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

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April 4, 2023

MEMORANDUM

TO: Council Members

FROM: Massoud Jourabchi, Manager Economic Analysis

SUBJECT: State of Electric Utilities 2020-2022

BACKGROUND:

Presenter: Massoud Jourabchi

Summary:

Staff will provide an update on the state of electric utilities over the past couple of years. Highlights from this report include:

- Regional economy continues to improve, growing at average annual rate of 3.5% (2011-2021)
- Regional employment surpassed pre-pandemic levels
- Electric sales continue to be flat. Declined in 2020 about 500 aMW and increased in 2021 by about 700 aMW from previous year
- Regional electricity bills continue to be below national average. Increased by \$4 dollars in 2021.
- Electric utilities collected \$15 billion dollars, in 2021
- Winters and Summers temperatures continue to drive peak loads.
- Region continues to do more with less electricity

Relevance: The Council must develop a long-term load forecast as part of a power plan and develops annual short-term hourly load forecast to support other

studies. Continued monitoring of the economy and energy markets in the region are important for supporting load forecasting efforts.

Workplan: Preparation of Tools and Data for the Ninth Power Plan

State of Regional Economy & Electric Utilities In 2020-2022

Massoud Jourabchi
April 2023

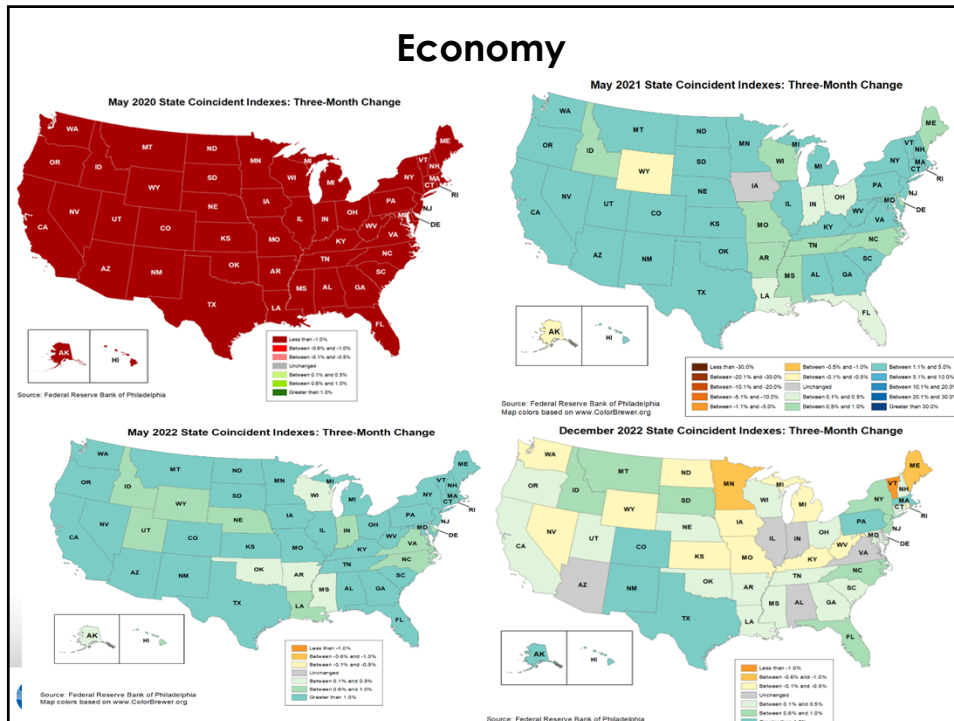
In this presentation

- Determinants of Demand for Energy
- Snapshots of Regional Economic Conditions
 - Economic output
 - Employment
- Temperature Conditions
 - Summer
 - Winter
- Demand for Electricity Energy and Peak Loads
- Electric Utilities Revenues and Consumer Bills
- Doing more with less

