forward.</p>	
45	<p>Karen Shea, Garry Chinn & Rabiindra Kiran, Southern California Edison</p>	<p>SCE Policy Driven Powerflow and Stability Results - Sanjay Patil Presentation</p> <p>SCE notes that the North of Lugo area policy-driven Inyo PS mitigation should be removed as this is already identified and required for queued generation projects. The upgrade is already included in an LGIA originally filed unexecuted before FERC. The issues that resulted in filing the LGIA unexecuted have been resolved, resulting in an Effective LGIA which includes the Inyo PS mitigation as part of the required scope. Consequently, this upgrade should be removed from policy-driven and instead labeled as a GIP-related mitigation.</p> <p>North of Lugo area policy-driven SVD at Inyokern may necessitate Inyokern Substation rebuild as the substation configuration may not allow for the installation of an SVD. Consequently, a detailed evaluation of the substation will need to be undertaken to evaluate feasibility and appropriate cost for such SVD.</p>	<ul style="list-style-type: none"> • The report currently states that “Upgrading INYO phase shifter was previously identified in GIP and would address this concern. This is a localized concern that should be addressed by GIP.” Presentation didn’t provide such details for the mitigation. • SVD was proposed in Inyokern area not at Inyokern substation. • IID RAS should trip generation under the Devers –Mirage outage. Once the generation is tripped overload on Julian Hinds-Eagle Mountain or SCE-MWD tie would be mitigated. • The ISO agrees that these SPS should not be listed as a policy-driven upgrade but rather as a GIP-related upgrade. In fact, SPS is not being recommended as a policy-driven upgrade. • AV Clearview project proponent informed the ISO that the 115 kV line to Edwards should be modeled as normally open and with this modeling the overload is eliminated.

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	<p>Path 42 SPS does not monitor loading on the Julian Hinds-Eagle Mountain or SCE-MWD tie at Julian Hinds for loss of Devers-Mirage No.1 and No.2 230 kV transmission lines. Consequently, it is inappropriate to assume that the IID SPS would address this problem unless monitoring is installed on these MWD facilities so that the SPS can be intelligent and trip resources when required.</p> <p>Tables state in multiple pages of the presentation, that “SPS to trip new renewables in Ivanpah Area was proposed in previously conducted GIP studies.” This statement should be modified to read “SPS to trip generation interconnecting in the Ivanpah Area is being implemented as these new renewable resources are interconnected consistent with identified GIP study requirements.” The rationale for this modification is that the upgrade should not be listed as a policy-driven upgrade but rather as a GIP-related upgrade.</p> <p>The results suggest the AV Clearview Project is an alternative to the Coolwater-Lugo 230 kV mitigation. This is factually incorrect since the AV Clearview Project, as presented in the material, would create an overload on the underlying 115 kV non-CAISO lines from Edwards to Kramer. As such, it is inappropriate to make such a representation when ALL issues are not properly mitigated. In addition, one of SCE’s South of Kramer (SOK) project objectives is to also facilitate interconnection of new resources in the Lucerne Valley area which the AV Clearview Project does not allow. SCE recommends removing the</p>	<ul style="list-style-type: none"> • Generation modeling was provided by CPUC. • Windhub 66 kV jurisdiction has not been official yet. • SPS to trip Control area generation is due to a localized concern and should be addressed by GIP.
