COMMENTS & RECOMMENDATIONS OF TERRA-GEN POWER ON DRAFT CTPG PHASE 3 STUDY REPORT

OVERVIEW

Terra-Gen Power (TGP) appreciates the opportunity to submit these comments and recommendations on the July 21st ***Draft CTPG Phase 3 Study Report*** (Report). We focus both on treatment of Nevada geothermal generation in the Report and other assumptions about transmission access.

A large of amount of planned and potential Nevada geothermal generation can be available to meet California's ambitious 33% renewable-energy goals. The reliability, high load factor, and non-intermittent nature of this generation would both: (1) mitigate integration cost and scheduling/operating concerns raised by some other renewable-energy technologies; and (2) make any associated transmission investment highly economic. Thus, it should be a key part of any "least-cost, best-fit" renewable-energy development plan.

However, this beneficial generation source must have a viable and timely transmission path to California load centers, or it will not be developed and California would have to substitute more costly and problematic renewable-energy sources to meet its needs. Given the extremely limited transmission access via northern California, the CTPG should prioritize upgrades to the Control-Kramer and/or Inyokern-Kramer, along with other interconnection-related upgrades, in the final Report.

Comments: TGP is concerned about these specific elements of the Report:

- ***The inaccurate assumptions regarding Nevada geothermal generation***, in particular:
  - The amount of Nevada geothermal generation imports that will enter California, which is far less than is being developed for the California market, as represented in the CAISO and NV Energy interconnection queues; and
  - The flow-path assumptions into California for that generation, which do not match the likely transmission flows or Points of Interconnection.

  These inaccurate assumptions lead, in turn, to incomplete analyses in the Report – specifically, a lack of identification and mitigation of overloads and stability concerns on both the Dixie Valley-Oxbow line and the Control-to-Kramer Substation corridor.
- ***The unclear relationship between upgrades needed to "obtain a power flow solution" and those identified as "high priority" upgrades in Appendix C.***
- ***The timing of different proposed transmission upgrades***, compared to the expected on-line dates for the generation.
- ***The apparent determination of transmission needed for each CREZ in isolation***, to mitigate criteria violations in each area, instead of a more comprehensive approach.

Recommendations: TGP recommends that, in the final Report, the CTPG:

- ***Correct the portfolio assumptions for Nevada geothermal generation***, to reflect the amount of generation and delivery points in current interconnection requests and reasonably likely future development, and include mitigation measures for the resulting overloads on the Dixie Valley line and Control-Kramer corridors.

- ***Clarify that the transmission facilities needed to reliably solve the power-flow cases are also "high-priority" upgrades.***

- ***Refine its transmission-priority recommendations***, to include:

  - **Timing considerations**, to accommodate known CODs for generation now in the interconnection process; and

  - **The optimal transmission mix overall**, considering generation from all CREZs in a given scenario together, instead of each area separately.

ISSUE DETAILS

Amount of geothermal development in CTPG scenarios: The Report continues the inconsistencies from the Phase 2 report between the geothermal generation assumed in its analyses and that in the actual generation interconnection queues that those assumptions are supposedly based on.

There is nearly 500 MW of Nevada geothermal generation in the CAISO interconnection queue, and over 800 MW of Nevada geothermal generation in the NV Energy interconnection queue (most of which cannot be used to serve the small amount of load in Nevada, and thus is under development for export to California). The CAISO queue generation projects have all posted their Large Generation Interconnection Process (LGIP) Initial Interconnection Financial Security (IFS), a stronger indicator of project viability than much of the other generation in the Report assumptions. However:

- ***The Phase 3 "RETI Best CREZ" portfolio*** includes just 187 MW of total generation for all of Nevada (table 4.3), comprised of 20 MW of biomass and 167 MW of geothermal (as listed under "Nevada-Owens Valley" in Table 4.4); and

- ***The "Generation Interconnection Queue" portfolio*** (Table 4.5) shows 487 MW of solar thermal generation (no geothermal) in "Nevada North" and only 57 MW of geothermal generation in "Nevada Central."

The Report (in the footnote to Table 8.3.1) considers more northern Nevada generation, reflecting the nearly 2,100 MW of northern Nevada wind and geothermal generation in the NV Energy queue, but then (without explanation) assumes that 50% will not be developed. The Report then re-"characterizes" 1,040 MW of previously assumed Lassen County generation as Nevada North generation coming into the COI via the Lassen CREZ.

In other words, the Report assumes no additional generation coming into the CAISO from Nevada – it just re-names the generation already assumed for that path.

The CTPG has not explained (in the Report, or in previous reports or meetings) why: (1) the "Generation Queue Development Interest Portfolio" omits 233 MW of geothermal generation in the interconnection queue of the CAISO – the largest CTPG member; or (2) a 50% failure rate is assumed for northern Nevada generation in the NV Energy queue for but for no other area.

