

**CALIFORNIA ISO
2012-2013 TRANSMISSION PLAN**

**COMMENTS OF THE STAFF OF THE
CALIFORNIA PUBLIC UTILITIES COMMISSION
FOLLOWING THE DECEMBER 11 AND 12 STAKEHOLDER MEETINGS ON RPS
PORTFOLIO, CENTRAL CALIFORNIA, HIGH IMPORT, AND OTHER STUDIES**

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December 27, 2012

Introduction

The Staff of the California Public Utilities Commission (“CPUC Staff”) appreciate this opportunity to provide comments on the study results and information provided by the California Independent System Operator (“CAISO”) at the December 11 and 12 stakeholder meeting held as part of the Transmission Planning Process (“TPP”) to develop the 2012-2013 Transmission Plan. Our comments below cover these points:

1. High priority should be given to developing mutual understanding regarding characteristics, locations and timing of demand-side measures.
2. For the policy driven powerflow and stability studies, assumed generator injection (dispatch) levels and load scenarios should be clearly identified.
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.
4. It is important to have information on the transmission infrastructure benefits of planning scenarios emphasizing distributed generation (DG).
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).

6. Additional analysis and information regarding the relative benefits of the proposed AV Clearview and Coolwater-Lugo transmission projects would be a valuable inclusion in the 2012-2013 Plan.
7. The high out of state import study could provide greater insight, if aspects of the study are clarified.
8. Where voltage support needs have been identified, quantification will assist the CPUC.
9. Clarification of policy-driven planning deliverability assessment results will better inform stakeholders.
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.
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.
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 Transmission Plan should further explain, and explore alternative mitigation.
13. Considerable efforts to improve the economic planning studies are commendable, and the changes should be fully explained in the Draft Transmission Plan.
14. Changed circumstances relating to the Delany-Colorado River 500 kV project, which dramatically increase the benefit / cost ratio, should be clearly explained.

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.

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.

2. *For the Policy Driven Powerflow and Stability Studies, Assumed Generator Injection (Dispatch) Levels and Load Scenarios Should be Clearly Identified*

The December 11 presentation identifies peak and off-peak studies as 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-peak¹, as well as nameplate RPS generation modeled, by CREZ². 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.

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 studies³ and the new renewables include substantial amounts of solar 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.

¹ See slide 19 of the presentation summarizing policy driven planning base cases and study assumptions.

² For example, see slide 4 for the SCE area presentation.

³ See slide 19 of the presentation summarizing policy driven planning base cases and study assumptions.

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.

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.

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.

The December 11 presentation shows nameplate renewable generation capacity within different renewable zones⁴ 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

⁴ See, e.g., slide 7 of “Policy Driven Planning Deliverability Assessment Results – SCE Area.”

methodology, such as via a BPM whose salient points can be cited or quoted when deliverability studies are presented, such as in the TPP.

4. *It is Important to Have Information on the Transmission Infrastructure Benefits of Planning Scenarios Emphasizing Distributed Generation (DG).*

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.

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 has 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 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.

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).*

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 have been reserved for development by incumbent transmission owners only.

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.

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.

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 TPP versus the GIP. This could be done via tariff, BPM, or other mechanism, but needs to be done.

6. *Additional Analysis and Information Regarding the Relative Benefits of the Proposed AV Clearview and Coolwater-Lugo Transmission Projects Would be a Valuable Inclusion in the 2012-2013 Plan.*

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 under the planning cases studied. 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.

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.

7. *The High Out of State Import Study Could Provide Greater Insight, If Aspects of the Study Are Clarified.*

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 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.

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.

Furthermore, it is important to identify which 3000 MW of renewable generation was removed 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.

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.

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.

8. Where Voltage Support Needs Have Been Identified, Quantification Will Assist the CPUC (for example, Greater Southern PG&E Area -- Voltage Support).

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.

As noted by Stephen Berberich, President and CEO of CAISO, vars and voltage support are almost more important than generation, in the context of meeting summer needs.⁵

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.

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."⁶ 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.

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 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.

⁵ Statement made at California Energy Commission workshop, June 22, 2012.

⁶ 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).

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.

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.

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 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.

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.

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.⁷ 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-

⁷ See, e.g., slides 4-8 (PDF pages 141-145).

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.

13. *Considerable Efforts to Improve the Economic Planning Studies Are Commendable, and the Changes Should Be Fully Explained in the Draft Transmission Plan.*

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 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.

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*

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.

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.

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