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April 4, 2023

### **MEMORANDUM**

**TO: Council Members**

**FROM: Annika Roberts and Dylan DSouza**

**SUBJECT: Generating Resource Builds Summary and Power Plan Comparison**

### **BACKGROUND:**

**Presenter:** Annika Roberts and Dylan DSouza

**Summary:** Staff will present a review of regional and WECC wide supply side resource acquisitions and retirements since the adoption of the 2021 Power Plan. This update has been shared with the Generating Resource Advisory Committee (GRAC), and a brief summary of their comments and reactions have been incorporated into this presentation.

**Relevance:** The 2021 Power Plan tasked the region with developing at least 3500 MW of renewable resources by 2027. Also as part of the Plan development, the Council generated a WECC wide build out to inform market prices used in our study. This update on resource acquisitions and retirements is meant to serve as a check-in on how regional actions align with or diverge from the 2021 Power Plan resource strategy and assumptions of the larger WECC. In preparation for the mid-term assessment, this is a first look at how closely the region is following the power plan resource strategy.

**Workplan:** Tracking and reporting on generating resource builds, both in region and across the WECC, as compared to the 2021 Power Plan analysis and strategy

More Info: Presentation to Generating Resource Advisory Committee:  
<https://www.nwcouncil.org/meeting/generating-resources-advisory-committee-2023-03-31/>

# Resource Updates Since 2021 Power Plan

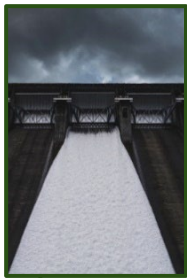
Annika Roberts & Dylan DSouza  
April 2023

# Outline

- Plan Context
- In-Region Generating Resource Update
- WECC-wide Generating Resource Update
- Broader Resource Landscape
- What we heard from the GRAC
- Next steps

# **GENERATING RESOURCES AND THE PLAN**

# 2021 Power Plan: Regional Resource Strategy



## Existing System: More flexibility

- Greater potential flexibility in the hydro system and the ability to more effectively use our thermal fleet to provide reserves is needed, collectively reducing regional needs and supporting the integration of renewables



## Renewables: >3.5 GW by 2027

- Significant renewable build recommended (>3.5 GW by 2027), due to their low costs, interruptibility, and carbon reduction benefits. This build out will impact the transmission system.



## Energy Efficiency: 750 aMW by 2027

- Significantly less acquisition than prior plan due to greater cost-competitiveness with other resources, not being dispatchable, and being sensitive to market prices



## Demand Response: low-cost capacity

- Products that provide highest value to the system are those that can be regularly deployed at low cost and with minimal to no impact on customer (e.g. DVR, TOU)

# Renwables in the 2021 Plan

- At least **3500 MW** additional renewable resources by 2027
- Additional recommendation for policymakers/utilities pursuing aggressive emissions reductions to evaluate adding more renewables as a means of displacing emissions both within their portfolio and in the broader market

## Section 6: Resource Development Plan

### *How the Electric Sector Has Changed*

The Council's 2021 Power Plan is significantly different than its Seventh Power Plan, adopted just five years ago. This is due to changes in the economics of renewable resources and the adoption of regional clean energy policies. The rapid cost reduction for solar and wind power technologies, when coupled with federal and state inducements, has provided an incentive for building large amounts of utility-scale solar and on-shore wind power across the region and put increased competitive pressure on thermal generators that operate at higher costs.<sup>32</sup>

Along with this changing economic landscape, the plan also recognizes clean-energy policies and goals implemented at state, city, and regional levels, and the interconnectedness of the region's energy systems.

<sup>32</sup> To this point, the region's electricity supply has led to a significant increase in renewable resources.  
<sup>33</sup> Uncertainty in the Seventh Power Plan was due to the uncertainty of Centralia's future role in the power market.

future development of significant renewable and non-carbon emitting resources. The combination of increased competitive pressure and clean energy policies has resulted in the early retirement of less efficient thermal generators, and increased thermal generator planned retirements during the initial five-year "action period" of the plan. This indicates that the capacity of coal-fired power plants in the region will be reduced by more than 60 percent over the next decade.<sup>33</sup> Furthermore, uncertainty remains over the role of existing natural gas-fired power plants beyond this decade, and the future development of new gas-fired generators within the region.