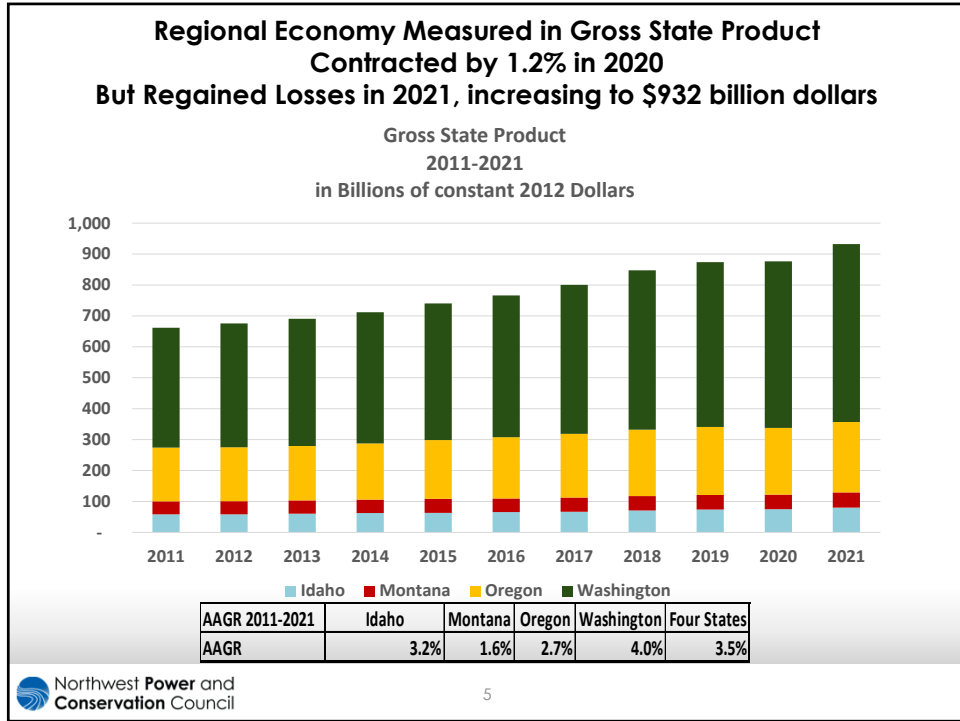
Determinants of Demand For Energy

- Demand for Energy is Driven by demand for goods and services at homes, buildings, industries and transportation.
- Factors impacting demand for Electricity are
 - Long-term Trends
 - Demographic Conditions
 - Economic Conditions
 - Inter-fuel Competition
 - Building Codes and Appliance Standards
 - Climate (weather)
 - State and Federal Policies on electrification of transportation
 - Short-term Trends Impacting Peaks
 - Change in seasonal, daily and hourly temperatures

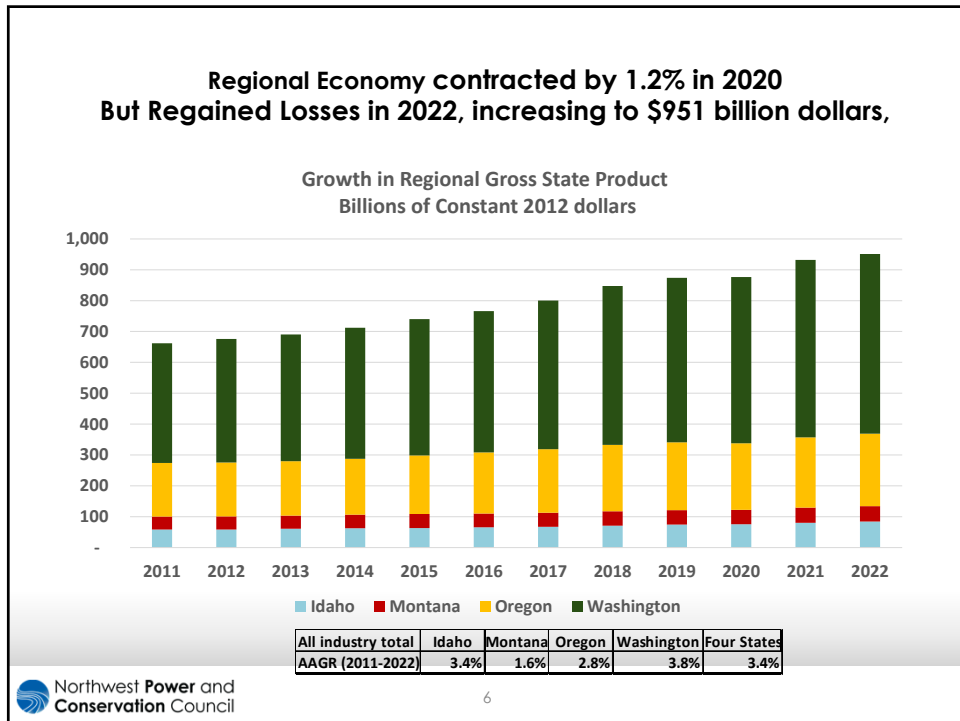
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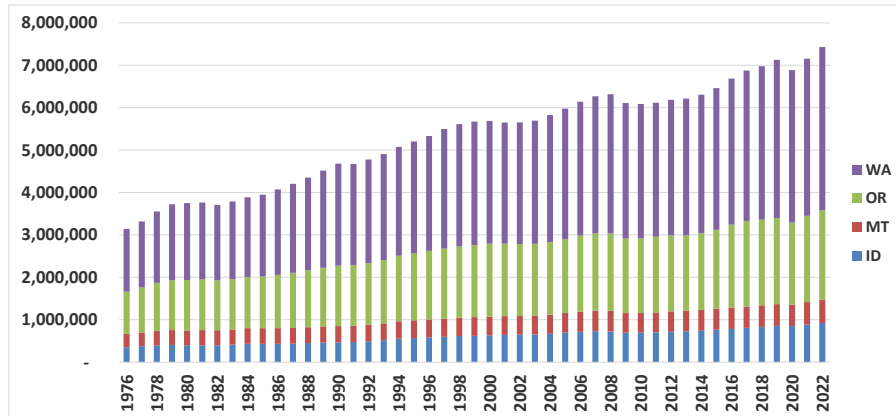


