California Transmission Planning Group (CTPG)
Technical Study Team Response to
June 2, 2011, Comments of the CPUC Staff on the
CTPG's Proposed 2011 Work Plan

Comment:

On March 14, 2011, the Staff of the California Public Utilities Commission (CPUC Staff) submitted comments on the California Transmission Planning Group's (CTPG) development of a 2011 study plan. Those comments included the request that resource cases studied by the CTPG this year should include renewable resource scenarios developed and utilize for the CPUC's Long Term Procurement Plan (LTPP) proceeding. These CPUC cases provide the foundation for the California Independent System Operator's (California ISO) current 33-percent RPS integration studies and are expected to be incorporated into the California ISO's Transmission Planning Process (TPP) for the 2011-2012 Transmission Plan cycle.

CTPG Technical Study Team Response:

The CTPG Technical Study Team is considering the CPUC Staff's recommendation that the CTPG's 2011 study work include evaluation of the renewable resource scenarios developed for the CPUC's Long-Term Procurement Plan.

Comment:

In responding to CPUC Staff's request that the CTPG study plan for 2011 include renewable resource cases developed for the CPUC's LTPP proceeding and utilized in California ISO studies, the CTPG stated that *"… if the CTPG decides to undertake an evaluation of the LTPP's "Environmentally-Constrained" generation development scenario* [which includes high levels of distributed PV generation] *it will be necessary to determine what the expected simultaneous output of these resources will be for the month and hour the CTPG chooses to simulate in its power flow studies. The CPUC staff's assistance in defining the simultaneous output of these resources would be appreciated*."

CPUC Staff recommends that for determining the appropriate level (and probability level) of simultaneous output to be assumed for distributed PV and in fact for all solar and wind resources, the CTPG should especially rely on detailed representation of hourly and intra-hourly output patterns developed for the California ISO's 33-percent RPS integration study. Additionally, implementation of the CPUC's Environmentally Constrained (high-DG) case in the California ISO's TPP should inform the CTPG's modeling of DG *locations*. CPUC Staff would like to be included in discussions with California ISO and the CTPG regarding how the above information will be used for transmission planning studies.

CTPG Technical Study Team Response:

The CTPG Technical Study Team will review with the California ISO the applicability to the CTPG's power flow studies of the "hourly and intra-hourly" output patterns for distribution-level generation resources used by the California ISO in its 33-percent RPS integration study.

Comment:

In March, CPUC Staff requested that for its study cases the CTPG provide a synopsis of the generation mix and its utilization (e.g., generator injection levels in power flow cases) to facilitate stakeholder understanding of the kind of generation futures being represented and how these futures compare to assumptions and results in other studies such as the California ISO's TPP and integration studies, and also TEPPC studies. The CTPG Technical Study Team then requested CPUC Staff provide *"suggestions as to how 'within-California' areas should be defined for purposes of aggregating the technology-specific generation output modeled in the CTPG's power flow cases."*

CPUC Staff recommends that generation capacities and injection levels in power flow cases be reported at a level of aggregation corresponding to those aggregations used in the California ISO's 33-percent RPS integration study and more generally used to structure TEPPC west-wide data. Under this approach, for reporting purposes generators would be aggregated into 8 areas within California corresponding to 8 "load bubbles" as follows: PG&E Bay, PG&E Valley, SMUD, Turlock ID, SCE, LADWP, SDG&E, and Imperial ID. Furthermore, transmission flows would be reported for interfaces among these 8 areas and also between each of these 8 areas and surrounding out-of-state "load bubbles" as defined in the TEPPC data base, such as BPA, Pacificorp West, AZ Public Service, and Salt River Project (*e.g.*, BPA-to-PG&E Valley flow). If ongoing study results and their assessment indicate that further breakdown would be useful, such as to represent certain local areas, this refinement could be added.

Finally, a technology breakdown might include: nuclear, combined cycle, simple cycle combustion turbine, fossil steam, hydro, pumped storage, wind, solar thermal, solar PV, other renewable, and other.

CTPG Technical Study Team Response:

The CTPG Technical Study Team appreciates the CPUC Staff's suggestions as to how the reporting of results could be improved. At a high level, it should be fairly easy to report generation and loads aggregated at the standard "study areas" defined in the power flow program. The CTPG believes the standard study areas for SCE, LADWP, SDG&E, and Imperial ID correspond closely with TEPPC's definitions for the SCE, LADWP, SDG&E, and IID "bubbles." However, the power flow program defines a single PG&E study area to represent TEPPC's PG&E Bay, PG&E Valley, SMUD, and TID "bubbles."

It should also be fairly easy to report aggregate power flows between the standard study areas defined in the power flow program, between the standard study areas inside California as well as

between standard study areas outside of California. Reporting power flows by "interfaces" requires a specific definition for each interface. Some interfaces, such as those listed in the CTPG's 2010 study reports, have already been defined in the power flow program. Depending on which other interfaces are desired, additional work may be required to define those interfaces. The CTPG Technical Study Team requests that the CPUC Staff list the specific interfaces for which power flow information is requested.

Aggregating generator output by technology presents a challenge since the power flow program input database lacks a ready means of identifying the fuel source or fuel conversion technology for each generator. For example, the electrical characteristics of a simple cycle gas turbine may be the same as a gas turbine used in a combined cycle application. Similarly, the electrical characteristics for a gas-fired steam generator could look the same as the electrical characteristics for a geothermal generator. In addition, there are many differences between the power flow program and TEPPC's economic grid simulation model in terms of generator naming conventions, generator bus numbers, generator maximum and minimum output capabilities, and the way in which thermally connected generators are modeled (*e.g.*, the power flow program generally models each discrete generating unit at a combined cycle plant while TEPPC's economic grid simulation model may aggregate all of the generators at a combined cycle plant into a single unit). Thus, the CTPG Technical Study Team does not believe it will be feasible to provide the level of generator aggregation requested by the CPUC staff.