

COMMENTS & RECOMMENDATIONS OF TERRA-GEN POWER ON DRAFT CTPG PHASE 4 STUDY PLAN

OVERVIEW

Terra-Gen Power (TGP) appreciates the stakeholder engagement and the opportunity to submit these comments and recommendations on the September 23rd ***Draft CTPG Phase 4 Study Plan*** (Plan). As in prior comments, our remarks here focus on development of the Control-to-Kramer corridor as a potential conduit for Nevada North geothermal generation; however, they consider that development in the context of broader regional transmission and operational issues.

We strongly support the proposed Plan to focus on assessing potential transmission needs to facilitate generation imports from outside California. It is clear that meeting a 33% RPS target at a reasonable overall cost will require significant and timely generation development both inside and outside the state.

We are especially encouraged to see CTPG investigating considerable generation under development in Nevada to meet the California RPS as most of the nearly 7,700 MW of generation in the NV Energy queue (including about 1,000 MW of geothermal capacity) is being developed for California markets.

Additional consideration of Nevada and other out-of-state development offers an opportunity to meet the RPS in a more cost-effective and operationally superior manner, take advantage of synergies between high-potential out-of-state and California area development, and also address other grid-wide issues.

Specifically, we recommend that the CTPG consider the following in the Plan, and in the analyses that will follow:

- ***Updates of Nevada North geothermal and other out-of-state import assumptions***, including generation in neighboring BAA interconnection queues and its relative likely viability;
- ***Potential synergies between out-of-state and in-state development*** that could improve transmission economics for both;
- ***Relative economic, operational, and scheduling features of different renewable-energy technologies***;
- ***The relative timing of the need for transmission development in different areas***; and
- ***Larger regional transmission issues in northern California***, including the potential benefits from tying Owens Valley and Nevada generation into the Fresno area.

Each of these recommendations is addressed further below.

RECOMMENDATION DETAILS

Updated Nevada North geothermal and other out-of-state import assumptions: We are very encouraged to see, in September 30th conference-call slides, that the CTPG has already begun looking into the details of the NV Energy generation interconnection queue. The Plan should follow

through with these initial proposals to continue that investigation and provide for similar investigations of other neighboring-BAA queues.

However, there is likely a larger amount of generation under development for delivery to California than will actually be developed; and this may present a problem with using queue data for the Phase 4 analyses. We understand the CTPG's reluctance to get involved with assessments of generation-project viability; however, it would help the credibility and usefulness of the analysis if the CTPG could work with surrounding out-of-state BAAs to use public and readily available "commercial interest" indicators to do at least some screening, e.g., identifying projects with pending Transmission Service Requests with identified export points into California, or those that have progressed to advanced interconnection-study stages or provided financial security or deposits. This would help avoid the need for rougher assumptions, like equal-percentage capacity reductions.

Potential synergies between out-of-state and in-state development: Rather than look at the various out-of-state high-potential CREZs in isolation, the Plan should consider the possible joint economies of developing electrically related out-of-state and California CREZs.

One example is the relationship between the considerable solar and wind resources identified in the Owens Valley CREZ and the geothermal generation under development in northern Nevada. If transmission development for both areas is considered together, the incremental cost for transmission to accommodate Nevada geothermal generation would be likely be considerably reduced by significant Owens Valley development, and vice versa.

There are likely other instances of these synergies between different high-potential renewable resource areas. Giving higher priority to transmission upgrades that could serve generation in multiple CREZs would also lower the risk that any such upgrades would be "stranded" and/or underutilized.