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**Regional Employment that was expanding in 2019,
Declined by almost 300,000 Jobs by the end of 2020
but in 2021 and 2022 more than 540,000 Jobs were added**



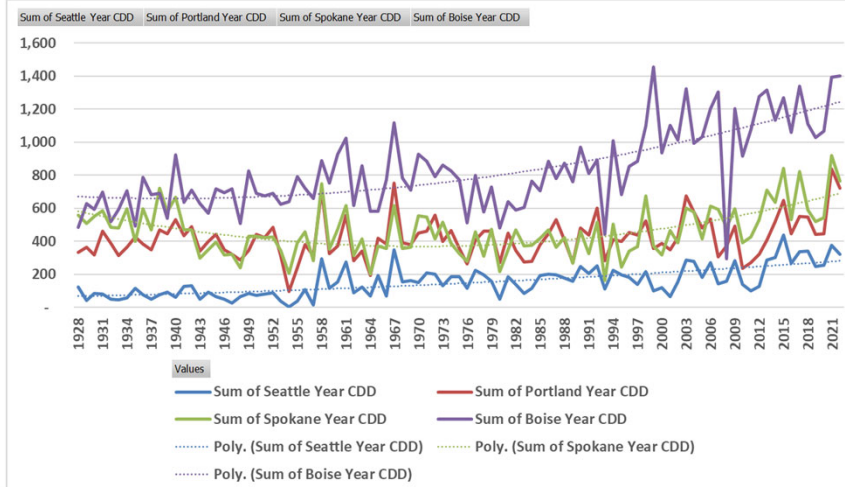
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Impact of Climatic Events and day-to-day changes in temperature

- Fires in the West and Rain in the East
- Billion-dollar weather and climate disasters
- Increased recognition of need for climate risk measurement by insurance and financial firms.
- Climate changes also impact day-to-day patterns of temperatures.
- Heating degree days (HDD) and Cooling Degree Days (CDD) approximate change in heat and cooling requirement.
- Heating and cooling requirements that have traditionally represented about 30% of total average load is changing its seasonal and diurnal patterns with changes in peak loads.

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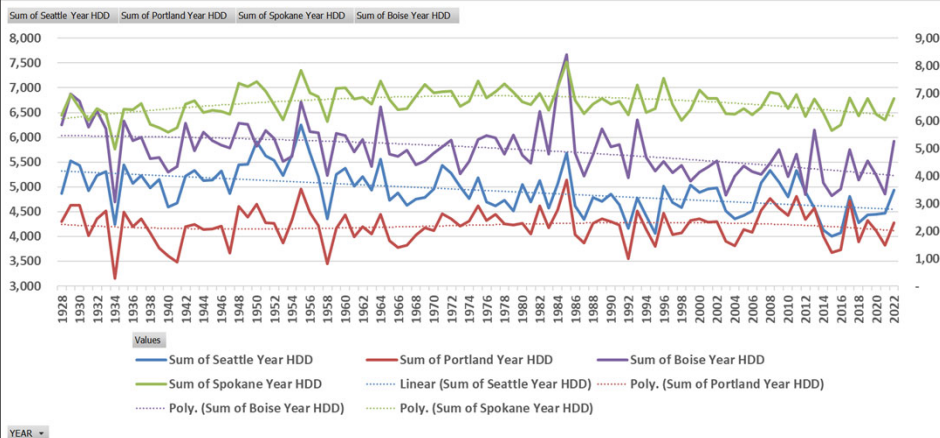
Trends in Cooling Requirement show sharp increase



Annual Rate of Change in Cooling req.	Seattle	Portland	Spokane	Boise
1993-2022	3.67%	3.29%	5.52%	4.07%
1928-1993	0.12%	0.26%	1.99%	0.15%

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Trends in Heating Requirements show slower decline



Annual Rate of Change in Heating req.	Seattle	Portland	Spokane	Boise
1993-2022	0.12%	-0.19%	-0.24%	-0.24%
1928-1993	0.03%	-0.08%	-0.26%	-0.02%

