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

March 30, 2021

MEMORANDUM

TO: **Council Members**

FROM: **Jennifer Light**

SUBJECT: **2021 Northwest Regional Forecast**

BACKGROUND:

Presenter: Shauna McReynolds, PNUCC Executive Director

Summary: The Pacific Northwest Utilities Conference Committee (PNUCC) released its annual update to the Northwest Regional Forecast (NRF). This report is a summation of the region's loads and resources over the next ten years from the utilities' perspective. Shauna will present the key finding from the 2021 NRF.

Relevance: The NRF provides a forecast of loads and of resource supply to identify potential needs in the near future. This is similar to the Council's annual resource adequacy assessment, which will be presented later this year, but the NRF differs in that it is essentially the sum of each utilities' load forecasts and current/expected resources, providing an expected projection of future needs.

More Info: The full report will be made available here: https://www.pnucc.org/system-planning/Northwest-Regional-Forecast/

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2021 NORTHWEST REGIONAL FORECAST

EXECUTIVE SUMMARY

The annually updated PNUCC *Northwest Regional Forecast (Forecast)* provides utilities, decision makers and others with the evolving 10-year picture of anticipated Pacific Northwest electric power loads and resources. By collecting and examining utility-reported information in a consistent manner, the *Forecast* serves as a barometer for the region from the utilities' perspective, highlighting trends in a changing power system and outlining utility plans for meeting future electricity demand.

The region, along with the rest of the Western Interconnection, is actively navigating large thermal unit retirements and acquiring significant amounts of renewable generation amidst a push to reduce carbon emissions. A few years ago, coal unit retirements were on the horizon. Today over 2,000 MW of coal have retired in Northwest, and another 2,000 MW are in line to go. As a result of the changing resource mix and forecasted load growth, a growing peak and flexible capacity need is emerging. This is elevating system adequacy concerns and pressing utilities to find low carbon solutions.

Trends observed in past analysis continue in this year's *Forecast*. **In addition to coal retirements,** other key trends in the *2021 Forecast* are:

- **Summer Peak Load Still Tracking, Winter Drops Again:** The anticipated magnitude and growth of summer peak load remain in line with past projections. In contrast, the winter peak load forecast starts lower and has slower growth than last year's forecast.
- **Energy Efficiency Remains a Priority:** The 2021 energy efficiency savings estimate over the 10-year study horizon is on par with past years, underscoring utilities' commitments to these programs to reduce demand.
- **Renewables Developing Rapidly:** Thousands of megawatts of renewable resources are on the drawing board for the next decade to meet decarbonization policy goals and requirements, address adequacy, and achieve economic savings.
- **Resources Needed to Meet Peaks:** Utilities are eyeing potential resource additions for meeting both summer and winter peak demand.

Augmenting individual utilities' long-term resource planning efforts, a number of Northwest utilities have been collaborating on nearer term adequacy challenges via the Northwest Power Pool. They are advancing a regional adequacy program to better address today's resource adequacy concerns and to be better prepared for extreme weather events like those experienced in other regions of the U.S. this last year.

2021 Northwest Regional Forecast

April 7, 2021

Northwest Power & Conservation Council

Pacific Northwest Utilities Conference Committee

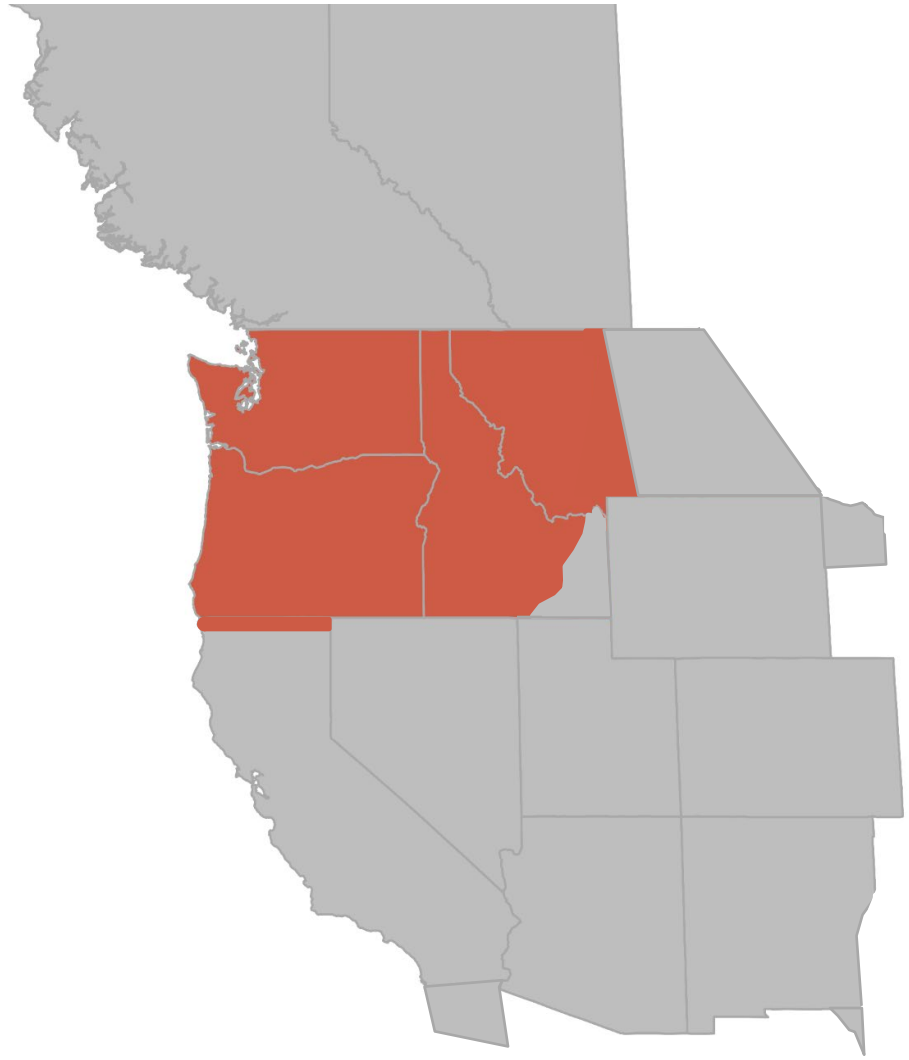
- Long history began with the Tacoma Conference in 1947
  - Staffed up in 1980 with passing of the NW Power Act
- Unique, diverse membership
  - investor-owned utilities, public utilities, and industry partners
- Forum for engaging on issues of common interest and fundamental to the Northwest power industry i.e., regional power supply and demand
- Job One: "Supporting members in achieving their missions by bringing the *Power* of good ideas *Together*."
  - Board of Directors and Committee structure
  - Large staff of three

PNUCC

Bringing the *Power* of good ideas *Together*.

PNUCC *Northwest Regional Forecast*

- Aggregates utility data in Power Act footprint
  - 28 reporting and BPA (135 total)
- Requirements reflect
  - 1-in-2 loads after energy efficiency
  - Firm exports
  - A 16% planning margin for peak
- Resources include
  - Utility owned/contracted resources only
  - Long-term imports
  - Hydro under critical water conditions (8% for peak)