Economic, operational, and scheduling features of different renewable-energy technologies: There are many factors impacting the relative economics and other integration aspects of different kinds of renewable energy. Specifically, the CTPG should consider:

- **Transmission economics:** Renewable-energy technologies with high load factors will more fully utilize transmission than those with lower load factors – i.e., the former will provide RPS benefits at a lower per-MWh transmission cost than the latter, and access more renewable energy per MW of added transmission capability. Any statewide transmission plan should consider this important element, in order to give the state the ability to meet a 33% RPS at the lowest possible cost. It also assures that peak demands are being met and managed appropriately.
- **Integration requirements:** All other things equal, renewable-energy technologies with steady, "baseload" operations (e.g., geothermal or biomass) will require fewer other resources and/or active grid management to balance variability and maintain reliable grid operations, and will thus not require costs to be incurred for such resources and operations. Such baseload technologies may also readily be adjusted downward to address potential over-generation conditions and offer additional benefits that can help the Grid Operators (e.g., CAISO, LADWP, SMUD, etc) manage other intermittent renewable resources; they are natural replacements, and true hedges, for coal and natural gas, without the price risks inherent in those technologies.
- **Scheduling issues:** The CAISO has commenced an initiative to consider a "Dynamic Transfer" framework to accommodate inter-BAA imports; the complexities of such a framework has forced the CAISO to postpone that effort into next year while it first conducts operational

studies to determine any operational limitations on such arrangements. Geothermal and other flexible baseload technologies:

- **Do not require such complex Dynamic Transfer arrangements between BAAs**, and can readily be scheduled using today’s hourly, “static” scheduling practices; and
- **Can help accommodate future Dynamic Transfer arrangements for intermittent resources**, by providing flexibility that the CAISO can use to manage variability of those resources while ensuring that scarce import transmission resources are fully utilized.

Relative timing of transmission-development needs in different areas: Given the large amount of transmission that will be needed to accommodate a 33% RPS by 2020, any usable transmission plan must include consideration of the timing for development of different new-generation areas. Transmission owners cannot build all the needed new facilities simultaneously, and hard choices will have to be made about where to start implementing any transmission plan.

Transmission-project timing is particularly important for the projects vying for federal stimulus incentives (so-called “ARRA Projects”), several of which are in the BLM “Fast Track” process and could enter the market quickly. These projects, and others in advanced development, have a near-term need for certainty, and for actual transmission sooner rather than later, to remain viable and meet their development milestones.

Thus, in addition to incorporating information about out-of-state interconnection queues and project readiness, as discussed elsewhere in these comments, the Phase 4 analyses should use the associated CODs of the interconnection requests to help prioritize and sequence its transmission recommendations. This would greatly improve the relevance and usefulness of the ultimate CTPG statewide transmission plan to both transmission and generation developers.

Larger regional transmission issues: The CAISO is already planning to upgrade Kramer Substation to 500 kV, to accommodate generation already in its interconnection queue. TGP suggests that the CAISO consider:

- ***Upgrading the Control-to-Kramer corridor to 500 kV,***
- ***Creating a 500 kV connection from the upgraded Control Substation to the Fresno area (e.g., Helms)*** that would tie into the PG&E-proposed Central California Clean Energy Transmission Project (C3ETP), perhaps also looping in SCE’s Big Creek generation (to address oscillation and other operational issues), as specified in several C3ETP analysis scenarios, and
- ***Upgrading Path-52 to handle higher transfer capability*** to access renewable resources located in Nevada.

This configuration would have several significant operational benefits, for example:

- ***Create a robust northern California transmission loop***, that augments transfer capabilities across Path 26;
- ***Increase system reliability and operational flexibility***, which could potentially be improved by use of DC transmission system (line or cable) in the Control to Fresno corridor;
- ***Provide PG&E and northern California municipal utilities additional access to renewable Resource Adequacy (RA) resources***, without the constraints imposed by the CPUC NP26/SP26 locational limitations;

- ***Provide an alternative and effective path for Owens Valley and Nevada generation*** to enter the CAISO grid without traveling through the already-limited LA Basin and related areas and corridors.

We hope that the CTPG will consider this transmission proposal as it finalizes the Plan and proceeds with the Phase 4 analyses.

Please do not hesitate to contact for any questions or clarifications.

Contact:

Dinesh Salem-Natarajan

dsn@terra-genpower.com

858-764-3744