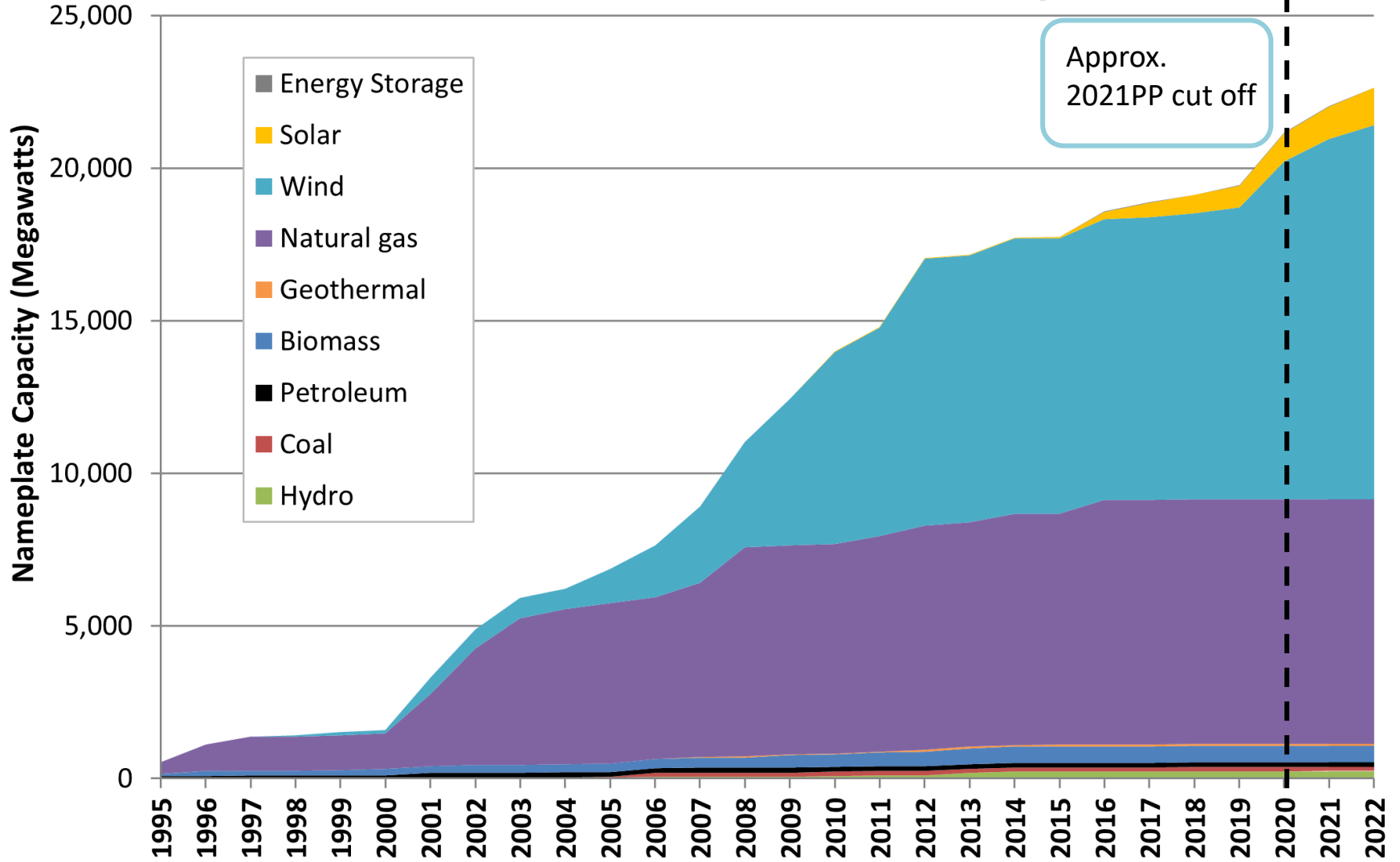
Perhaps even more uncertain is the extent to which clean energy policies will affect other sectors of the economy and the demand for

For generation resources, the Council recommends the region acquire at least 3,500 megawatts of renewable resources by 2027, as a cost-effective option for meeting energy needs and reducing emissions.