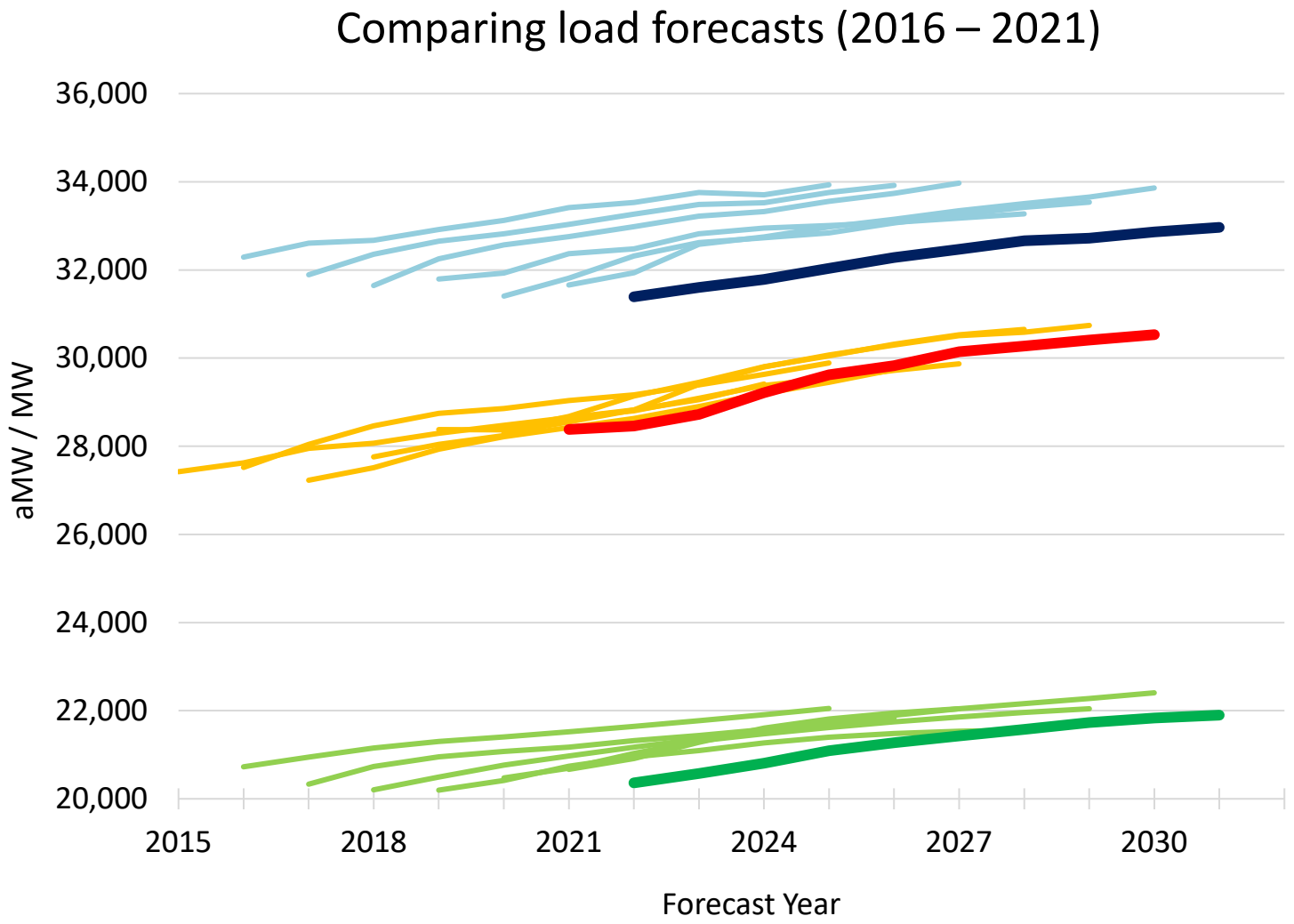


Loads: Summer growth tracking, winter resets again

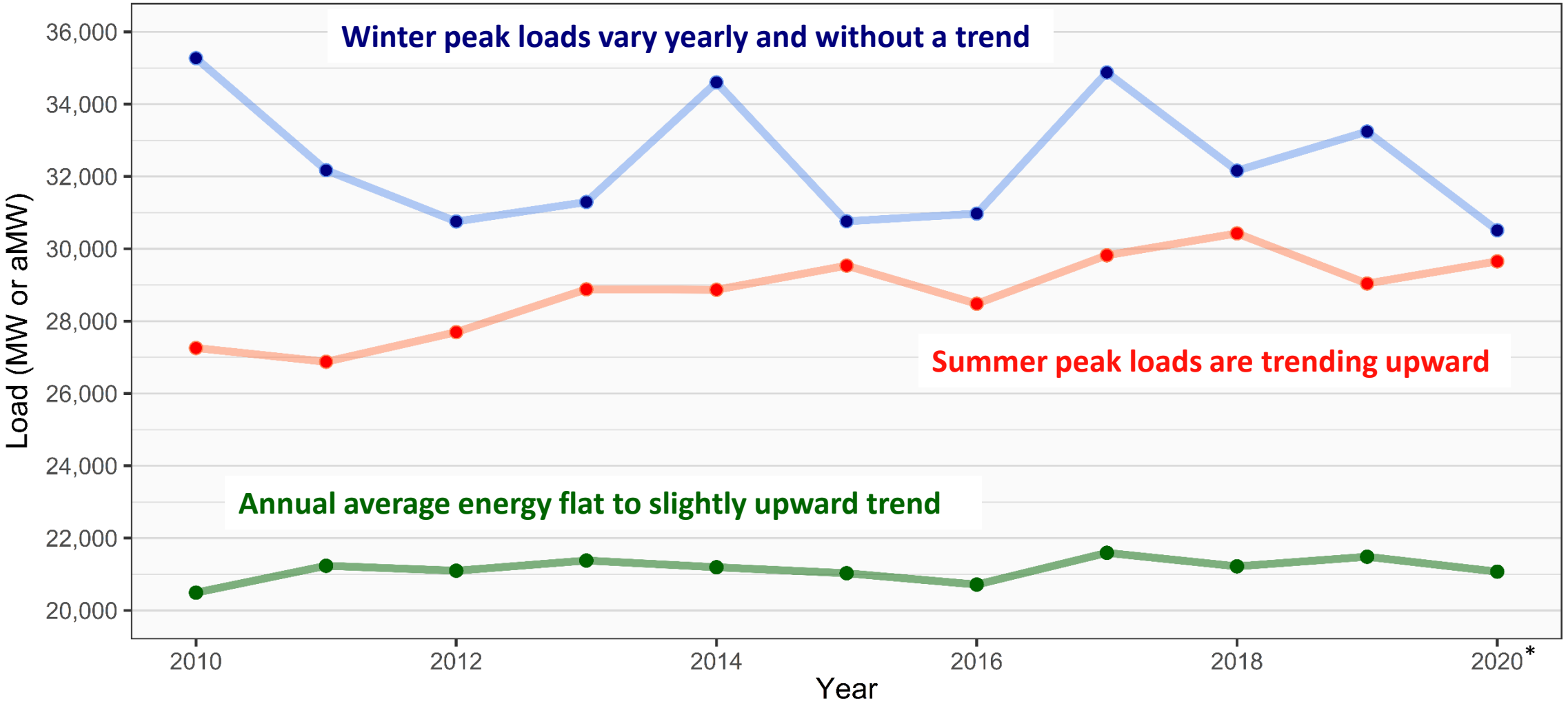
Winter 1 hr. peak (Jan) forecast at 0.5%/year

Summer 1 hr. peak (Aug) forecast at 0.8%/year

Annual average energy forecast at 0.8%/year



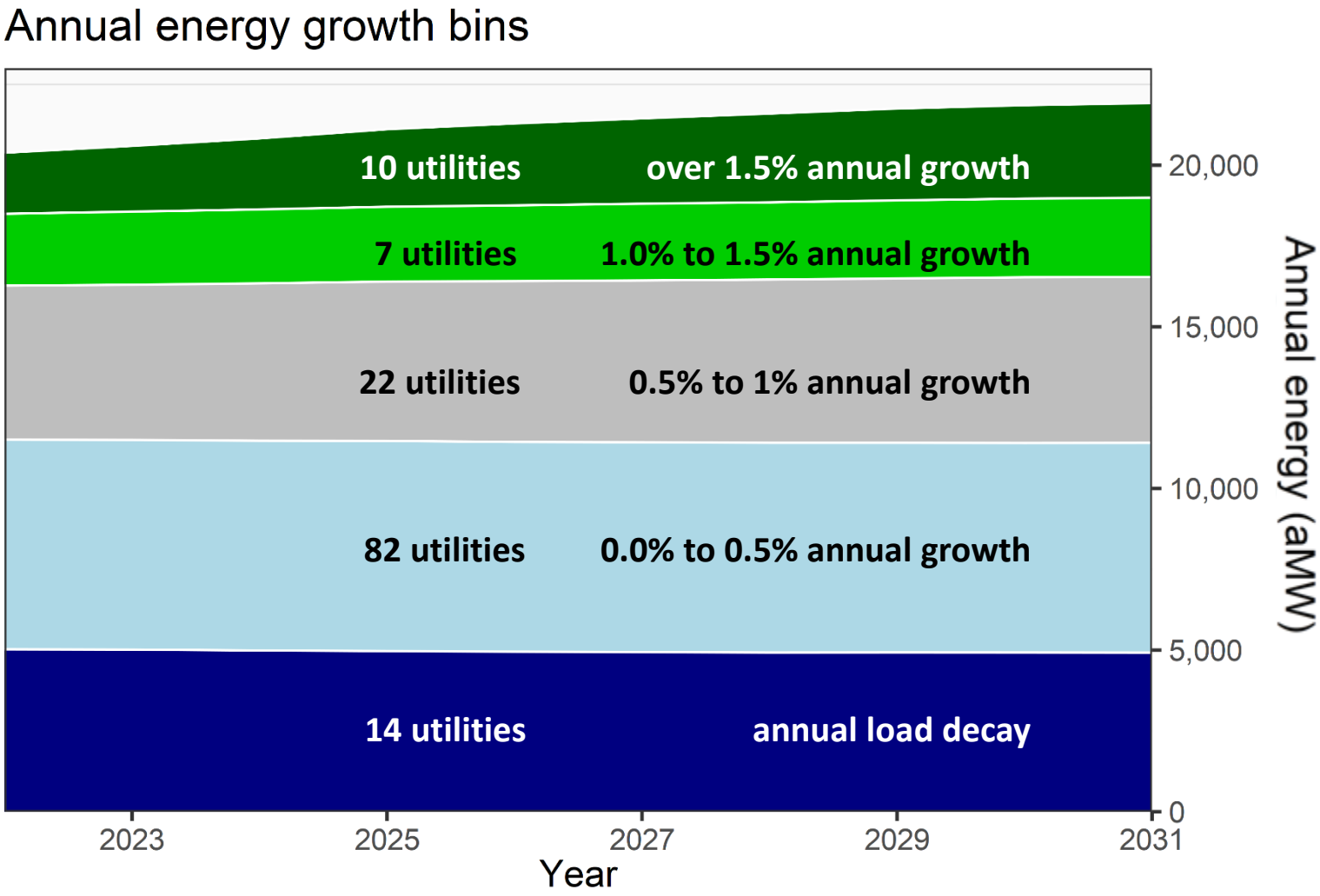
Loads: historical review



Slightly larger footprint than the NRF; not adjusted for weather; * 2020 values are estimates

