Northwest Power and Conservation Council

May 3, 2007

MEMORANDUM

TO: Power Committee

FROM: Jeff King

SUBJECT: Status of power system CO_2 production forecast

The results of the Current Status CO2 production forecast case were discussed at the April Power Committee meeting. The Current Status case includes confirmed (completed or under construction) generating resource additions as of March 2007, plus planned generating resource acquisitions as contained in the current integrated resource plans of Northwest utilities. The results of the Current Status case were compared to the Base Case (Fifth Power Plan resource portfolio ("L27aX")).

Staff expects to have the results of an initial Lower Snake River Project Removal (Lower Snake) case available for discussion at the May meeting. As was discussed at the April meeting, various resource replacement assumptions could be used for the Lower Snake case. Ideally, a resource portfolio including replacement resources would be created using the Portfolio Risk model. However, because of difficulties with supporting software, the Portfolio Risk model is not currently available.

A second approach, proposed at the April meeting, would be to identify the additional new resources appearing in those L27aX futures where load exceeds average by similar magnitude of the energy loss resulting from removal of the Lower Snake projects. However, an examination of L27aX high load futures indicates that few additional resources are developed in these futures, either because most high load futures result from short-term volatility or because essentially all optioned resource have been developed. For most L27aX high load futures (even averaged over several years) the additional energy appears to be obtained from the market or by running existing resources at higher capacity factors. While feasible, this seems an unlikely long-term response to permanent retirement of major resources, and moreover, would violate regional system reliability criteria.

However, a rely-on-the-market strategy could be a possible short-term response to dam removal, and one whose CO2 production effects are relatively easily estimated, since the effect will largely be to dispatch additional gas-fired resources. Moreover, this case can serve as a basis for comparing alternative replacement resource assumptions.

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A more sophisticated approach is to use the AURORA long-term capacity addition feature to identify replacement resources. The AURORA capacity addition mode does not include the risk assessment capability of the Portfolio Risk model, but can be constrained with respect to new resource types and earliest service dates. For this case, staff will create a Lower Snake resource portfolio as follows:

- Assume that the four Lower Snake projects cease power generation in 2017.
- Assume that 200 aMW of conservation in excess of mean L27aX conservation is ramped in at annual increments of 50 aMW, beginning in 2014.
- Assume the L27aX new resource portfolio is otherwise developed at mean levels.
- Use the AURORA capacity expansion feature to fill in needed additional generating resources, assuming the availability of 400 MW (360 aMW) of wood residue biomass, 400 MW (360 aMW) of geothermal and 1000 MW (360 aMW) of high-cost wind (wind+ transmission) in addition to the new resource options of the L27aX portfolio (IGCC coal, gas combined-cycle and gas peaking resources). Lower-cost wind is fully developed in the L27aX portfolio.

The No Summer Spill case should also be complete for the May meeting. Because of the time required for model setup, run and results compilation, and the need to simulate of the effects of full achievement of state renewable portfolio standards targets, additional time will be needed for the Low Conservation and High Renewables cases.
