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

December 5, 2017

MEMORANDUM

TO: **Power Committee**

FROM: **Massoud Jourabchi**

SUBJECT: **2016 state of economy and electric utilities in the Northwest**

BACKGROUND:

Presenters: Massoud Jourabchi

Summary: Economy is growing. Employment levels have returned and exceeded pre-recessionary levels. Recovery has not been uniform across the region. Electricity sales declined in 2016 but is showing growth in 2017. Utility revenues increasing. Region continues to produce more goods and services using less electricity.

Relevance: Part of ongoing monitoring of the economy and power system in the region

Workplan: Tracking sales trends and markets

Background:

Although regional economy, jobs, output, employment has returned to or surpassed pre-recessionary period, the recovery has not been uniform across the region. With faster recovery for metropolitan areas and slower recovery in the rural communities. A table showing percent change in employment, gross county output and population for each state is included at the end of this cover memo.

Electric utilities had significant drop in their sales in 2016. Drop in sales was present across the sectors. Largest impact on sales was due to warmer weather. Losses in industrial sector, highlighted by closure of one of the two remaining smelters, caused a significant drop in sales. Other factors contributing to lower sales were continued growth in conservation acquisition and installation of distributed generation behind the meter. Revenues of utilities continue to grow but rate of growth has slowed down. Recovery has not been uniform across the region. The following tables, county level percent change in employment (non-farm employment), gross county output (in $2009) and population, for 2016 are compared to 2007. Negative values indicate decline from 2007 levels.

eState	County	Employment	Population	Gross County Product
ID	Ada County	10%	18%	9%
ID	Adams County	-8%	-1%	6%
ID	Bannock County	-1%	6%	-9%
ID	Bear Lake County	-1%	-2%	2%
ID	Benewah County	-4%	-2%	2%
ID	Bingham County	4%	3%	12%
ID	Blaine County	-9%	3%	-5%
ID	Boise County	-8%	-1%	-9%
ID	Bonner County	-7%	4%	1%
ID	Bonneville County	9%	14%	11%
ID	Boundary County	-1%	9%	8%
ID	Butte County	-7%	-12%	-3%
ID	Camas County	-8%	-3%	4%
ID	Canyon County	11%	18%	11%
ID	Caribou County	1%	0%	10%
ID	Cassia County	17%	9%	24%
ID	Clark County	-21%	-9%	-8%
ID	Clearwater County	-8%	-3%	-1%
ID	Custer County	-10%	-3%	-3%
ID	Elmore County	-2%	-2%	-4%
ID	Franklin County	3%	9%	10%
ID	Fremont County	-3%	-1%	2%
ID	Gem County	11%	2%	3%
ID	Gooding County	-2%	1%	6%
ID	Idaho County	-7%	2%	1%
ID	Jefferson County	5%	18%	11%
ID	Jerome County	17%	12%	27%
ID	Kootenai County	8%	16%	7%
ID	Latah County	-1%	8%	4%
ID	Lemhi County	-10%	-1%	-2%
ID	Lewis County	16%	4%	24%
ID	Lincoln County	6%	7%	12%
ID	Madison County	11%	9%	17%
ID	Minidoka County	13%	7%	22%
ID	Nez Perce County	1%	4%	-3%
ID	Oneida County	7%	4%	10%
ID	Owyhee County	11%	1%	1%
ID	Payette County	-4%	3%	4%
ID	Power County	3%	2%	13%
ID	Shoshone County	-2%	-4%	4%

ID	Teton County	-11%	23%	-4%
ID	Twin Falls County	10%	13%	17%
ID	Valley County	-8%	6%	0%
ID	Washington County	-7%	1%	4%

State	County	Employment	Population	Gross County Product
MT	Beaverhead County	10%	4%	21%
MT	Big Horn County	4%	6%	13%
MT	Blaine County	-9%	2%	6%
MT	Broadwater County	3%	13%	20%
MT	Carbon County	-2%	5%	4%
MT	Carter County	7%	-1%	19%
MT	Cascade County	2%	2%	4%
MT	Chouteau County	-4%	0%	13%
MT	Custer County	7%	4%	23%
MT	Daniels County	3%	3%	21%
MT	Dawson County	3%	4%	19%
MT	Deer Lodge County	9%	-2%	24%
MT	Fallon County	7%	13%	16%
MT	Fergus County	3%	0%	18%
MT	Flathead County	2%	11%	12%
MT	Gallatin County	21%	21%	33%
MT	Garfield County	-1%	6%	18%
MT	Glacier County	-5%	4%	11%
MT	Golden Valley County	-2%	-14%	9%
MT	Granite County	12%	11%	21%
MT	Hill County	3%	3%	18%
MT	Jefferson County	-5%	7%	8%
MT	Judith Basin County	14%	-7%	27%
MT	Lake County	4%	5%	15%
MT	Lewis & Clark County	6%	11%	21%
MT	Liberty County	-3%	8%	11%
MT	Lincoln County	-5%	-1%	4%
MT	Madison County	3%	5%	12%
MT	Mccone County	3%	-4%	16%
MT	Meagher County	2%	-4%	15%
MT	Mineral County	-10%	1%	6%
MT	Missoula County	5%	9%	3%
MT	Musselshell County	25%	4%	42%
MT	Park County	0%	2%	15%
MT	Petroleum County	-15%	4%	16%
MT	Phillips County	-3%	-1%	12%
MT	Pondera County	-6%	-1%	3%
MT	Powder River County	24%	-1%	35%
MT	Powell County	4%	-4%	14%
MT	Prairie County	3%	9%	20%
MT	Ravalli County	3%	5%	16%

MT	Richland County	14%	23%	28%
MT	Roosevelt County	11%	11%	26%
MT	Rosebud County	-3%	2%	11%
MT	Sanders County	-13%	1%	1%
MT	Sheridan County	14%	5%	30%
MT	Silver Bow County	4%	3%	17%
MT	Stillwater County	-7%	6%	2%
MT	Sweet Grass County	-14%	-4%	-6%
MT	Teton County	-7%	-1%	7%
MT	Toole County	-5%	0%	8%
MT	Treasure County	-5%	-7%	15%
MT	Valley County	17%	3%	29%
MT	Wheatland County	1%	2%	29%
MT	Wibaux County	8%	8%	26%
MT	Yellowstone County	6%	12%	13%

