Northwest **Power** and **Conservation** Council

April 28, 2015

MEMORANDUM

TO: **Power Committee Members**

FROM: **John Fazio, Senior Systems Analyst**

SUBJECT: **Resource Needs Assessment through 2035**

BACKGROUND:

Presenter: John Fazio

Summary As part of the Seventh Power Plan process, staff has produced a forecast of Pacific Northwest electricity demands through the study period (2035) under low and high economic scenarios. In a parallel process, existing generating resources that are dedicated to serving NW demand have been identified. To get a quick picture of the region's future resource needs, staff has calculated the gaps between projected future demand and existing resources. The energy load/resource balance ranges from a deficit of 1,200 to 3,300 average megawatts for 2026 and from a deficit of 2,500 to 6,100 average megawatts for 2035. The gaps between peaking capacity and peak-hour need are greater. The capacity load/resource balance ranges from a deficit of 2,500 to 4,600 megawatts for 2026 and from a deficit of 4,000 to 8,200 megawatts for 2035.

The results shown above, however, take a deterministic approach by simply looking at the expected low and high growth scenarios and average hydroelectric conditions. A more sophisticated approach to assessing resource needs is to use the GENESYS model, which takes various future uncertainties into account. The first step is to assess the loss-of-load probability (LOLP) for a future year and growth scenario. The second step is to add dispatchable capacity to that system until the LOLP is reduced to

the Council's standard of 5%. The third and final step is to repeat the second step but instead of adding generating capacity, reduce load until a 5 percent LOLP is achieved. The former analysis (step 2) yields the capacity need for the region and the latter analysis (step 3) yields an estimate for the energy need.

Staff has completed this preliminary assessment for the capacity and energy needs of the region through 2035 using the method described above and will present results at the power committee meeting on May 5th. The general conclusion is that both the energy and capacity required to maintain an adequate supply (5 percent LOLP) are lower (and more accurate) than the deterministic load/resource balance calculations.

Relevance This assessment is valuable because it gives planners an indication of the range of potential energy and capacity needs the region may need over the next 20 years. Of course, the Council's resource strategy, which is developed with the aid of the Regional Portfolio Model, is a much more robust and adaptable plan that covers even more future uncertainties than does the GENESYS model. But, comparing the needs assessment with a proposed resource strategy offers a valuable crosscheck and validation of the strategy.

Workplan: B. Develop Seventh Power Plan and maintain analytical capability
C. Co-chair and manage the Resource Adequacy Advisory Committee

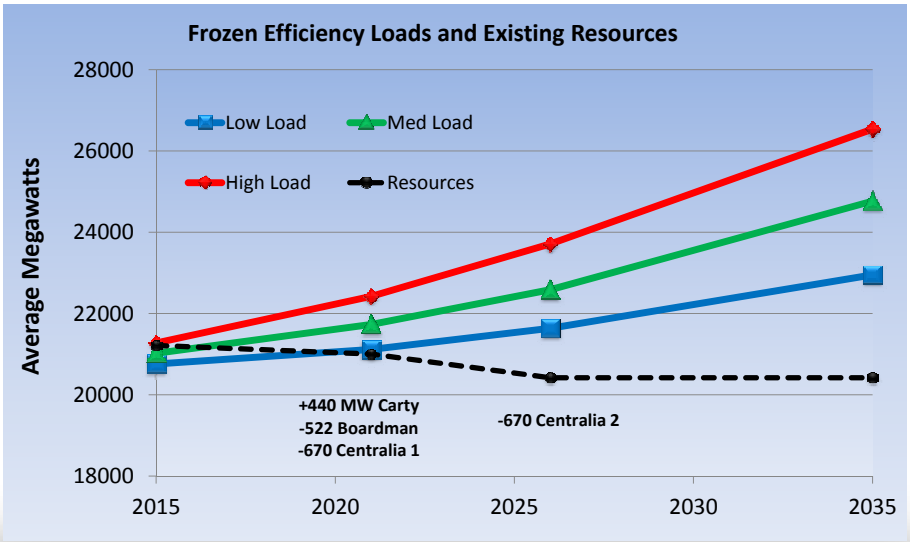
Background: One of the criticisms of past power plans is that verification of the adequacy, efficiency, economy and reliability of resulting future power supplies could have been more robust. To improve that, the Council has done two things. First, it has developed an Adequacy Reserve Margin for both energy and capacity (based on the 5 percent LOLP standard) that is used in the RPM as a minimum build amount to maintain resource adequacy through time.

