

CTPG RETI Stakeholder Input Meeting
January 20, 2010
San Diego, CA
Stakeholder Questions and Comments

The following are the RETI Stakeholder comments and questions pertaining to the 2010 Phase 1 CTPG 2020 Study Report presented at the January 20th CTPG RETI Stakeholder Input meeting and comments and suggestions of what should be included in the Phase 2 Study Plan. If questions were answered at the meeting by representatives of CTPG, the response is included below. In some cases, CTPG has expanded on the responses given at the meeting and the expanded responses are shown below. CTPG may provide further responses at a later date.

Commenter 1 – Dave Korinek (KEMA)

Q: Resource portfolio – Is it correct that the initial CTPG report models resource portfolios that reflects the procurement plans of each member in the study?

A: Yes

Q: What is the planned methodology for generation curtailment. Is this work to be done and if so, what criteria is the group thinking about for generation tripping or curtailment in place of transmission upgrades/additions? CTPG's written response noted that CAISO has both single and double contingency tripping limits, but the response didn't propose specific criteria. What is the study group's criteria?

A: We will provide full discussion in written comments. Existing schemes that use Remedial Action Schemes to mitigate reliability criteria violations will be used as guidance. However, the CTPG study team has not yet discussed specific criteria for determining when such operational measures should be included as the recommended mitigation for identified reliability criteria violations. Development of such criteria is expected to be part of CTPG's future work.

A: Further Response – CTPG's draft Phase 2 study plan indicates that "CTPG will not perform an alternative analysis for mitigating the need for a new or upgraded transmission line with protection control systems. This alternative analysis will be completed by the entity responsible for each particular proposed transmission improvement utilizing its own analysis assumptions and mitigation policies and practices. Therefore, the CTPG will provide wire recommendations only."

Commenter 2 – Gary Tarplee (Mission Energy)

Q: What kind of influence will this report have with ISO and regulatory authorities? What will be the next steps for identified transmission?

A: Mo Beshir- The CTPG expects its work to be on-going and cyclical in nature; additional studies will be performed to continually update the California conceptual transmission plan.

A: Jim Avery- The approval process will be completed by the applicable decision-maker (CAISO, LADWP, etc.) or, for joint projects, multiple decision-makers. The CTPG is a technical study group only.

Commenter 3 – Carl Zichella (Sierra Club; RETI)

Comment – Suggests that CTPG plug in data on net short from a variety of state agencies for estimates of energy efficiency (EE), combined heat and power (CHP), photovoltaic (PV) and other distributed generation (DG) applications. The current net short estimates aren't complete. Attention should be paid to agency efforts to reconcile different estimates.

Response from Rich Ferguson of RETI - Joint agency staff is working on uncommitted energy efficiency numbers and should be releasing those in a couple of days. However, a projection of how CHP and in-front-of-the meter distributed generation applications may be expanded over the next decade will not be included in this release.

Comment – For those elements of CTPG's initial conceptual transmission plan that are not common to elements in the RETI Phase 2A conceptual transmission plan, a RETI-comparable environmental review should be conducted, especially for those elements that would not be built on existing right-of-way.

Comment – Calculation of capacity enhancements on lines; much discussion about how much fossil will be backed down, but that isn't the same as calculating how much capacity will be freed when contracts for fossil are phased out; e.g., LA contracts.

Response: "Contracts" with fossil-fired generators will not generally be the deciding factor in determining which fossil-fired generators will be backed down to accommodate increased renewable energy production. This is because "contracts" ultimately have little to do with which dispatchable generators actually run and which will not. The relative level of variable operating costs for each dispatchable generator is what will determine which generators actually run and which are backed-down or turned off. This is consistent with the merit-order

based fossil-fired generation decremental dispatch approach used in CTPG's initial studies.

CTPG believes that other fossil-fired generation decremental dispatch approaches are worthy of consideration for future CTPG study work, including the possibility of ordering decremental dispatch based on each generator's relative level of carbon emissions.