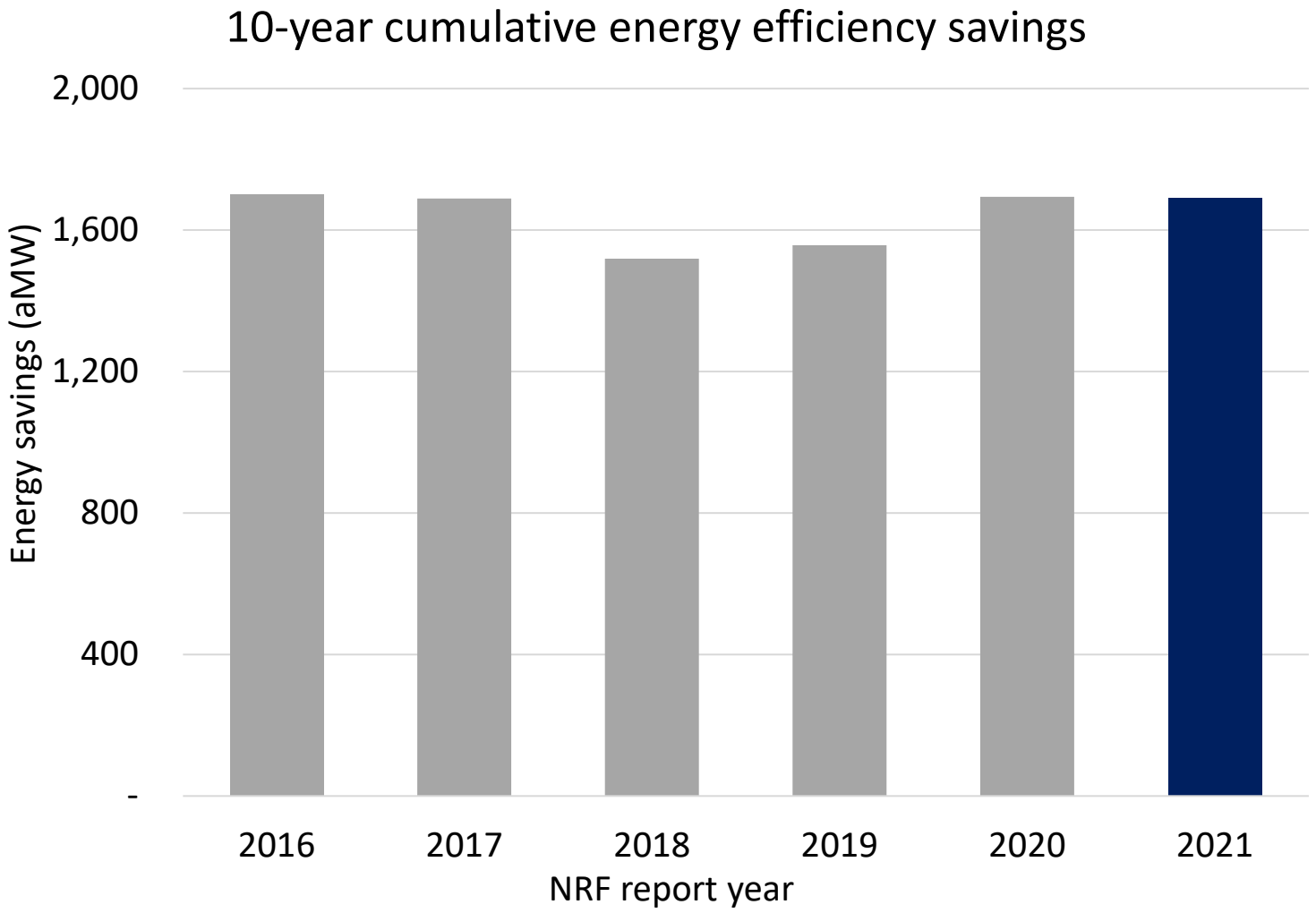
Load growth expectations vary

Most utilities forecasting growth at or under 0.5% per year



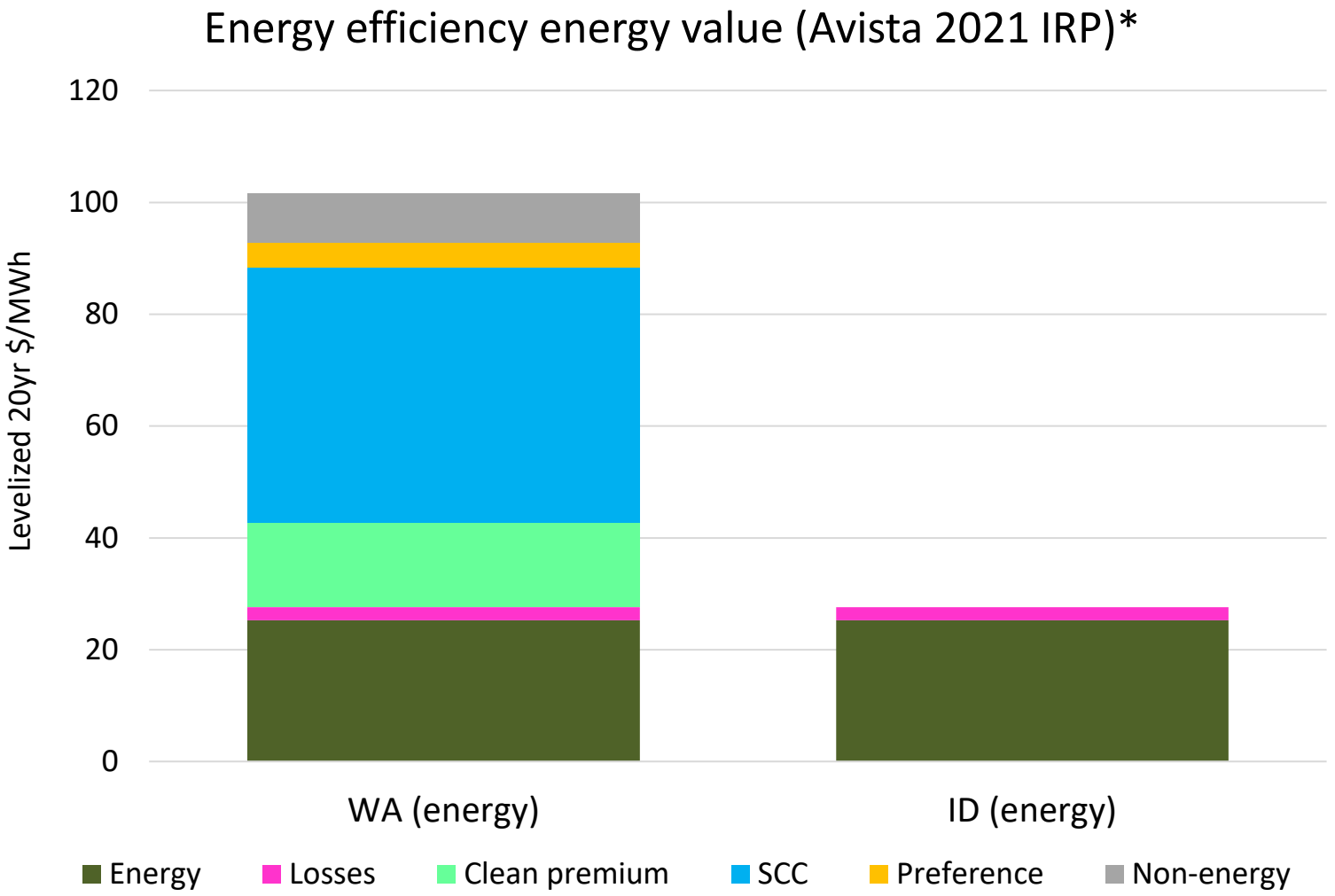
Energy efficiency remains a priority

Draft *2021 Plan* baseline 10-year value 800 aMW



NRF EE values historically lower than Council retrospective estimates

