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March 5, 2013

MEMORANDUM

TO: Council Members

FROM: Ben Kujala

SUBJECT: Presentation from BPA on the oversupply outlook for 2013

Oversupply of electricity occurs when the minimum generation level of dispatched generators combined with non-dispatchable generation, such as wind power, exceeds the demand for energy. The Federal Columbia River Power System Biological Opinions (BiOps) requires minimization of Total Dissolved Gas (TDG) from hydro system spill. This increases the minimum generation level of hydro during periods of high runoff that typically occur in spring. The minimum hydro generation combined with increases in the installed capacity of the regional wind fleet has led to oversupply conditions in the last two years. These conditions generally occur during evenings and weekends when loads are low.

During oversupply conditions, BPA has displaced non-hydro generation using its Oversupply Management Protocol (OMP). In 2011 around 97,500 MWh of non-hydro generation was replaced with hydro generation. In 2012, around 49,600 MWh of non-hydro generation, including wind generation, was replaced with hydro generation. The Council has worked with BPA and other regional stakeholders on methods to reduce the occurrence of oversupply through the Oversupply Technical Oversight Committee of the Wind Integration Forum.

At the Council meeting on March 12, Steve Kerns will present an update on the outlook for oversupply conditions this coming spring. Steve is the supervisor of Short-term Planning section of the Power Business Line at the Bonneville Power Administration.

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2013 Overgeneration Update

March 12, 2013



2012 Review

- BPA discussed overgeneration with the NWPPC in February 2012
 - For 2012, BPA estimated an average of 414 MW-months (302,000 MW-hr) of wind displacement at a cost of about \$12 million
- In March 2012, BPA filed a new proposal with FERC:
 - Differed from ER in that displacement would occur on a least cost basis
 - Proposed that costs incurred by displacement would be split roughly 50/50 between power customers and wind generators
 - Now termed Overgeneration Management Protocol (OMP)

2012 Review

- In the spring of 2012 BPA displaced approximately 70 MW-months (about 50,000 MW-hrs) of wind generation and paid wind generators \$2.7 million for these curtailments
- In December 2012, FERC conditionally approved BPA's use of OMP provided that BPA file an acceptable cost allocation methodology within 90-days, March 20.
 - A 7(i) rate setting process to establish the cost allocation methodology was already underway.
 - On Jan. 22, BPA filed for, and was granted, an extension to the filing deadline in order to complete the rate setting process.
 - Last week, BPA refiled with FERC and intends implement OMP during the Spring 2013 if necessary

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2012 Lessons Learned

- Even though the amount of wind displaced in 2012 was less than that displaced in 2011 (about 97,000 MW-hrs), the prevalence of negative prices indicates that overgeneration conditions were worse in 2012 than in 2011
 - Day-ahead light-load hour prices in the Northwest were negative nearly 60 percent of the time from April through July 2012 compared to 40 percent of the time during the same months in 2011.
- A number of factors resulted in wind displacement amounts being lower than expected, even though the 2012 water year was above average
 - Regional wind generation lower than estimated (especially in April)
 - Conditions allowed for a significant amount of water (2.8 Maf) to be stored in Canada
 - Flood control draft ended earlier than modeled which enabled nearly 17 feet of additional reservoir storage at Grand Coulee in late April
 - Spill exchanges with mid-Columbia hydro projects
- BPA reran the model after the 2012 oversupply season using actual generation and export data. The result was an expected displacement of 46 MW-months which validated the model's methodology.

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2013 Overgeneration Analysis

- Incorporated recommendations from 2012 lessons learned paper:
 - Included NonTreaty Storage in Hydsim study
 - Modified the model to vary regional thermal gen, loads, and exports
 - Added July to the study period
- Updated assumptions for expected load, thermal and wind generation, exports, and spill to reflect what the region experienced in 2011 and 2012.
 - Adjusted thermal to account for CGS being down for refueling in 2013
- Using the HYDSIM 80-year rate case study for 2013, expected wind displacement is estimated to be 283 MW-months with an estimated displacement cost is \$10.0 million
 - The likelihood of displacing wind is about 50 percent, as opposed to 65 percent in the 2012 study
 - The chance that wind displacement costs will exceed \$50 million is less than 5 percent
 - However, the current volume forecast is below average. Using this information, the analysis suggests that the expected wind displacement is 87 MW-months with a cost of \$2.6 million and a likelihood of about 30 percent.