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December 1, 2005

MEMORANDUM

TO: Power Committee

FROM: Jeff King

SUBJECT: Briefing regarding the status of coal gasification power generation

Coal gasification combined-cycle plants are an emerging form of power generation combining one of several updated versions of old fuel conversion technology (conversion of coal to combustible gas) with state-of-the-art power generation technology (combined-cycle power plants). The predominant configuration is the integrated gasification combined-cycle (IGCC) power plant. IGCC plants offers the fuel cost advantage of coal, with generally higher efficiency and lower air emissions than conventional coal-fired power plants. Other potentially significant advantages include control of mercury emissions and capture of carbon dioxide for sequestration at lower cost than possible with conventional coal generation technology. Further advantages include the potential for co-production of transportation fuels and fertilizers and the ability to cleanly fire difficult fuels such as petroleum coke.

This potential currently comes at a cost premium and with greater performance uncertainty than conventional coal plants. In the 5th plan, the estimated cost of constructing an IGCC plant ranges from \$1300 to 1600/kW vs. \$1240/kW for a conventional plant. However, costs are expected to decline as new plants are constructed, and when risks such as possible future CO₂ control requirements are considered, IGCC technology is preferred to conventional coal technology in the Council's power plan.

Several IGCC demonstration plants were constructed in the US and Europe during the early 1990s and the technology was poised to go fully commercial. Low natural gas prices and the introduction of reliable and low-cost gas turbine combined-cycle technology subsequently led to natural gas combined-cycle plants becoming the new generating technology of choice. Interest in IGCC plants, however, has surged with persistent high oil and gas prices, prospects of tighter regulation of mercury and prospects of carbon dioxide regulation. Planning for several North American plants is underway, including a proposal by Energy Northwest for a 600 MW project at Kalama, Washington on the lower Columbia River.

In preparation for a presentation by Energy Northwest regarding its proposed project (rescheduled for the January Council meeting), staff will brief the Power Committee regarding

the current status of coal gasification power generation technology at its December meeting. This briefing is largely based on information from several conferences regarding coal gasification attended by staff during the past year, notably the annual Gasification Technologies Conference in October 2005. This briefing, however, is not the report to the Council called for in Action GEN-7A regarding the commercial status of coal gasification combined-cycle technology. That report is scheduled for late 2006.

A power point presentation will be available at the Committee meeting. No Committee decision or other action is required.

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