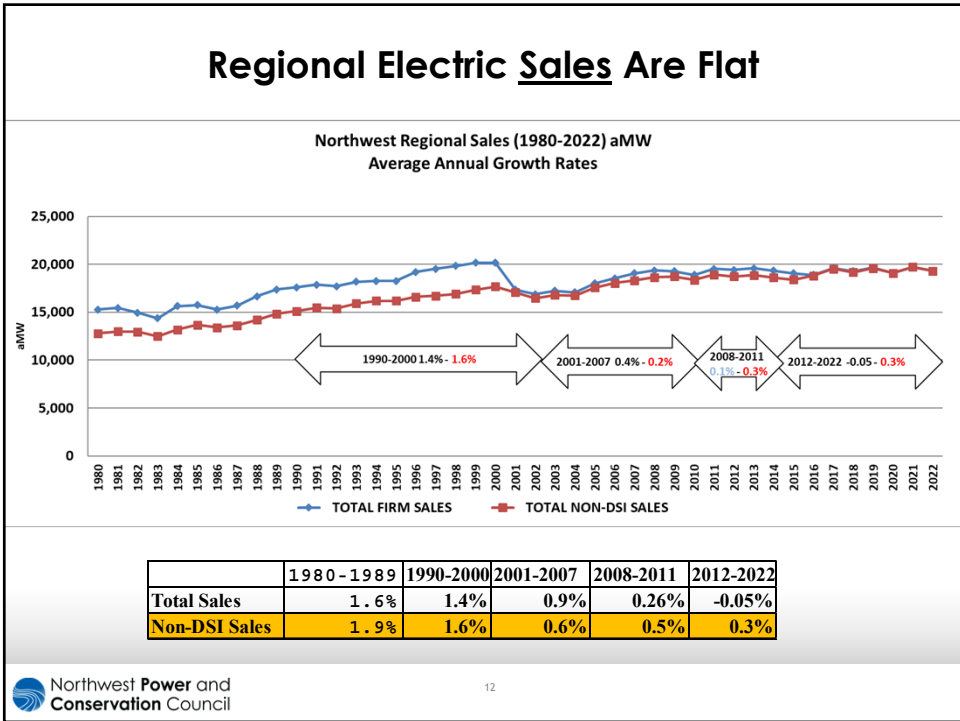
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Regional Electricity Sales, Bills and Loads

Northwest Power and Conservation Council

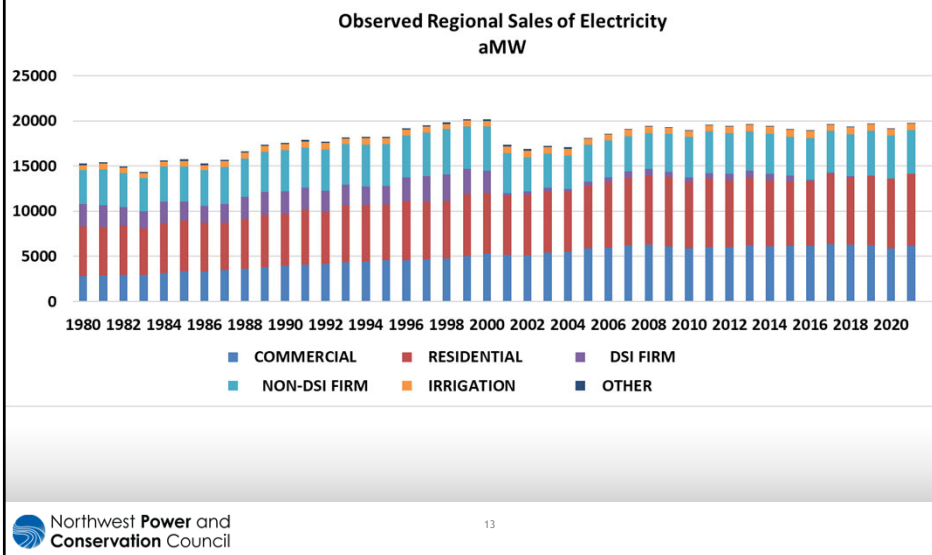
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Regional Electricity Sales Have been stable at around 20,000 aMW



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2021 Regional Sales were slightly higher than 2019

All Utilities	2019	2020	2021
COMMERCIAL	6,254	5,920	6,190
RESIDENTIAL	7,620	7,699	7,972
INDUSTRIAL FIRM	5,043	4,718	4,809
DSI FIRM	60	11	11
NON-DSI FIRM	4,983	4,707	4,798
IRRIGATION *	700	745	745
Transportation	25	14	15
TOTAL FIRM SALES	19,642	19,096	19,729

