Northwest Power and Conservation Council

June 21, 2007

MEMORANDUM

TO: Power Committee Members

FROM: John Fazio, Senior System Analyst

SUBJECT: Draft 3-Year and 5-Year Resource Adequacy Assessments

The Northwest should have adequate generating capability for the next five years but that doesn't mean that all utilities have adequate supplies. Most of the region's surplus is attributable to uncontracted Independent Power Producers (IPP) generation, which means that many utilities are short of firm resources and are actively acquiring resources.

The Northwest Regional Forecast of Loads and Resources (NRF) published by the PNUCC shows the region's utilities to be deficit three and five years out, but it doesn't include the IPP generation or the 1,500 MWa of other non-firm resources counted in the Forum's assessment. Subtracting both from the Forum's total leaves the difference between the two estimates on the order of about 2, 500 MWa. About 1,000 MWa of the difference is due to load differences (primarily in the DSI loads) and the remainder is due to resource differences. The bulk of the resource difference is likely due to utilities reporting expected operation of resources as opposed to their availability.

The Forum's assessment indicates that resources exist to assure an adequate supply but a lot of that supply is uncontracted. For individual utilities to be adequate, they must secure some of the surplus or acquire their own resources. That choice is based on economic factors.

The Forum's adequacy standard calls for the annual generating capability to be at least equal to the annual average load. On the resource side of this equation, nearly 4,000 average megawatts of non-firm resources are included. The current estimated load/resource balance is 4,260 MWa for 2010 and 4,050 MWa for 2012.

The adequacy standard also calls for a 25 percent reserve margin (surplus generating capability over the peak load hours) for winter months and a 19 percent reserve margin for the summer months. Current estimates for winter reserve margins are 48 percent and 46 percent for 2010 and 2012, respectively. Summer estimates are 32 percent and 30 percent, respectively. All of these values are above the capacity targets.

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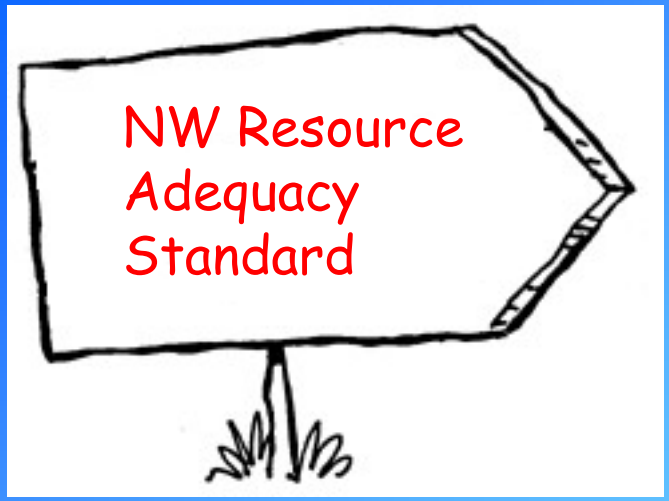
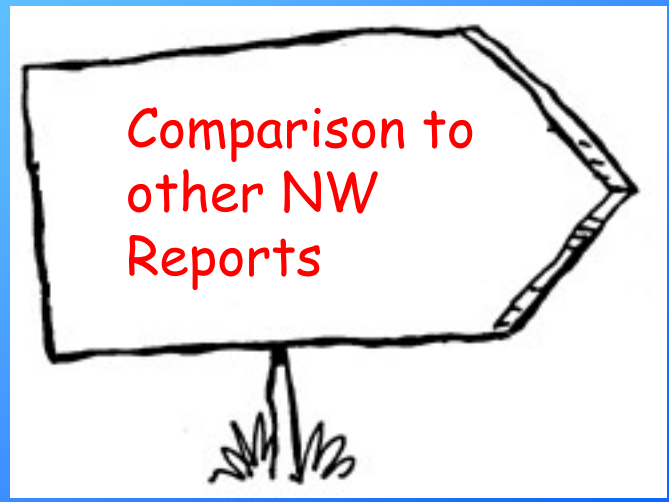
Pacific Northwest Resource Adequacy Assessment for 2010 and 2012

Power Committee Meeting
Portland, Oregon
July 11, 2007

Topics


NW Resource
Adequacy
Standard


2010 & 2012
Assessment


Comparison to
other NW
Reports

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Adequacy Standard

- **Annual Energy**

  Annual generating capability =
  average annual load

- **Peaking Capacity**

  Peak-duration capability =
  expected peak load + reserve margin

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Assumptions

- **Generating Capability includes:**
  - Out-of-region market* (approx. 750 MWa)
  - In-region market (IPP approx. 2,600 MWa)
  - Hydro flexibility* (approx. 750 MWa)

- **Reserve Margin covers:**
  - Operating reserves (approx. 6%)
  - Extreme temperatures (6% to 15%)
  - Other contingencies (4% to 7%)

*The magnitudes of out-of-region market and hydro flexibility (including non-firm hydro) are derived from a loss-of-load probability analysis and combine to make up the 1,500 MWa planning adjustment shown in slide 17.