# **IN-REGION GENERATING RESOURCES**

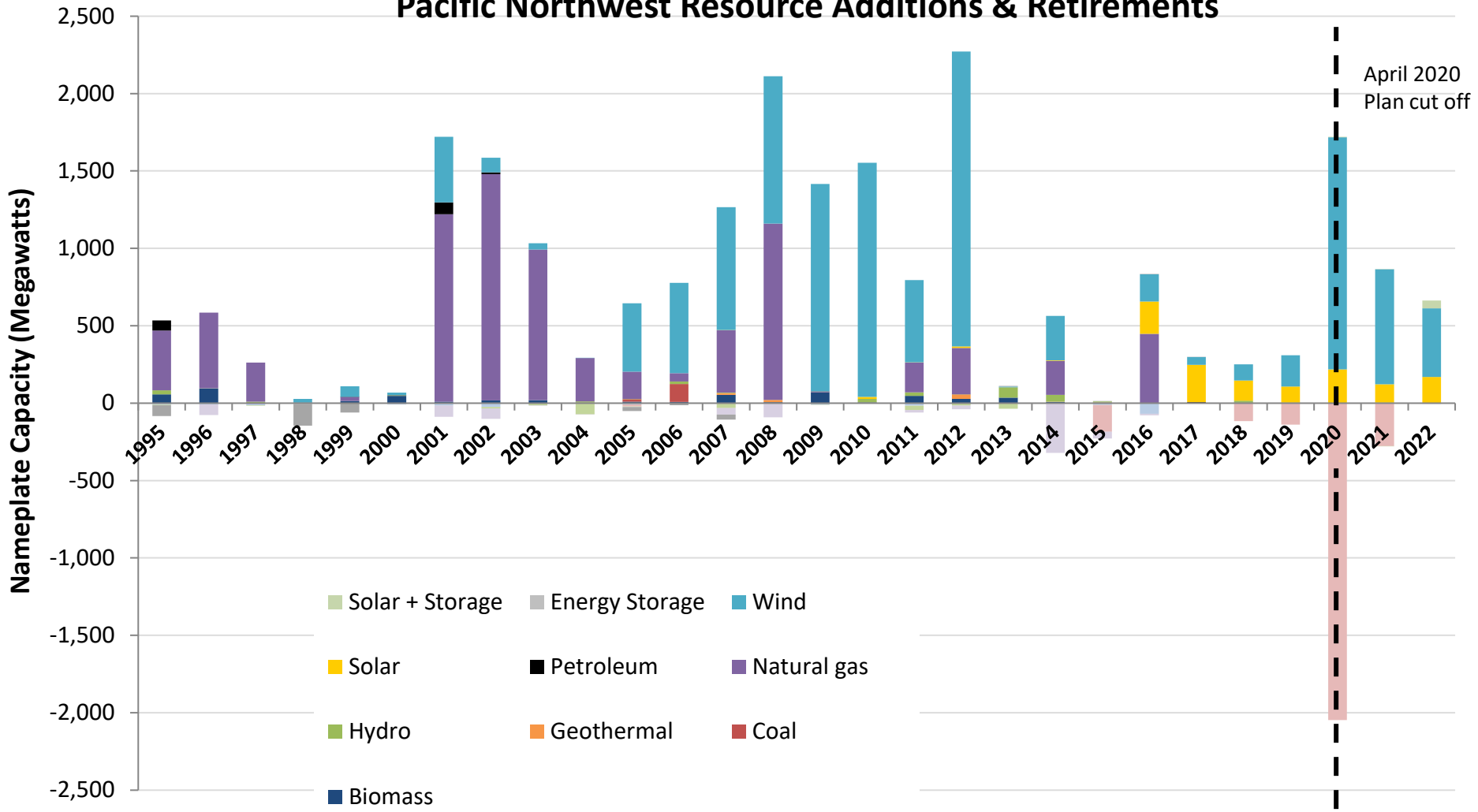


# PNW Cumulative Resource Additions - 1995 through 2022

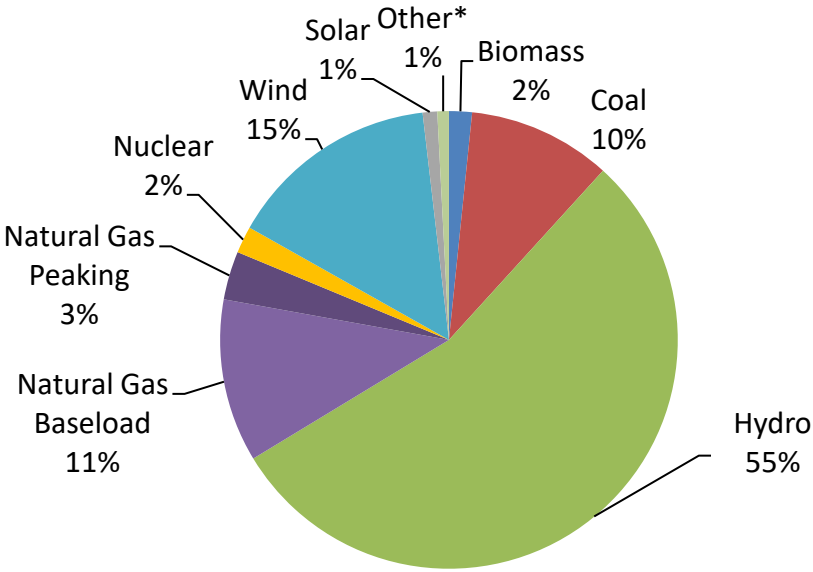


Approx.  
2021PP cut off

# Pacific Northwest Resource Additions & Retirements

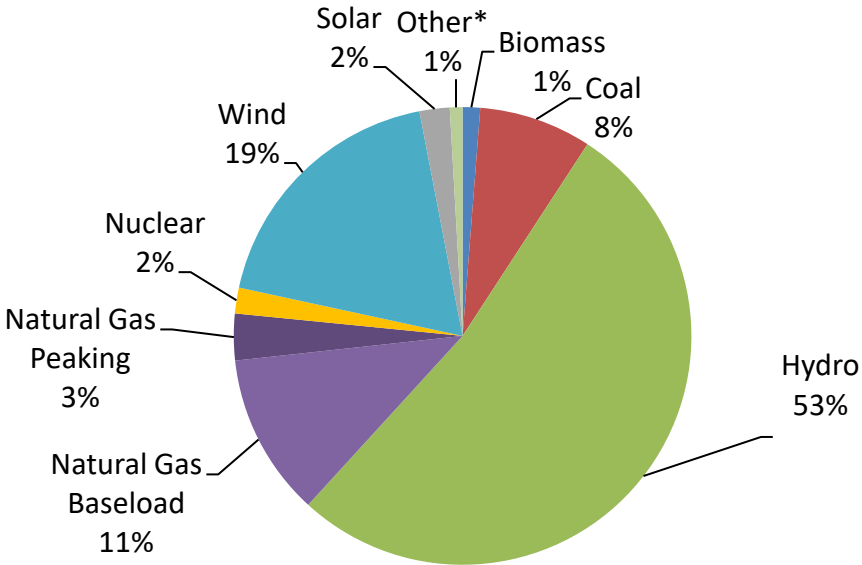