*- Irrigation data for 2021 was not updated and are preliminary

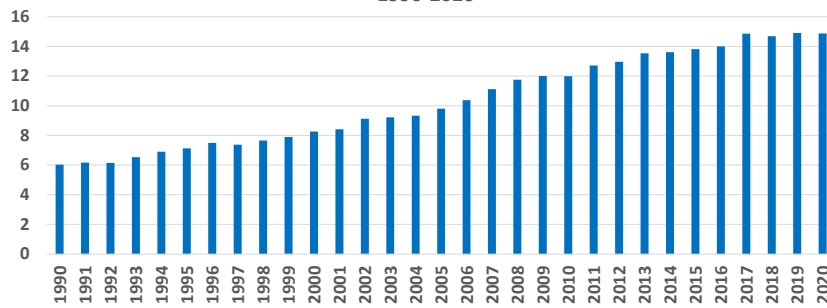
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Electric Revenues and Rates

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Over the past 30 years total of \$320 billion dollars was collected from electric Sales

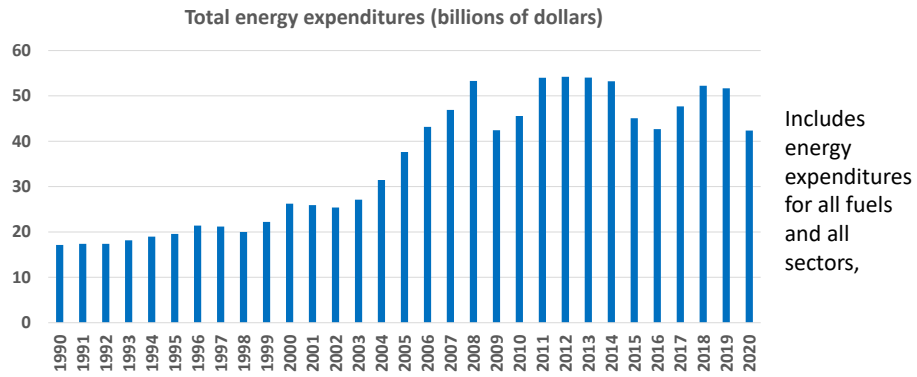
NW Utility Revenue from Sales of Electricity
(Billions of Dollars)
1990-2020



Source: Council analysis of State Energy Data System (SEDS)

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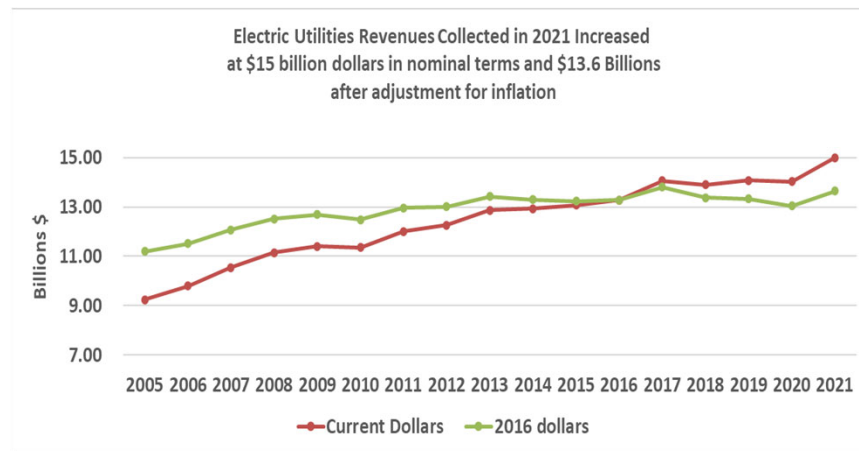
**In the NW
Cumulatively over the past 30 years total of
\$1.1 Trillion dollars was spent in all forms of
energy**



Source: Council analysis of State Energy Data System (SEDS)