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	<p>“or AV Clearview Project” as mitigation from the table shown on multiple pages of the Policy Driven Planning Deliverability Assessment Results – SCE Area Presentation.</p> <p>The North of Lugo Delivery Assessment results identifies an overload on the Coolwater-Dunn Siding loop 115 kV No.1 transmission line. There is no such line in existence so it appears an arbitrary collector substation was modeled with arbitrary megawatts reflected on such collector substation. To date, there is no active queued generation resource seeking interconnection to the 115 kV line that runs from the Coolwater 115 kV switchrack to the Ivanpah Substation. SCE would like to better understand location of assumed collector substation and amount of assumed resource connected in this area. In addition, SCE requests the CAISO provide information on the basis for such assumptions given the fact that there is no commercial interest in this area as evidenced by the lack of projects in the generation interconnection queue. Without better details it is unclear how the recommendation can be supported as an appropriate policy-driven upgrade.</p> <p>The table on slide 9 (slide 35 of the PDF file) shows non-CAISO upgrades. The table should remove the loss of a Windhub A-Bank as such outage is non-CAISO jurisdictional. Also, the use of an SPS should be reflected as a GIP-related upgrade and not as a policy-driven upgrade; this item should be removed altogether since the facility is not CAISO jurisdictional.</p>	
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		<p>Also, this same table defines loss of Inyo-Cottonwood 230 kV in multiple pages and suggests an SPS for Control Area generation projects as mitigation. The Inyo-Cottonwood 230 kV line is a transmission line owned by LADWP. It is unclear how the CAISO intends to expand an SPS to include loss of transmission outside of CAISO jurisdiction. Since the expansion would involve facilities outside of CAISO Control, it is unclear how the CAISO can recommend such an upgrade under the Policy Driven classification.</p> <p><u>Page 33 Thermal Overloads (Peak)</u> On page 33 Thermal Overloads (peak), CAISO suggested that IID SPS would mitigate overload on Julian Hinds – Eagle Mountain under the loss of Devers-Mirage No.1 and 2 220kV transmission lines. Current IID SPS design will NOT be sufficient to mitigate this overload under this contingency. Therefore, tripping generation in IID will need further review to mitigate this overload. Also, according to Intertie Planning, mitigation to this overload is NOT covered in the on-going IID SPS design scope.</p>	
46	<p>Karen Shea, Garry Chinn & Rabiindra Kiran, Southern California</p>	<p>33% RPS Sensitivity Case Assessment Modeling a High Out of State Import Scenario - Yi Zhang Presentation</p> <p><u>Page 125 (online) Potential Mitigations East of Eldorado</u></p> <p>The need to consider potential mitigations east of Eldorado is driven by the addition of 3,000 MW of renewable generation production at</p>	<p>As stated in the slides, the ISO is participating in WECC processes to address WECC area impacts of similar projects, outside the ISO area.</p> <p>Several participants in the Mead-Adelanto project are ISO participating</p>

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Edison	<p>Eldorado relative to the base case. The simulation results found that the case diverged for the loss of 3,000 MW at Eldorado with a note that divergence is mainly caused by voltage stability in the Northwest. To address this concern, Option 1 proposed by the CAISO is for a new 500 kV line from Eldorado-Rancho Vista along with the use of series capacitors.</p> <p>As part of QC4 Phase I, which considered a similar scenario of 3,000 MW being added at Eldorado, SCE had proposed a third line from Eldorado to Lugo 500 kV line via Pisgah and new 500 kV lines from Pisgah to Rancho Vista and Pisgah to Serrano. In addition, to mitigate post-transient voltage issues caused strictly by the 3,000 MW injection at Eldorado, the CAISO had proposed the 2nd 500 kV line from Grizzly 500 kV substation in Northwest to the Tracy substation in PG&E via Captain Jack and 400 MVAR's of dynamic reactive support on WECC's Path 26. Based on the QC4 studies, SCE feels that the Eldorado-Rancho Vista 500 kV line as the only major upgrade to accommodate the 3,000 MW injection at Eldorado may not be sufficient to address all reliability needs, perhaps due to the use of over-simplified assumptions, and requests further clarifications from the CAISO.</p> <p>As an alternative to building the Eldorado-Rancho Vista 500 kV line (Option 2), the CAISO is proposing to convert the Mead-Adelanto 500 V line to DC which seems odd, since the Mead-Adelanto 500 kV line is a non-CAISO facility. SCE would also appreciate the CAISO providing an explanation for this approach.</p>	transmission owners.