Energy efficiency opportunities vary

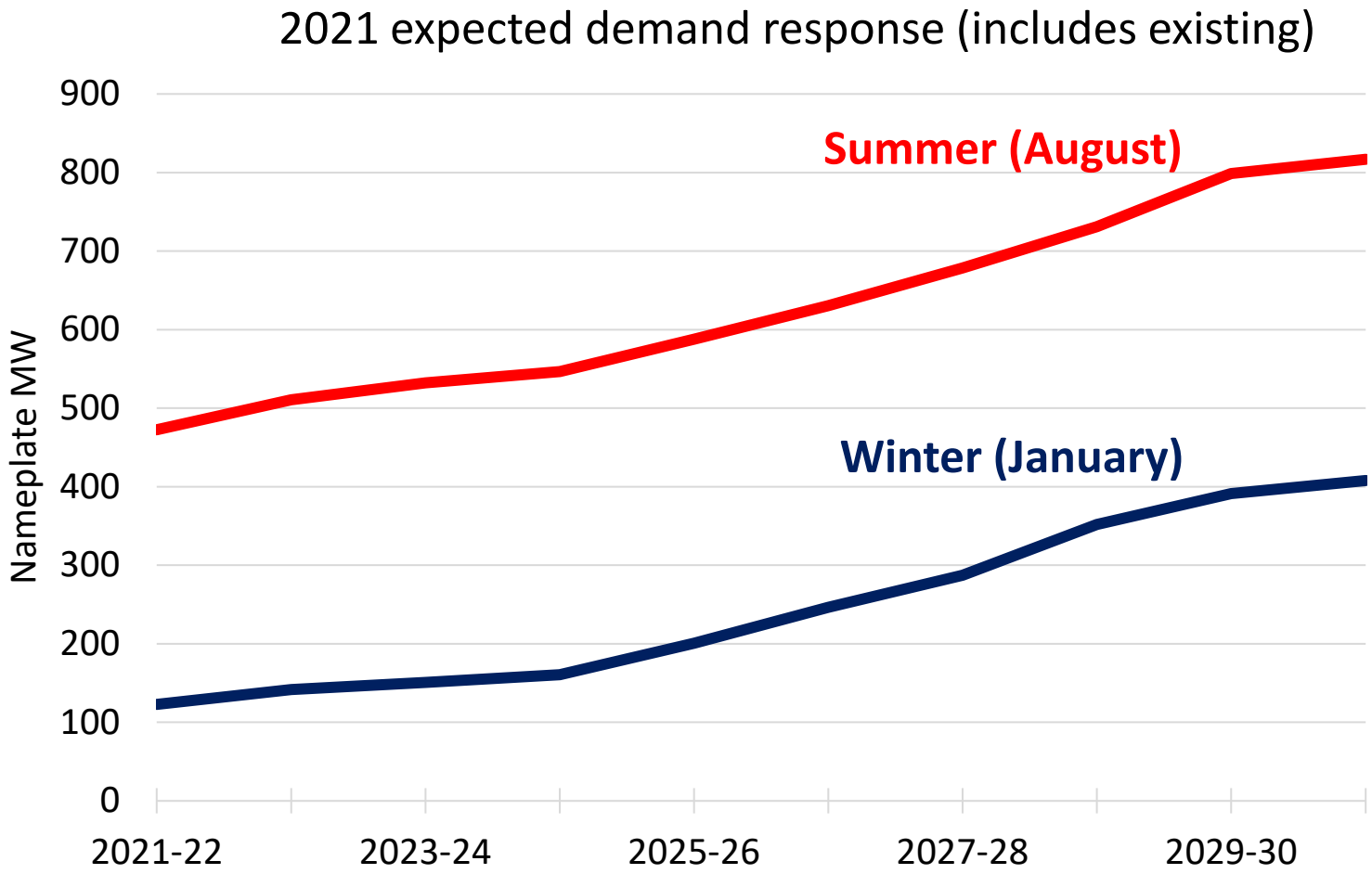


Value of energy efficiency (and subsequent acquisitions) varies by utility and jurisdiction

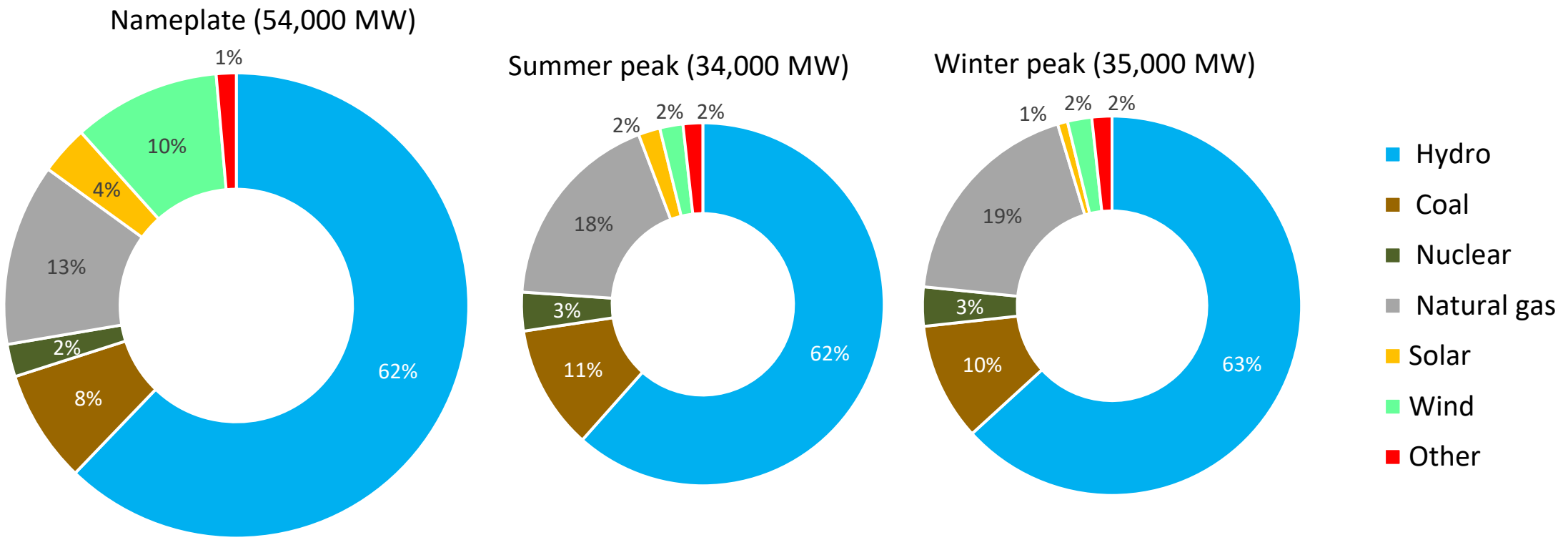
*Avista also provides a capacity value by state, ID and WA are closer in value under this view

