State of Electric Utilities in the Northwest

with a view to the future

Panel 6

Electric Utilities and Decarbonization

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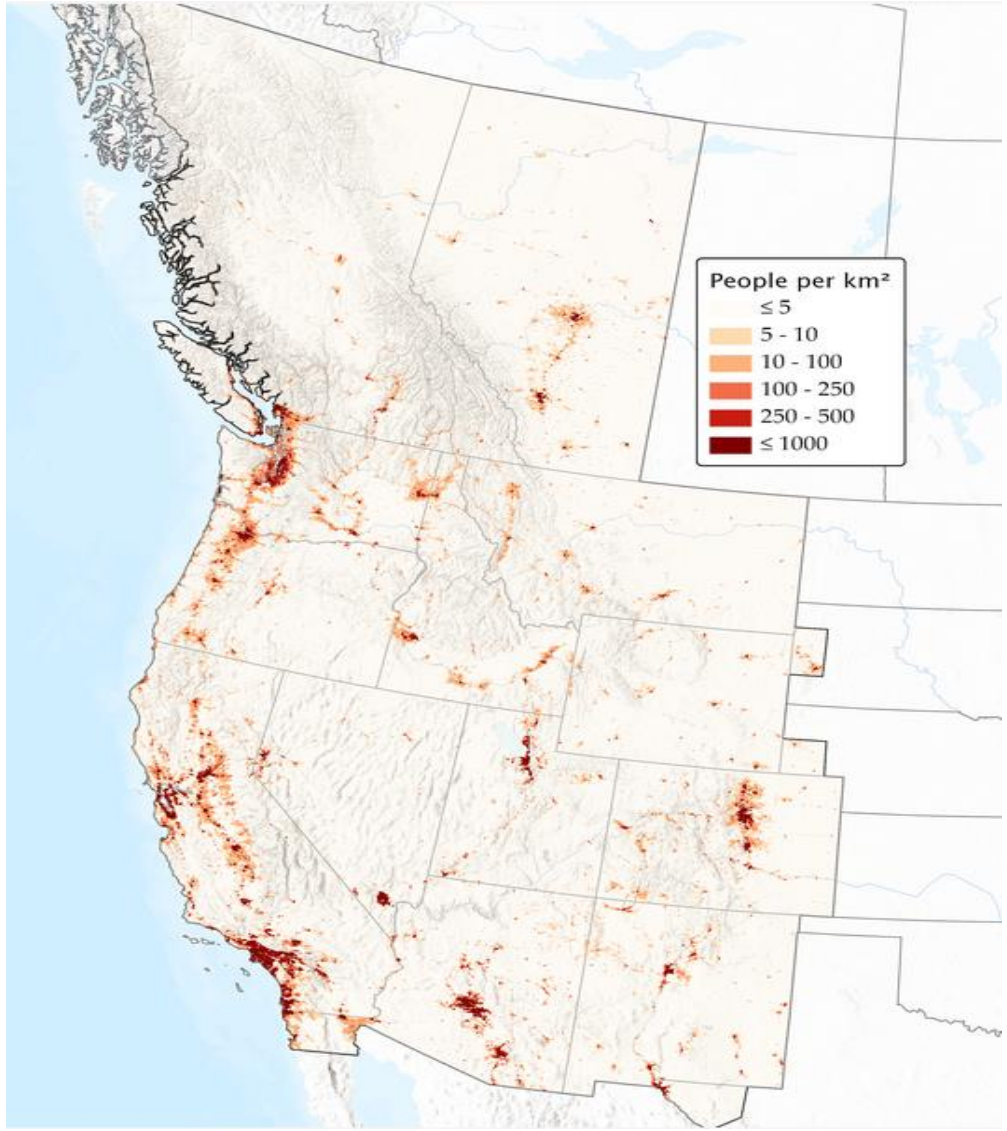
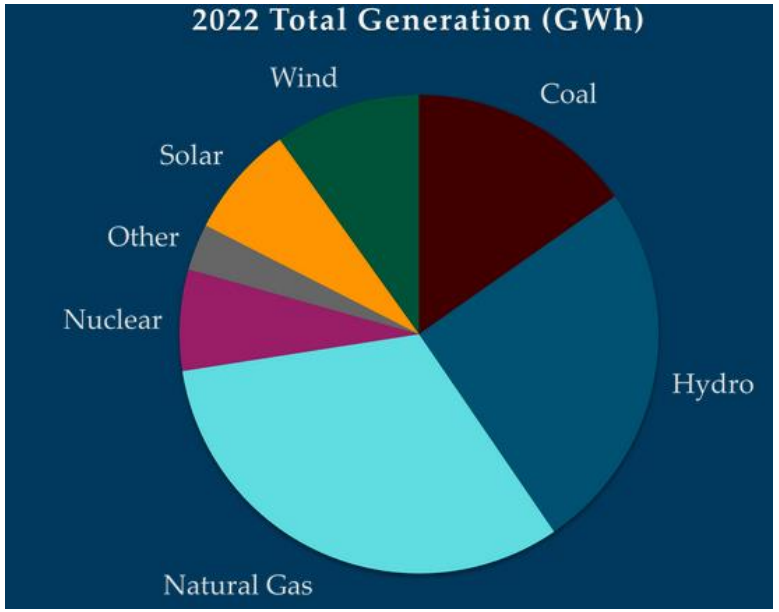
- **Background**
  - **Western Electric Coordinating Council (WECC) and Balancing Authorities**
  - **Northwest Utilities (IOUS and POUS)**
- **Factors Impacting Supply and Demand for Electricity**
  1. **Long-term trends (population, economy, housing mix, technology, inter-fuel competition, climate)**
  2. **Short-term trends (temperature, precipitation)**
  3. **Trends in Energy and Peaks with & without weather impacts**
- **January 2024 Freeze**
- **Forecast of loads under climate mitigation and adaptation policies**

