Northwest Power and Conservation Council

November 3, 2005

MEMORANDUM

TO: Power Committee

FROM: Jeff King

SUBJECT: Discussion regarding fuel and CO_2 offset analyses

A topic of increasing interest is the effect of various types of generating resource changes on the overall fuel use efficiency of the power system and on the production of carbon dioxide and other pollutants. These are often important objectives of policies and programs attempting to change the composition or operation of the power system. A related issue is the effect of modified system operation for other purposes (to reduce the impacts of the hydropower system on fish, for example) on fuel use and pollutant production.

The AURORA Electricity Market Model, used by the Council for forecasting wholesale power prices, is in theory, a useful tool for evaluations of this type. In AURORA, generating units are individually modeled, and are dispatched hourly on an economic basis to serve loads. It is relatively easy to add or remove specific types of capacity or to constrain dispatch in accordance with proposed policies and then observe the net system effects, such as natural gas consumption or CO_2 production.

Few, if any organizations other than the Council have this analytical capability with results available to the public. Consequently, over the past several years the Council staff has received requests by state agencies and others for the type of analysis described above. Moreover, the Council itself has need of such analyses. For example, the CO_2 offset effects of energy efficiency improvements are taken into consideration by the Regional Technical Forum in valuing specific efficiency improvements.

In the past, requests have been infrequent, and the staff have performed these analyses on an "as time is available" basis for agencies and not-for-profit organizations. However, the frequency of requests has increased, one driver being increasing concerns regarding global climate change. Moreover, an in-depth examination of an AURORA study concerning generating unit dispatch this last summer indicated that while this type of study may appear straightforward in theory, it is more complex and time consuming in practice to achieve consistent and replicable results than formerly appreciated.

Because of the conflict of the increasing importance of this type of analysis and limited staff time available for these studies, the staff is evaluating the feasibility of conducting a "generic"

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analysis of the fuel and CO_2 offset effects of classes of resource additions, or alternatively, establishing a generic framework that could be readily adapted to specific studies. These would be based on the 5th power plan, and could represent "official" Council data. The staff will report back to the Power Committee on the feasibility of this approach at a future meeting.

At this meeting, I will brief the Power Committee on the analytical methods and some preliminary results. No committee decision or other action is required at this time.

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