Demand response projection moving up

Draft *2021 Plan* baseline showing zero new DR

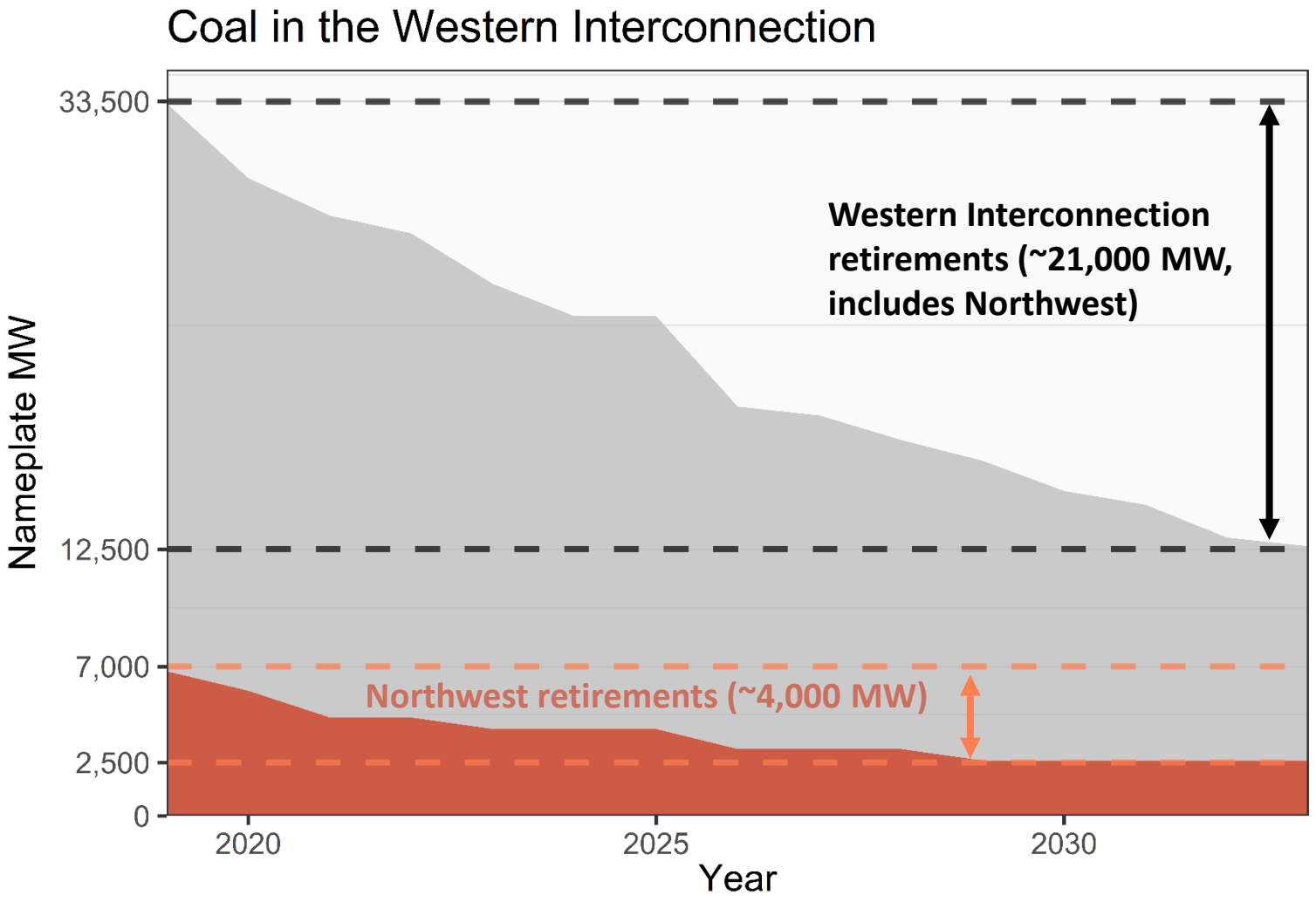


Generating resources capabilities vary by type



NW utility firm resources only; IPP resources would increase the total values. Summer/winter hydro at 8% water, wind & solar at peak capacity contribution levels (utility set).

Coal retirements spurring adequacy concerns

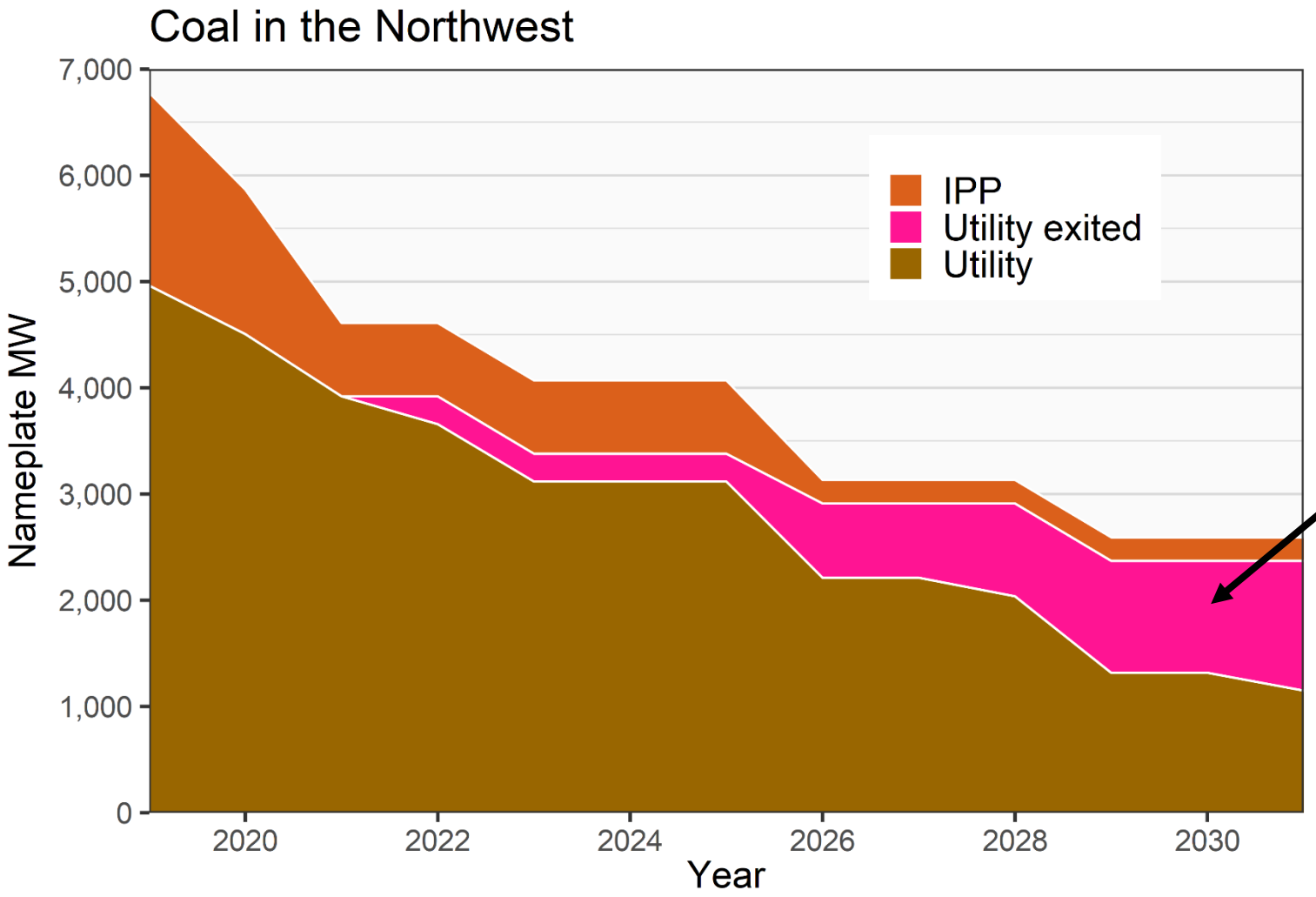


Pace of coal retirements is quickening

Other thermals retirements also occurring (e.g. Diablo)

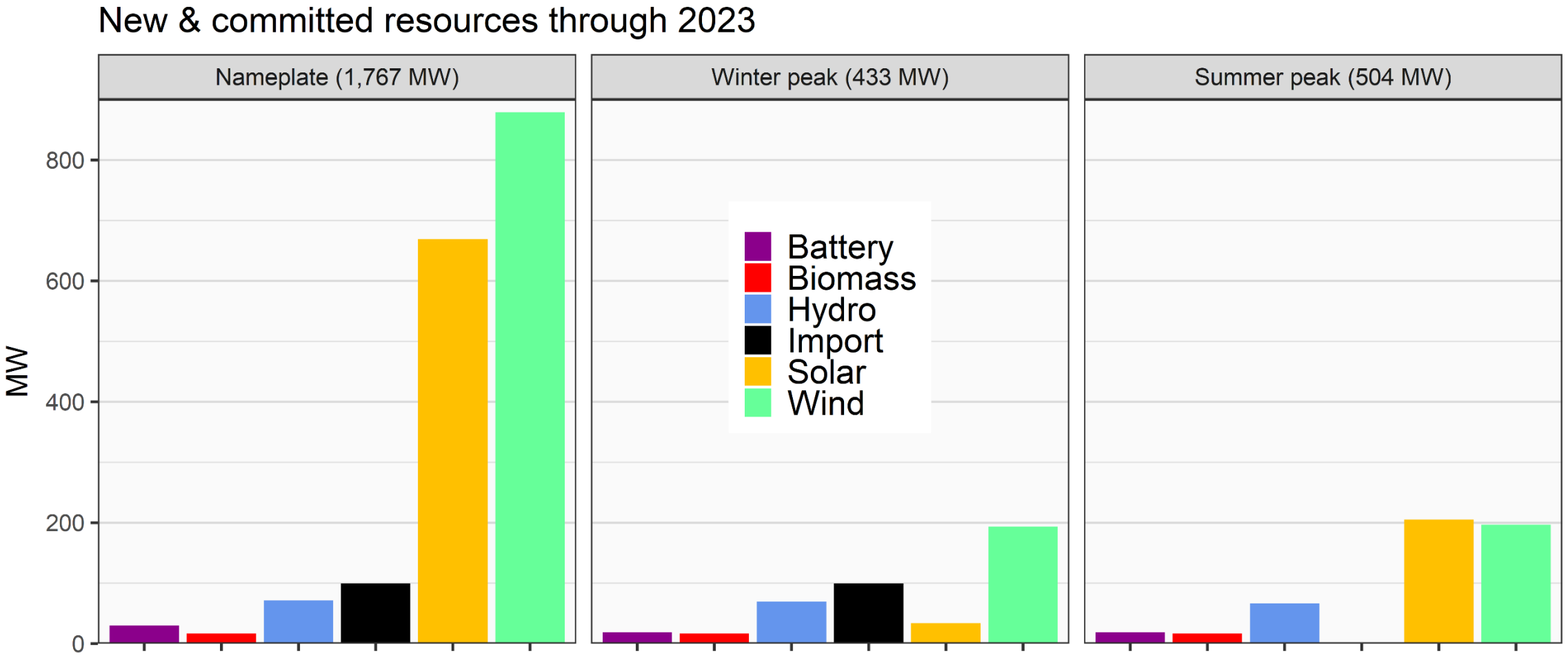
All interconnection retirements impact the region through changing power market dynamics

