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August 2, 2016

MEMORANDUM

TO: Council Members

FROM: John Fazio, Senior Systems Analyst

SUBJECT: System Capacity Contribution of Montana Wind Resources

BACKGROUND:

Presenter: John Fazio

Summary: During the development of the Seventh Power Plan, the Council established a method to assess the associated system capacity contribution (ASCC) for all resources, including energy efficiency. The ASCC is used in conjunction with the Council's adequacy reserve margin in the Regional Portfolio Model to ensure that all resources are evaluated on an equal basis. The ASCC is a measure of how a resource interacts with the existing power supply, in particular, the hydroelectric system and its inherent storage.

A resource can provide an effective system capacity that is greater than its nameplate capacity by generating during light load hours to replace hydroelectric generation. This increases the amount of water available during peak load hours, which can increase the hydroelectric system's peaking capability. The combined nameplate capacity of the added resource plus the increased hydroelectric peaking capacity are added to make up the associated system capacity contribution.

The Council has recently obtained historical generating data for several Montana wind generating sites. Two promising sites (near Judith Gap and near Great Falls) were examined in more detail. Simulated wind

generation data for these two sites was created based on National Renewable Energy Laboratory (NREL) Weather Research and Forecasting Model and site appropriate turbine power curves. This data was analyzed using the Council's GENESYS program to assess the ASCC value for these two wind sites.

Preliminary results indicate very promising ASCC values for these two sites – greater available wind generation during regional peak load hours. Staff will present on these initial findings.

Relevance: Although wind generation is variable and sometimes unpredictable, it has proven to be an important non-carbon emitting resource for the Northwest. Adding generation from many diverse wind sites has the effect of “averaging” out the generation from these variable resources and makes them more valuable to the power supply.

Workplan: C.4.1 Update generating resource datasets and tools

Background: Wind resource development has increased dramatically over the past 15 years. Since 2003, over 8,300 megawatts of wind nameplate capacity has been added to the regional power supply. Today, wind makes up 14 percent of the region's installed capacity but, unfortunately, only provides 8 percent of the region's energy generation. Wind is a good non-carbon emitting resource when added to a system that has significant storage, i.e. the hydroelectric system. Wind can be more effective in meeting our demands if more diverse wind sites can be developed.

More Info: N/A