WECC's Goal is to:
Ensure a reliable bulk electric system in Western Interconnection Area



- The Western Interconnection serves a population of over 80 million people.
- Over 448 registered entities providing power in 37 Balancing Authorities
- Demand of over 918 million MWH in 2022.
- Summer Peak demand over 180,000 MW, Winter Peak 139,000 MW
- 295,000 MW of capacity (~ 23% of US Capacity)
- 870,000 GWH of Generation (Dominated by Natural Gas in the Southwest and Hydro in the Northwest).



Electric Utilities in the Northwest

- **8 Investor Owned Utilities**
- **151 Publicly Owned Utilities**
- **12 Power marketers**
- **3 Behind-the-meter entities**

Average Annual Growth Rate (Northwestern States)	Electricity Demand	Retail Price
1970-1981	4.7%	10.4%
1982-2000	1.7%	2.4%
2000-2021	0.8%	2.4%

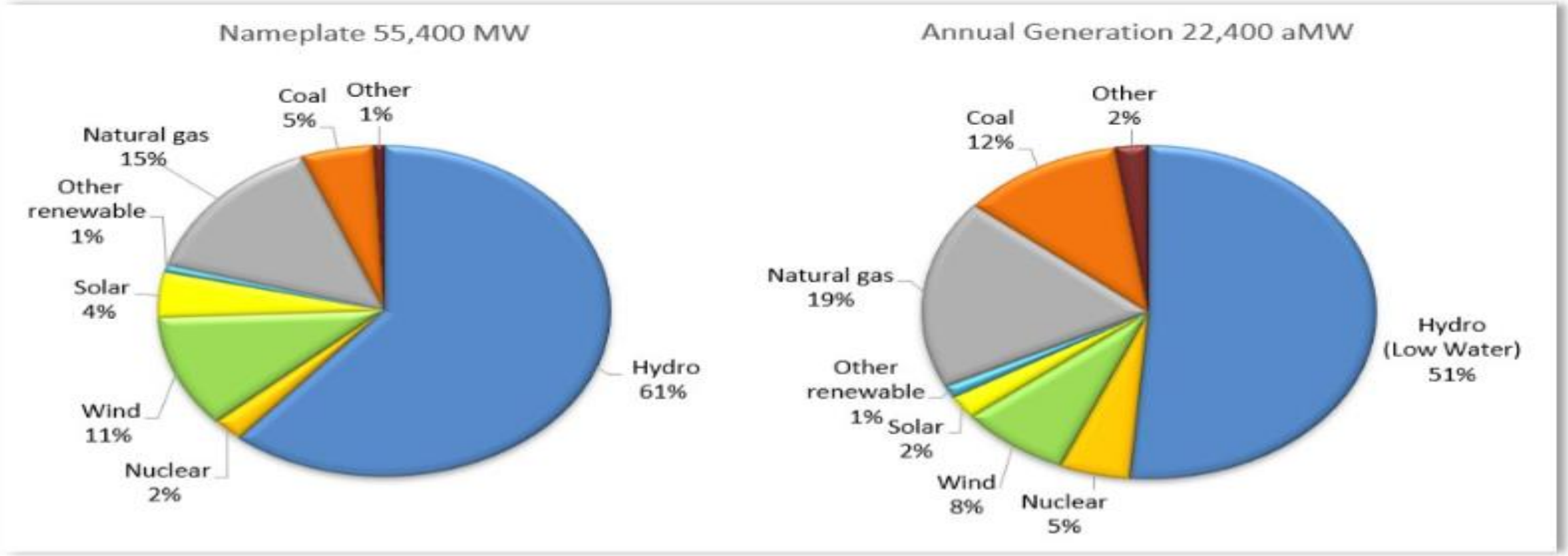
- **In 2022 electric utilities in the NW served 7.2 million residential, commercial and industrial customers**
- **Retail revenue $17 billion dollar**

- **Annually NW power sector has emitted about 40 MMT CO2 eq. , roughly ~2% of National level emissions.**