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47	Karen Shea, Garry Chinn & Rabiindra Kiran, Southern California Edison	<p>Economic Planning Studies – Preliminary Results – Xiaobo Wang Presentation</p> <p><u>Preliminary Study on Delany-Colorado River Project – Operation Year 2017</u></p> <p>SCE has the following questions and request for clarification related to the preliminary economic assessment, which apparently finds the Delany-Colorado River 500 kV line to be economic:</p> <ul style="list-style-type: none"> • What are the natural gas and GHG prices used in the study? • What types of resources are being dispatched in Arizona for California? Fossil, renewables, or some combination? • What portion of the CAISO resource portfolio is being reduced to offset the economic resources from Arizona? If it is in PG&E or SDG&E, are grid expansions on SCE's system needed to accommodate this? If expansions are needed in SCE's system, the costs must be considered and added for the transmission that was built to accommodate the existing resource. • Please provide clarification on what resources will be used and turned off. Knowing the assumptions for generation that is 	<p>The natural gas assumptions were stated as follows on Page 10 of the Dec 12 presentation:</p> <ul style="list-style-type: none"> • Natural gas price reference: EIA forecast of Henry Hub price in AEO 2012 • Natural gas price allocation: MPR prices used in the ISO 2011 renewable integration study <p>References of the natural gas prices are the following:</p> <ul style="list-style-type: none"> • Natural Gas price reference Henry Hub price forecast from EIA AEO2012: http://www.eia.gov/oiaf/aeo/tablebrowser/#release=AEO2012&subject=0-AEO2012&table=13-AEO2012&region=0-0&cases=ref2012-d020112c • Natural gas price allocation CAISO Renewable Integration Study 2011: http://www.caiso.com/informed/Pages/StakeholderProcesses/IntegrationRenewableResources.aspx <p>Types of resources dispatched in Arizona for California</p> <ul style="list-style-type: none"> • Renewables, being fixed schedule resources, are not dispatched in the model • Fossil-fuel generation are dispatched to meet the local demand and export to California <p>CAISO resources reacting to the economic resources in Arizona</p> <ul style="list-style-type: none"> • In general, old and inefficient generation (anywhere in the system) may get dispatched off with respect to the economic resources in Arizona. • The extensive 8760 hourly simulations did not find any
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		<p>being turned off is equally as significant as the generation being turned on in Arizona.</p> <ul style="list-style-type: none"> • Are the calculated benefits over a 30 year period? • Are the cost and benefit values in NPV dollars? <p>If the study assumes importing renewables into CA, do these renewables meet SB-1X criteria?</p>	<p>additional needs for upgrading the transmission systems in the ISO-controlled grid due to the proposed the Delany – Colorado River 500 kV line. Here, it is noted that the Colorado River – Devers – Valley 500 kV line #2, West of Devers Upgrade, Barre – Ellis 230 kV reconfiguration were already modeled in the base case based on the unified study assumptions. The production simulation did not identify any bottlenecks in the system in the downstream of the Delany – Colorado River line.</p> <p>Benefit horizon:</p> <ul style="list-style-type: none"> • Consistent with the range of time frames that can be considered under TEAM framework and the PVD2 study, the economic benefits are estimated for 50 years of economic horizon. • While estimating economic benefits further and further into the future decreases the accuracy of such estimates, the present value of those benefits (and the corresponding impact of increased forecast error) are less significant due to the application of discount rates in determining the present value. • The effect of performing these calculations over a 40 versus 50 versus 60 year time frame was demonstrated to be minimal in the tornado chart on page 17 of the ISO presentation “Economic Planning Studies - Part 3: Evaluation of Economic Planning Study Requests”, Feb 7, 2012
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			<p>Cost and benefit values in NPV dollars:</p> <ul style="list-style-type: none"> • Yes
48	<p>Karen Shea, Garry Chinn & Rabiindra Kiran, Southern California Edison</p>	<p>SCE Recommendations on Policy Driven Deliverability Assessment SCE Results</p> <ul style="list-style-type: none"> • Inyo phase-shift transformer should be removed as a policy-driven upgrade and instead be shown as a GIP upgrade. • AV Clearview Project should be removed as mitigation for reasons stated above. • Coolwater-Dunn Siding should be removed as mitigation since there are no active interconnection requests for new projects in the Dunn Siding area. • All SPS to trip generation should be addressed within the GIP studies as reliability upgrades needed to interconnect new generation resources. Consequently, SPS should be removed as a policy-driven upgrade since it can only be defined with a specific generation project and is therefore not a barrier to meeting 33% RPS. • Pahrump is not an SCE facility; it is a VEA facility. The 	<p>Cost and benefit values in NPV dollars:</p> <ul style="list-style-type: none"> • The report currently states that “Upgrading INYO phase shifter was previously identified in GIP and would address this concern. This is a localized concern that should be addressed by GIP.” Presentation didn’t provide such details for the mitigation. • Please see response above for AV Clearview. • Generation modeling was provided by CPUC.

