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

April 1, 2014

MEMORANDUM

TO: Power Committee Members

FROM: John Fazio – Senior Power Systems Analyst

SUBJECT: Resource Adequacy Update

Work is underway to develop the Council's next assessment of resource adequacy for the Pacific Northwest region. The assessment will focus on operating year 2019, covering October 2018 through September 2019.

Resource adequacy is measured as the probability that power resources will be insufficient to meet electricity loads. This measure is referred to as a loss of load probability (LOLP) and the Council has set a maximum limit on that probability of 5 percent. It should be noted that adequacy assessments only count existing resources, plus those that are sited and licensed. Forecasted loads are also reduced using the energy efficiency targets in the Council's most recent Northwest Power Plan.

The Council's previous resource adequacy assessment was released on December 4, 2012 (document number 2012-12) and focused on the year 2017. The result of that assessment was a LOLP of 6.6 percent, 1.6 percent above the 5 percent target. The good news is that it would only take about 500 megawatts of new generation capacity to bring the adequacy level back within the tolerance limit. In aggregate, utility integrated resource plans show a much higher level of potential new resource development through 2017.

Between 2017 and 2019, regional electricity loads are expected to grow by about 260 average megawatts (or about 0.6 percent per year) after the roughly 350 average megawatts per year of energy efficiency are taken into account. During that same span, thermal and wind resources are expected to increase by about 670 megawatts and 270 megawatts, respectively. The capacity of standby resources, used only during periods of stress, is expected to increase by only 13 megawatts, while the energy contribution will roughly be cut in half (due to limited hours of operation).

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The preliminary assessment for 2019 assumes an availability of 1,700 megawatts of power imports from California during the winter. Using this assumption, the preliminary result for 2019 shows a slight drop in the LOLP from the 2017 value, to about 6 percent. However, the 6 percent LOLP may drop further when updated information about California imports is included.

The Council has retained Energy GPS to assess available winter peak imports from California. Energy GPS's analysis shows that winter 2019 power supply from California is expected to exceed the south-to-north intertie capacity of about 3,600 to 4,000 megawatts. However, the level of reliance on California imports should not be based on the expected amount but rather on an amount that is reliably available during periods of stress. Nonetheless, the 1,700 megawatt assumption appears too low.

On April 4th, the Resource Adequacy Advisory Committee will review data, assumptions and results for the draft assessment for 2019. If the committee were to recommend, for example, increasing the import assumption to 2,400 megawatts, the resulting LOLP would drop to 5.1 percent - nearly to the Council's standard of 5 percent.

The committee's recommendations, along with any revisions to the 2019 assessment, will be presented to the power committee on April 8th.

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Resource Adequacy

Preliminary Assessment for 2019

Power Committee Meeting
Spokane, Washington
April 8, 2014

Outline

1. 2017 Assessment
2. Preliminary 2019 Assessment
3. RAAC Recommendations
4. A Look at 2021
5. Schedule

2017 Assessment Summary

- Document #2012-12
- Existing resources, target EE, 1,700 MW peak-period winter import
- Conclusion: slightly inadequate
  LOLP = 7%, Council max = 5%
- Solution: 350 MW dispatchable generation or combinations of resource/demand reductions
- IRP planned resources >> 350 MW

Changes from 2017 to 2019

- Load growth = 260 MWa
  - 0.6% growth per year
  - Includes 700 MWa EE savings
- Resources = 667 MW
  - Carty: 440 MW
  - Port Westward 2: 220 MW
  - Wind: 267 MW

Uncertainties Not Modeled Explicitly

- SW winter peak import range:
  0 MW to 3,200 MW
- Load range:
  Council's low to high short-term forecast

LOLP Sensitivities 2019 (%)

7.0 Low Load 0 Import	9.6 Med Load 0 Import	14.1 High Load 0 Import
4.2 Low Load 1700 Import	5.9 Med Load 1700 Import	8.7 High Load 1700 Import
3.4 Low Load 3200 Import	4.4 Med Load 3200 Import	7.0 High Load 3200 Import

LOLP Sensitivities 2019

Load Variation **Imports** (MW)	-2.5%	-1.5%	0%	+1.5%	+2.5%
0	6.95%	8.04%	9.63%	12.27%	14.14%
900	5.37%	5.97%	7.32%	9.17%	10.88%
1700	4.14%	4.98%	5.93%	7.82%	8.72%
2400	3.69%	4.32%	5.11%	6.67%	7.48%
3200	3.38%	3.98%	4.64%	5.91%	7.03%
4000	3.10%	3.80%	4.37%	5.42%	6.53%

RAAC Recommendations

- SW Imports – TBA
  - Limited by S-to-N tie capacity
  - Need to assess min S-to-N transfer capability
  - Between 1700 and S-to-N transfer capability
- Add 2021 Scenario
- Review IPP Assumptions
- Natural Gas Availability
- Technical Appendix
  - Curtailment characteristics
  - Other adequacy metrics and results

SW Peak-Period Winter Imports

AC+DC S-to-N Limits (5-Year Average Min) Energy GPS Estimate for Available Imports		
Month	**Imports**	**Tie Limit**
January	9,300	3,310
February	10,200	3,371
March	10,200	3,425
April	11,600	3,421
May	16,200	3,420
June	9,100	3,424
July	0	3,366
August	0	3,403
September	0	2,912
October	13,200	2,706
November	12,400	3,409
December	10,100	3,417

Likely RAAC 2019 Recommendation
LOLP ~ 4.6 to 5.1%

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However (see next slide) →

An Early Look at 2021

- Loss of two coal plants
  - Boardman: 601 MW
  - Centralia 1: 730 MW
- Load growth between 2019 and 2021
  - Under 300 MWa (0.6% per year)
  - Includes 700 MWa of EE (350/year)
- Rough Estimate LOLP ~ 11%

Schedule for 2019 Assessment

Mar 21st	Apr 4th	Apr 8th	Apr28-May2	May 14th
Technical	Review data and modeling changes, preliminary 2019 assessment			
	Steering	Review major assumptions, preliminary 2019 assessment		
		Council Power Committee	Major changes since 2017 assessment Preliminary 2019 assessment	
			Joint Tech and Steering	Review final 2019 assessment
				Council / Final 2019 assessment

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