Utilities exiting Northwest coal units



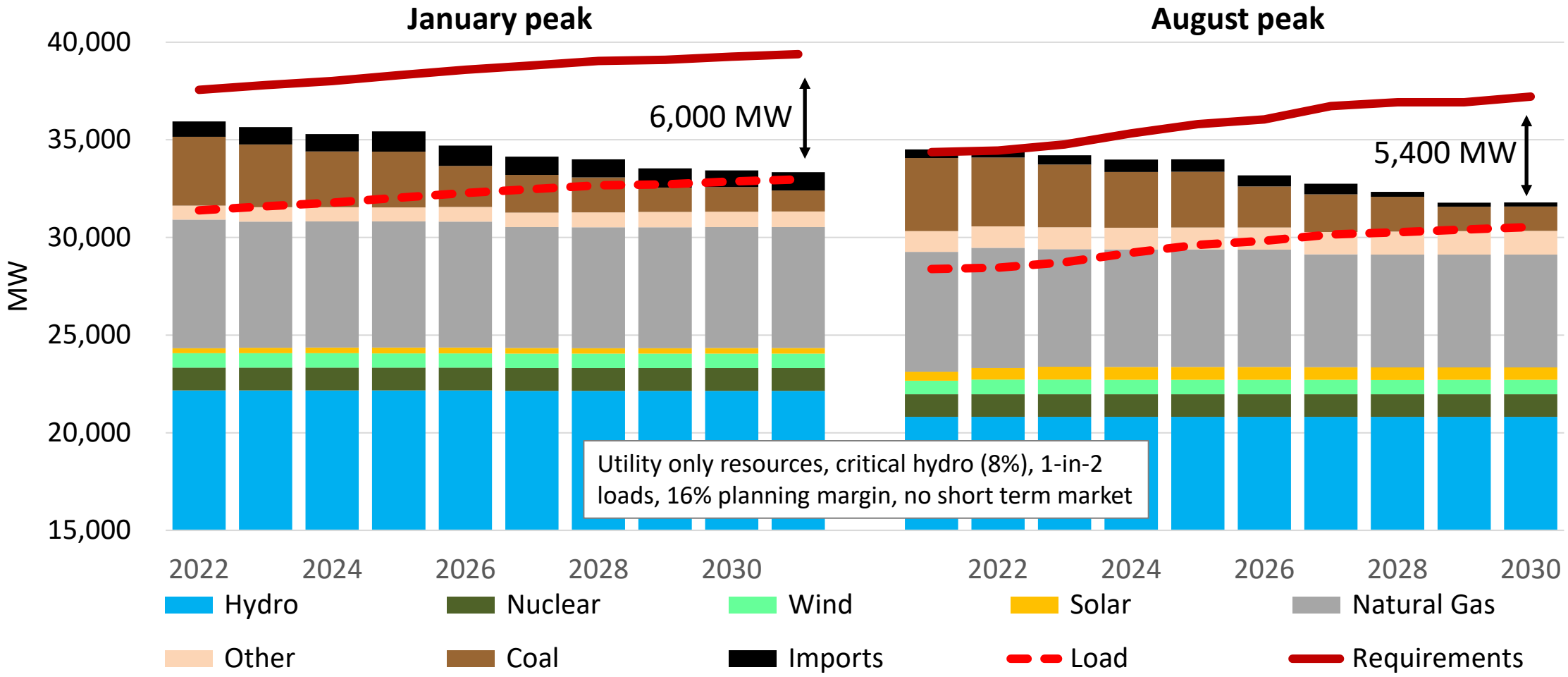
Utilities planning to exit coal units without a retirement date

Newest additions mostly wind & solar



Resources included in the load/resource balance

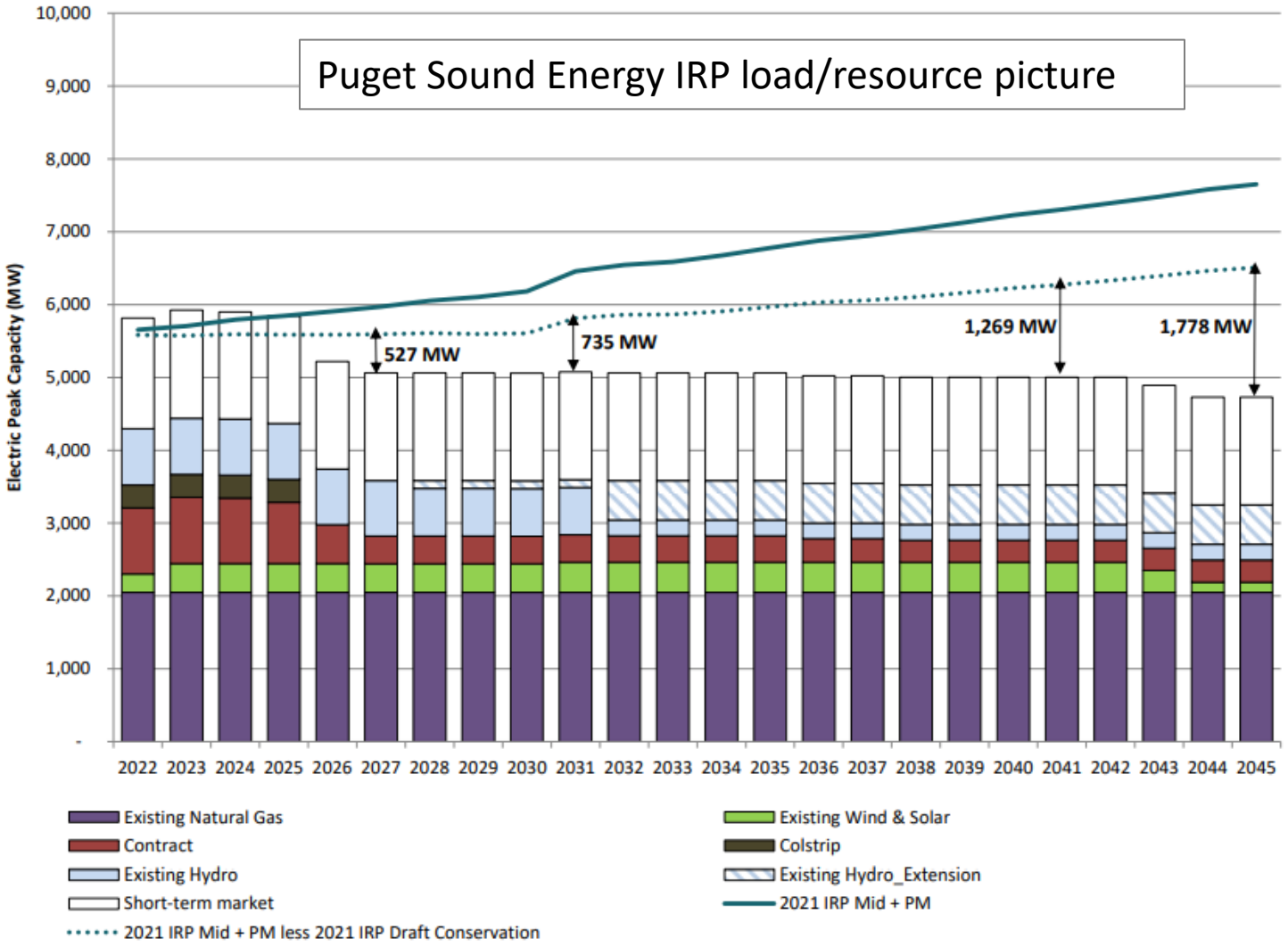
Peak load/resource balance



Gap is a barometer for need, not a precise resource adequacy metric

Utilities seeing adequacy needs

Puget Sound Energy (and many other utilities) seeing a resource need as coal and other resources exit