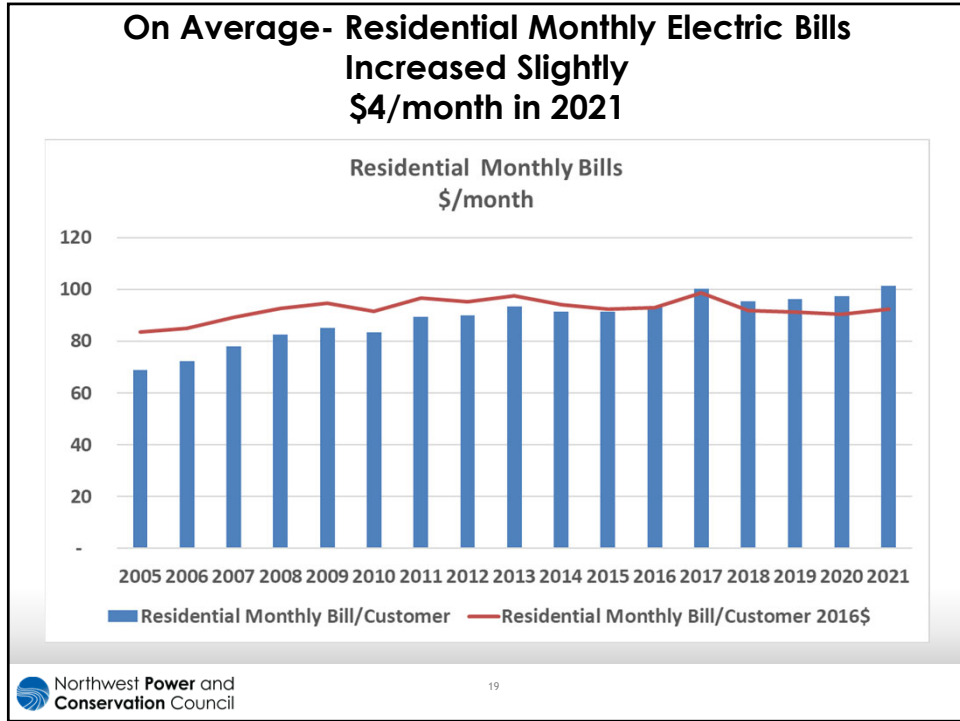
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**Since 2005 Electric Utilities Revenues have increased at annual Rate of 3%
After Adjustment for inflation, growth rate has been 1.2% per year**