Load	Winter Peak (MW)	Summer Peak (MW)	Energy (aMW)
2022	35,079	32,036	21,950
2023	33,649	32,414	21,598

Regional Supply Is Dominated by Hydro

Figure 3: Northwest Utilities Generating Resources 2023



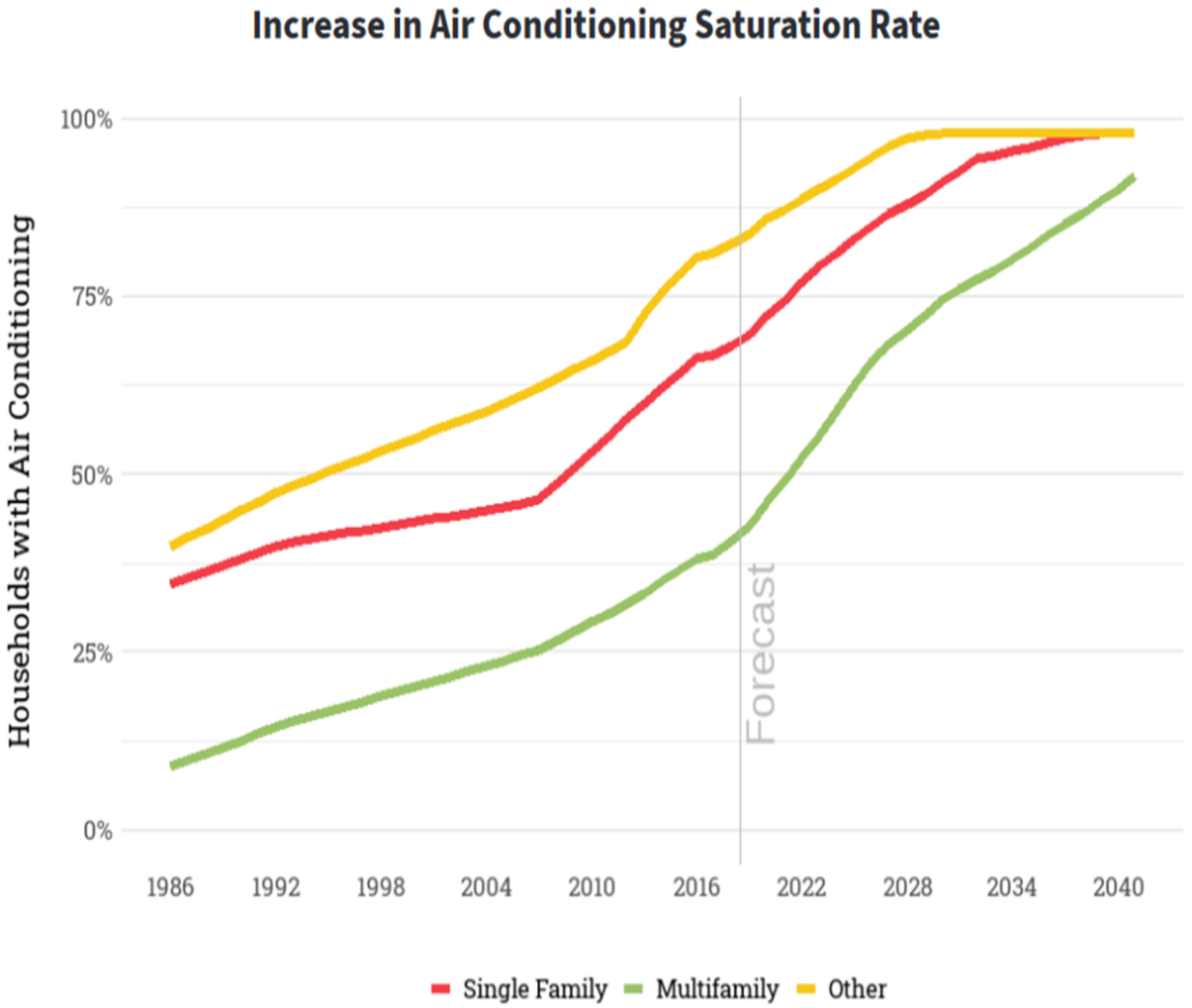
Long-term Factors

Average Annual Growth Rates	1997-2022
Population	1.24%
GDP (constant 2012 dollars)	2.99%
Electrical consumption	0.34%
Energy Efficiency Investment	Over 7000 aMW