Second, the Council has asked staff to assess the future resource needs of the region for various economic growth scenarios. The resource needs assessment can be used as a check to verify that future power supplies derived from the Council's power plan will be adequate.

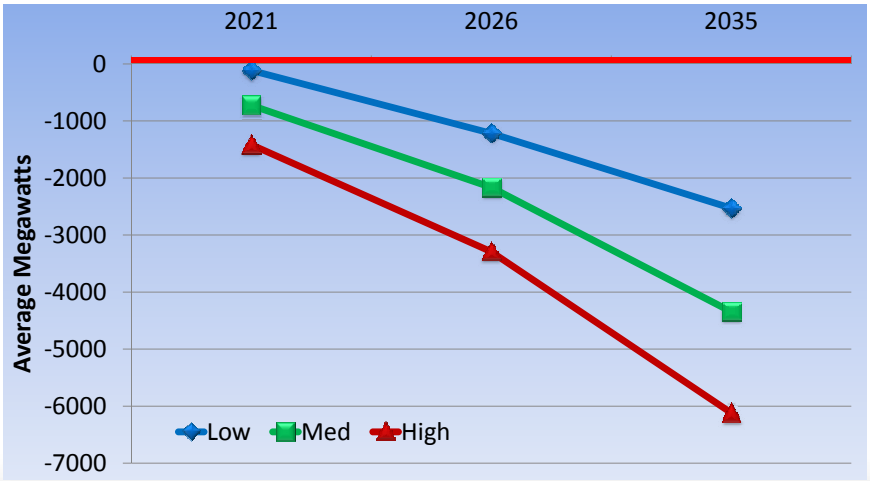
2016-2035
Resource Needs Assessment

NW Power and Conservation Council
Power Committee Meeting
Portland, Oregon
May 5, 2015

Loads and Resources 2016-35



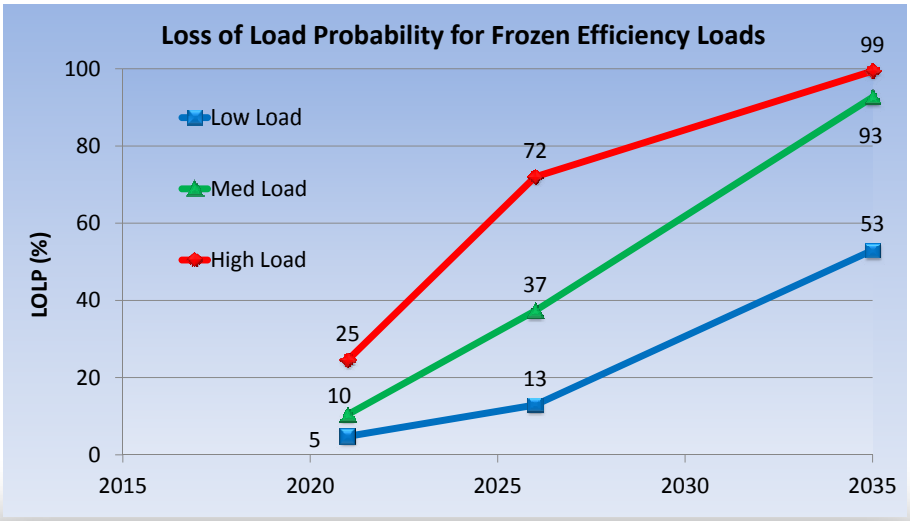
Energy Load/Resource Balance



Energy Load/Resource Balance
(average megawatts)