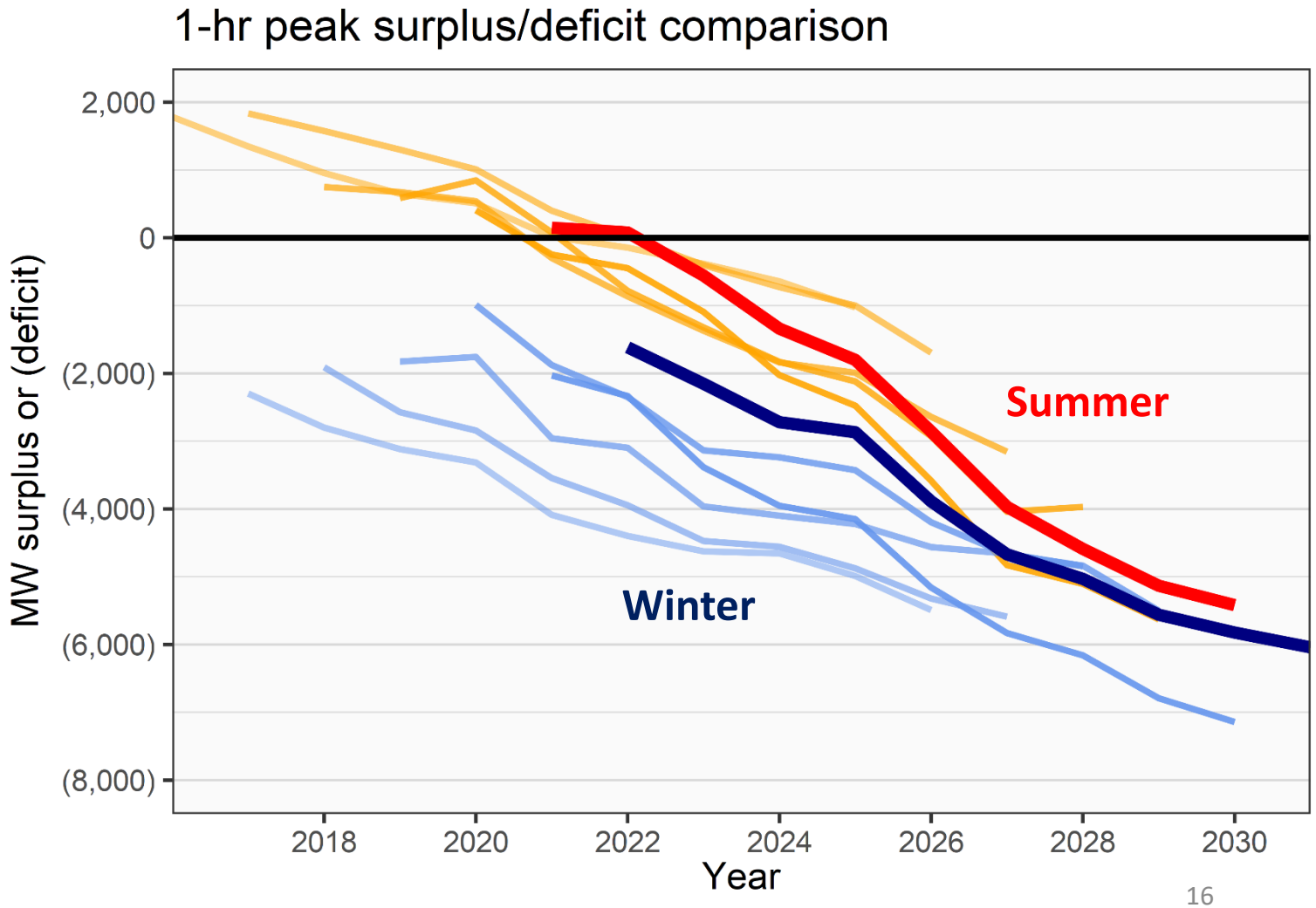


Summer and winter deficits starting to converge

Summer vs. **winter**

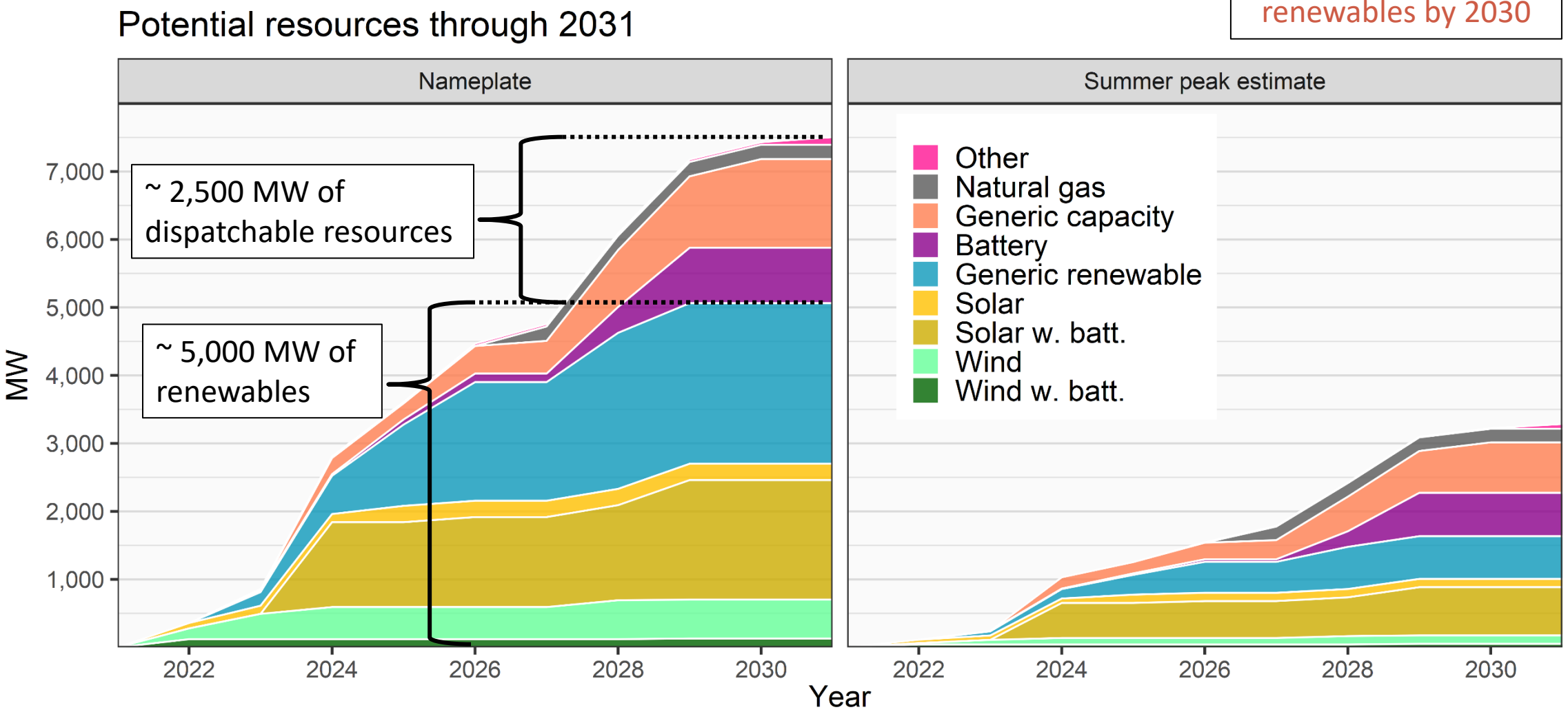
Winter deficit is deeper, yet summer may become the bigger challenge

- The greater West is summer peaking
- CAISO is having summer challenges
- Less hydro available in summer
- Summer loads are growing faster