Comment- Need to clarify decision on whether to model Green Path North. Sierra Club understands that LADWP has indicated it will not pursue the GPNP.

Response - The CTPG Study Team used the WECC 2019 "Heavy Summer" power flow case as its "seed case," and the 500 kV variant of the GPNP was included in that case. The possibility the GPNP will be pursued is why the CTPG study team ran a sensitivity case without the GPNP. Future studies may not include GPNP in the cases.

Further Response – The Green Path North Project will be removed in CTPG's Phase 2 study work.

Question to Carl – when is RETI data on net short going to be ready? A: Function of when government people working on "unified assumptions" complete their work. End of month?

Further Response – CTPG will work with RETI to resolve the net short calculation for Phase 2 study work over the next week.

Question to Carl -- What about developing environmental scores for RETI enhancements in Phase 2? A: Carl - Would like to help, but will be a function of what line segments are being reviewed and whether there are new corridors. The latter will probably score badly.

Commenter 4 – Dariush Shirmohammadi (CalWEA)

Comment – Studies show that lack of Green Path North causes some violations; simple upgrade resolving violations should be added. Shouldn't base case include removal of Green Path North and inclusion of those upgrades? Depends on where LA is leaning.

Comment -- What is dubbed as RETI transmission projects in CTPG report were presented by PTOs to RETI. Unlike the CTPG, RETI did not actually have a process by which it identified the elements of the RETI Phase 2A conceptual transmission plan. The elements of the RETI Phase 2A conceptual transmission plan were provided by utilities and independent transmission developers participating in RETI and evaluated for environmental impacts. Therefore, when

referring to elements of the RETI Phase 2A conceptual transmission plan, CTPG should use the term “RETI reviewed” instead of “RETI projects.”

Comment – CTPG needs to provide more explanation of the differences between the renewable development assumptions used by RETI and those used by CTPG. The fact that RETI’s renewable development projection assumed an amount of renewable energy equal to 1.6 times RETI’s renewable net short estimate, is only one of several differences.

Q: Given overloads identified in the study, why not consider that there will be a lot of wind in the area and that could address – if we use the wind adjusted ratings – to get rid of some of the 2-3% overloads. Shouldn’t we update the database for studies including wind and focus on 10-20% overloads.

Comment - CTPG should update its CREZ-specific wind output profile database with the latest information. CTPG’s studies should also consider the use of dynamic line ratings since, when the wind is blowing hard, conductor cooling is more significant and more power can be transferred for a given weather condition than would be indicated by static line ratings.

A: Jim Avery – The question is should we use dynamic line ratings? The CTPG and/or decision making organizations will assess that and other mitigation methods, if moving forward with a proposed project.

A: Further Response -- NERC and WECC reliability standards require transmission planners to identify mitigation strategies for all identified reliability criteria violations, regardless of the magnitude of the violation.

Response Dariush – Scenarios we’re studying for planning, we should have the capability to state that the line ratings would be higher.

Q: The results for the C2 case, which indicate that 32% of California’s forecast retail sales in year 2020 can be served with renewable resources without the need to add transmission infrastructure beyond that included in the WECC 2019 “Heavy Summer” seed case, has “no foundation in reality.” This is because wind will not be intentionally dispatched at 20% of nameplate if there is enough wind available to support output at 100% of nameplate. None of them will be in business. Such a scenario has no foundation in commercial reality.

A: Based on a discussion with the representative of the CalWEA, it appears the CalWEA representative misunderstood the study methodology that the A, B and C cases used to determine the amount of renewable energy that would be simultaneously producing power during each of the system conditions assumed for each case’s respective power flow analyses. Wind is generally modeled at 20% of nameplate, solar at 80% of nameplate, and geothermal and biomass are modeled at 100% of nameplate, because these are reasonably typical scenarios

for what would happen during the system condition assumed for study purposes (late afternoon in the summer).

CTPG agrees that if there is enough wind available to support output at 100% of nameplate, that is in fact what will be produced and delivered to the grid. Accounting for this possibility requires additional study work and, as CTPG has indicated, these types of “deliverability” studies are expected to be included in future phases of CTPG’s work.