# 2021 Power Plan (April 2020) vs. Today (March 2023)



Installed Nameplate Capacity - 63,301 MW

April 2020

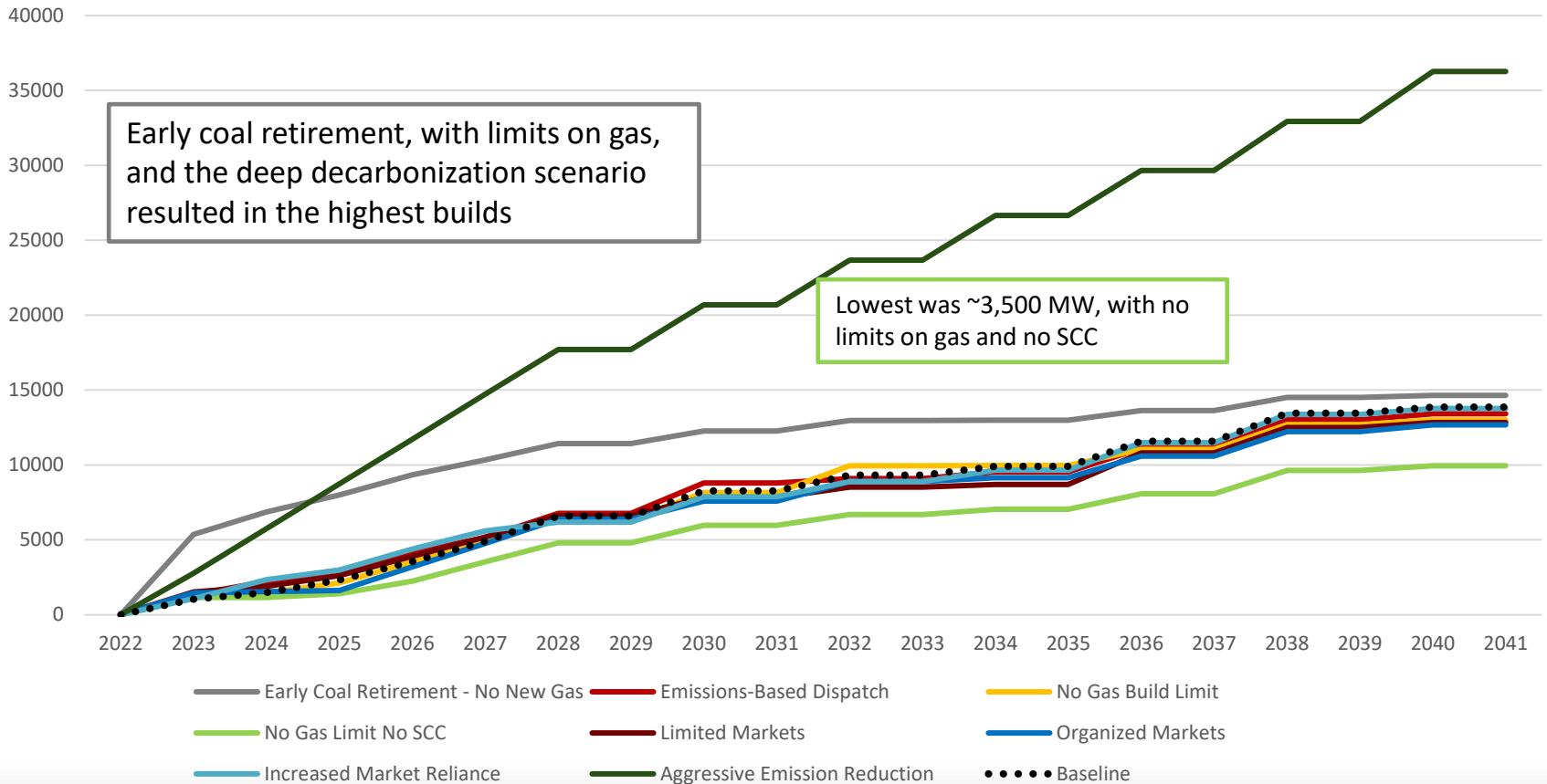


Installed Nameplate Capacity - 65,886 MW

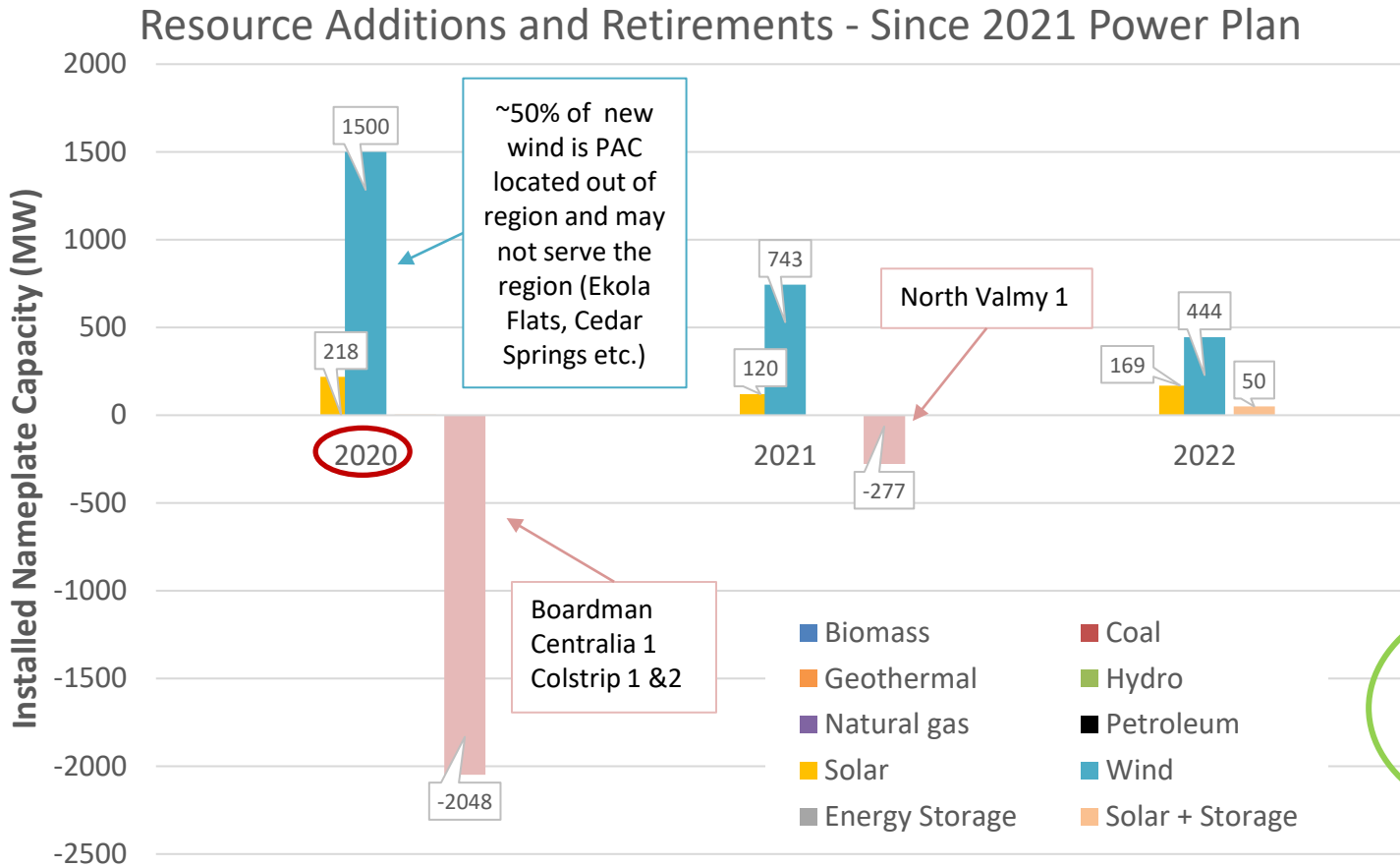
March 2023

\*Other - Geothermal, Petroleum, Solar, Energy Storage (Pumped Hydro + Battery)