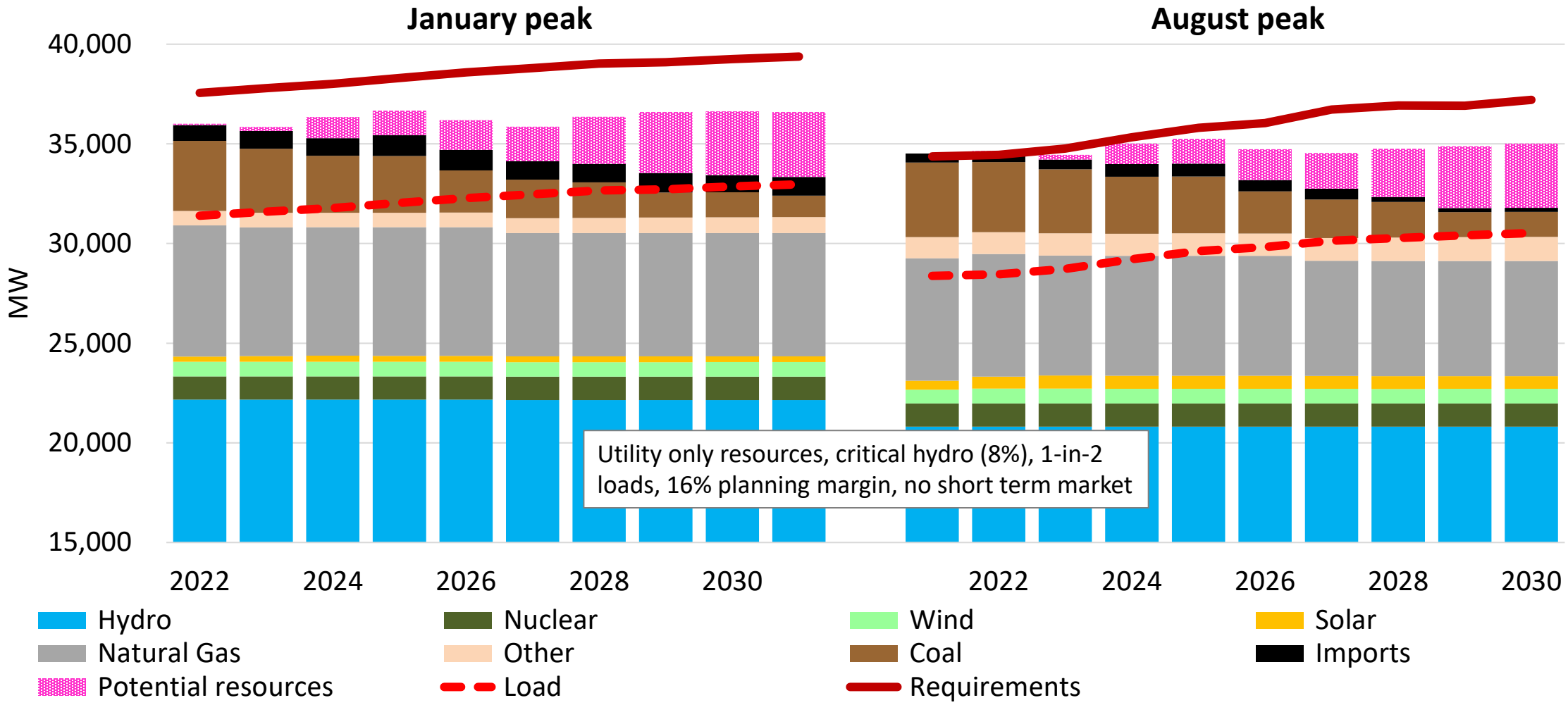
Future utility resources mostly renewable

Draft *2021 Plan* baseline: 8,000 MW renewables by 2030



Winter peak is similar to summer in total; peak capabilities estimated by staff/utility

Expected resources help offset gap



2021 Northwest Regional Forecast

Main takeaways

- Summer peak load is tracking with past forecasts, winter continues the pattern of lower and slower
- Energy efficiency remains a priority for utilities
- Coal retirements are a major factor in growing adequacy concern
- Renewables are developing rapidly and make up much of utilities' expected future generation
- Resources are needed to meet peak loads

The *2021 Power Plan*

What we are watching

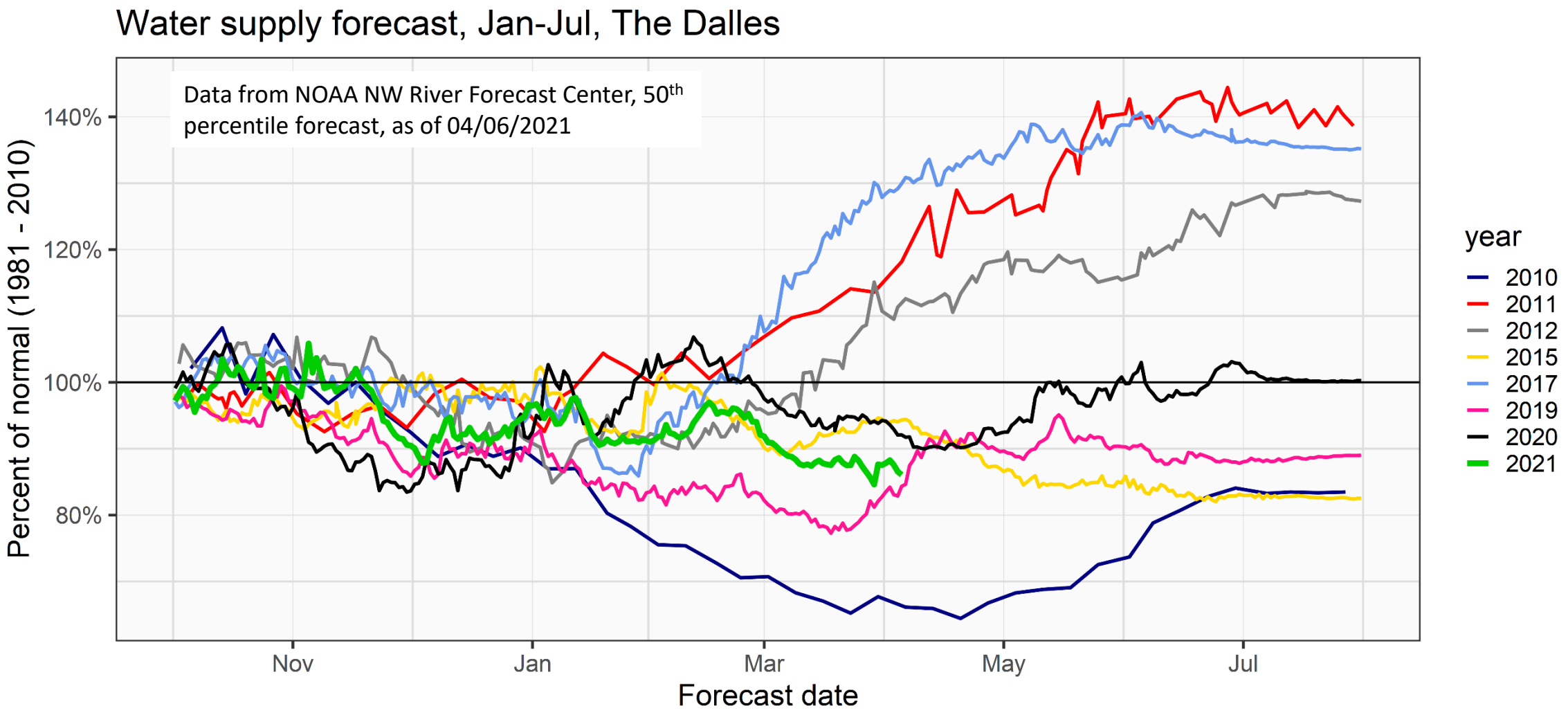
- Resulting resource needs. Utilities see need through 2030 (capacity & energy)
- Value of energy efficiency. A priority for utilities
- Continue to watch underlying analysis, i.e. large Western Interconnection buildout

Our goal – The *2021 Plan*

- Recognizes the growing complexity of the Northwest power system
- Acknowledges the reality of rapidly changing policies
- Underscores the upcoming power system challenges

Extra slides

Water is challenging to forecast



Sun setting on NW coal plants

Plant/Unit name	Nameplate MW	Offline year	Captured in NRF?
~~Valmy Unit 1~~	254	End of 2019	Yes, 50%
~~Colstrip Unit 1~~	330	End of 2019	Yes, 50%
~~Colstrip Unit 2~~	330		
~~Centralia Unit 1~~	670	End of 2020	No
~~Boardman~~	585	End of 2020	Yes, 100%
Jim Bridger 1	540	End of 2023	Yes, 100%
Centralia Unit 2	670	End of 2025	Yes, ~50%
Valmy Unit 2	267	End of 2025	Yes, 50%
Jim Bridger 2	540	End of 2028	Yes, 100%
Colstrip 3	740	None yet	Yes, declining
Colstrip 4	805	None yet	Yes, declining
Jim Bridger 3	540	None yet	Yes, declining
Jim Bridger 4	508	None yet	Yes, declining

Leaning on our neighbors

California expects 48,000 MW of new resource in 2030, Council buildout is showing over 120,000 MW in California (not pictured)

California
Clean Electricity Resources

	Existing Resources	Projected New Resources	
	2019*	2030**	2045**
Solar (Utility-Scale)	12.5 GW	16.9 GW	69.4 GW
Solar (Customer)	8.0 GW	12.5 GW	28.2 GW
Storage (Battery)	0.2 GW	9.5 GW	48.8 GW
Storage (Long Duration)	3.7 GW	0.9 GW	4.0 GW
Wind (Onshore)	6.0 GW	8.2 GW	12.6 GW
Wind (Offshore)	0 GW	0 GW	10.0 GW
Geothermal	2.7 GW	0 GW	0.1 GW
Biomass	1.3 GW	0 GW	0 GW
Hydrogen Fuel Cells	0 GW	0 GW	0 GW
Hydro (Large)	12.3 GW	N/A†	N/A†
Hydro (Small)	1.8 GW	N/A†	N/A†
Nuclear	2.4 GW	N/A†	N/A†

California data from recent SB 100 Joint Agency report
https://www.energy.ca.gov/sb100