Q: Why, in CTPG’s initial studies, is so much wind generation capacity in the Tehachapi CREZ assumed to be connected to Barren Ridge substation?

A: The renewable procurement portfolio data submitted by CTPG members to the CTPG study team required, in some cases, interpretation in order to model the indicated generation in the power flow cases. This interpretation resulted in a large amount of Tehachapi wind capacity being modeled at the Barren Ridge substation. In future work CTPG intends to model a smaller amount of Tehachapi wind generation as connected to the Barren Ridge substation and a larger amount as connected to the Whirlwind and Windhub substations. Note also, that sensitivity work conducted by the CTPG indicates that the reliability criteria violation that would be mitigated by the addition of the 500 kV Barren Ridge-Vincent #1 line, does not appear if this shift in connection points is made.

Q: Cases A, B and C appear to include different sets of network upgrades. No attempt appears to have been made to “normalize” the network upgrades across all three cases. Shouldn’t this be done?

A: Each of the three cases contains, by design, unique assumptions and approaches. Accordingly, differences in the network upgrades included in each of the cases should be expected. Given that each of the three cases has a different premise, it is not clear how it would be possible, or that it would make sense, to “normalize” the upgrades across all three cases.

As CTPG moves forward with its analysis, which will include new scenarios and assumptions, operational measures and other transmission upgrade alternatives may appear as attractive candidates for mitigating reliability criteria violations.¹ At some point in the process, the CTPG Executive Committee will need to make decisions as to what specific set of infrastructure additions, operational mitigation measures, and CREZ connection schemes should be included in CTPG’s

¹ Note that the draft Phase 2 study plan indicates that “...CTPG will not perform an alternative analysis for mitigating the need for a new or upgraded transmission line with protection control systems. This alternative analysis will be completed by the entity responsible for each particular proposed transmission improvement utilizing its own analysis assumptions and mitigation policies and practices. Therefore, the CTPG will provide wire recommendations only.”

transmission plan. Note that these decisions should be informed by comparative analysis of the projected benefits and estimated costs of the various alternatives identified.

Commenter 5 – Rich Ferguson (RETI)

Comment – Proposed alternative net short: There is a joint staff recommendation for alternative scenario for EE and CHP behind the meter. RETI will put this into its net short. Unfortunately, some groups have not come up with DG number on incremental behind the meter DG.

Comment – RETI has been thinking about scenarios for some time; especially to bound what are needed for least regrets projects. RETI Transmission Working Group has a meeting with CTPG on webex a week from tomorrow (January 28 at 2:30). These are open to all parties. Thursday 2:30-4:30.

Q: to Rich – When will straw scenarios be available?

A: Tomorrow afternoon.

Q: When will net short ready?

A: We can send the current version discussed at the 1/19 RETI meeting tomorrow.

Further Response – CTPG is working with RETI to prepare the net short and scenario data for Phase 2, with the option to move analysis that is not ready for Phase 2 into Phase 3.

Commenter 6 -- Dave Kates (Nevada Hydro)

Q: Table 41 mentioned The Nevada Hydro Company's Talega-Escondido/Valley-Serrano (TE/VS) project but didn't include this project in CTPG's initial conceptual transmission plan.

A: The TE/VS project was not included in the WECC 2019 "Heavy Summer" power flow case which was used by CTPG as the seed case for its initial round of power flow studies. Based on the locations of the reliability criteria violations found in this initial study work, it does not appear that the TE/VS project would be an infrastructure addition that would be effective in mitigating any of those violations. However, future CTPG work may uncover other violations for which TE/VS would be effective mitigation. Further, CTPG has not yet attempted to evaluate the relative benefits that new infrastructure additions might bring to constrained load pockets such as the San Diego area and the Los Angeles basin. Depending on the magnitude of these benefits and the cost of the project,

it is possible that the TE/VS project would be a sensible addition to the CTPG conceptual transmission plan.

