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August 3, 2010

MEMORANDUM

TO: Council Members

FROM: Ken Corum, Power Division

SUBJECT: Recommendation for Council contribution to pilot program to explore providing balancing services with demand response

PROPOSED ACTION: Fund a \$25,000 contribution to a jointly funded project conducted by Ecofys, US, Inc. and a number of other team members. The project will be funded principally by Bonneville Power Administration (Bonneville) and will involve an approximately \$1,000,000 pilot program testing and demonstrating the rapid development and deployment of controllable loads to provide both balancing services in the Bonneville balancing area and localized benefits to Bonneville's load-serving utilities. The other team members include Lower Valley Energy, EnerNoc, Steffes Corporation, Spirae, Dr. Hashem Nehrir of Montana State University, Shuai Lu of Pacific Northwest National Laboratory, Renewable Northwest Project, Iberdrola Renewables, and Horizon Energy. The team could grow with the participation of other Bonneville customer utilities as the project proceeds.

SIGNIFICANCE:

- The Pacific Northwest has seen fast growth in the amount of electricity generated by renewable sources, primarily wind. This growth is expected to continue, which has focused attention on increasing needs for balancing resources to accommodate variable-output generation.
- The Council's Sixth Power Plan recognizes this situation, devoting a chapter to "Capacity and Flexibility Resources" and including in the Action Plan a number of items to understand and develop the ability to accommodate renewable generation
- In particular, the Council's Sixth Power Plan calls for the evaluation and demonstration of demand response as a possible source of ancillary services that can provide load following and/or wind integration.

BUDGET/ECONOMIC IMPACTS:

- The Council's participation in the \$1,000,000 pilot program would be in the form of a contract for a total of \$25,000. The work is anticipated to be performed in this fiscal year (2009-10), but some activities may not occur until FY 2011. The Power Division's budget has funds available in both years to cover this activity.
- Some additional staff time to participate in a technical advisory panel may be necessary. This participation would not be a significant burden on the division and would improve staff's understanding of the technologies and program design issues involved in realizing the goal of providing ancillary services from the demand side.

BACKGROUND:

In its Sixth Power Plan, the Council turned its attention to the area of capacity and flexibility resources. Historically, sufficient capacity and flexibility have been available from the region's hydroelectric system. However, as constraints on the operation of the hydroelectric system have increased, as the region's total demand for electricity has grown, and as the amount of variable generation (primarily wind) has grown, there has been increasing attention paid to the issue of providing these resources in the future.

The Sixth Plan addressed this issue in Chapter 12, "Capacity and Flexibility Resources," describing the potential sources of these resources. The Council recognized that institutional changes, including improvement in wind forecasting, shorter scheduling periods, and dynamic scheduling, should be pursued first. The chapter also described a number of flexible generation and energy storage technologies, including utility demand response programs, which could provide capacity and flexibility.

In the Sixth Plan's Action Plan, the Council included action items DR-2 and DR-3, which call for the evaluation and demonstration of demand response as a potential source of load- and wind-balancing.

ANALYSIS:

The project proposed by Ecofys and its team is focused directly on the evaluation and demonstration called for in the Sixth Plan's action items DR-2 and DR-3. The project will test the use of electric water heaters and commercial cold storage facilities to provide up-and-down control of load for power system variation in loads and wind generation. It will also develop a guidebook for consumer-owned utilities, including templates for the analysis of the business case and for the solicitation of suppliers of load control technologies.

In the course of the project, protocols for controlling loads, optimal rates of increase and decrease of controlled loads, and communication options will be evaluated and refined. The economics of these loads as sources of ancillary services, lessons learned by project participants and Bonneville staff, and appropriate incentives and marketing to obtain participation from end-use customers will be evaluated. The project will help the region identify which technologies are market-ready and which still need development or field testing.

The Council will receive copies of all deliverables of the project.

ALTERNATIVES:

- One alternative is for the Council to approve the \$25,000 financial contribution to the project. While the Council's support is not large as a share of the total, it would be a sign of the Council's commitment to the Sixth Plan's action items pertaining to demand response and ancillary services and an endorsement of this project's relevance to those action items. Further, the Council's support could encourage utilities that have not yet decided to participate in the project to do so and thus increase the range of experience resulting from the project. The staff recommends this alternative, since it helps ensure the future of the project and since it gives the Council greater ability to shape the project.
- The other alternative is for the Council not to give financial support to the project, or to give less than the proposed \$25,000. This would require that the project find other support to compensate, making it more difficult for the project to proceed. The total expenditure envisioned is in the \$1,000,000 range, depending on the number of utilities that decide to participate, so the Council's support might be made up by other parties and the project might be completed anyway.