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

February 7, 2017

MEMORANDUM

TO: **Council members**

FROM: **Massoud Jourabchi, Steven Simmons**

SUBJECT: **Report on recent cold weather events and their impact of loads and prices**

BACKGROUND:

Presenter: Massoud Jourabchi and Steve Simmons

Summary: In this presentation we will track loads, prices for December 1, 2016 through January 22, 2017. Hourly regional temperatures are used to estimate peak loads. Mid C market prices and natural gas prices are reviewed and no significant jump in prices in response to loads were found.

Regional peak occurred at 8 AM on Thursday January 5th 2017 after 3 days of unseasonably cold temperatures. Preliminary analysis shows that peak load was about 32,000 MW. Although significantly higher than 2015 peak loads of about 28,000 MW, it was not the highest regional winter peak load experienced in the region, that occurred on February 1996 with load of over 36,000 MW. Market prices for electricity and natural gas went up, but were in-line with recent winters, and lower than the price spikes seen in the winter of 2013/2014.

Relevance: Evaluation of adequacy of resources given rare events.

Workplan: Continued monitoring of regional loads, resources and prices.

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Background: During the last two weeks of December 2016 and first three weeks of January 2017 the region experienced a number of days of unseasonably cold temperatures. Heavy snow in the Portland area caused many business and school cancellations. Schools were closed for total of 9 days in this period. This weather event presented an opportunity to test the resource adequacy in the region. Council staff obtained hourly loads from a number of regional utilities and estimated the coincident peak load for the period December 1, 2016 through January 2017. Preliminary estimates puts the peak load at about 32,000 to 33,000. Although not the highest peak load experienced in the region, which occurred on December 2009 at 34,791 MW, it is among the top peak loads in the past 20 years.

Review of Recent Cold Weather Events and their Impact on Regional loads and Market Prices

February 14, 2016

Massoud Jourabchi
Steven Simmons

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SEVENTH NORTHWEST POWER PLAN

In this presentation

- Review of historic temperatures and loads (average and peaks) for December and January.
- Review of Winter of 2017 experience.
  - Preliminary Regional Loads
- Market Prices for Electricity and Natural Gas

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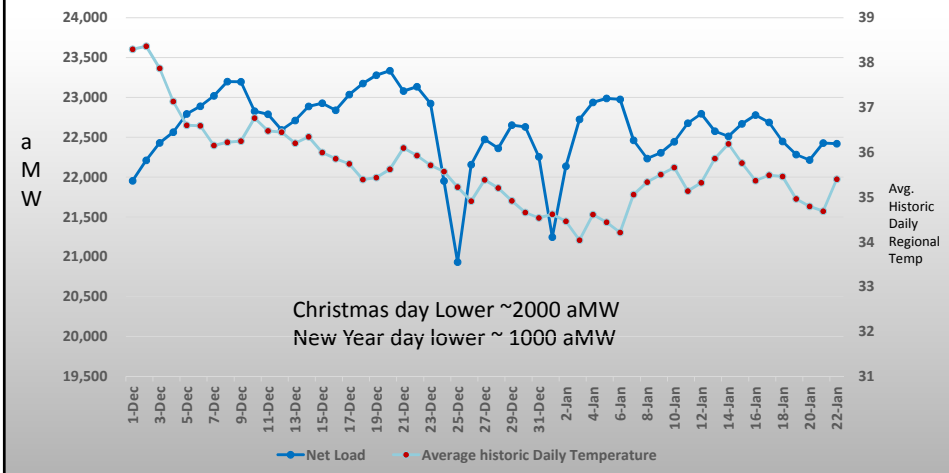
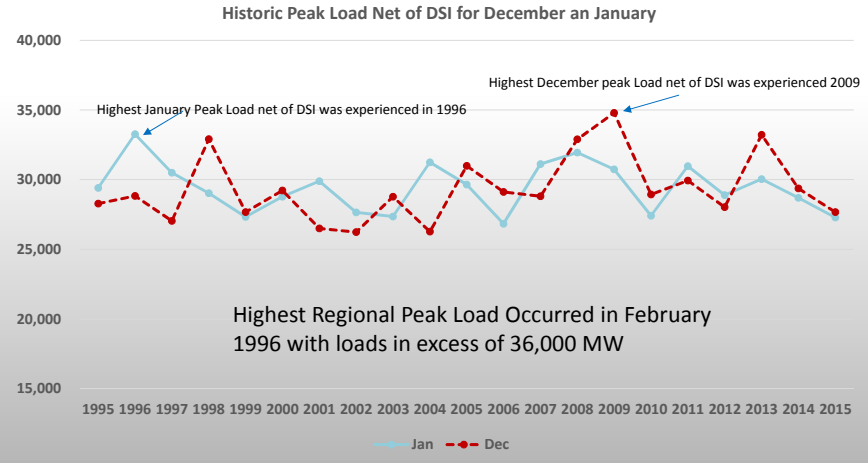
Historic Daily Average Load (net of DSI) and Daily Temperatures