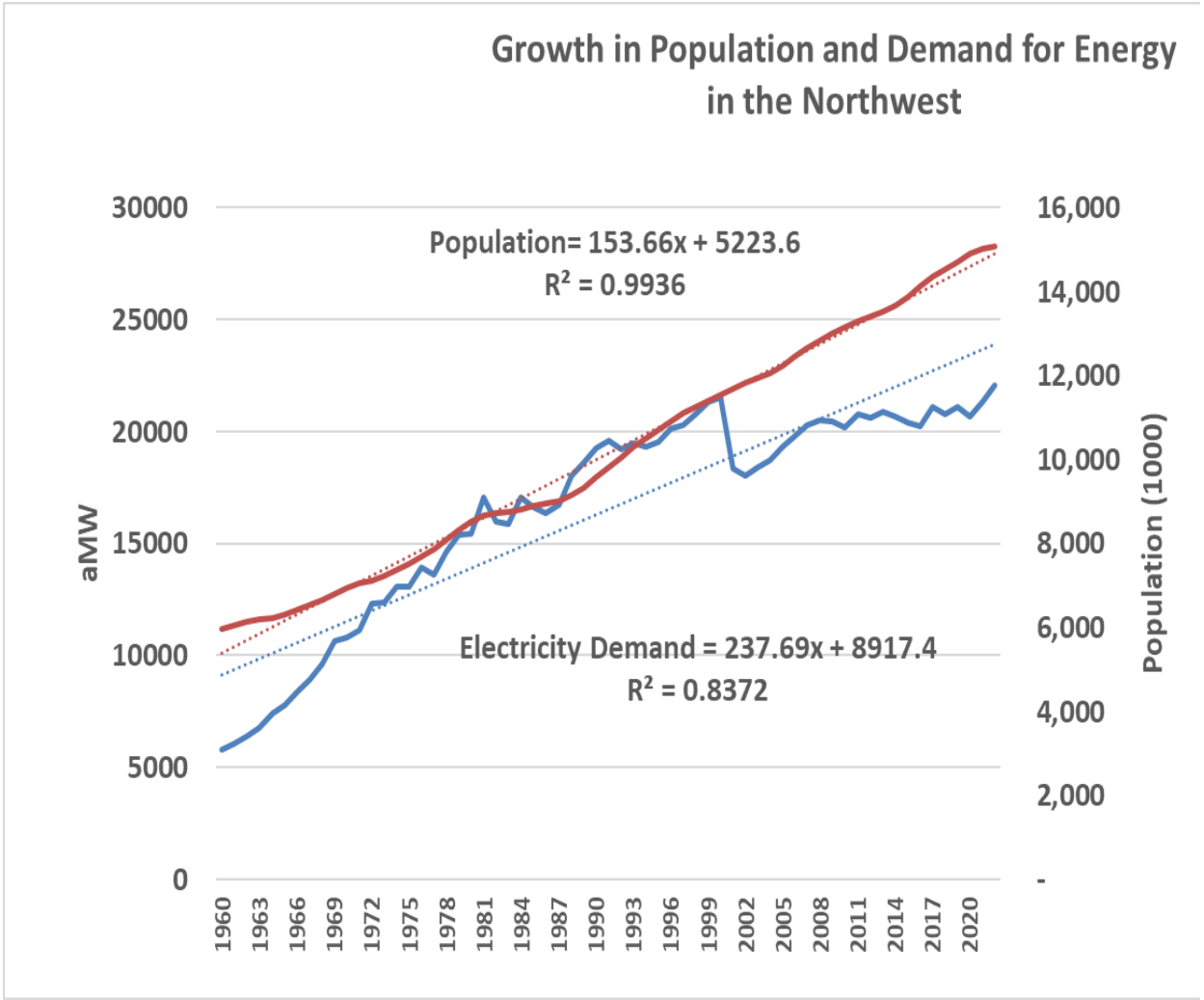
Table 4. Share of Space-Heating by Fuel and State