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		<p>presentation should be updated to reflect VEA issues separate from SCE issues.</p> <p>Table shown on Slide 11 states that Tehachapi (230 kV) zone is not deliverable due to loss of Eldorado-Lugo 500 kV and Lugo-Mohave 500 kV transmission lines. Tehachapi is located west of the line outage in a different area (northern) which does not contribute incremental flow to joint-owned Lugo-Victorville 500 kV transmission line. Consequently, this zone should be removed from this outage.</p>	
49	Victor Kruger, San Diego Gas & Electric	<p>The CAISO studied several alternative economic projects and presented preliminary results. One project appeared economic (Delany – Colorado River 500 kV line #2) and the rest appeared uneconomic (including North Gila – Imperial Valley 500 kV line #2). The economic assessment considered a number of factors (primarily congestion mitigation) but did not include possible benefits in reducing costs of meeting Resource Adequacy (RA) requirements. A reduction in RA costs as compared to the RA costs that would be incurred without the proposed projects, could cover most of the costs of a proposed project. The proposed 500 kV North Gila – Imperial Valley #2 line may offer such benefits.</p> <p>RA costs currently come from meeting System and Local requirements, but a new Flexible requirement is expected to begin in 2014. A proposed transmission project would have no impact on System RA requirements (because they are based only on peak load and a</p>	<p>In principle, the ISO agrees with this comment that RA benefits, in the form of capacity benefits, are an integral part of the economic benefits. The ISO economic planning studies always evaluate capacity benefits (estimated outside production simulation) in addition to the energy benefits (calculated by production simulation).</p> <p>As this comment pointed out, RA capacity benefits can be classified in three categories: system RA, LCR and flexible capacity. With respect to the proposed North Gila – Imperial Valley 500 kV line, the ISO’s preliminary findings on capacity benefits are as follows:</p> <p>(1) System RA benefits In the downstream of the North Gila – Imperial Valley line, there are significantly amount of solar resources that will occupying the transmission capacity. The remaining capacity limits the capability of importing additional RA capacity from Arizona. Therefore, it is not quite</p>

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	<p>planning reserve margin).and little or no impact on expected Flexible RA requirements (driven mainly by variability in load and generation). However, in certain locations, proposed projects can have a very large impact on Local RA requirements. This is important because Local RA is more expensive than System RA because, at the local level, there are far fewer suppliers competing against one another to offer dependable capacity. In some cases, the combined amount of dependable capacity within a local area may even be less than the Local RA requirement; thus, every supplier knows that it's RA capacity will be procured and, accordingly, will seek a high price. A proposed transmission project that reduces a Local RA requirement creates a benefit equal to the difference between the cost of Local RA and System RA (Local RA counts towards meeting System RA requirements so any reduction in Local RA requirements means that an equivalent amount of lower cost System RA must be procured). SDG&E estimates that the difference between the cost of Local RA and System RA for the San Diego Local Capacity Requirement (LCR) area, Greater Imperial Valley-San Diego LCR area and San Diego-ECO LCR area, could be in the range of \$20 - \$40/kW/year.</p> <p>If the proposed 500 kV North Gila – Imperial Valley #2 line shifted 1000 MW from Local RA to System RA, the reduction in RA costs (\$20 - \$40 million per year) would appear to make the proposed line economic and worth further evaluation.</p> <p>The recent (November 2012) WECC approval of a Remedial Action</p>	<p>possible for the North – Gila – Imperial Valley #2 line to import an additional 1000 MW of RA capacity. As a result, the system RA benefit is limited.