State	County	Employment	Population	Gross County Product
OR	Baker County	-2%	0%	28%
OR	Benton County	8%	7%	-3%
OR	Clackamas County	5%	11%	22%
OR	Clatsop County	5%	5%	40%
OR	Columbia County	1%	4%	15%
OR	Coos County	-5%	1%	31%
OR	Crook County	-15%	4%	11%
OR	Curry County	-7%	1%	27%
OR	Deschutes County	9%	19%	7%
OR	Douglas County	-5%	1%	29%
OR	Gilliam County	-5%	2%	23%
OR	Grant County	-6%	-1%	18%
OR	Harney County	-5%	0%	13%
OR	Hood River County	10%	9%	55%
OR	Jackson County	1%	9%	-3%
OR	Jefferson County	2%	6%	32%
OR	Josephine County	-1%	5%	-2%
OR	Klamath County	-6%	0%	25%
OR	Lake County	-4%	0%	17%
OR	Lane County	0%	7%	6%
OR	Lincoln County	-3%	5%	33%
OR	Linn County	2%	9%	7%
OR	Malheur County	-2%	-3%	27%
OR	Marion County	6%	10%	3%
OR	Morrow County	36%	2%	99%
OR	Multnomah County	9%	15%	27%
OR	Polk County	5%	13%	-1%
OR	Sherman County	26%	0%	54%
OR	Tillamook County	5%	4%	42%
OR	Umatilla County	2%	3%	36%
OR	Union County	-2%	3%	30%
OR	Wallowa County	1%	1%	26%
OR	Wasco County	9%	7%	43%
OR	Washington County	13%	15%	33%
OR	Wheeler County	5%	-5%	20%
OR	Yamhill County	5%	10%	22%

State	County	Employment	Population	Gross County Product
WA	Adams County	22%	10%	8%
WA	Asotin County	9%	5%	10%
WA	Benton County	16%	19%	11%
WA	Chelan County	11%	9%	11%
WA	Clallam County	1%	6%	-6%
WA	Clark County	12%	14%	29%
WA	Columbia County	-5%	1%	-4%
WA	Cowlitz County	1%	5%	1%
WA	Douglas County	13%	13%	19%
WA	Ferry County	7%	2%	-6%
WA	Franklin County	33%	33%	34%
WA	Garfield County	-7%	2%	-11%
WA	Grant County	14%	13%	7%
WA	Grays Harbor County	-8%	0%	-16%
WA	Island County	2%	5%	-12%
WA	Jefferson County	-5%	6%	-8%
WA	King County	12%	16%	23%
WA	Kitsap County	2%	8%	1%
WA	Kittitas County	7%	15%	-3%
WA	Klickitat County	18%	7%	10%
WA	Lewis County	-1%	4%	-9%
WA	Lincoln County	-3%	-2%	-10%
WA	Mason County	-2%	6%	-9%
WA	Okanogan County	9%	5%	0%
WA	Pacific County	2%	-1%	-5%
WA	Pend Oreille County	-3%	2%	1%
WA	Pierce County	7%	12%	9%
WA	San Juan County	6%	6%	-3%
WA	Skagit County	2%	8%	-10%
WA	Skamania County	-4%	7%	11%
WA	Snohomish County	12%	15%	23%
WA	Spokane County	3%	9%	7%
WA	Stevens County	-1%	3%	5%
WA	Thurston County	10%	16%	8%
WA	Wahkiakum County	-16%	4%	-12%
WA	Walla Walla County	6%	6%	8%
WA	Whatcom County	7%	12%	5%
WA	Whitman County	18%	15%	12%
WA	Yakima County	5%	7%	13%

2016
State of Economy & Electric Utilities in the Northwest

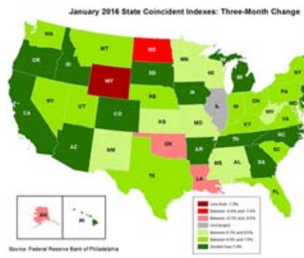
December 2017

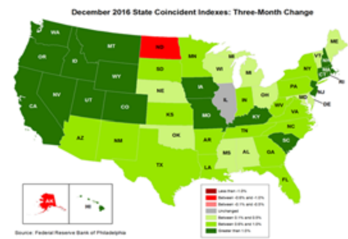
Massoud Jourabchi

In this presentation

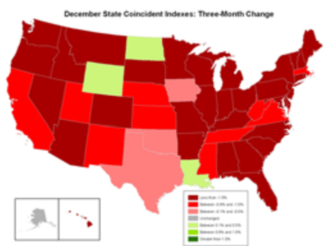
- State of Economy
  - Jobs, output, population and housing
    - Uneven recovery
- State of electric utilities
  - Sales, Revenues, Rates
  - Average and Peak Loads 1995-2016
  - Factors contributing to lower sales
  - Doing more with more electric efficiency
- Quick glance at 2017 sales and weather