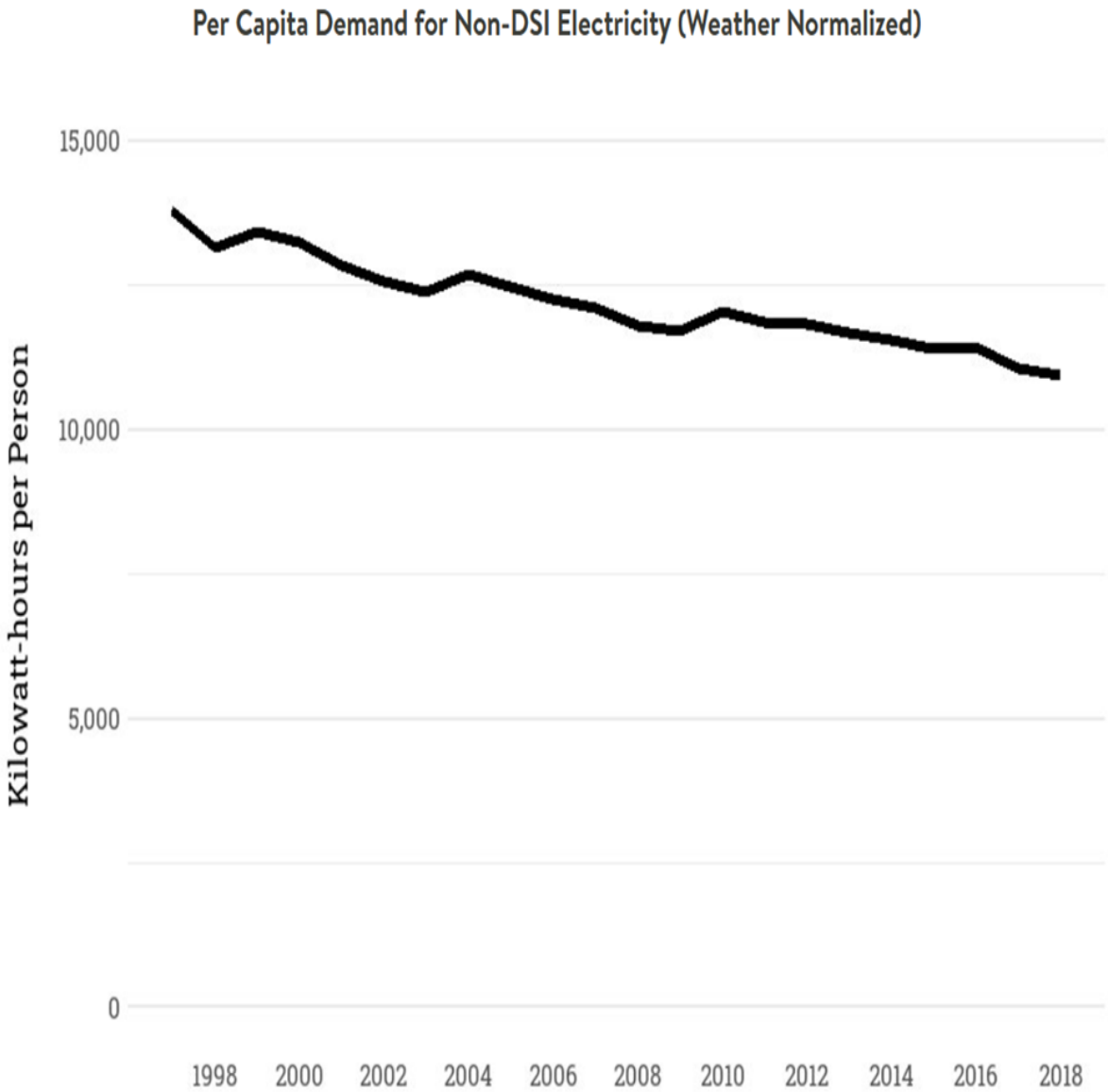
	Natural Gas*	Electricity	Others**
Idaho	57%	32%	11%
Montana	64%	23%	13%
Oregon	41%	48%	11%
Washington	39%	52%	8%
Four states	44%	46%	10%

* includes bottled, tank, or LP gas
** includes fuel oil, kerosene, coke, wood



Region has increased efficiency of energy and electricity usage (normalized for weather)