</p> <p>(2) LCR benefits Within the greater SDG&E area, the development of renewable resources will fill up the LCR need, leaving no benefits for the proposed line.</p> <p>In the ISO economic planning, both production benefits and capacity benefits are being evaluated for the proposed North Gila – Imperial Valley 500 kV line #2. In the study results to be finalized, both economic benefits will be included.</p> <p>It is recognized that the existing North Gila – Imperial Valley is a weak link because loss of the line will end up isolation of the SDG&E system from the Arizona supply. The ISO will continue to work with SDG&E and other stakeholders to identify the need (not limited to the economic need) to plan for the second line.</p>
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	<p>Scheme (RAS) makes the tripping of both the Sunrise Powerlink and the Southwest Powerlink a Category “C” contingency event and, with the addition of the already-approved 500 kV Hassayampa-North Gila #2 line and the proposed 500 kV North Gila-Imperial Valley #2 line, sets the stage for a potentially large reduction in Local RA requirements. (The completion of these transmission lines would provide parallel 500 kV lines connecting the Phoenix and San Diego areas.) By itself, the RAS would significantly reduce the San Diego sub-area LCR need, but not the Greater Imperial Valley-San Diego LCR area need. This is because, with the current Path 44 rating of 2500 MW north-to-south, the loss of the existing 500 kV North Gila – Imperial Valley #1 line only allows 2500 MW of post-contingency imports into the Greater Imperial Valley-San Diego LCR area on Path 44 and post contingency imports into the Greater Imperial Valley-San Diego LCR area of a few hundred MW from the IID Balancing Authority at Imperial Valley substation. However, with the addition of the already-approved 500 kV Hassayampa-North Gila #2 line and the proposed 500 kV North Gila-Imperial Valley #2 line, at least 1200 MW can flow into the Greater Imperial Valley-San Diego LCR area and into the San Diego LCR area from the east with any element out of service on either of the parallel 500 kV lines between the Phoenix area the San Diego area. This post-contingency import in combination with the 2500 MW of post-contingency imports from the north on Path 44, has the potential to significantly reduce local RA requirements, thereby saving San Diego area consumers money. SDG&E notes that the CAISO recently released the results of study work indicating that a new 230 kV</p>	
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	<p>Sycamore Canyon – Penasquitos line could increase post-contingency imports from the east above the 1200 MW level.</p> <p>The cost differential between Local and System RA in the 2017 and later time frame—when the proposed 500 kV North Gila-Imperial Valley #2 line could be in service—is difficult to predict. The CAISO CPM rate of about \$70/kW/year may be a useful proxy for a Local RA price, but Once-through cooling (OTC) retirements and probable SONGS derates or possible SONGS retirement¹¹ make this uncertain. The expected Flexible RA requirement when coupled with all the remaining Local CAISO requirements (for all areas) and RPS requirements may severely reduce the market price of the small remaining System RA requirements that can also be supplied by imports, perhaps as low as \$30 - \$50/kW/year. So an estimated differential between Local and System RA of \$20 - \$40/kW/year is plausible.</p> <p>SDG&E recommends that the CAISO augment its analysis of the proposed 500 kV North Gila – Imperial Valley #2 line to include expected long-term RA cost savings and determine if these added benefits would make the project economic. Also, sensitivities involving different scenarios for the amount of generating capacity available at SONGS, OTC retirements, and LTPP additions need to be evaluated as these factors may affect the magnitude of benefits provided by the</p>	
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¹¹ The availability of generation at the SONGS has a significant impact on the maximum amount of post-contingency imports into the San Diego LCR area; less SONGS generating capacity means a lower level of post-contingency imports.

