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July 2, 2008

MEMORANDUM

TO: Power Committee

FROM: John Fazio

SUBJECT: Requests from the June 2008 Power Committee Meeting

The Power Committee made several requests of staff at the June meeting in Spokane. Requests related to resource adequacy are listed below.

- More detail on resource assumptions used to make the adequacy assessment
- An accounting of changes to IPP status over the past several years - will be provided by Jeff King in a separate presentation
- A side-by-side comparison of this year's assessment to last year's assessment
- An accounting of changes in resources and loads since last year's assessment - changes to resource assumptions will be provided by Jeff King

Detailed resource and load information used to assess the power supply's adequacy for 2011 and 2013 is provided in a spreadsheet (Adequacy Assessment 52808.xls), which was emailed to Council members in June. The attached PowerPoint presentation includes several slides listing specific resource assumptions developed and approved by the Resource Adequacy Forum. All of these assumptions will be reevaluated by the forum this year.

A side-by-side comparison of resources and loads is summarized in the presentation and is detailed in a spreadsheet (Adequacy 2008 vs 2007.xls), which will be emailed to Council members. The annual average load forecast for 2013 changed from 21,672 MWa (2007 assessment) to 23,625 MWa (current assessment), an increase of 1,953 MWa. Available resources for 2013 stayed nearly the same, decreasing by 135 MWa in this year's assessment. The resulting annual load/resource balance for 2013 dropped from a surplus of 3,967 MWa (2007) to 1,879 MWa (2008) -- still above the minimum threshold.

For hourly needs, a comparison to the 2007 assessment is harder to make because the sustained peak duration changed from a 50-hour period to an 18-hour period. However, the difference between the assessed reserve margins and their respective minimum thresholds has decreased since last year's assessment.

For winter, the 2007 assessment showed a reserve margin of 48 percent for 2013 -- 23 points above the minimum threshold of 25 percent (based on a 50-hour period). This year's assessment shows a 31 percent reserve margin for 2013, only 8 points above the 18-hour period threshold of 23 percent.

For summer, the 2007 assessment showed a reserve margin 36 percent for 2013 -- 17 points above the minimum threshold of 19 percent (based on a 50-hour period). This year's assessment shows a 26 percent reserve margin, merely 2 points above the 18-hour period threshold of 24 percent.

Economic thresholds (higher than the minimum thresholds) are to be based on the Council's power plan but have not yet been properly evaluated. A preliminary estimate for the economic threshold for annual needs suggests that the load/resource balance should be surplus by about 3,000 MWa. The region's projected surplus is less than the estimated economic threshold for both 2011 and 2013. Based on the implementation plan developed by the forum and adopted by the Council (<http://www.nwcouncil.org/library/2008/2008-07.pdf>), this means that the region may be in a "yellow" alert status. Recommended actions for a yellow alert include;

- Presenting a summary of the adequacy assessment to the Council and the public (done at the June meeting in Spokane),
- Comparing the Council's assessment to other regional reports (currently underway)
- Having the Resource Adequacy Forum review the underlying data and assumptions (scheduled meetings over the next month)

It should be noted that the current capacity assessment is conservative because the hydro peaking capability is underestimated. New values for hydro peaking capability are being developed but were not available at the time of this year's assessment. The hydro peaking values used in this year's assessment are based on a 50-hour peak duration -- similar to what was used in last year's assessment. There is no doubt that the 18-hour period hydro capability will be greater, thus increasing the amount of surplus winter and summer capacity.



Pacific Northwest Resource Adequacy Assessment for 2011 and 2013

Power Committee Meeting
Kalispell, Montana
July 15, 2008

- ✓ Assumptions
- ✓ Adequacy Assessment Recap
- ✓ Changes from last year
- ✓ Comparison to other reports

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Current Capacity Assumptions

- ✓ Out-of-region market
 - 3,000 MW maximum in winter
 - None available in summer
- ✓ Non-firm hydro
 - 2,000 MW in winter
 - 1,000 MW in summer
- ✓ Uncommitted IPPs
 - Full availability in winter
 - 1,000 MW maximum in summer
- ✓ Wind
 - 5 percent over the sustained peak period

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Current Energy Assumptions

- ✓ Out-of-region market
 - About 200 MWa per year
- ✓ Non-firm hydro
 - About 1,100 MWa per year
- ✓ Uncommitted IPPs
 - Dispatched as regional resources limited by capacity assumptions
- ✓ Wind
 - 30 percent of nameplate annually

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Adequacy Assessment

Energy	2011	2013	Min
L/R Bal	2,600	1,900	0

Capacity	2011	2013	Min
Winter	38%	31%	23%
Summer	31%	26%	24%

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Adequacy Assessment - Energy

L/R Bal (MWa)	2011	2013	Min
Last Year's	4,100	4,000	0
This Year's	2,600	1,900	0
Difference	-1,500	-2,100	

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Adequacy Assessment- Capacity

(MW)	2011	Gap	2013	Gap	Min
'07 Win	49%	24%	36%	11%	25%
'07 Sum	48%	23%	36%	11%	19%

'08 Win	38%	15%	31%	8%	23%
'08 Sum	31%	8%	26%	2%	24%

Sustained Period changed from 50-hours in 2007 to 19-hours in 2008.