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Adequacy Targets

- **Annual Energy**
  Load/Resource Balance = 0

- **Capacity Reserve Margin =**
  25 percent in winter
  19 percent in summer

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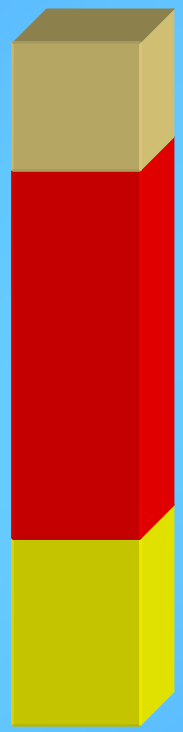
Winter Capacity Target

Target: 25%



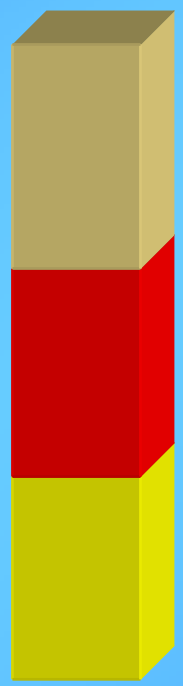
4% for planning adjustment reserves

15% for adverse temperature reserves

6% for operating reserves

Summer Capacity Target

Target: 19%



7% for planning adjustment reserves

6% for adverse temperature reserves

6% for operating reserves

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Resource Adequacy Assessment

Energy	2010	2012	Target
Load/Res Bal	4260	4046	0

Capacity	2010	2012	Target
Winter	48%	46%	25%
Summer	32%	30%	19%

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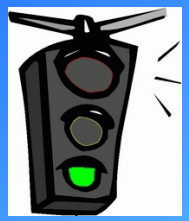
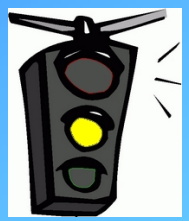
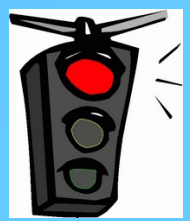
Interpreting the Results



Green light – Regional power supply is adequate



Yellow light warning – economic standard* is not met in either the 3rd or 5th year or the physical standard is not met in the 5th year