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		<p>proposed 500 kV North Gila – Imperial Valley #2 line.</p> <p>In early 2013 the CAISO should expand its annual LCR determination to include two sensitivity studies: 1) For the 5-year ahead study add the North Gila – Imperial Valley #2 line with both SONGS units available at 100%, 2) For the 10-year ahead study add the North Gila – Imperial Valley #2 line with both SONGS units retired. These two sensitivity studies will allow evaluation and quantification of the Local RA benefits of the North Gila – Imperial Valley #2 line under a range of future possible scenarios and help determine if the North Gila – Imperial Valley #2 line should be pursued as an economic project.</p>	<p>The ISO will consider the comment on the North Gila- Imperial Valley #2 line as an economic study request. SDG&E should submit this comment again during the development of the 2013/14 TPP Study Plan.</p>
50	John Jontry, San Diego Gas & Electric	<p>Regarding the presentation, “SDG&E Policy Driven Powerflow and Stability Results”, SDG&E notes that the overload of the Miguel-Bay Boulevard 230 kV line shown on slide #6 assumes a 912/1175 MVA rating (normal/emergency). If the Bay Boulevard project as submitted by SDG&E is approved by the CPUC, this line will have a rating of 1175/1175 MVA which will mitigate this overload.</p>	<p>This information will be considered while recommending any mitigation for this issue.</p>
51	John Jontry, San Diego	<p>SDG&E notes that the Sycamore-Penasquitos (SX-PQ) 230 kV line was identified as an element of a “least-regrets” plan for mitigation of</p>	<p>The need for this line will be addressed in the draft comprehensive plan write-up with due consideration given to the policy-driven study</p>

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	Gas & Electric	system problems in the “Briefing on Nuclear Generation Studies Preliminary Results”, presented to the CAISO Board of Governors at the December 13-14 board meeting. SDG&E also identified this project as having significant reliability benefits and submitted it in the 2012/2013 reliability project window. This project also has benefits from a policy standpoint (as indicated on Slide #12 of the “SDG&E Policy Driven Powerflow and Stability Results” presentation). SDG&E strongly recommends approval of this line as a reliability project as a part of the 2012/2013 Draft Transmission Plan so that design and permitting efforts can get underway as soon as possible.	and the nuclear back-up study.
52	John Jontry, San Diego Gas & Electric	SDG&E also submitted four (4) dynamic reactive projects in the 2012/2013 reliability project window, and makes a similar observation that the CAISO has identified additional dynamic reactive support in the San Diego area as having benefits from a policy standpoint and from a nuclear generation backup “least-regrets” standpoint. SDG&E makes a similar recommendation as with the SX-PQ line, that one or more of these reactive support projects be approved as a part of the 2012/2013 Draft Transmission Plan so that design and permitting efforts can get underway as soon as possible.	The need for additional dynamic reactive support will be addressed in the draft comprehensive plan write-up with due consideration given to the policy-driven study and the nuclear back-up study.
53	Sarah K. Friedman, Sierra Club	A. The Net Short is improperly applied and results in gross over-estimation of the need for new transmission capacity for the RPS program. As we discussed in the Conceptual Plan Comments, although we are pleased to see the ISO coordinating with other state agencies to use a consistent value for the Net Short for transmission planning purposes,	The renewable portfolios and associated net short assumption were developed by the CPUC, CEC, and ISO in an open stakeholder process. The ISO currently has less than 1000 MW of power that is produced from coal and imported into the ISO system. In addition, the contracts

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		<p>there appears to be a fundamental misunderstanding in terminology. Based on our reading, the ISO may be conflating the amount of additional renewable energy necessary to meet California's RPS goals—which is what the CPUC value provides— with the amount of new transmission capacity that will be needed to deliver that renewable energy. By ignoring California state policies and laws which reduce the need for new transmission-- such as allowing 10% of RPS obligations to be met through RECs, 3,100 MW of renewable distributed generation through existing programs and at least 3,700 MW of new transmission capacity from out-of-state coal retirements---leads to an over-estimation of the amount of new transmission needed to meet California's RPS goals.</p>	<p>associated with this power are not expiring during the ten year planning horizon.</p>