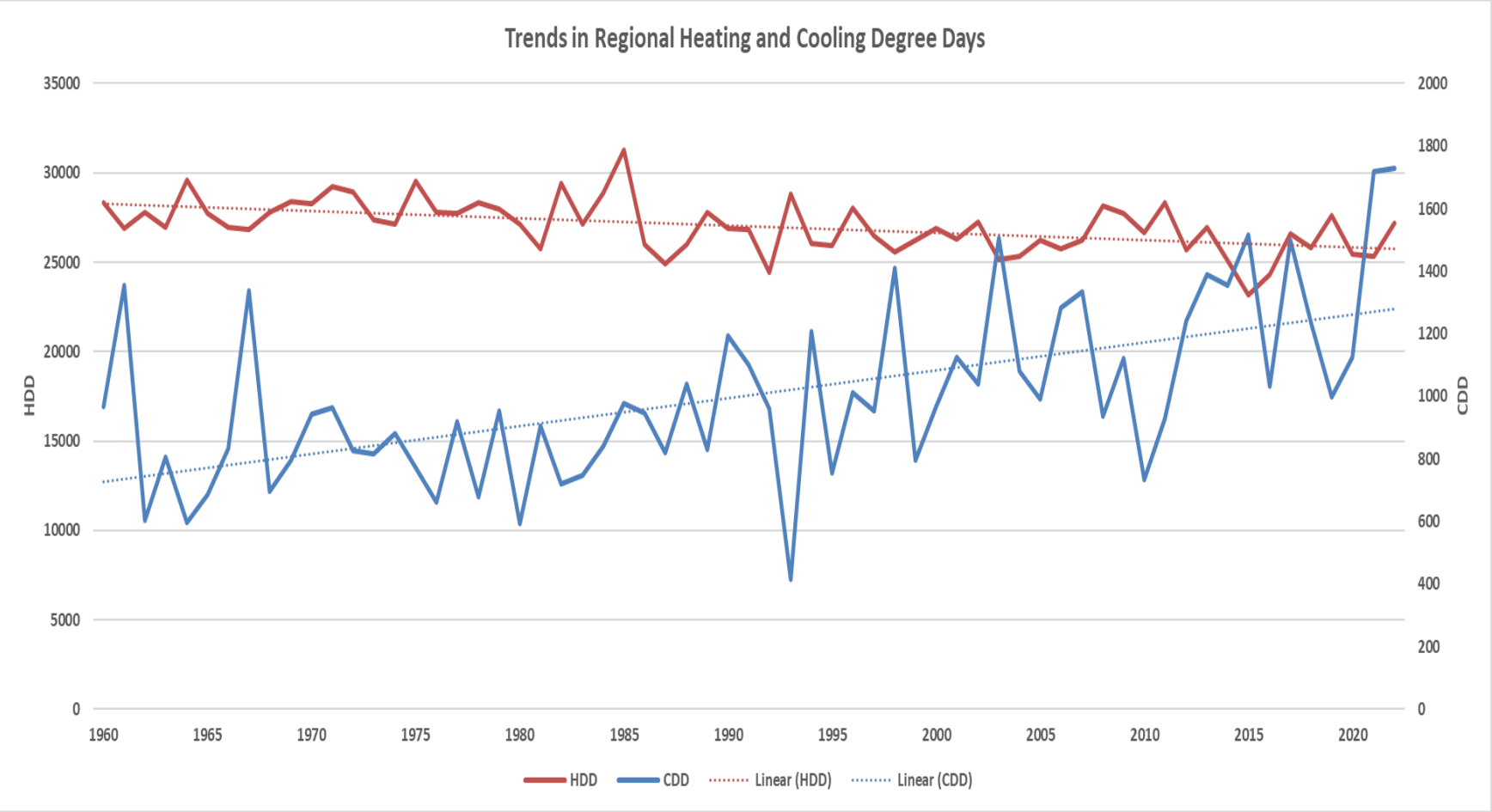




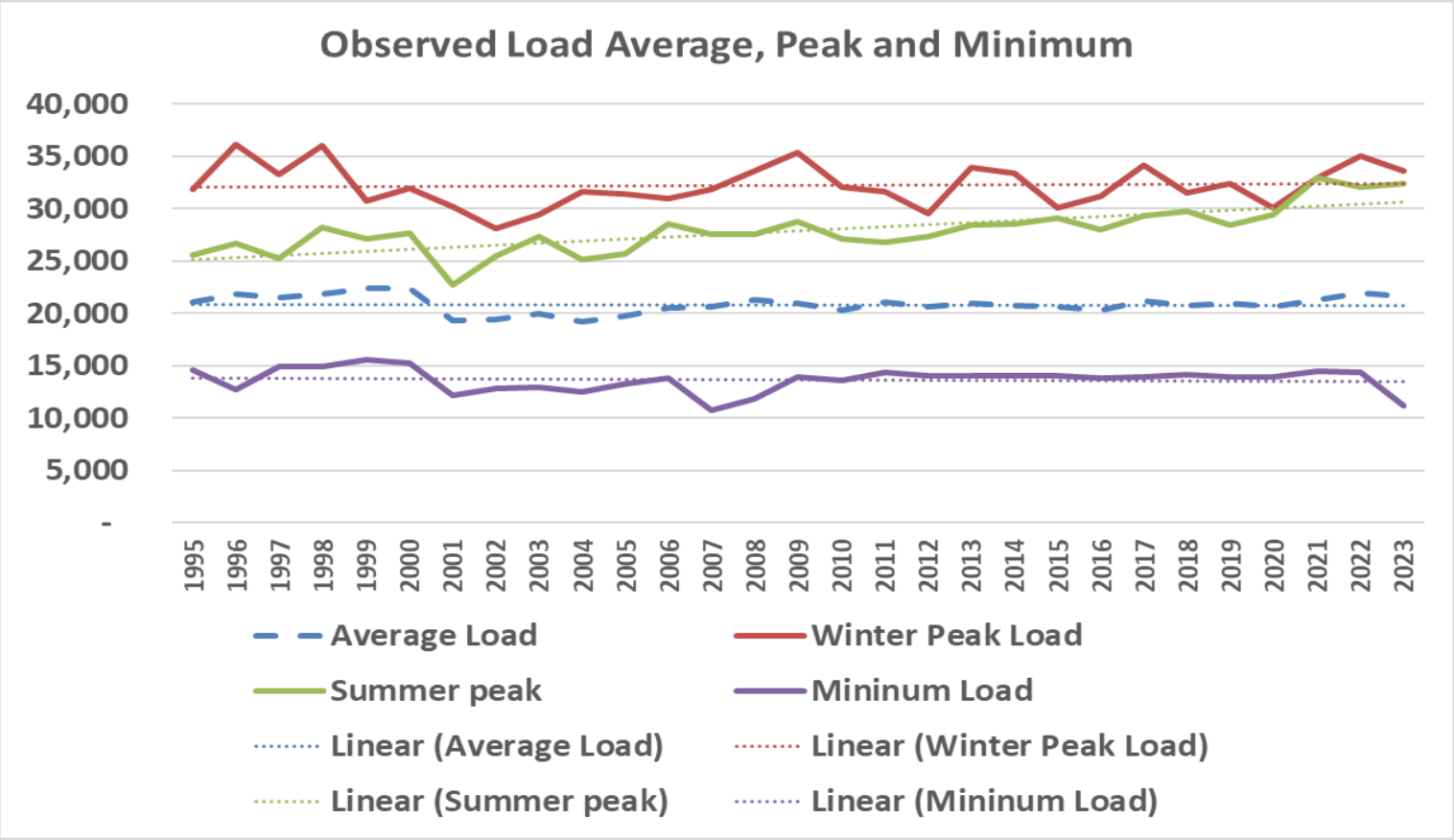
Short-term Factors

- Demand side
  - Daily and hourly variations in temperature and humidity impacts utility peak and energy demands
- Supply side
  - Seasonal variation in precipitation impacts pattern of availability of hydropower
  - Wind and solar generation also impacted due to dependence on availability of sun and wind.

Trends in Regional Temperatures and space conditioning requirements (HDD and CDD)



NW region which was typically a winter peaking system now has dual peaks with summer peaks growing faster



	Growth rate 2000-2023
Energy MWa	-0.2%
Winter peak MW	0.2%
Summer Peak MW	0.7%

1993-2017