Christmas day Lower ~2000 aMW
New Year day lower ~ 1000 aMW

Regional Peak loads for December and January Have Been Declining

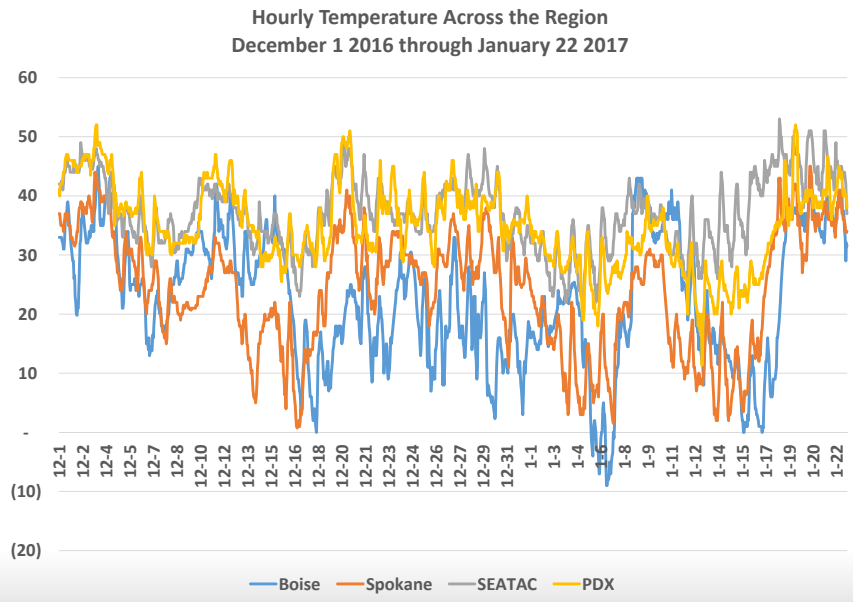


Highest Regional Peak Load Occurred in February 1996 with loads in excess of 36,000 MW

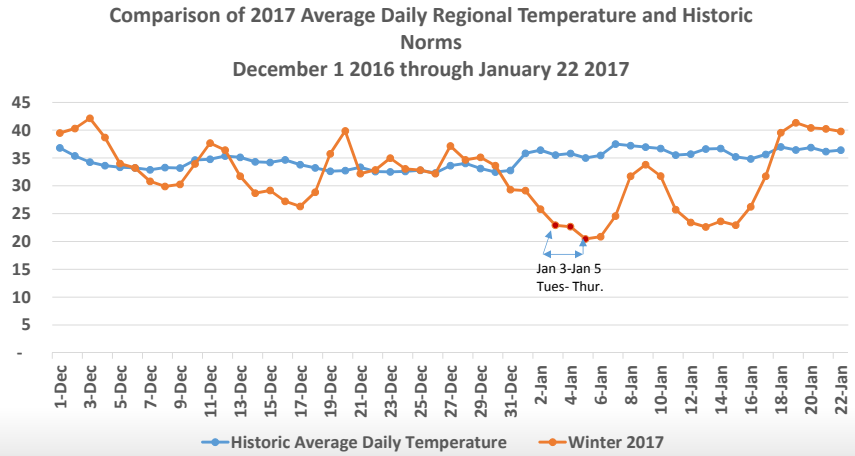
Regional Winter Peak Loads (netted for DSI)

- In the past 20 years average winter peak has been about 29,400 MW.
- The highest peak load was 35,000 MW occurring on December 2009
- Peak loads have been on decline