Overall economy is improving as can be seen from the state coincident indexes

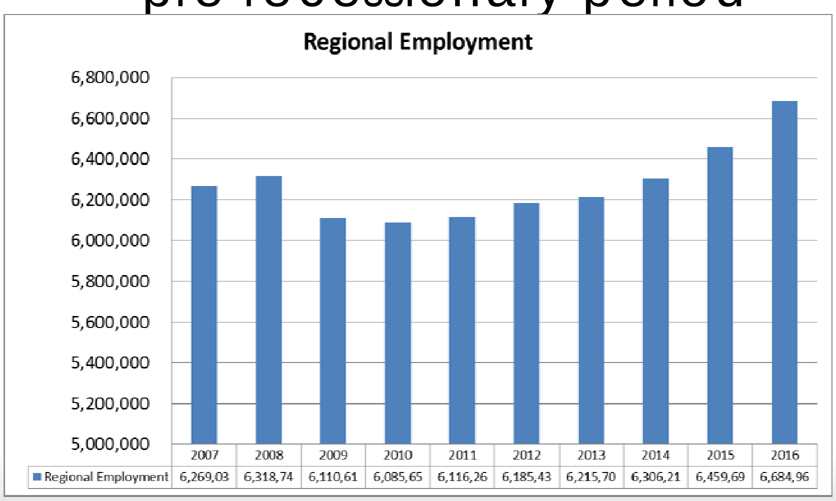




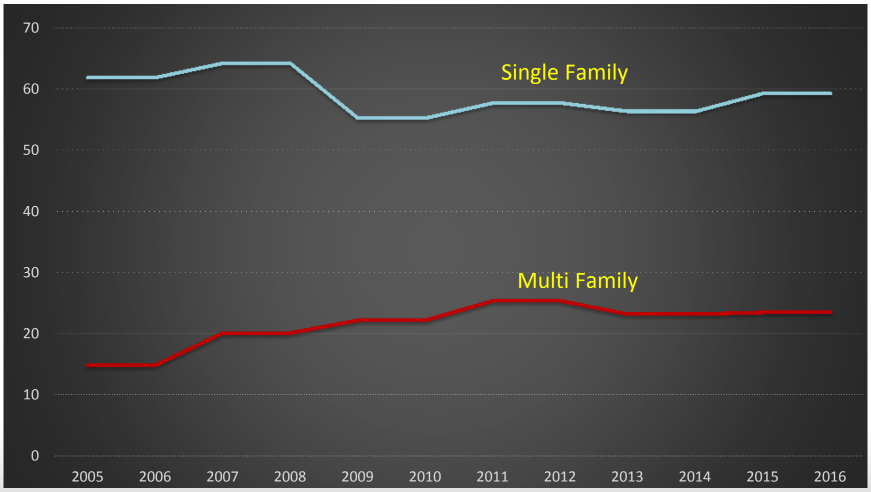
This is what economy looked like back in December 2008



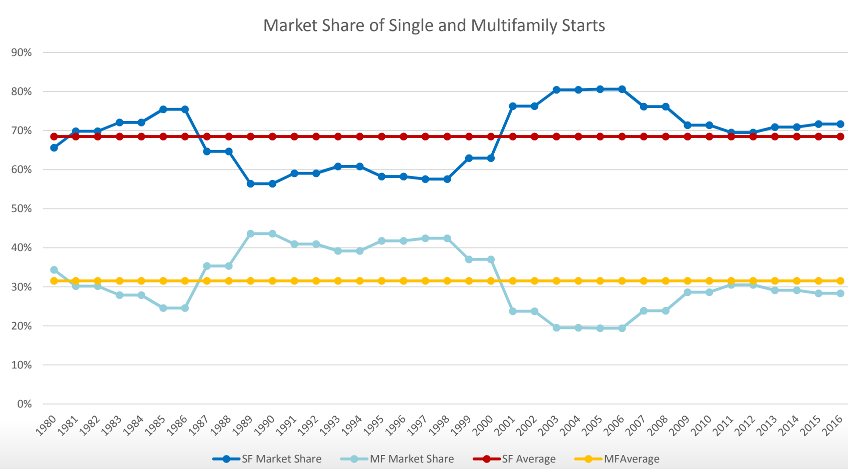
Returning and surpassing pre-recessionary period



Housing Starts (1000s)



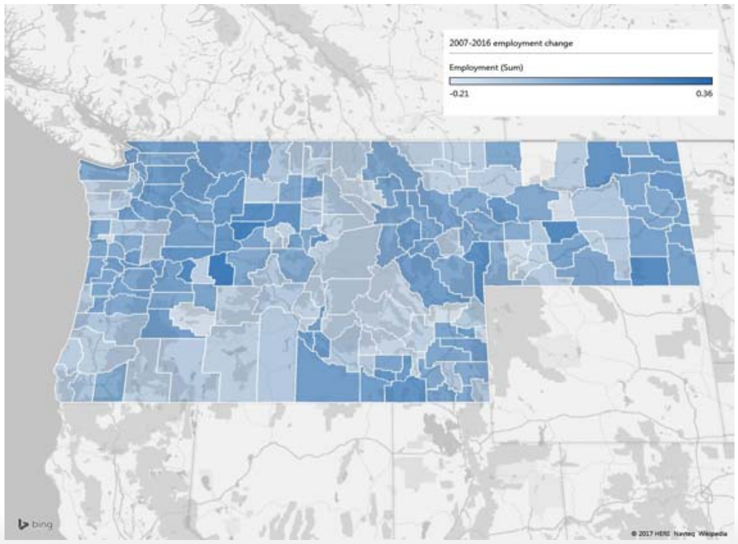
Market Share of Single and Multifamily Construction is returning to historic averages



Economic Recovery has not been uniform across the Region

Percent change in non-farm Employment

2016 compared to 2007



Percent change figures for each county are shown in the cover memo.

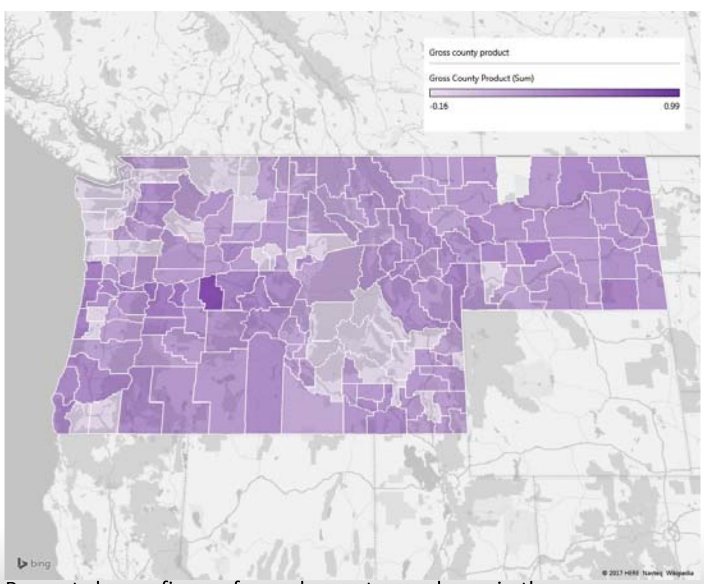
Northwest **Power** and **Conservation** Council

SEVENTH NORTHWEST POWER PLAN

Economic Recovery has not been uniform across the Region

Percent change in Gross County Output $2009

2016 compared to 2007



Percent change figures for each county are shown in the cover memo.