# Average Regional Renewable Builds Across Various Sensitivities



# Resource changes\* since 2021 Power Plan...



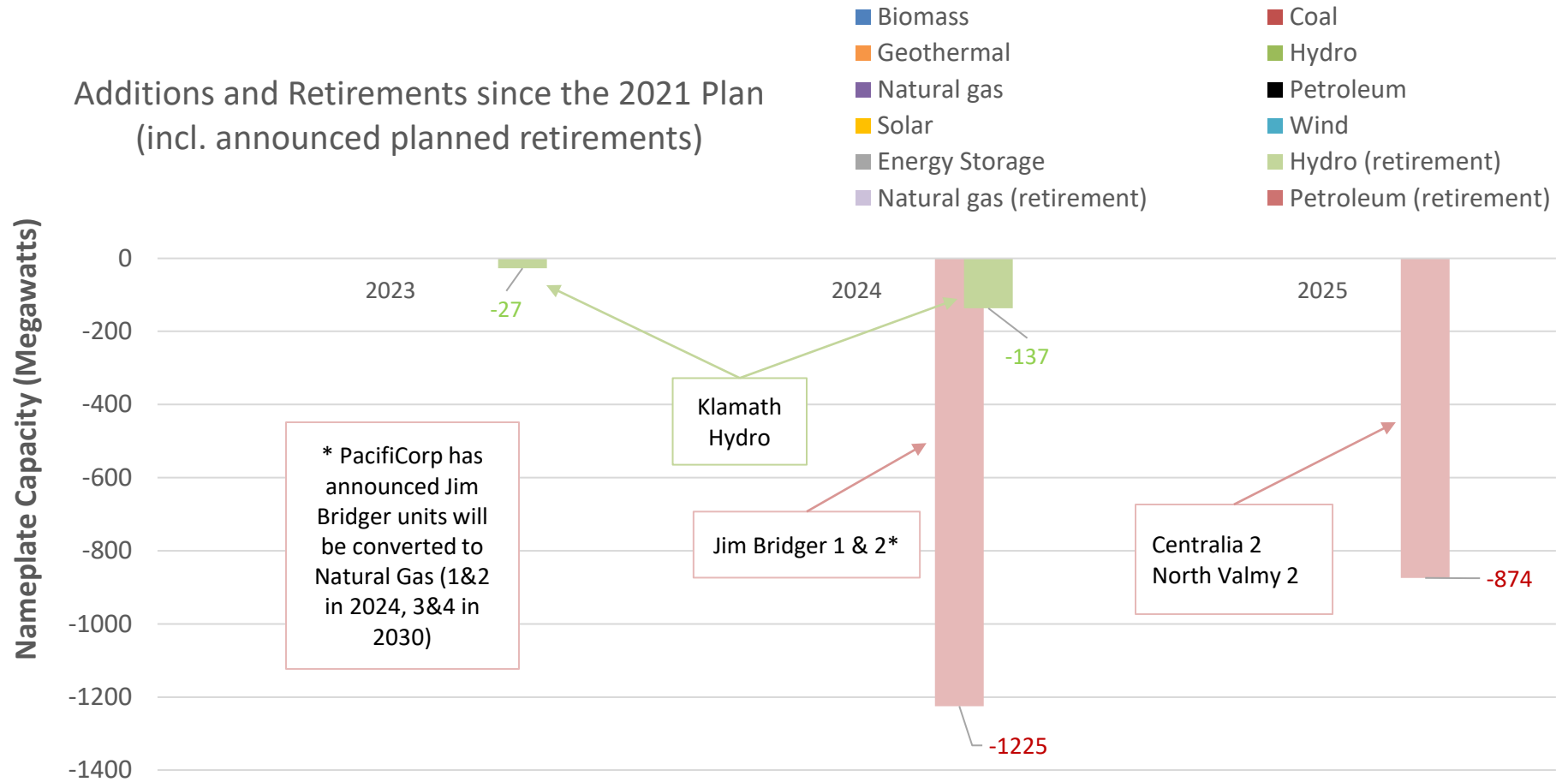
\*Resources were frozen in April of 2020, before many of these resources had gone online

~2500 MW new renewables

- 507 MW new solar PV
- 2687 MW new wind; not all in region (Ekola flats, Cedar springs I, II, III)
- Starting to see a little bit of storage
- Consistent with the Plan forecast lots of new renewable builds and no new fossil fuel plants planned

# ... and announced retirements

Additions and Retirements since the 2021 Plan  
(incl. announced planned retirements)