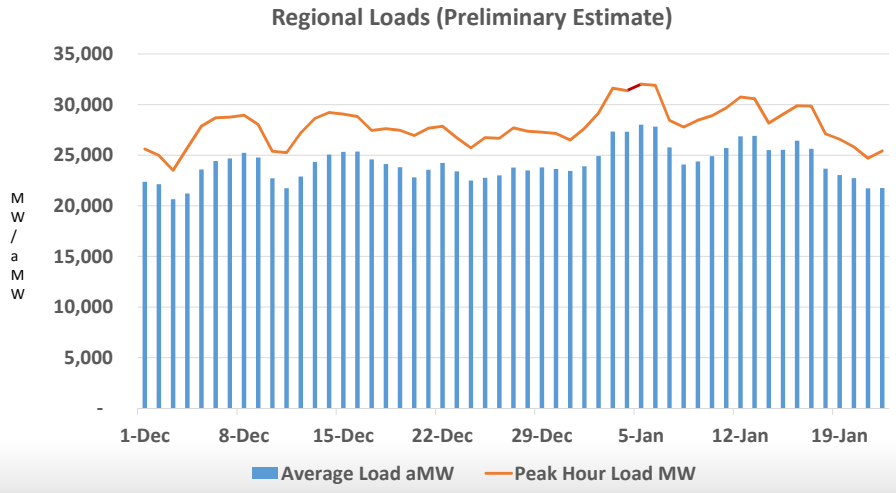
Peak Loads Net of DSI (MW)	on Average	Highest	AAGR 1995-2015	AAGR 2005-2015
January	29,428	33,260	-0.4%	-0.8%
December	29,310	34,791	-0.1%	-1.1%



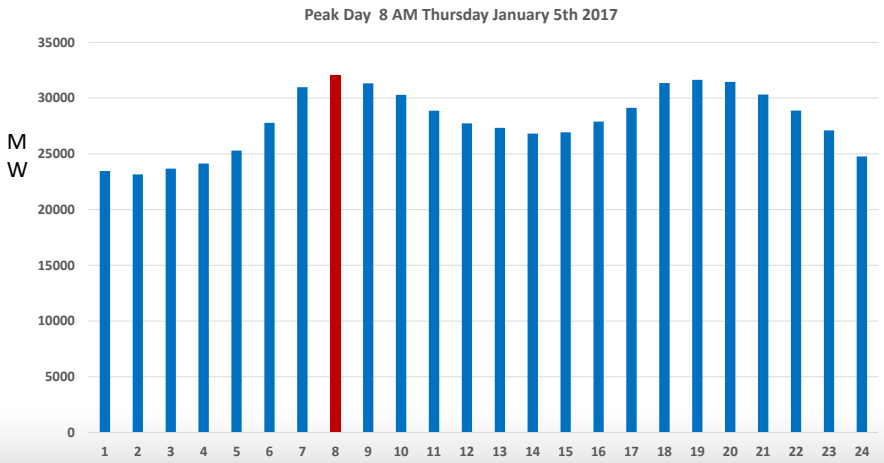
Winter of 2017 started warmer than usual but then got much colder



Peak load for winter 2017 is estimated at 32,500-34,800 MW



Regional Peak occurred on Thursday January 5th



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Comparison of Historic and 2017 Winter Loads

Winter 2017	Energy (aMW)	Peak Hour (MW)
Low *	20,191	31,389
Medium *	20,815	32,360
High *	21,439	33,331
Historic Values (1995-2015)	23,507	34,791

*Winter Peak for 2017 occurred on 8 AM Thursday January 5th after three days of abnormally cold temperatures.

Is our Estimate of Peak loads reasonable? These utilities represent about 63% Of regional winter peaks for this period. Using that information and data from the 6 utilities peak load is about 33,400 MW.

8 AM Thursday January 5th 2017	
Coincident peak	Peak Load (MW)
BPA	10,943
Avista	2,254
Grant County	753
Idaho	2,810
Western portion of Northwestern	507
PGE	3,759
Subtotal	21,026
Regional Estimated peak	33,375