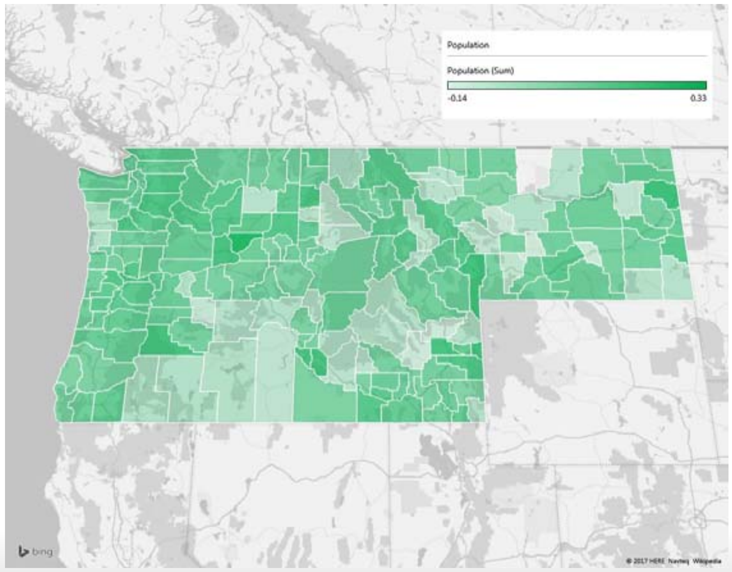
Northwest **Power** and **Conservation** Council

SEVENTH NORTHWEST POWER PLAN

Growth in Population has not been uniform across the Region

Percent change in Population

2016 compared to 2007



Percent change figures for each county are shown in the cover memo.

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

SEVENTH NORTHWEST POWER PLAN

Sales in 2016 Declined

- Even with increased employment, increased number of new home construction, we find 2016 sales were below 2015 levels.
- This was in part due to:
  - Warmer weather
  - Higher conservation acquisition levels
  - Higher installation of behind-the-meter generation.
  - Drop in industrial (DSI) load.

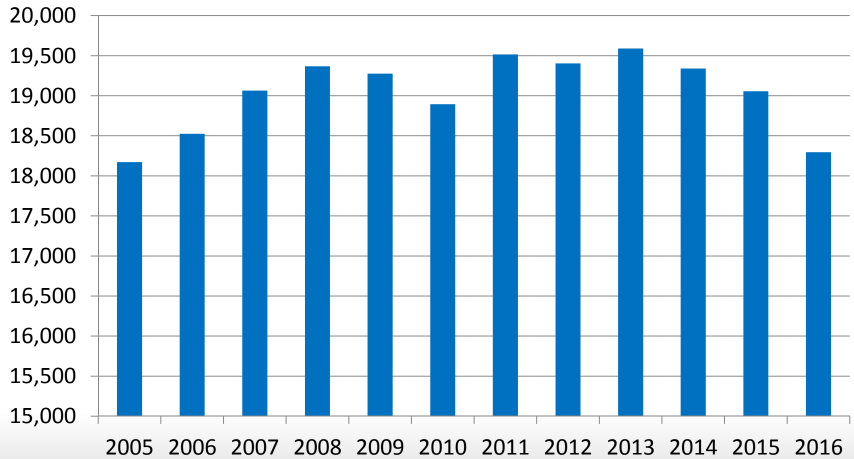
Northwest **Power** and **Conservation** Council

10

SEVENTH NORTHWEST POWER PLAN

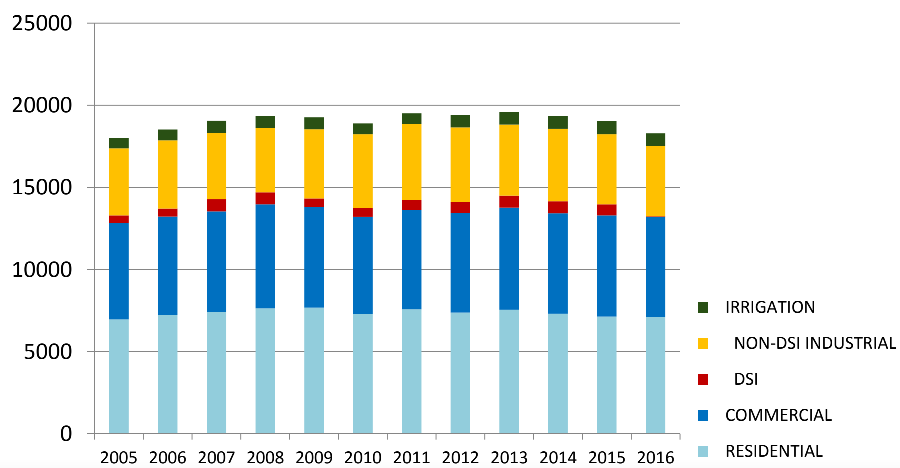
Correction

2016 regional electricity Sales were lower than 2015 by 750 aMW



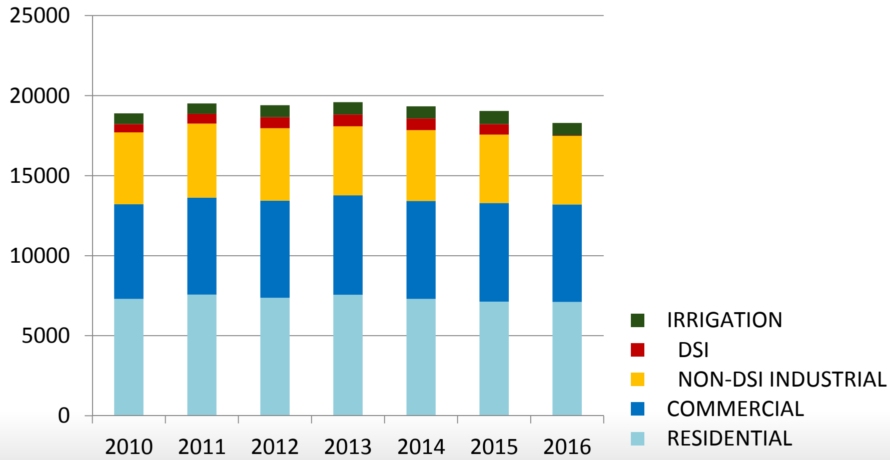
Correction

Historic Sales by class of Customer (aMW)