Deviations from Normal weather has

Increased Winter peak loads by 8000 MW

Increased Summer peak loads by 4500 MW

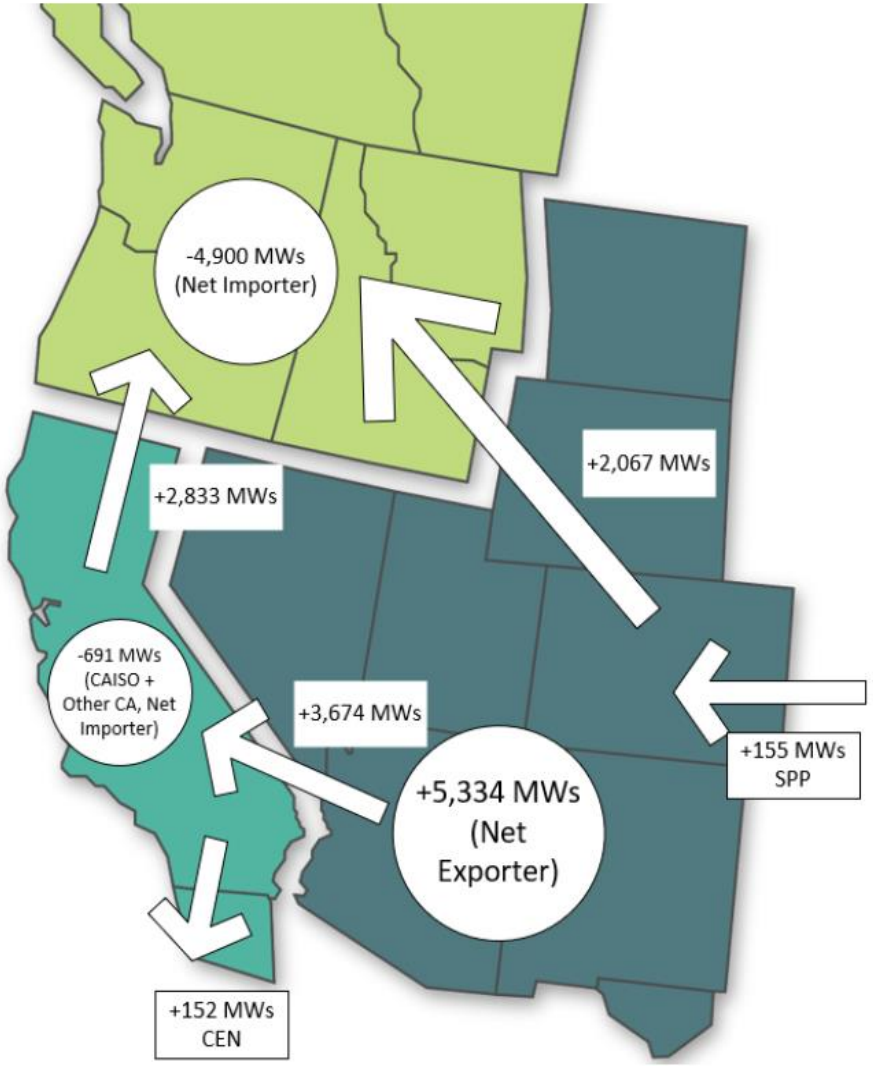
January 2024 Freeze and Utilities Response

- In the last week of January 2024, NW region was hit with a weeklong freeze and wind storms.
- Temperatures in Northwest Balancing Areas were below normal. Loads were significantly higher

	Jan 2014-2023	Jan 2024
Temperatures	~40	12
Energy aMW	24,000	34,000
Peak MW	30,000	36,000

- Natural gas and electric transmission and distribution infrastructure were put under stress.
- Hydro resources were significantly lower ~ 4000 aMW.
- However, the integrated system narrowly escaped wide-spread interruptions.

