

Review of new resources and retirements since adoption of the Seventh Power Plan: Mid-term Assessment

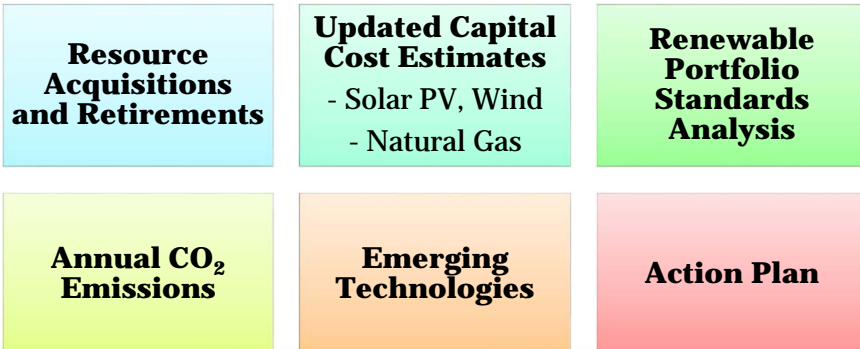
Gillian Charles, Mike Starrett

Power Committee

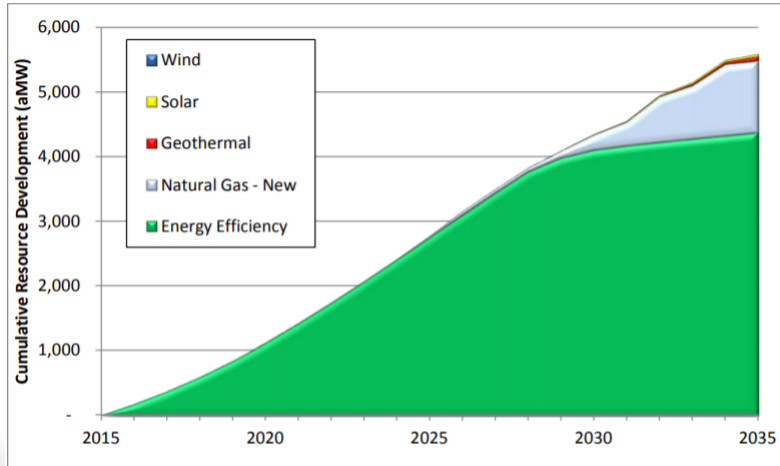
May 8, 2018



Seventh Plan Mid-Term Assessment:  
Generating Resources

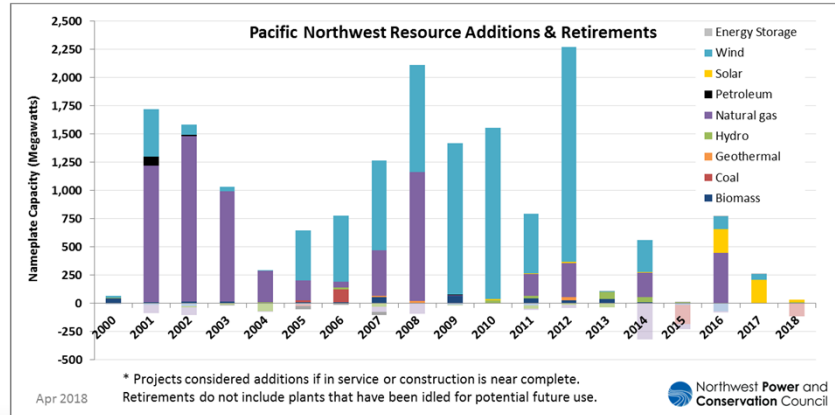


### Seventh Power Plan: Average resource development over all 800 futures in RPM\*

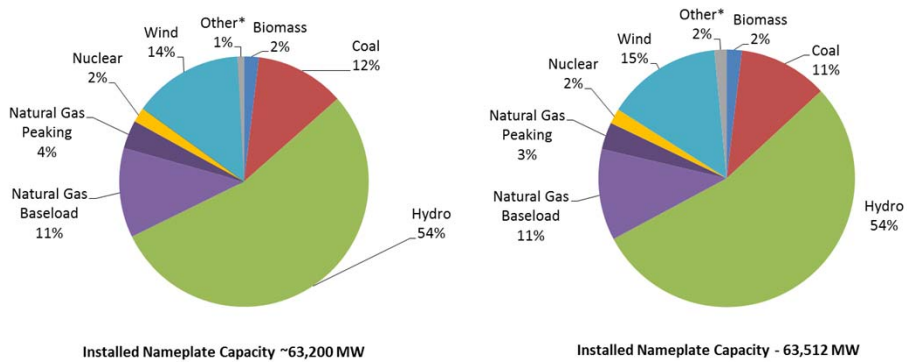


“The plan also recognizes that **individual utilities**, which have varying access to electricity markets and varying resource needs, **may require near-term investments in resources to meet their adequacy and reliability needs**. For example, some utilities face significant near-term resource challenges, particularly if there is limited access to surplus resources from others. These factors limit the ability of the regional resource strategy to be specific about optioning and construction dates for natural gas-fired resources, or for the types of natural gas-fired generation. As a result, new gas-fired generation may be required, even if utilities deploy demand response resources and develop the energy efficiency called for in the plan.”