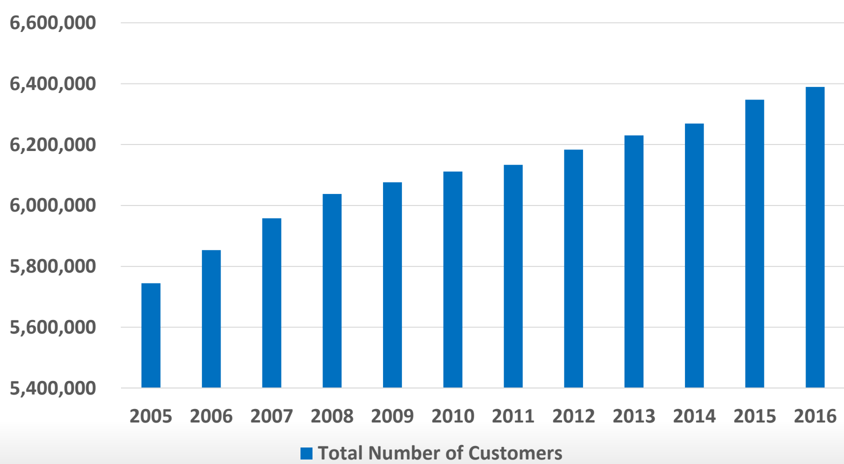
Correction

Historic Sales by class adjusted for weather



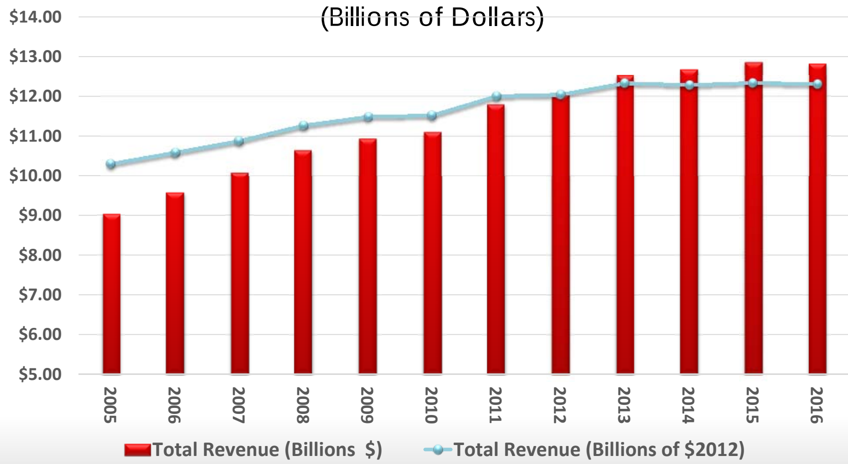
Northwest Power and Conservation Council 13 SEVENTH NORTHWEST POWER PLAN

Number of Electric Customers growing at 1% annually

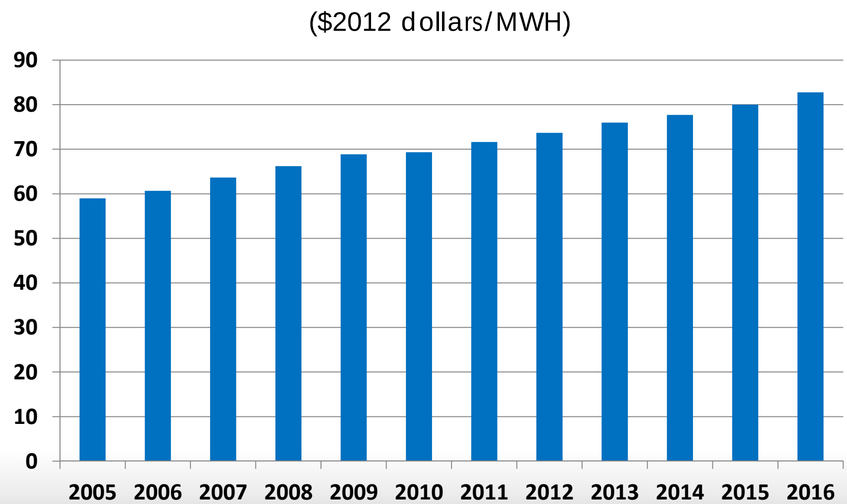


Northwest Power and Conservation Council 14 SEVENTH NORTHWEST POWER PLAN

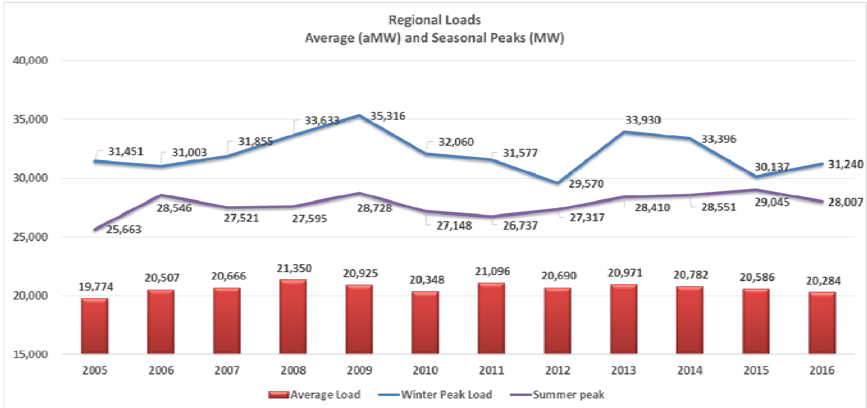
Electric Utility Retail Revenues declined in 2016