# PNW Coal Unit Retirements

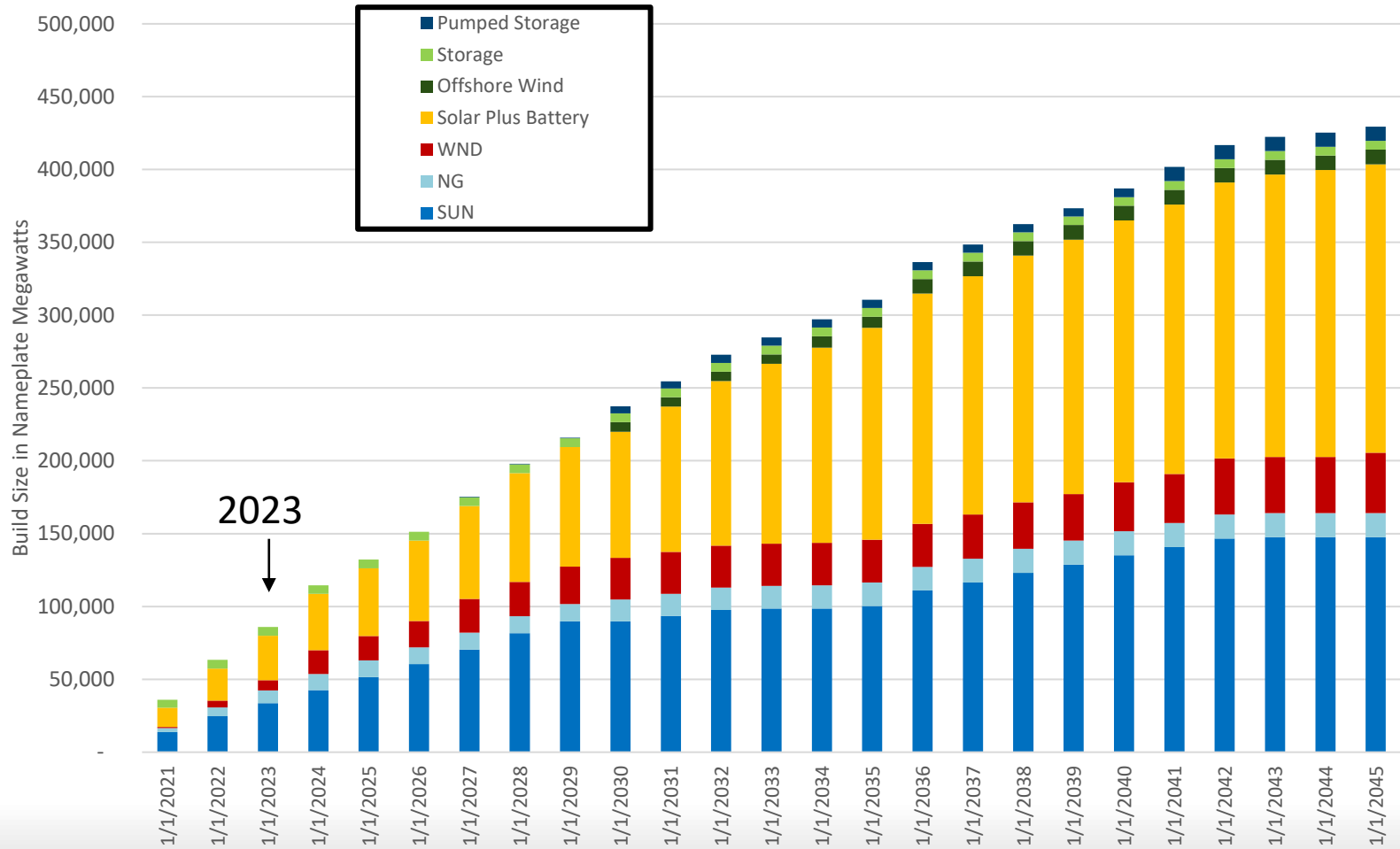
Coal Unit	Nameplate Capacity (MW)	Planned Retirement (2021 PP)	Planned Retirement (March 2023)
North Valmy 1	277	2019/2021	2021
Colstrip 1	358	Jan 2020	2020
Colstrip 2	358	Jan 2020	2020
Boardman	601	Oct 2020	2020
Centralia 1	730	Dec 2020	2020
Jim Bridger 1	608	2023	2024*
Centralia 2	730	2025	2025
North Valmy 2	289	2025	2025
Jim Bridger 2	617	2028	2024*
Colstrip 3	778	–	–
Colstrip 4	778	–	–
Jim Bridger 3	608	–	2030*
Jim Bridger 4	608	–	2030*

\*Planned conversion to natural gas announced in PacifiCorp's draft IRP

# **WECC-WIDE GENERATING RESOURCE PATTERNS**

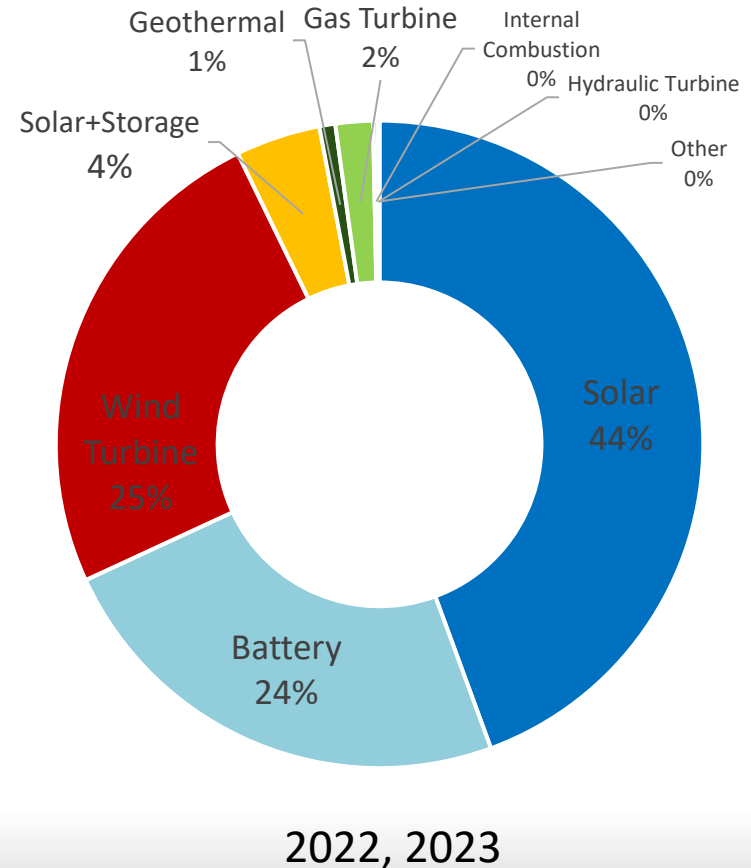
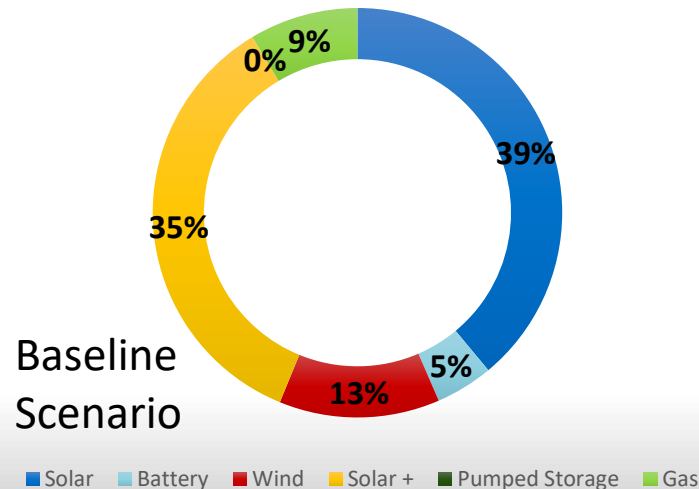