Load Forecast	2021	2026	2035
Low	-114	-1218	-2531
Med	-727	-2166	-4346
High	-1417	-3292	-6119

LOLP 2016-35



Energy Required[1] for Adequacy
(average megawatts)

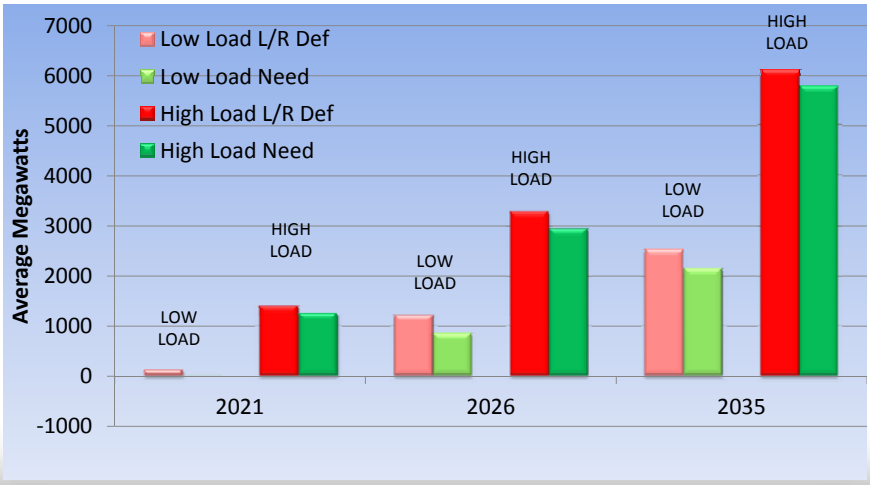
Load Forecast	2021	2026	2035
Low	-10	850	2165
High	1270	2950	5780

[1]To get to a 5% LOLP

Capacity Required for Adequacy
(megawatts)

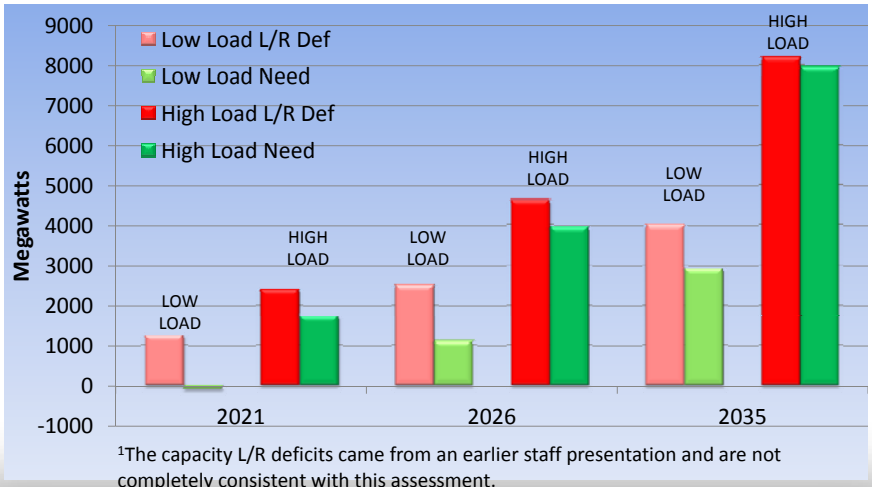
Load Forecast	2021	2026	2035
Low	-80	1120	2920
High	1750	3960	7960

Energy Comparison
Energy L/R Deficit vs. Energy Needs



Capacity Comparison

Capacity L/R Deficit[1] vs. Capacity Needs



[1]The capacity L/R deficits came from an earlier staff presentation and are not completely consistent with this assessment.