State-Provincial Steering Committee

2012 Study Request to the Western Electricity Coordinating Council

January 20, 2012

The State-Provincial Steering Committee (SPSC) requests that the Western Electricity Coordinating Council (WECC) model the following study requests as part of the Transmission Expansion Planning Policy Committee's (TEPPC) 2012 study program.

1. Stress Test of the Common Case Transmission Assumptions (CCTA)

The SPSC requests a stress test of the grid with CCTA against five sensitivity cases. These cases represent plausible futures that could stress the current grid with the CCTA additions in the year 2022. The five cases below would be modeled with the 26 new CCTA projects but without additional new large transmission:

(a) Lower loads assuming increased levels of demand-side management (DSM), demand response (DR), and distributed generation (DG);[1]
(b) Higher loads that are 10% above the expected loads assuming higher economic growth;
(c) Shifting 2000 MW of expected wind development in the Northwest to solar development in the Southwest;[2]
(d) Shifting 2000 MW of expected wind development in the Northwest to wind development in Montana and Wyoming;[3]
(e) Higher renewable energy development driven by a federal RPS that establishes a 15% requirement for all load serving entities except for those entities that have a higher RPS standard. This policy would increase renewable energy requirements by 23,000 GWh or a 15.7% increase above the Common Case assumptions. New renewable generation will be located geographically near the loads with increased demand for renewables.[4]

[1] This case is being modeled by WECC as PC 4 in the 2011 Study Program. Modeling results would be used in the stress test analysis.
[2] The 2000 MW level is a benchmark stress level intended to have a significant impact on the grid without adding new transmission. This benchmark may be revised later given new information and feedback from technical experts and consultation with WECC staff on inputs in the 2022 Common Case.
[3] Id.
[4] The benchmark in this request that a federal RPS 15% floor leads to an increase of 23,000 GWh of renewables or a 15.7% increase in the Western Interconnection may is an initial estimate that could be revised with additional information. SPSC may revise the RPS percentage to attain the desired stress impact of a 10-15% increase of renewable energy.

2. Reliability Check on the 2022 Common Case.

In the first 10 year Plan process, WECC staff, the SCG and a consultant worked to model reliability impacts of the 2020 Reference Case. Some progress was made but results were inconclusive. As a part of the 2012 WECC staff coordination activities, the Planning and Coordination Committee's Technical Studies Subcommittee is performing a power flow case using the 2022 Common Case assumptions. This should evaluate WI system performance relative to NERC standards, focusing on the TPL requirements.

In this study request, SPSC reiterates the importance placed on reliability by state regulators. We suggest that the work being done by TSS be made a formal case in the 2012 TEPPC Study Program. If this TSS work is not completed, we request that WECC and TEPPC identify other methods to complete a reliability analysis of the Common Case.

3. Model the 2022 Common Case with Real World Limitations

WECC's 10-Year Regional Transmission Plan identified a number of limitations associated with production cost modeling as an analytical tool.[5] It is important to improve the set of modeling tools used in transmission planning to better reflect real world institutional limitations of the Western Interconnection.[6] SPSC requests continued modeling improvements in the next study cycle to better reflect real world institutional constraints, such as the following:

a. Improve hurdle rates and expand the number of hurdle rate zones modeled (e.g., WECC/E3 study of an Energy Imbalance Market) to more accurately reflect "friction" in the current operation of the Western power system.[7]
b. Model flexible generation (and demand-side) reserves to reflect the need for Balancing Authorities (BAs) to individually balance loads and resources.
c. Explore mechanisms that could limit the dispatch of generation to meet BA imbalances to those generators (or demand response) within the BA or in an immediately neighboring BA, and evaluate these results when compared to balancing at multiple locations as the production cost tool would normally do.
d. Limit the location of assumed incremental generation to areas where there is sufficient physical transfer capacity to deliver power from the generator all hours of the year. Run a second iteration that limits the location of assumed incremental generation to areas where there is sufficient Available Transfer Capability (ATC).

[5] "The PCM is useful for economic evaluation but does not evaluate capital costs, transmission reliability, or sub-hourly operational impacts. Additionally, it does not recognize the limitations of ownership or contractual rights on a generator's ability to access transmission. Of particular concern, the increasing amounts of variable generation analyzed in the 10-year planning studies indicate the need for sub-hourly and stability analyses and other evaluations outside the capacity of the PCM." WECC 10-Year Regional Transmission Plan Summary (2011) at 12-13.
[6] Example of recent efforts to better reflect real world conditions is the incorporation of costs associated with wear and tear from cycling thermal generation.
[7] The E3 hurdle rates would be evaluated and perform an analysis of the pros and cons of using these in lieu of the seven zone hurdle rates presently used in TEPPC.

4. Economic Evaluation of New Relocation Cases

TEPPC's 2010 study program modeled resource relocation cases that shifted 12,000 GWh of energy from California to 8 different locations in the Western Interconnection. SPSC supported this type of analysis and recommended analyzing resource shifts from other parts of the West. SPSC proposes analyzing a set of resource relocation cases for three load centers: (1) Phoenix load center, (2) the Portland and Seattle load centers, and (3) the Northern California/San Francisco Bay load center. Specifically,

a. In order to meet loads in the Phoenix area, shift 12,000 GWh of planned solar generation in Arizona to three alternative areas that can supply the energy equivalent amount of: (i) wind energy in New Mexico, (ii) wind energy in Wyoming, and (iii) solar energy from southern Nevada. Derive and compare the generation and transmission cost of delivering this energy to Phoenix from these alternative sources.
b. In order to meet loads in the Portland and Seattle area, shift 2,000 MW of planned wind energy in the Columbia Gorge area to two alternative areas that can supply the energy equivalent amount of: (i) wind energy in Montana, and (ii) wind energy in Wyoming. Derive and compare the generation and transmission cost of delivering this energy to Seattle/Portland from these alternative sources.
c. In order to meet loads in the Northern California/San Francisco Bay area, analyze and compare the following three alternative options that can supply 6,000 GWh of renewable: (i) wind energy from the Columbia Gorge; (ii) wind energy from Montana and Wyoming, and (iii) geothermal energy in Nevada. Derive and compare the generation and transmission cost of delivering this energy to Northern California/San Francisco from these alternative sources.