Import paths into the CAISO: TGP is intimately familiar with the political and economic considerations related to development in that area and the transmission issues associated with it, and we strongly believe that the best import path to assume for northern and central Nevada geothermal generation is through the Control Substation area. However, the Report does not fully substantiate its assumptions that:

- ***Central Nevada generation would enter the CAISO through the Dixie Valley-Oxbow line***, and flow south through a new substation to Inyokern and then to Kramer. However, this assumption does not consider that:

  - **Virtually all the Nevada geothermal generation in the CAISO interconnection queue has specified a Control Substation Point of Interconnection.** As noted above, these projects have already posted IFS as required, the CAISO is well into interconnection studies based on that POI; and

  - **The Dixie Valley-Oxbow line cannot physically accommodate the central Nevada generation now in the CAISO generation interconnection queue with a Control Substation POI without upgrades**, much less any additional future generation coming into the CAISO through that line. In other words, this power-flow assumption would overload the line and cause a reliability-criteria violation. That violation should be identified and mitigated in the final report if this import path continues to be assumed for central Nevada geothermal generation.

- ***Northern Nevada generation would enter California through the Lassen CREZ and the COI***, despite:

  - **The very minimal support for this assumption.** The CTPG has stated (in meetings and conference calls) that this import path is "possible" and has referenced "discussions" with some entities about that. However, the Report does not contain any details or explain how this import path can be viable, since:

    - ***Northern Nevada regional utilities (e.g., NV Energy) have no concrete plans or any commitments to build transmission to COI***, and such a plan would be unlikely to win public support in Nevada; and, in any case,

    - ***There is no available firm capacity on COI.*** The Report acknowledges that this import-path assumption would require additional transmission capacity on the COI (adding the 500 kV Captain Jack-Olinda #2 and the 500 kV Olinda-Tracy #2 lines to the power flow base cases); however, the Report continues to omit consideration of any alternative paths into the CAISO that might be more realistic or economic.

  - **The inconsistencies between this import path and that assumed by RETI**, even in the CTPG's RETI-based portfolio analyses. The RETI Phase 2A report identified Control Substation as the major delivery point for Nevada geothermal and other generation, and an enhanced Control-Kramer corridor as a major transmission path for renewable-generation development.

    The RETI assumptions were well-vetted through an extensive and open stakeholder process. The CTPG should at least include RETI delivery-point and power-flow assumptions in all RETI-based portfolio scenarios; otherwise, these inconsistencies will inevitably lead to inconsistent transmission-needs assumptions between the CTPG and RETI efforts, as well as reliability-criteria violations.

  The more realistic Control Substation CAISO delivery point for northern Nevada geothermal generation would require: (1) a path into Control Substation (e.g., upgrades to Path 52 or the Dixie Valley-Oxbow line, and/or some alternative like a new collector station in Nevada); and (2) mitigation of overloads from Control Substation south to Kramer Substation (as shown in the RETI Phase 2A report).

Clarification of Report recommendations regarding transmission facilities added to the base cases: The Report states (at p.75) that the Phase 2 analysis included the following transmission upgrades added to the base case "to obtain a power flow solution" for the central Nevada imports over the Dixie Valley-Oxbow line:

- "New Sub" 230 kV Substation (near the city of Bishop)
- +/-200 MVAR synchronous condenser at New Sub
- Aurora Switching Station (Tap 127) connected to the existing Dixie Valley-Oxbow line
- Two 230 kV ring buses on the existing Dixie Valley-Oxbow line
- Inyokern Substation upgrade to 230 kV
- New Aurora Switching Station-New Sub 230 kV line
- New New Sub-Inyokern 230 kV line

Likewise, both the Phase 2 report and this Report added such upgrades in other areas to accommodate generation interconnections and imports. However, none of these transmission upgrades appears on the list of "High Priority" and "Medium Priority" upgrades on Appendix C.

Since these upgrades are assumed in the power-flow base cases, it seems logical that they would be considered "high priority," perhaps even higher than the upgrades with that designation in Appendix C. The final Report should clarify the status of these upgrades with respect to the transmission upgrades listed in Appendix C.

Refinement of transmission-priority recommendations: The Report recommendations for transmission upgrades do not appear to consider:

- ***The timing of generation now in the interconnection process:*** 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. The various transmission owners cannot build all the needed new facilities simultaneously, and hard choices will have to be made about where to start in implementing any transmission plan.

  Transmission needed to serve generation now in a queue and under development should be prioritized higher, and constructed before, transmission to serve more speculative generation in other promising areas. This is particularly important for the projects vying for federal stimulus incentives (the so-called "ARRA Projects"), several of which are in the BLM "Fast Track" process and could enter the market quickly. The final Report should use available data on the presence of such generation in those queues, and the associated CODs of their interconnection requests, to help prioritize and sequence its transmission recommendations.

- ***The overall transmission needs for all the generation in each scenario:*** The Report appears to identify needed transmission upgrades on a CREZ-by-CREZ basis, looking at generation development there, identifying criteria violations, and then proposing upgrades to mitigate those violations. Instead, the final Report should consider synergies between the different CREZs and develop an optimal mix to serve all the generation in each scenario.

  One example of these synergies is the RETI concept of the "gateway CREZ," i.e., potential transmission synergies between out-of-state and in-state CREZs. The RETI analyses have identified the Owens Valley CREZ as a potential gateway CREZ for Nevada generation; the incremental cost to construct transmission to accommodate Nevada geothermal generation would be considerably reduced by significant Owens Valley development, and vice versa. Giving higher priority to transmission upgrades that could serve generation in multiple CREZs would also lower the risk that any transmission upgrade would be "stranded" and/or underutilized.