Average Regional Revenue per MWH Increased



For the past 12 years regional **loads** have been fairly flat except for Summer peaks

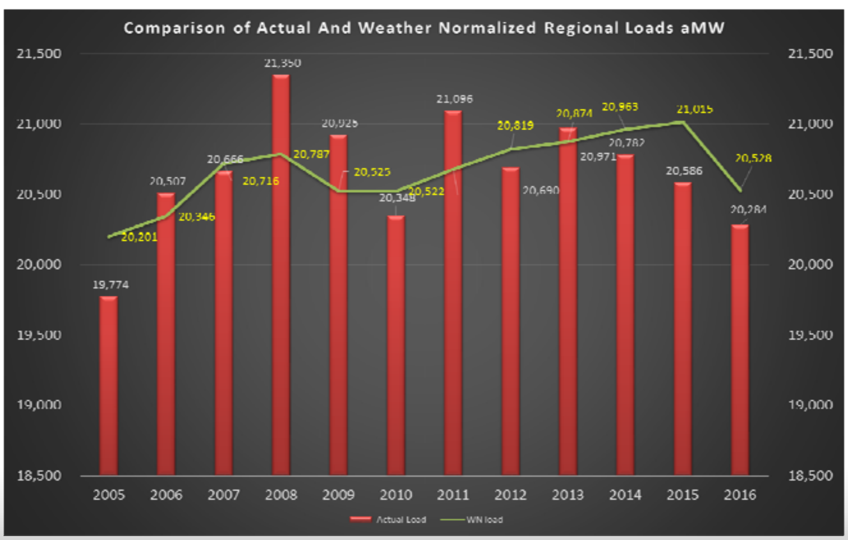


	AAGR 2005-2016
Winter Peak Load	-0.4%
Average Load	0.4%
Summer peak	1.2%

Northwest Power and Conservation Council

SEVENTH NORTHWEST POWER PLAN

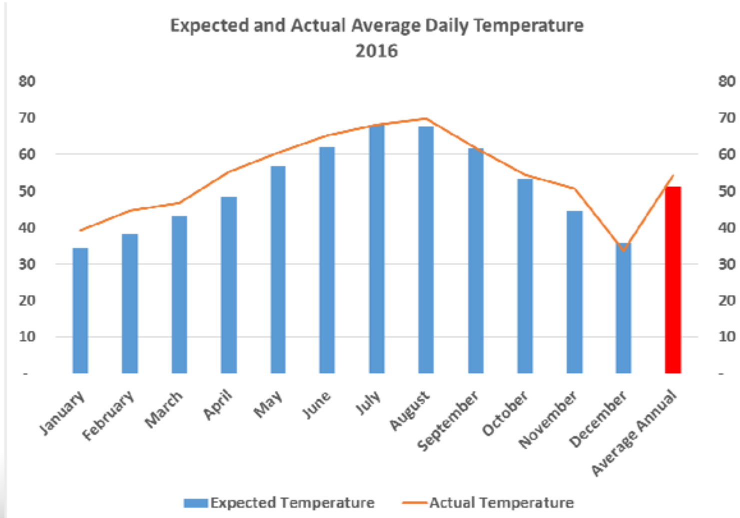
Load in 2016 would have been higher under normal weather



Northwest Power and Conservation Council

SEVENTH NORTHWEST POWER PLAN

2016 was 6% warmer than Average

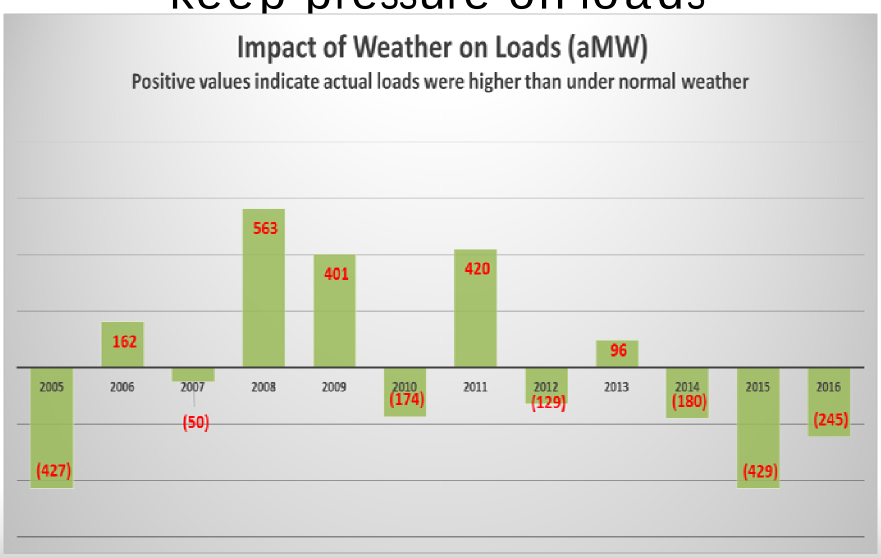


Northwest Power and Conservation Council

19

SEVENTH NORTHWEST POWER PLAN

Warmer temperatures continues to keep pressure on loads



Northwest Power and Conservation Council

20

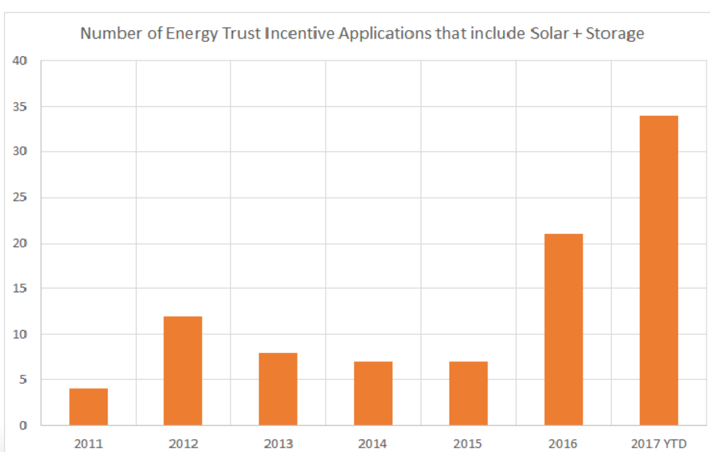
SEVENTH NORTHWEST POWER PLAN

Another factor keeping sales volumes down has been behind-the-meter solar installations