# WECC and the 2021 Plan

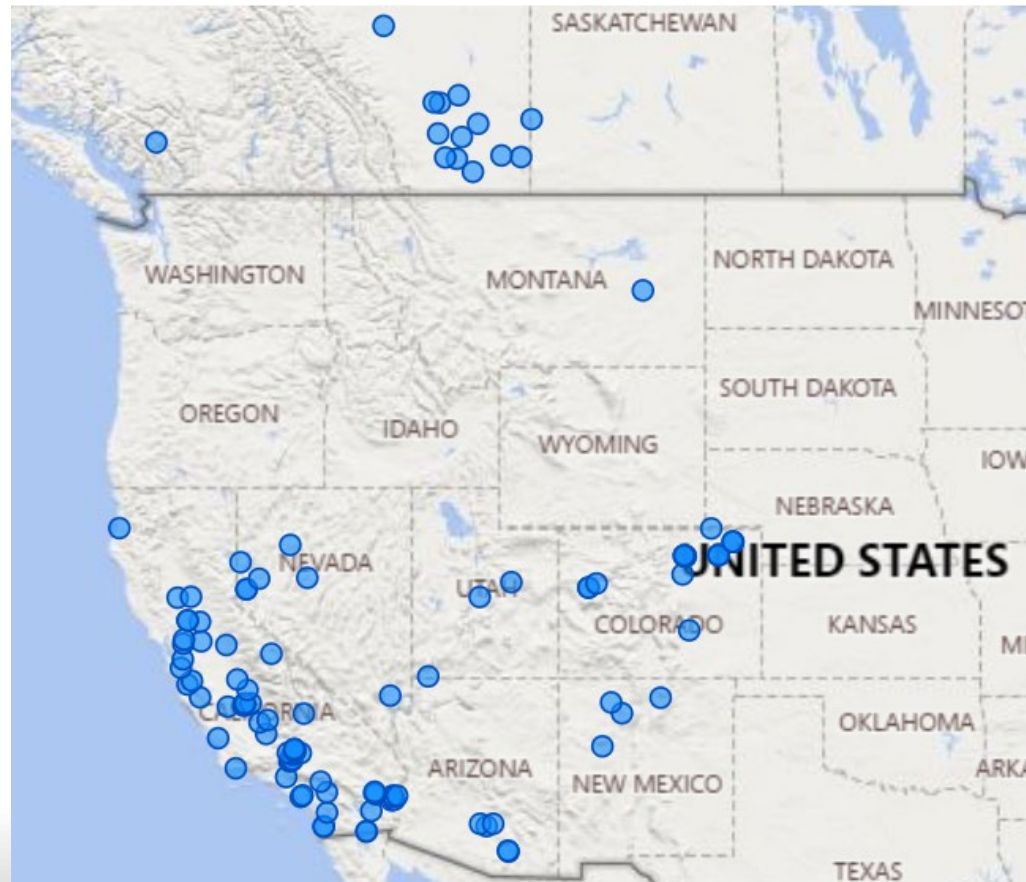


# Generating Resource Additions by Technology (WECC)

Total: 7,631 MW  
 Solar: 3,520 MW  
 Battery: 1,879 MW  
 Wind: 1,955 MW  
 Solar+: 336 MW  
 Gas Turbine: 148 MW  
 Geothermal: 63 MW



# Where are the New Generating Resources Across the Wider WECC



# **BROADER RESOURCE LANDSCAPE**

# National Resource Additions

- Not the view of the rest of this presentation, but large scale look forward
- We see the PNW is trending the way of the rest of the country
  - However, seeing more wind than solar, no new gas, and only just touching battery storage
- Direction at least partially policy driven

## Clean energy will dominate new U.S. power plant capacity added in 2023

Solar, wind, battery storage and nuclear make up 84% of utility-scale generating capacity planned to come online this year

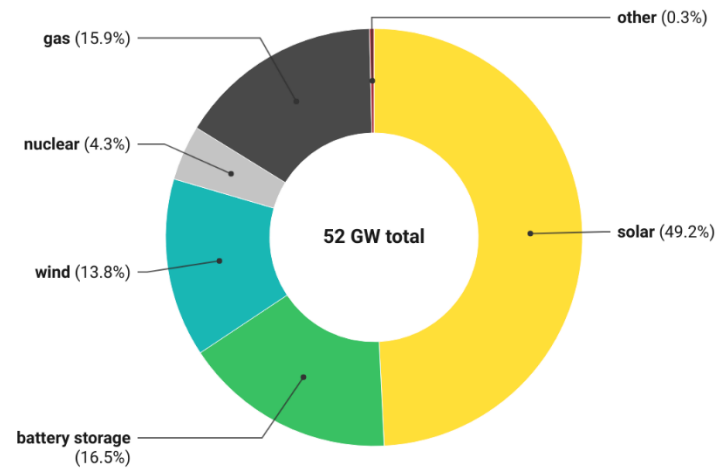


Chart: Canary Media • Source: Preliminary Monthly Electric Generator Inventory, January 2023 data

# Policy Changes

Federally:  
Bipartisan  
infrastructure Law  
(BIL) & Inflation  
Reduction Act (IRA)