54	Sarah K. Friedman, Sierra Club	<p>B. Transmission Planning should properly incorporate the most current information on the Desert Renewable Energy Conservation Plan.</p> <p>We strongly support incorporating the land use assumptions and natural resource data developed in the Desert Renewable Energy Conservation Plan (DRECP) process into transmission planning. The DRECP is a far-reaching initiative with huge impacts on the physical and energy landscape of California. The ISO is an integral part of this process, and in particular, has provided invaluable guidance on the development of the DRECP Conceptual Transmission Plan. The DRECP will operate by designating areas of the California desert as renewable energy development focus areas (DFAs). Gen-ties, transmission lines and facilities (both upgrades and new), and</p>	<p>Thanks for the comments. We continue to work with the CPUC and CEC to improve the portfolio development process. However, we believe that these enhancements will be fine tuning that will not change currently identified transmission needs.</p>

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		<p>transmission line stringing activities are each covered activities subject to the DRECP within the Plan area. One of the key pieces to ensure renewable energy development is incentivized within the DFAs is prioritizing and facilitating the rapid development of transmission serving the DFAs.</p> <p>To date, the DRECP appears to be incorporated into the transmission planning process rather indirectly--- the CEC incorporates data regarding the DFAs in giving specific generation projects environmental scores, and provides this data to the CPUC for use in developing scenarios. During the time between the development of the scenarios and the Materials, the DRECP has published an interim document (the "Interim Document") with updated Development Focus Areas (DFAS).¹ The Interim Document includes the alternatives which will be analyzed by the REAT agencies in the Draft DRECP and Draft EIS/EIR in 2013. The ISO should incorporate this more accurate data regarding the DFAs into the transmission planning process. Although we understand that a new transmission plan is developed annually, because of the far-reaching implications of the DRECP, the importance of transmission to the success of the DRECP and the long-lead time to develop transmission projects, this data should not be limited to environmentally scoring projects² or to the Environmentally Constrained Scenario, but should be used in each scenario, and particularly in the base case.</p>	
55	Sarah K. Friedman, Sierra Club	<p>C. Assumptions regarding Conventional Generation.</p> <p>We have concerns that assumptions referenced in the Materials could encourage duplicative natural gas plants, rather than exploring ways to</p>	<p>The amount of once through cooled generation assumed to be replaced is documented in much detail in the 2011/2012 TPP report. Which plants which were assumed to be repowered in the policy and</p>

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		<p>improve the transmission system to use existing gas more efficiently and flexibly. We thank the ISO for incorporating once-through cooling policies but request greater detail on assumptions regarding which plants will be repowered and how these assumptions are incorporated into the base case. We encourage the ISO to consider policies outside of the RPS encouraging renewables generation and the number of existing and planned natural gas facilities when developing these assumptions and to avoid incorporating assumptions that all OTC plants will be repowered in any part of the transmission planning process. We are also concerned to see all new generation from the 2022 Reliability Assessment base cases modeled. We encourage the ISO to look further at the potential impacts of distributed generation, demand-response and energy efficiency when incorporating projections on necessary conventional generation. Particularly, we believe the incorporating higher (and more realistic) levels of incremental uncommitted energy efficiency would provide a more realistic concept of our energy future and would reduce the forecasted need for conventional generation facilities.</p>	<p>economic studies are merely placeholders. Other electrically equivalent plants would be expected to produce similar results.</p> <p>The ISO is looking further into the potential impacts of distributed generation, demand-response and energy efficiency.</p>
56	Sarah K. Friedman, Sierra Club	<p>D. Specific Transmission Projects. Sierra Club is concerned that over-building transmission projects could result in unnecessary direct costs to California's customers as well as high indirect costs by guiding generation projects to sensitive and fragile locations through new transmission capacity. We are pleased to see the ISO focus on the Central Valley, an area of lower habitat value that historically has been overlooked in transmission planning. We are</p>	Thank you for the comments.