The entire West provided support for the Northwest



PNW Jan	2019-23	2024
hydro	15365	11721
coal	2411	1370
nuclear	1149	1154
gas	2524	3581
wind	1379	1631

- **Imports via the AC Intertie and the EIM made up for a lot of the hydro deficit**
- **The entire West provided support for the Northwest – facilitated and optimized by the Energy Imbalance Market**

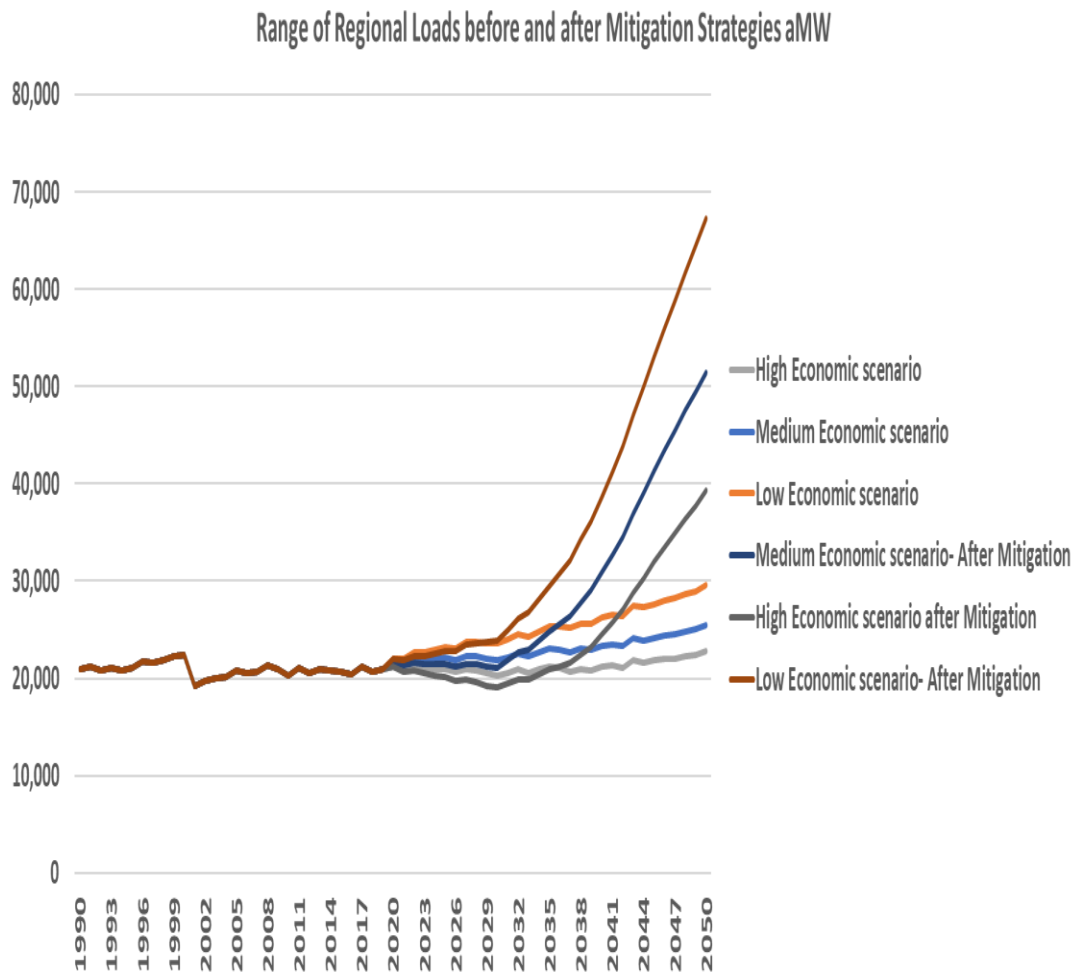
Western Power Pool

With permission from Fred Heutte NWEC. Presentation to WCEA Resource Adequacy Working group

As economy is being decarbonized, regional Utilities will face loads growth not seen in the past 60 years

- From the current base of about 21,000 aMW
- Data Centers
  - Hyperscale and Colocators ~ 4500 aMW
- Electrification of Economy
  - Energy loads could reach (40,000 to 70,000 aMW)
  - peak loads can be reach (62000 to 109,000 MW)

Average Annual Growth Rate	2022-2050
Base	0.5%
Pathways to Decarbonize	3%



In summary

- Northwest population and economy are powered by a large mix off electric utilities.
- Each utility is part of a larger west-wide power authority.
- Future growth in energy expected to come from
  - Decarbonization of economy– through both mitigating and adapting to climate change
  - Data Centers (hyperscale's)
- Peak loads are projected to be dominated by weather conditions.
- Utilities will face serious challenges to provide reliable power and meet climate change goals at the same time.
- West wide cooperation among utilities is needed.

Questions ?

For Additional Information or Questions

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