Commenter 7 – Scott Gutting (Energy Strategies)

Q: Next steps recommends testing Owens Valley and out of state resources. How can we help you figure out which transmission to test?

A : Mo – This will be included in the general procurement scenarios. We will look at out of state resources. In next set of recommendations from B&V (RETI) work, there are additional resources in the Out of State area. We will roll in that data. Send comments to CTPG on your recommended resources.

Commenter 8 – Paul Scheuerman (Citizens Energy)

Comment – A majority of green resources that were included in the case were California located resources. After RETI presentation, where there was discussion of out of state resources, should we not be thinking about importing of out of state resources? Should we be looking at some scenarios that focus on importing out of state renewable resources?

A : Mo – We will look at out of state resources. In next set of recommendations from B&V (RETI) work, there are additional resources in the Out of State area. We will roll in that data.

A: Further Response -- The renewable procurement plans provided by CTPG members for use in the CTPG's initial studies do include a significant amount of out-of-state renewable resources. (See Table 6 in the CTPG report.) CTPG envisions that its future work will include assessments of different scenarios. Some of these scenarios could include increased out-of-state renewable resource development (see Phase 2 draft study plan). CTPG encourages stakeholders to lay out such proposed scenarios in as much detail as possible.

Commenter 9 & 15 – Dan Coffey (reporter/writer)

Q: Will electrification of transportation be included in scenarios? Effect on off-peak loads?

A: Jan – Net short analysis does include some electric transportation load from CEC forecast.

Q – Since the purpose is to reduce GHG emissions, will the analysis consider that? Shouldn't we plan to shed higher carbon resources first?

A: Jan – This could be another way to back down generation but the data necessary for this scenario could be difficult to get.

A: Further Response – Edward Higginbottom of British Columbia Transmission Corporation (BCTC) indicated that it appears the Western Climate Initiative (WCI) has the “carbon footprint data” for each fossil-fired generation unit in the WECC. Edward has offered his assistance in obtaining this data from his WCI contacts.

Q: All these studies imply that “package-deal” is required. If package isn't complete, then will the system actually work? E.g., if all fixes aren't in place, will it work?

A: While CTPG's initial work has been focused around meeting renewable resource goals for the year 2020, it makes a lot of sense to look at what can be done on the transmission side to facilitate renewable resource development over time. This would mean identifying grid modifications that can accommodate renewable resource additions on a phased approach; modifications that can be done relatively quickly and easily. Substantial progress towards the year 2020 renewable resource goals appears possible without having to wait for the full “package deal.”

Q: Does CTPG's renewable net short estimate incorporate the impacts of rooftop solar photovoltaic and other distributed generation applications?

A: CPUC Staff Response: Behind-the-meter distributed generation (including projected rooftop solar photovoltaic) is captured in CTPG's renewable net short calculation as a reduction in forecast retail sales.

In-front-of-the-meter distributed generation that is renewable, counts towards the renewable net short and would therefore contribute directly to meeting the state's 33% Renewable Portfolio Standard (RPS) goal in year 2020. It is unclear exactly how much, if any, of this type of distributed generation is reflected in CTPG's current studies.

Commenter 10 – Keith White (CPUC staff)

Q: Process request – would be helpful for people to read others questions and comments. Could we get comments posted on website asap.

A: Written comments and some responses to comments are on the CTPG website now. Comments from this meeting will be posted as well.

Q: Provide the generator-specific amount of renewable power injections, and the corresponding fossil-fired generation decrements, included in the power flow cases. The CPUC staff will suggest a format that the CTPG can use to report this information.

A: The requested information is embedded in the power flow cases run by the CTPG study team. Upon request CTPG will provide any party with these cases provided the party can show that it has the required non-disclosure agreements with the WECC. CTPG will work with stakeholders interested in this renewable and fossil-fired generation data to see if it is practical to provide the data in other formats.

Commenter 18 - Anne Gillette (CPUC staff)

Q: Provide CTPG’s renewable resource development assumptions broken down by CREZ and by renewable technology.