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		<p>also pleased to see the ISO focus on improvements to ease transmission constraints in the Imperial Valley, an area with high renewable energy resources and relatively low habitat value.</p>	
57	Bill Pascoe, Consultant for TWE Project	<p>Slide 124 of the stakeholder meeting presentation (attached) shows critical contingencies and resulting reliability criteria violations for the High Import Scenario. The first four contingencies deal with N-2 outages of parallel 500 kV line segments between Eldorado and Lugo. [It appears that] these contingencies are Category D events that do not require mitigation. Assuming these are in fact Category D events, the mitigation options shown on slide 125 should be modified accordingly. If these are not Category D events, it appears that the WOR path rating will be significantly impacted.</p> <p>The fifth and sixth contingencies on slide 124 deal with N-2 outages of the parallel 500 kV lines between Colorado River and Devers. The resulting overloads are relatively modest. The same contingency/overload combination was identified for the SCE Area Deliverability Assessment on slide 136. The mitigation identified for this event (Lugo-Eldorado series caps and terminal upgrades) is also identified for system normal and other contingencies in the Deliverability Assessment. This information should be noted in the discussion of the High Import Scenario.</p> <p>(Note that the Deliverability Assessment also identifies the N-2 outage of the Eldorado-Lugo and Eldorado-Mohave 500 kV lines as a critical</p>	<p>SCE has determined that the continued classification of N-2 outages of parallel 500 kV line segments between Eldorado and Lugo as Category D outages, as the impacts of the outages worsen due to considerably increased transmission flows, is not prudent. Under existing system conditions the outages continue to be classified as Category C outages.</p> <p>The ISO is recommending policy upgrades for the Lugo-Eldorado series caps and terminal upgrades and for the Eldorado-Lugo and Eldorado-Mohave 500 kV outage mitigation.</p>

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		<p>contingency and identifies relocation of the Eldorado-Lugo line as mitigation. As discussed above, this is being treated as a Category D event in the WOR path rating studies. However, if further investigation indicates that this is a Category C event, the mitigation identified in the Deliverability Assessment would also mitigate the third and fourth contingencies in the High Import Scenario and this should be noted in the report.)</p> <p>The final contingency on slide 124 is the loss of 3000 MW injected into Eldorado. Slide 126 accurately describes the status of this issue. TransWest is in active discussions with [a WECC member] about this contingency as part of the TransWest Express (TWE) path rating studies. In these discussions, [a WECC member] has taken the position that impacts on COI should be no more severe than for a two-unit outage at Palo Verde. This implies a maximum injection into Eldorado in the 2600-2700 MW range. TransWest believes higher injections at Eldorado (up to 3000 MW) may be achievable under at least some system conditions. However, TransWest has agreed to limit HVDC line flows to 2650 MW in the current TEPPC studies until this issue can be fully resolved through the TWE path rating studies.</p>	
58	Bill Pascoe, Consultant for TWE Project	The Dec 11-12 stakeholder presentation (on the high import scenario) showed a small number of contingencies that caused overloads (see slide 124). Are there additional contingencies that caused overloads or voltage violations that were not included in the presentation?	The scenario studied was presented as a sensitivity to demonstrate boundary conditions, and is not an exhaustive analysis of another portfolio. Only a limited set of contingencies were analyzed. The potential solutions identified are conceptual, and the ISO is not recommending approval of the alternatives discussed in this analysis.

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	<p>The two overloaded elements for the contingencies identified in the presentation (slide 124) are relatively short lines between Eldorado and McCullough and between Victorville and Lugo. The proposed mitigation (slide 125) includes building a relatively long line between Eldorado and Rancho Vista or converting the Mead-Adelanto Line to DC. Did CAISO consider adding new lines between Eldorado and McCullough and between Victorville and Lugo as a mitigation alternative? Is there any reason to believe this alternative would be ineffective, infeasible or more expensive than the proposed mitigation?</p>	<p>That being said, the conditions studied in this sensitivity were by design beyond historically-experienced flows – which was the purpose of the sensitivity in replacing forecast in-state renewable generation with out-of-state renewable generation. If a similar high out of state scenario is identified through the stakeholder process as one of the likely scenarios in the future then the ISO could consider the upgrade options suggested by TWE.</p>
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