	2015	2016
number of solar installations	23,374	28,202
capacity installed Cumulative (DC MW)	187	214
Energy sold back to the utility MWH	16,916	6,529

- **Number of installations increased by 20%**
- **Capacity expended by 15%**
- **More energy was used on-site.**
- **Energy sold back was dropped by 72%**

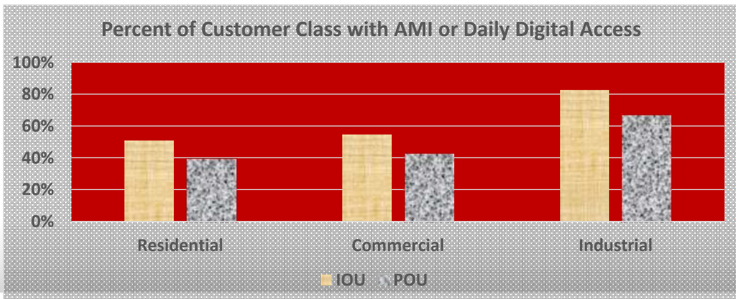
One reason behind lower energy sold back to utility could be incorporation of batteries



As of mid year 2017

Advance Metering Continued to Expand but faster installation is needed

Regional Picture as of 2016	Residential	Commercial	Industrial	Total
Total Number of meters	5,575,636	739,945	84,772	6,400,444
With AMR	35%	32%	20%	34%
With AMI	32%	34%	42%	33%
With Daily digital Access	14%	15%	34%	14%
With Direct Control	0.5%	0.01%	3%	0.48%
Energy Served by advanced metering (aMW)	2,335	2,017	1,874	6,228



Time-of-Use Rate Schedules in the Region

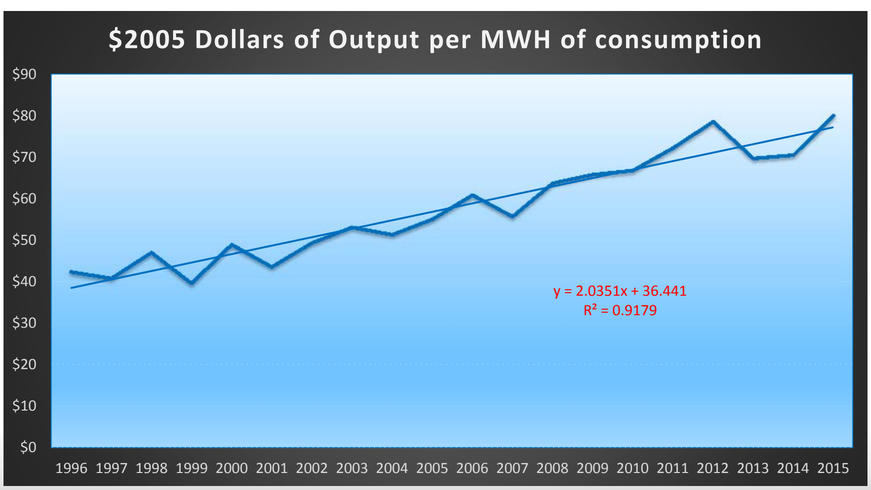
- There are 15 TOU rate schedules in the region.
- These schedules were focused mainly industrial customer, but residential and commercial TOU rates also available.
- Idaho power, PacifiCorp, PGE had the largest number of customers on TOU.
- In total 4% of industrial customers and 0.5% of commercial and 0.7% of residential customers were on TOU rates.
- Majority of these were voluntary opt-in rates.

	Residential	Commercial	Industrial	Transportation	Total	percent of total customers
2015	17,346	1,612	1,933	2	20,893	0.33%
2016	16,903	2,958	2,152	2	22,015	0.34%

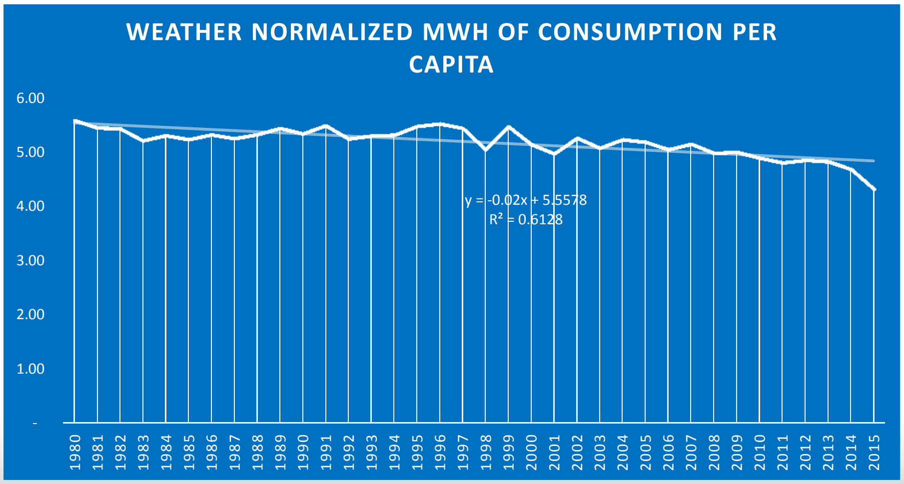
Region continues to Do More with Less electricity

- Using weather normalized electricity sales
  - Total regional product per MWH of electricity consumption
  - Residential sector consumption per household
  - Commercial sector output per MWH of consumption.
  - Manufacturing sector output per MWH of consumption.