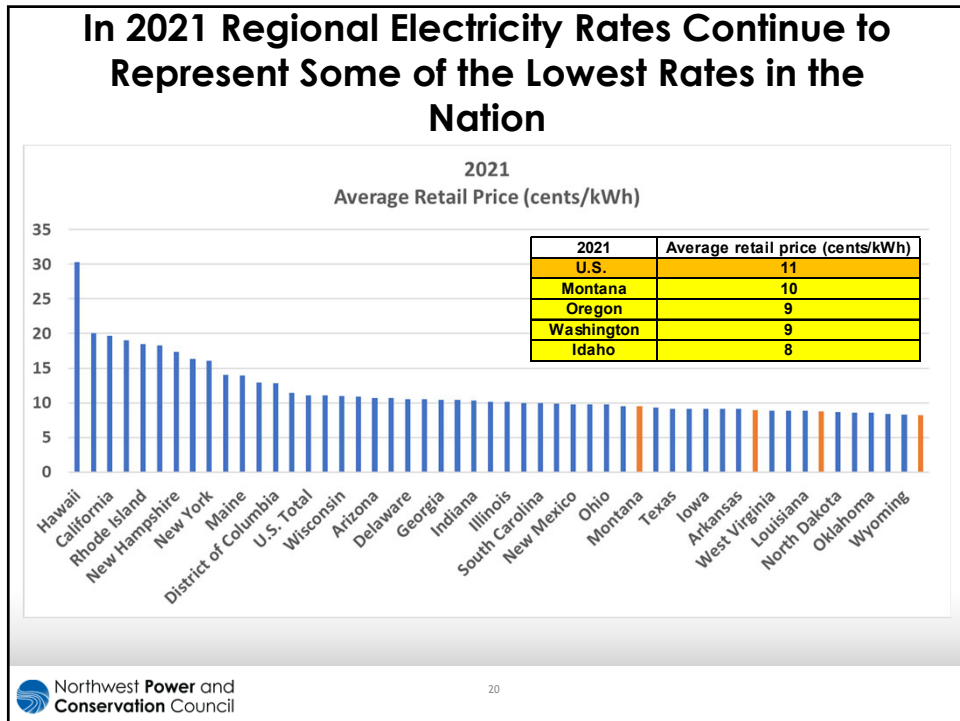


Revenue (Billions \$)	2005-2021 AAGR
Current Dollars	3.0%
2016 dollars	1.2%

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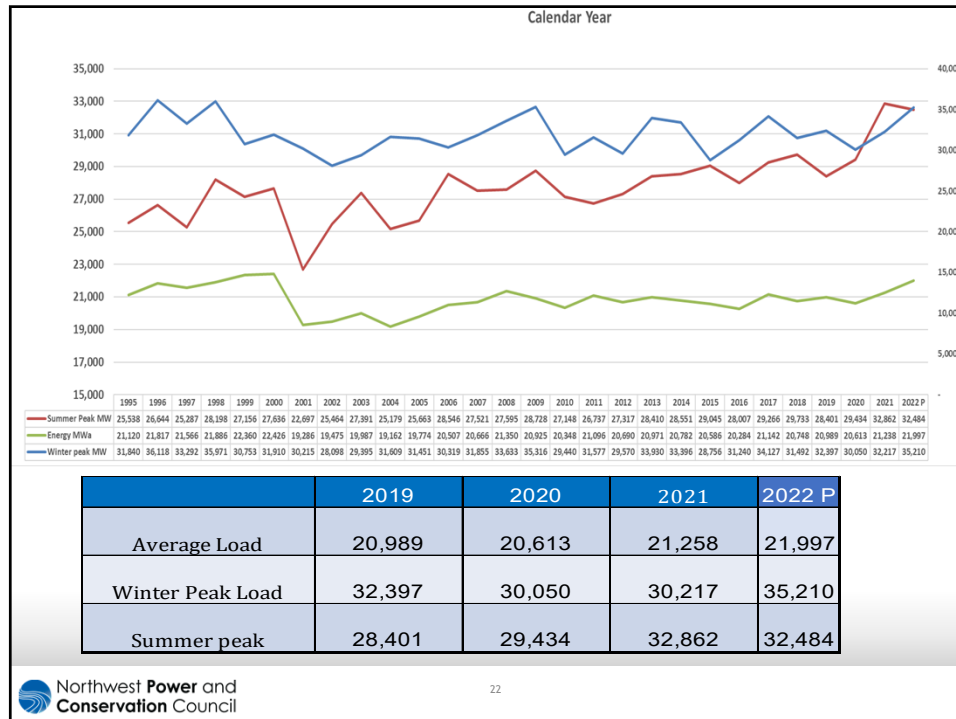


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Regional Loads

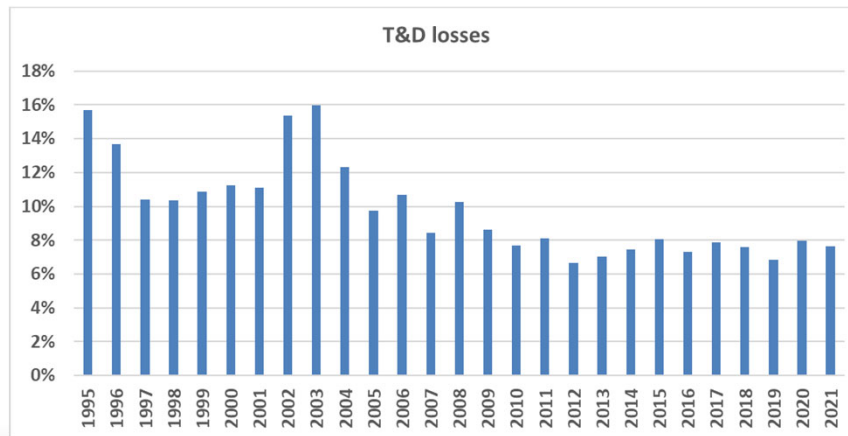
- Average annual regional loads have been stable since collapse of DSI and resource base industries
- Peak loads followed climate trends and weather patterns.
 - Summer peaks increasing
 - Winter peaks stable to declining

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T&D losses increased from 7% In 2019 to 8% in 2020 then in 2021 declined to 7.4%



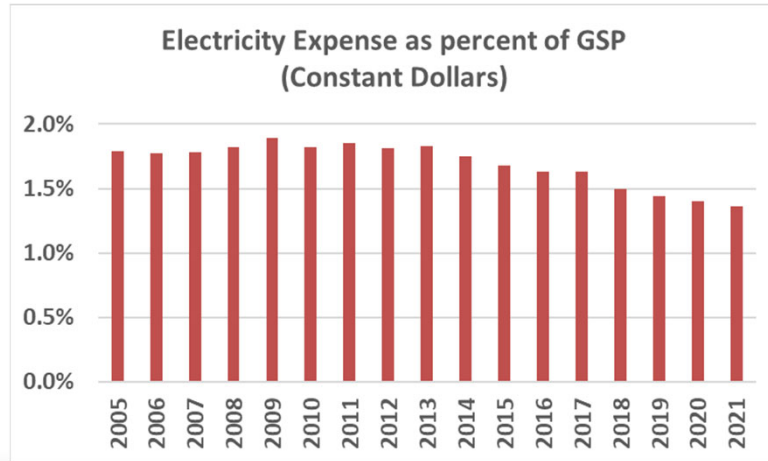
Measured as percent difference between Loads and Sales

Doing More with Less

Through investment in Energy Efficiency consumers have been able to reduce their energy bills while increasing economic productivity.