A: On January 21, 2010 the CPUC staff was provided with data showing the by-CREZ location, technology, installed capacity, annual energy production, and the simulated injection quantities used in the power flow cases, for the renewable resources included in the CTPG’s initial analysis.

Comment 11 -- Robert Jenkins (First Solar)

Comment – CTPG’s initial conceptual transmission plan includes infrastructure upgrades of large scope that will require a long lead time to implement. How will resources have time to develop if transmission comes on line close to 2020? Report would be enhanced by how transmission development adds incremental capacity geographically to facilitate meeting RPS goals. Temporal and spatial data. Timing -- SCE asked for a “CREZ” memo account in 2006 and here in 2010, we’re still working with CREZs. Would support procurement scenarios. CTPG’s Phase 1 study has an emphasis on Pisgah, but ISO queue requests for that area fell from 7000 MW to 0 MW after deposits were due. Need to test plan for robustness.

Response - While CTPG’s initial work has been focused around meeting renewable resource goals for the year 2020, it makes a lot of sense to look at

what can be done on the transmission side to facilitate renewable resource development over time. This would mean identifying grid modifications that can accommodate renewable resource additions on a phased approach; modifications that can be done relatively quickly and easily.

Commenter 12 & 21 -- Susan Schneider (Phoenix Consulting Group)

Q: Coordination between RETI and CTPG: Will there be sufficient overlap in recommendations?

A: Rich Ferguson RETI– Our goal is to come up with a single plan. We should be able to come up with a consensus approach.

Comment – CAISO generation queue scenario – Make sure that generators in queue have transmission. Prioritize transmission additions for generation projects that are making commitments now.

Comment – Issue of pump storage; 1300 MW under development. Lake Elsinore Advanced Pump Storage (LEAPS) was not considered by CTPG for mitigation. ISO includes pump storage and is focusing on assets that provide integration capabilities. CTPG should consider these as renewable integration tools and plan for them. Need to be consistent with ISO approach.

Response - Evaluation of the benefits of certain technologies in addressing the operational challenges of large amounts of intermittent renewable resources is something that CTPG would consider for future work. However, it should be noted that considerable work on these operational issues has already been conducted (e.g., the CAISO's 20% renewable integration study), and other work looking at higher levels of renewable generation is in progress and expected to be completed soon (i.e., the CAISO's 33% renewable integration study).

Depending on what stakeholders may suggest in terms of the specific operational issues that still need to be evaluated, CTPG may decide to conduct additional studies looking at various aspects of the operational challenges associated with significantly increased levels of intermittent renewable generation.

Comment – The RETI and CTPG generation by CREZ table. Glaring differences. Need column that explains the differences.

Further Response – The CTPG Phase 2 final study plan will provide additional explanation of differences between resource portfolio assumptions.

Q: Schedule. How will CTPG feed into RETPP schedule? March was schedule for comments on draft plan. Now results are coming out in May. So ISO's Phase

2 will start in March. Not clear how that will work with CTPG and ISO stakeholder comment period.

A: CTPG's phase 2 draft study report will be available in mid-March, followed by a comment period, and a final version at the end of March. CTPG's phase 3 draft study report will be available in mid-May, followed by a comment period, and a final version at the end of May. Each phase of CTPG's work represents an evolution based on the prior phase and will, by the end, be consolidated into statewide conceptual transmission plan.

This schedule matches the Phase 1 schedule contemplated by the CAISO's RETPP proposal. The CAISO's proposed Phase 1 schedule includes the delivery of a state-wide conceptual plan at the end of May.

Q: What are the cut-off dates for stakeholder comments related to CTPG's ongoing work?

A: The cut-off dates for each comment period will be published on the CTPG website in advance. However, stakeholder comments are welcome at any time and the earlier the better. Written comments are especially helpful.

Q: Is the Colorado River-Devers-Valley #2 project in the base case?

A: Yes.

Q: Will the "deliverability" analysis planned for CTPG's future work have an effect on the Delivery Network Upgrades identified for interconnecting generators in the CAISO's Large Generator Interconnection Process (LGIP)? Will the CTPG's "deliverability" analysis effectively challenge the Resource Adequacy (RA) capability ascribed to generators interconnecting to the CAISO?