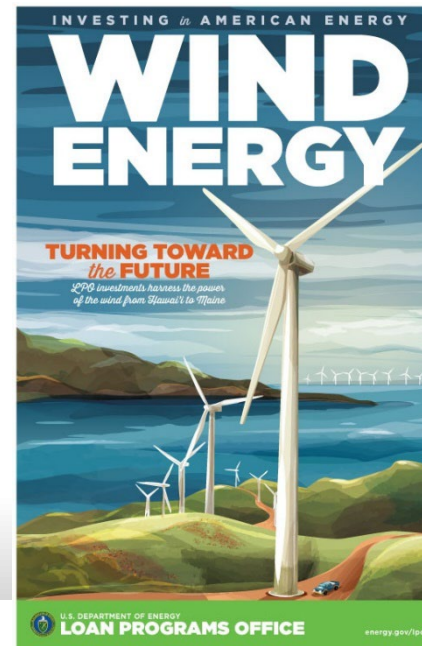
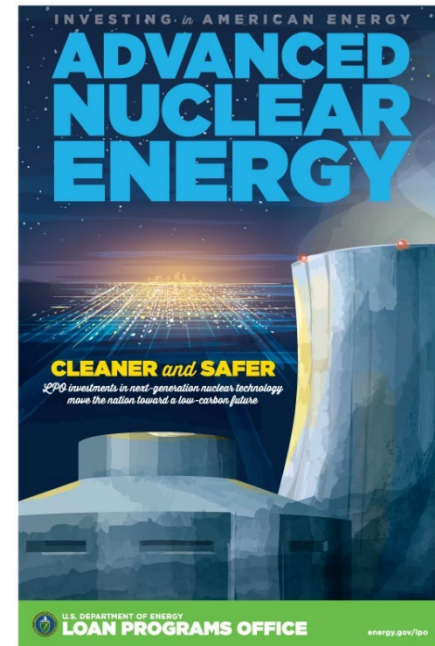
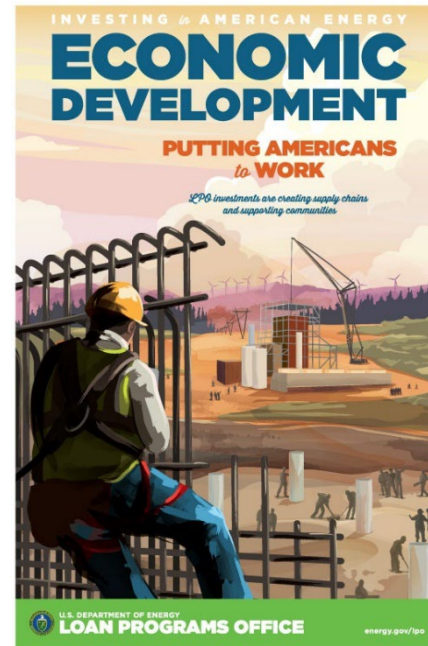
- Extended ITCs & PTCs
- Lots of grants available
- Electrification & Clean Energy focus

Regionally:

- WA Cap & Invest & Continued CETA compliance
- OR implementation of Gov. Brown's Executive order

Locally:

- New IRPs are forthcoming, dealing with what BIL/IRA means for their jurisdictions








## HYDROGEN

Generation • Infrastructure • Transportation






# FROM THE GRAC

# Advisory Committee Share Out

- IRP in April, saw cost changes  
Avista 
- LT build with refreshed assumptions  
BPA 
- Gas turbine upgraded for more flexibility, goal of improving renewable integration  
Clark PUD 
- Submitted IRP last fall, long term focus as near-term things are changing so quickly  
Grant PUD 
- Flagged 200+ MW of announce batteries in next 2 years, seeing big response from developers  
Idaho Power 

- NWestern submitting IRP by end of April, 175 MW RICE unit 2023/24 timeframe  
MT Energy Office 
- Flagged the importance of flexibility and resiliency, urged Council work on the subject  
UAMPS 
- Wrapped 2023 progress report, saw diverse portfolio mix responding to peak and clean energy needs  
PSE 
- Highlighted OR's community solar program and recent solar + storage efforts  
ODOE 
- Underlined the driving force of WA's clean energy policies  
WA UTC 

A valuable exercise to hear what's on stakeholders' minds, what they're seeing in their service territories, and in their work.

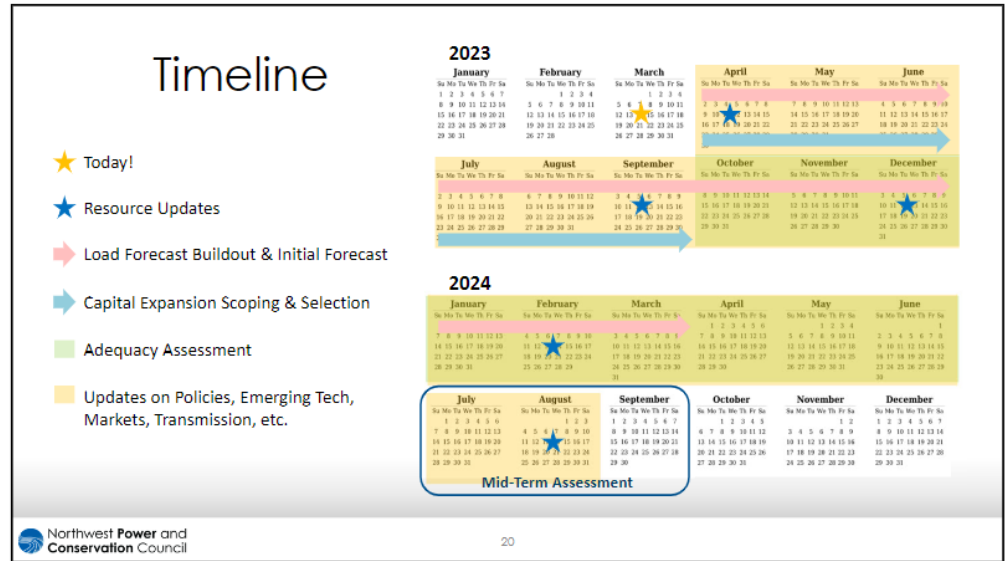
- Brought attention to new batteries coming up in utility IRPs and the importance of long duration energy storage  
Renewable NW 
- Emphasized extreme weather events and their impact on the system, and planning  
PSU 
- Agreed with points about batteries and solar + storage, expressed interest in virtual power plant models  
WA Department of Commerce 

Notably, many jurisdictions are thinking about similar things which align with Council work/focus as well.



# Up Next

- IRPs forthcoming
  - Tracking those updates, will come back to the committee with a summary
- Continuing to develop the granularity of our WECC data
- Emerging Technologies
  - Batteries, + Storage
- Culminating in the midterm assessment
  - Does the resource strategy in the 2021 PP continue to ensure an adequate, efficient, economical and reliable power system?



From division workplan update. Note the few key check points as we help prepare inputs for an updated adequacy assessment feeding into the midterm assessment in mid 2024