*- preliminary estimates subject to change

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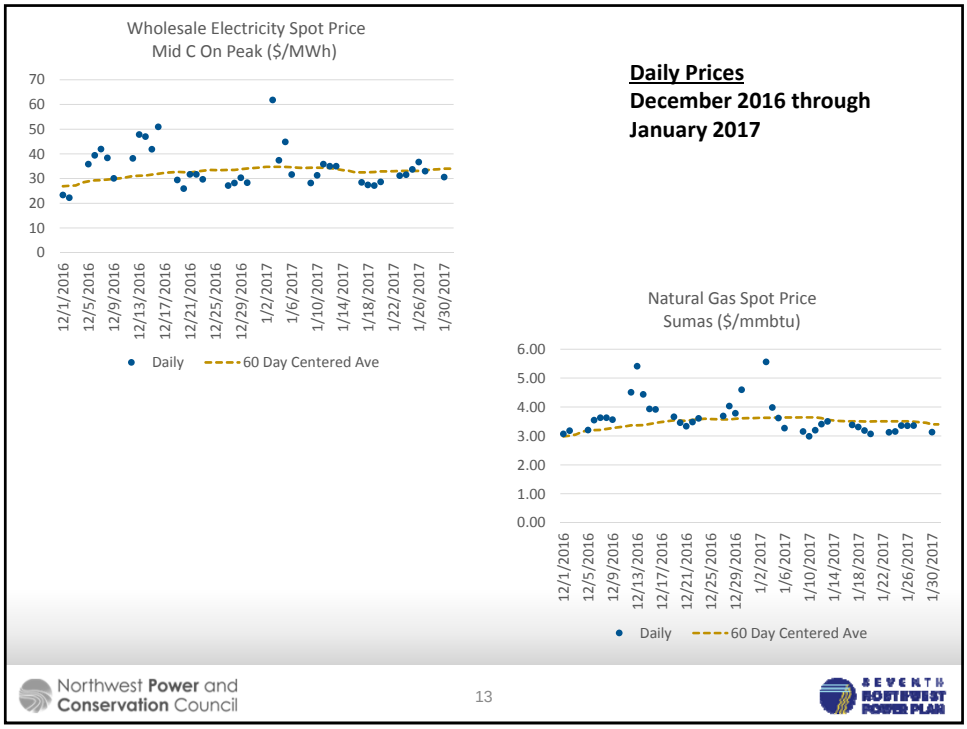
In Summary

- Our preliminary review of the regional temperature and loads, for December 1, 2016 through January 22, 2017, indicates that regional temperatures were significantly below normal in the January 3-January 5 and this led to higher energy and peak demand for electricity.

Market Prices

<u>Winter of 2016/2017 – so far</u>

- Electricity prices at the Mid C peaked in early January and mid December at the $50 to $60 dollar range per MWh
- Natural gas prices at Sumas peaked in same time frame in the mid $5 range per mmbtu
- Historically, these are not large price spikes
- Much lower than recent price spikes from February 2014