A: The "deliverability" analysis contemplated by the CTPG is not intended to challenge the RA capability ascribed to generators interconnecting within the CAISO control area.

Note that the draft CTPG Phase 2 draft study plan indicates that "the CTPG will not be conducting a Deliverability analysis to determine the necessary improvements and operating methodology for delivery of renewables to fulfill Resource Adequacy eligibility, and to provide integration capability for variable generating renewables, such as through pumped storage or other methods...This alternative analysis will be completed by the entity responsible for each particular proposed transmission improvement utilizing its own analysis assumptions." The CTPG Phase 2 final study plan will offer further clarification on this topic.

Q: Explain what CTPG means by “local overloads in load centers.” How can renewable resource additions outside of load centers create overloads within the load centers?

A: “Local overloads” appear when contingencies cause power flows on transmission lines within load centers to exceed the lines’ thermal ratings. The term “load center” as used in CTPG’s presentation should be construed in a broad sense; i.e., there is additional renewable generation within certain “load centers.”

Q: It appears that renewable procurement plans for entities responsible for serving 14% of California’s retail sales were not modeled in CTPG’s initial studies. Yet, CTPG indicates that it has identified enough new renewable resources to reach the 33% Renewable Portfolio Standard (RPS) goal by year 2020. If the renewable procurement plans for entities responsible for serving 14% of California’s retail sales were included in CTPG’s analysis, would California actually exceed the 33% RPS goal?

A: Yes.

Commenter 13 - Steven Kelly (IEP)

Comment – Identify the differences between RETI to CTPG so it is clear what is different. Suggest CTPG describe reasons for making the changes. Include a table in future reports.

Commenter 14 - Barry Flynn (Flynn RCI)

Q: “I know that CTPG is looking for comments with respect to fossil turndown assumptions but it would be good to understand why they picked a 30/70 split and then reduced based upon heat rate rather than some other approach.”

A: Since CTPG is focusing on the transmission to support attainment of California’s renewable resource goals, and because much of WECC’s high variable cost fossil-fired generation is located in California, it is reasonable to assume that the majority of the fossil-fired generation decrements will take place in California. At the same time, the economic effects of injecting large amounts of low or zero variable cost renewable generation onto the grid will be spread across the WECC since the WECC is economically tied through centralized and bilateral energy markets. This means fossil-fired generation outside the state of California will also be decremented.

The choice of 70% in-state/30% out-of-state, was a largely arbitrary decision and the CTPG requests that stakeholders provide suggestions as to how it should be

decided in future CTPG study work which fossil-fired generators in the WECC should be decremented and by how much.

A credible scenario for future evaluation by the CTPG would be to decrement fossil-fired generation on the basis of each fossil-fired generator's relative carbon footprint; generators with higher carbon footprints would be decremented ahead of generators with lower carbon footprints.

Commenter 16 - Alan Comnes (Sunpower)

Comment –The CTPG study is missing a transmission “reserve” or “contingency” margin. Studies need to account for uncertainties. Consider overbuilding transmission system to compensate for short-falls. Cautioned the planning group not to target exactly 33.0%. Suggested adding flexibility and targeting 33%+ in order to comfortably reach the 33% RPS. The amount of “excess” transmission capacity should be published for the benefit of renewable resource developers who could make use of this “excess” transmission capacity.

Commenter 19 - Sharon Firooz (AES Consulting)

Q: Confirm that if simultaneous imports into load pockets such as the San Diego area have been modeled in the same manner as south-to-north flows on Path 15 were modeled in CTPG's A-SN case -- i.e., if flows were modeled at the allowable limit prior to the addition of renewable generation and the associated fossil-fired generation decremental dispatch -- then, reliability criteria violations would likely have occurred (since the allowable import limits would be exceeded) and infrastructure projects which can mitigate this violation would be identified.

A: AES Consulting's understanding was confirmed as correct.