Red light warning – the physical standard is not met in the 3rd year

*Economic standard has not yet been developed

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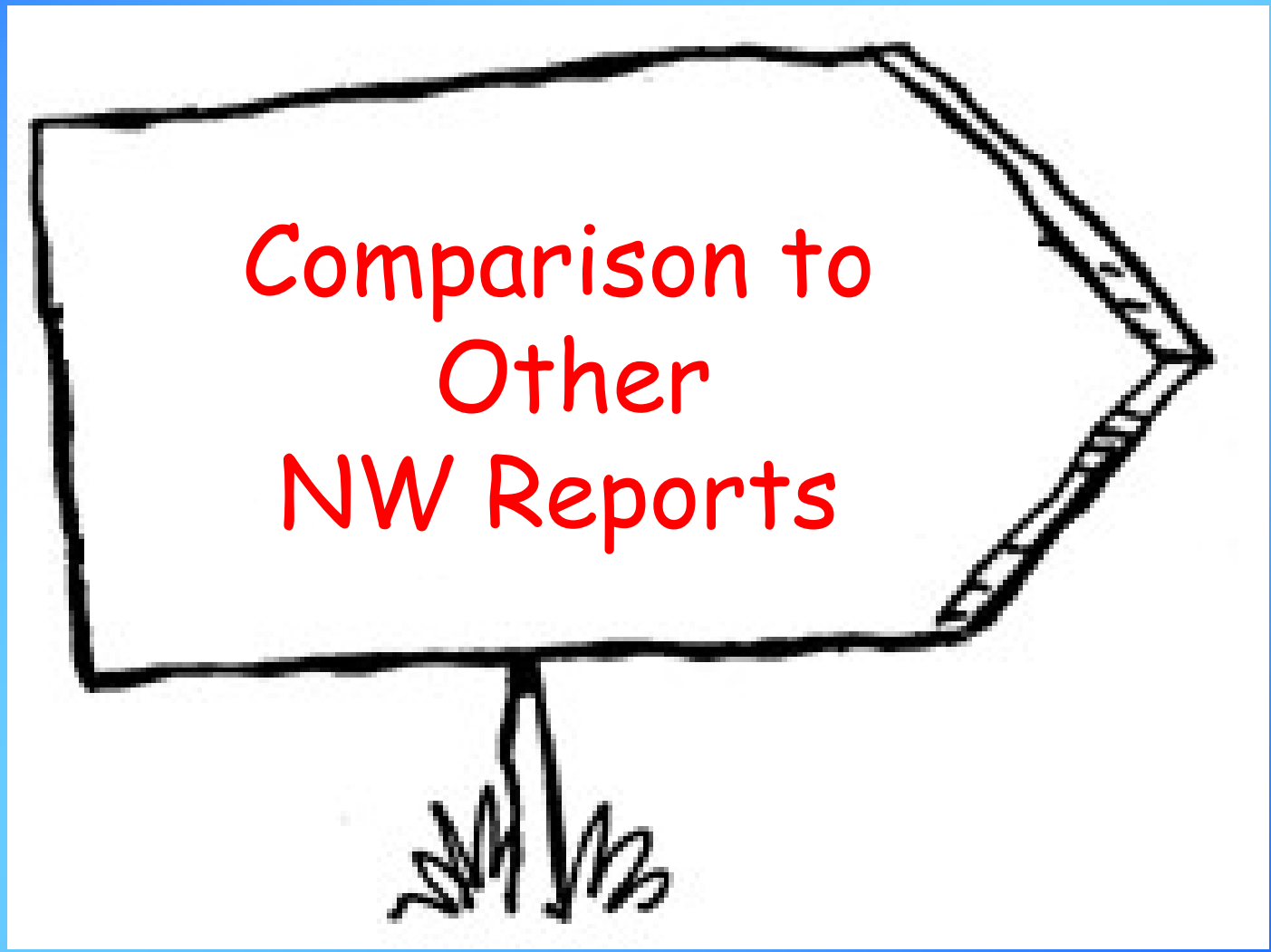

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Resource Adequacy Forum

"The Forum's overarching goal is to establish a Resource Adequacy Framework for the PNW to provide a clear, consistent, and unambiguous means of answering the question of whether the region has adequate deliverable resources to meet its loads reliably and to develop an effective implementation framework."

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Bonneville Power Administration

"The White Book projections are used as inputs into BPA's long-range resource planning process to assist planning for adequate and reliable load service for the Federal system and the PNW region."

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PNUCC

"Each year the Northwest Regional Forecast reports the sum of individual utilities' projected electric loads and anticipated generating resources as an indicator of the Northwest utilities' need to acquire additional power in the next decade."

Comparison of Methods

Forum	• Uses the Council's regional load forecast • Assumes full availability of resources • Assumes some use of non-firm resources, including uncontracted resources • Sets resource targets based on a 5 percent loss-of-load probability
PNUCC	• Assesses utility loads and resources • Based on utilities' assessment of resource availability and loads • Counts only firm resources • No explicit target for adequacy
BPA	• Similar to PNUCC but includes uncontracted regional resources • No explicit target for adequacy

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Load/Resource Balance (2010)

	RA Forum	PNUCC	BPA
Load	22,130	23,007	22,553
Resources	26,390	20,684	24,807
L/R Bal	4,260	(2,323)	2,254
Planning adj.	1,500	0	0
L/R Bal	2,760	(2,323)	2,254
IPP	2,528	0	3,366
L/R Bal	232	(2,323)	(1,112)

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Forum vs. PNUCC

	Forum	PNUCC	Diff	Reason
Annual Load	22,130	23,007	(877)	Mostly from DSI
Firm Resources	22,362	20,684	1,678	Mostly from CT

Firm Loads and Exports (2010)

	RA Forum	PNUCC	BPA
Non-DSI	20,919	20,843	21,878
DSI	302	812	473
Exports	909	866	913
Net Load	22,130	23,007	23,264

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Firm Resources and Imports (2010)

	RA Forum	PNUCC	BPA
Firm Hydro	11,555	11,496	11,793
Firm Imports	869	814	873
Large Thermal	4,654	4,404	6,104
Renewable & Other	1,535	1,300	1,531
Cogeneration	1,057	1,152	1,991
Combustion Turbines	2,692	1,518	2,515
Firm Total	22,362	20,684	24,807*

*BPA total includes IPP generation

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Conclusions

1. NW power supply is adequate
2. Almost all of the surplus is non-firm
3. Adequacy standard does not address price volatility
4. Regional standard does not address individual utility status
5. Resources are not needed for adequacy but may be needed for price stability or for individual utility needs

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