Wholesale Electricity Spot Price
Mid C On Peak ($/MWh)
70
60
50
40
30
20
10
0
12/1/2016
12/5/2016
12/9/2016
12/13/2016
12/17/2016
12/21/2016
12/25/2016
12/29/2016
1/2/2017
1/6/2017
1/10/2017
1/14/2017
1/18/2017
1/22/2017
1/26/2017
1/30/2017
Daily
60 Day Centered Ave
Daily Prices
December 2016 through
January 2017
Natural Gas Spot Price
Sumas ($/mmbtu)
6.00
5.00
4.00
3.00
2.00
1.00
0.00
12/1/2016
12/5/2016
12/9/2016
12/13/2016
12/17/2016
12/21/2016
12/25/2016
12/29/2016
1/2/2017
1/6/2017
1/10/2017
1/14/2017
1/18/2017
1/22/2017
1/26/2017
1/30/2017
Daily
60 Day Centered Ave
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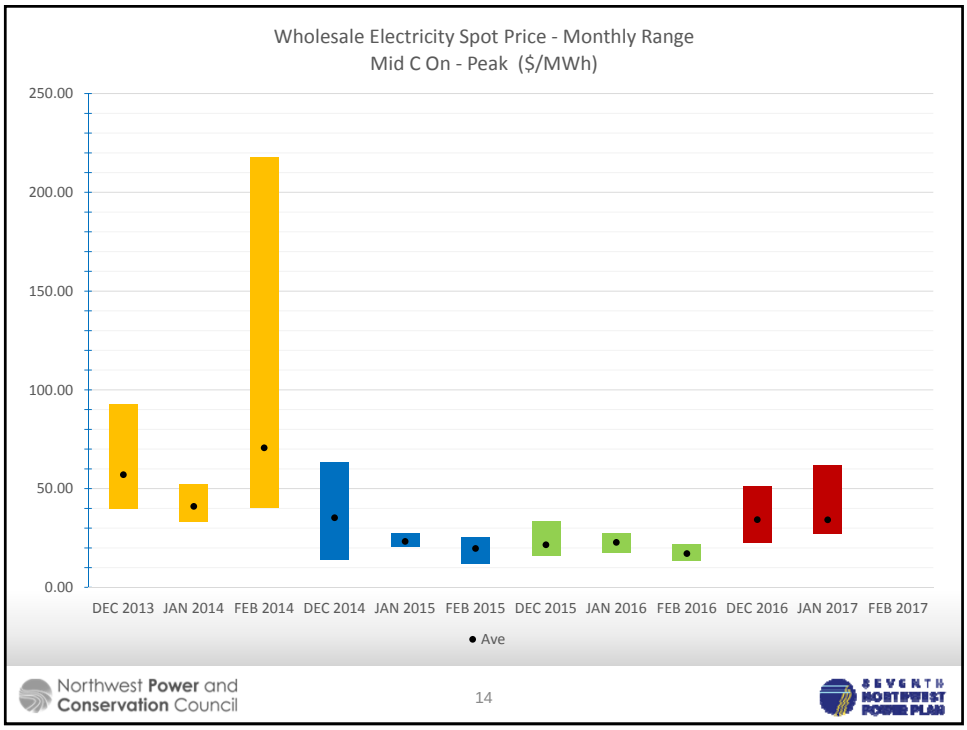
Wholesale Electricity Spot Price - Monthly Range
Mid C On - Peak ($/MWh)
250.00
200.00
150.00
100.00
50.00
0.00
DEC 2013
JAN 2014
FEB 2014
DEC 2014
JAN 2015
FEB 2015
DEC 2015
JAN 2016
FEB 2016
DEC 2016
JAN 2017
FEB 2017
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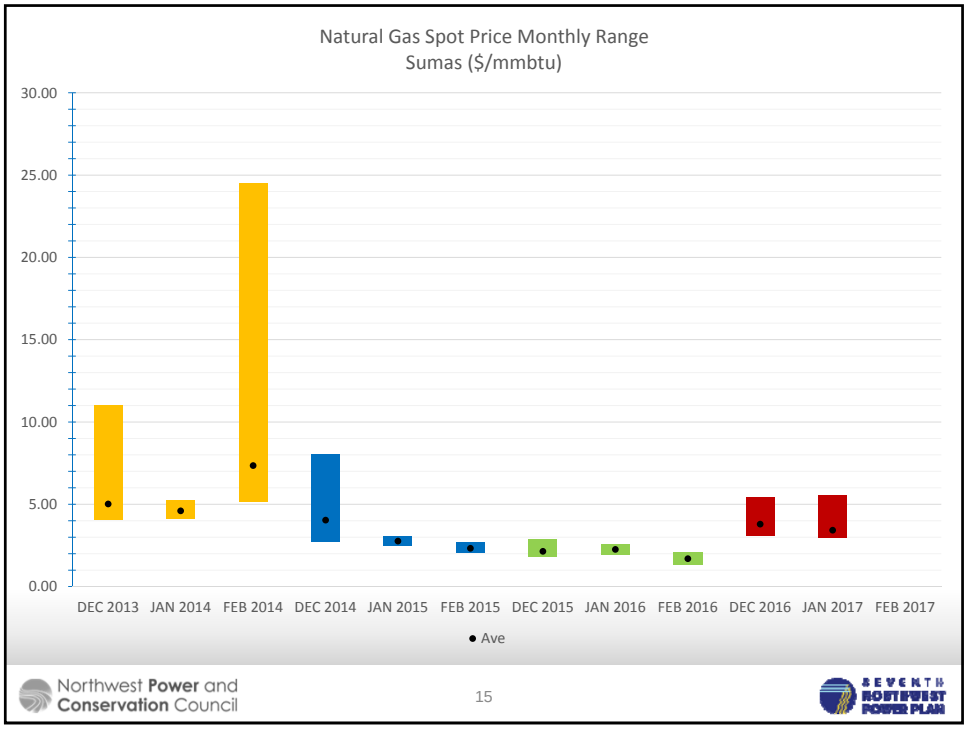
Natural Gas Spot Price Monthly Range
Sumas ($/mmbtu)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
DEC 2013
JAN 2014
FEB 2014
DEC 2014
JAN 2015
FEB 2015
DEC 2015
JAN 2016
FEB 2016
DEC 2016
JAN 2017
FEB 2017
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