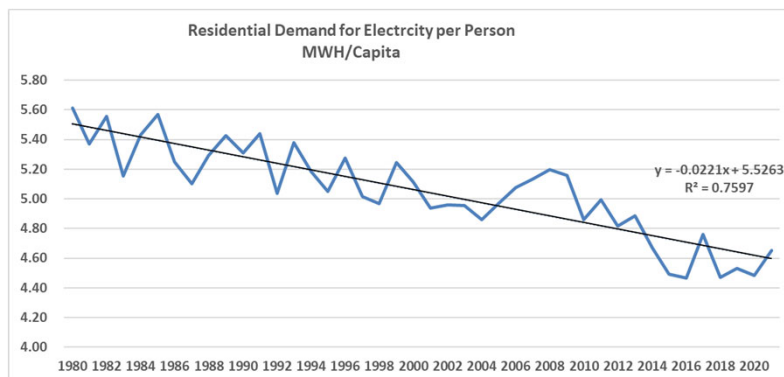
Structural changes in industries in the Northwest moved the region from relying on low value added, high energy consuming industries (wood, paper, pulp, aluminum,...) to higher value and lower energy consuming industries (chip manufacturing, professional services such as software production)

Region continues to produce goods and services with increased efficiency



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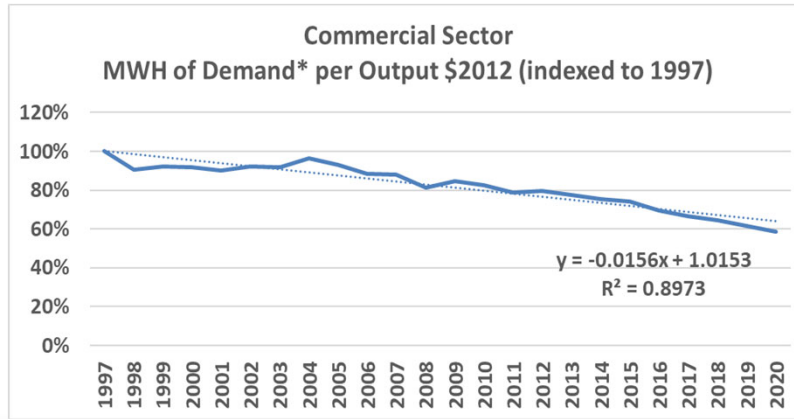
Electricity Use Per Capita Has Declined by ~ 20% since 1985



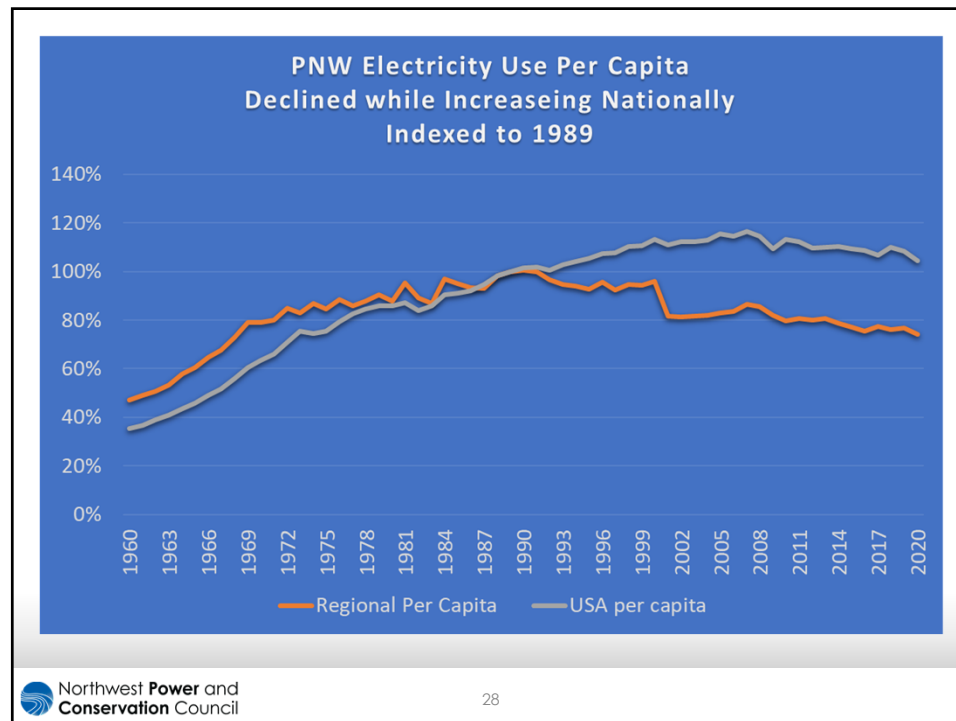
	Per capita Usage MWH
1985	5.57
2000	5.12
2010	4.86
2020	4.48
2021	4.65

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Commercial Sector Continue Improving Efficiency of Electricity Use



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In Summary

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- Regional employment surpassed pre-pandemic levels
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- Regional electricity bills continue to be below national average. Increased by \$4 dollars in 2021.
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Questions