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Resource and Load Assumptions for 2013

Summary	2007	2008	Diff
Net Demand	21672	23625	1953
Net Resources	25639	25504	-135
L/R Balance	3967	1879	-2088
Demand			
Non-DSI	21266	22643	1376
DSI	297	818	521
Coulee Pumping	117	117	0
Total	21681	23578	1897
Resources			
Critical Hydro	11672	11943	271
Non-Hydro Firm	9938	10090	152
PNW Uncontracted	2528	2171	-357
Planning Adjustment	1500	1300	-200
Firm Contracts			
Exports	780	904	124
Imports	788	857	68

Load Differences for 2011

Summary	Ann
Net Demand	1357
Net Resources	-173
L/R Balance	-1530
W/O Plan Adjustment	-1330
W/O Uncontracted	-973

Demand	Ann
Non-DSI	920
DSI	413
Coulee Pumping	0
Total	1333

Resources	Ann
Critical Hydro	233
Non-Hydro Firm	152
PNW Uncontracted	-357
Planning Adjustment	-200

Firm Contracts	Ann
Exports	124
Imports	99

Summary	% change from 07
Net Demand	6%
Net Resources	-1%
L/R Balance	-37%
W/O Plan Adjustment	-51%
W/O Uncontracted	-1143%

Demand	% change from 07
Non-DSI	4%
DSI	139%
Coulee Pumping	0%
Total	6%

Resources	% change from 07
Critical Hydro	2%
Non-Hydro Firm	2%
PNW Uncontracted	-14%
Planning Adjustment	-13%

Firm Contracts	% change from 07
Exports	14%
Imports	12%

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Reasons for the Difference

- ✓ **Increases in projected Demand in 2010**
 - Non-DSI load increased by 900 MWa
 - DSI loads increased by 400 MWa
- ✓ **Reason for increase in loads:**
 - Short-term model projected very low growth ~0.7%
 - Long-term model projected higher, 1.4%, load growth more inline with what has been experienced.
 - We calibrated the short-term model to long-term model.
 - Added new loads from Data centers not reflected in the short-term model.

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Load/Resource Balance (2011)

	Forum	NRF	BPA
Load*	22,882	22,609	22,594
Resources	25,466	20,062	24,372
L/R Bal	2,584	-2,547	1,778
Minus IPP	2,171		
Minus Non-firm	1,300		
Avail - Exp (approx)	1,600		
L/R Bal	-2,487		

*Load includes firm exports minus firm imports.

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Additional Slides

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Metrics

- **Annual Needs** – Annual average generating capability minus annual average load, referred to as the annual **load/resource balance** (in MWa)
- **Hourly Needs** – Surplus hourly generating capability over expected sustained peak hourly load, referred to as the **reserve margin** (in percent)

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Thresholds

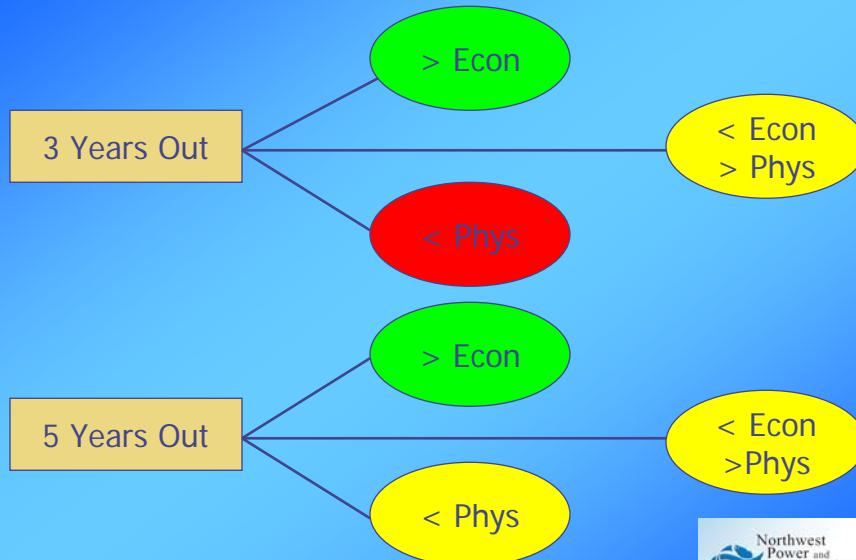
- **Energy – Load/resource balance**
 - Physical = 0 MWa
 - Economic = approx. 3,000 MWa
- **Capacity – Reserve margin**
 - Physical Winter = 23%
 - Physical Summer = 24%
 - Economic = ?

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Implementation Plan



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Implementation Actions

- ✓ **Green**
 - Proceed with normal planning activities
 - Compare results with other regional reports
- ✓ **Yellow**
 - Regional report
 - Forum review of data and assumptions
- ✓ **Red**
 - Regional conference
 - Regional review of data and assumptions
 - Identify inadequate utilities

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