Total Regional Economy

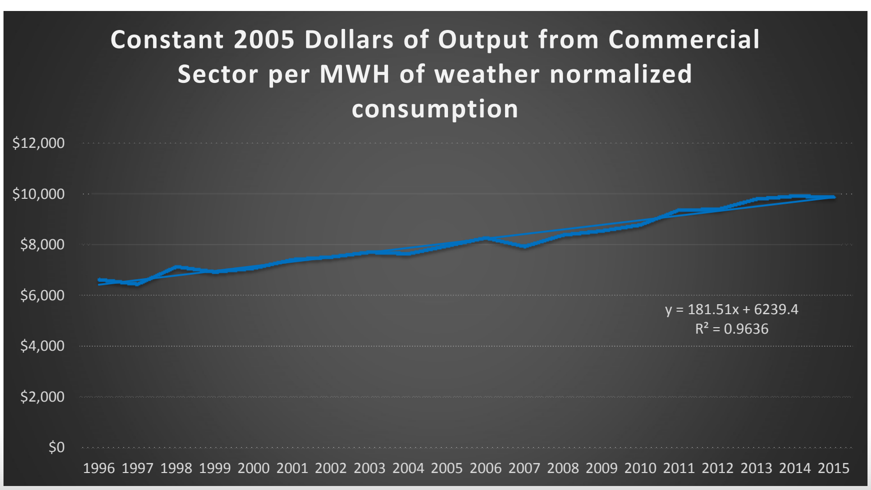


NW Residential Sector



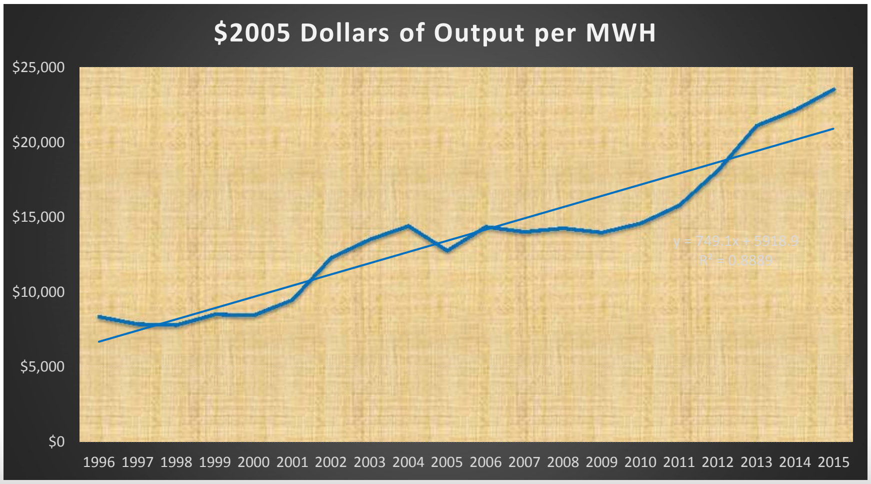
Northwest Power and Conservation Council 27 SEVENTH NORTHWEST POWER PLAN

Commercial Sector



Northwest Power and Conservation Council 28 SEVENTH NORTHWEST POWER PLAN

Non-DSI Manufacturing Sector



2017 Sales

Preliminary reports shows that compared to 2016 in the first 8 months of 2017*

- Sales were up 4%
- Residential sector increased by about 9%
- Commercial sector increased by 3%
- Industrial sector sales were flat.
- Revenues collected were up 6%

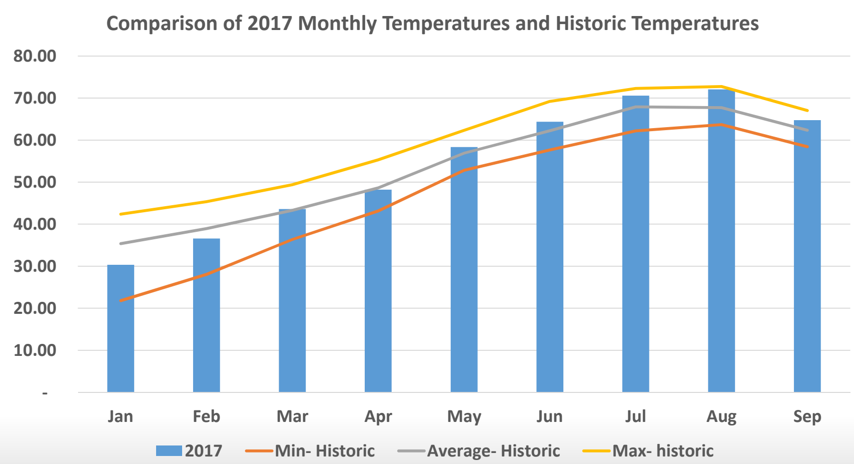
- This is in part due to impact of weather

*Preliminary survey data from monthly utility filing with EIA.
Not a census, subject to change. Final numbers not available until late 2018

2017 Started with a week-long freeze

- Winter of 2017 was among the top 5 coldest winters experienced in the region (1929, 1937, 1949, 1950, 1985)
- Average regional temperatures dropped to 19.6 degrees on January 6th 2017
- In the past 90 years region had experienced only 190 days colder than January 6th.
- Summer of 2017 was warmest in the past 90 years except for 2015.

Northwest Power and Conservation Council 31 SEVENTH NORTHWEST POWER PLAN



Northwest Power and Conservation Council 32 SEVENTH NORTHWEST POWER PLAN

Cold January 2017 pushed up Residential Sales by almost 17%

Year over Year Change in Sales in the 4 States (January Sales)			
	Residential	Commercial	Industrial
2015	-7.8%	-2.5%	1.0%
2016	3.8%	2.3%	-11.2%
2017*	16.6%	6.0%	-1.6%

*- Not finalized- Subject to change

Year over Year Change in Sales in the 4 States (Comparison for the first 6 months of the year)			
	Residential	Commercial	Industrial
2015	-7.4%	-0.4%	-0.1%
2016	2.2%	0.6%	-10.3%
2017*	9.7%	2.9%	-0.2%

Summary

- Economy is continuing its growth
- Employment levels have returned and exceeded pre-recessionary levels.
- Recovery has been uneven
- Electricity sales declined in 2016 but seem to be stronger in 2017.
- Weather, conservation and behind-the-meter generation help in keeping electricity sales low.
- Utility retail revenues collected continue to increase.
- Faster pace in AMI installations needed.
- Region continues to produce more goods and services using less electricity.