# Resource changes over the last two decades



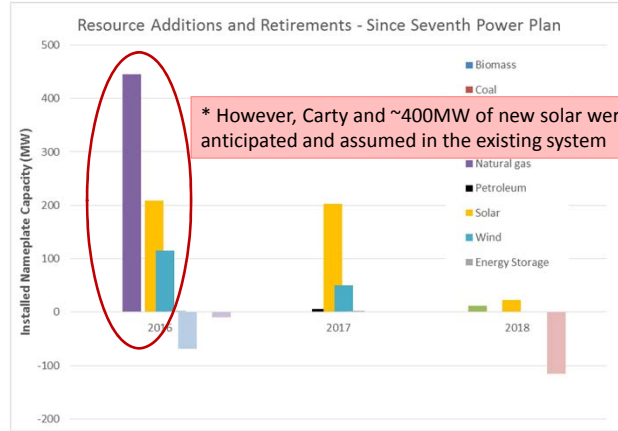
# Seventh Power Plan (Feb 2016) vs. Today (April 2018)



Located in Power Act Region or contracted to PNW loads; WECC; In-service, under construction, standby or idle  
Includes PacifiCorp WY wind plants  
\*Other - Geothermal, Petroleum, Solar

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

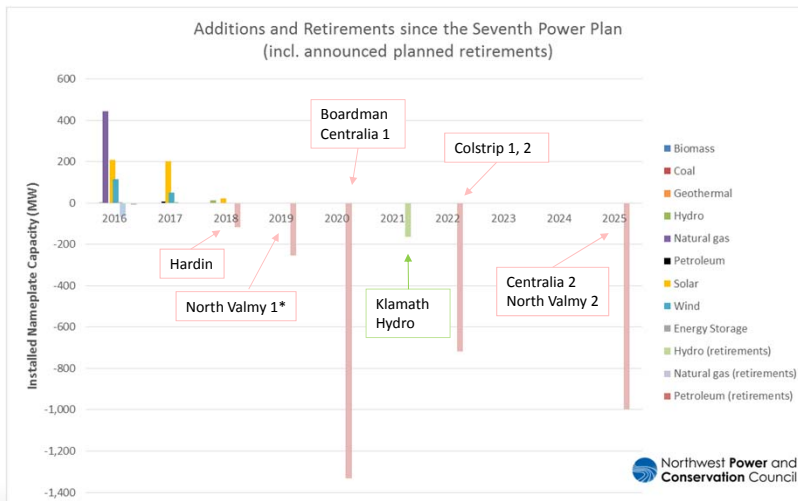
## Resource changes\* since adoption of the Seventh Power Plan...



\* However, Carty and ~400MW of new solar were anticipated and assumed in the existing system

- 435 MW new solar PV (mainly in ID and OR)
- ~440 MW new natural gas (Carty CC)
- 115 MW new wind; however only 10 MW in region (Chopin)\*\*
- 12 MW new hydro (SnoPUD's Calligan Creek and Hancock Creek)

## ... including announced retirements



## Planned Coal Retirements - Region

Plant	Retirement Date	Capacity & Op Yr	Location	Ownership
J. E. Corette	2015	173 MW (1968)	Billings, MT	PPL Montana**
North Valmy – 1 North Valmy – 2	2019 (?) 2025	254 MW (1981) 268 MW (1985)	Valmy, NV	Idaho Power, NV Energy (50/50)
Boardman*	2020	600 MW (1980)	Boardman, OR	PGE, Idaho Power (90/10)
Centralia – 1 Centralia – 2	2020 2025	670 MW (1971) 670 MW (1971)	Centralia, WA	TransAlta
Colstrip – 1 Colstrip – 2	2022	360 MW (1975) 360 MW (1976)	Colstrip, MT	PSE, Talen Energy (50/50)
Jim Bridger – 1*** Jim Bridger – 2***	2028 2032	578 MW (1974) 578 MW (1975)	Sweetwater, WY	PAC (2/3), Idaho Power (1/3)
Hardin	2018	116 MW (2006)	Hardin, MT	Rocky Mountain Power (Not related to PAC)
<b>Regional Total</b>		<b>3,037 MW****</b>		

\* Ceasing coal-fired production; future of Boardman plant TBD  
 \*\* Out of region (OOR)  
 \*\*\* Not a commitment; only part of PAC 2017 IRP forecast. Decision on SCR to be made by PAC in early 2018. Idaho power also evaluating SCR and early retirement in their IRP process with no decision yet.  
 \*\*\*\* includes 50% of North Valmy; does not include Corette or Bridger

## Summary of recent IRPs: Caveats

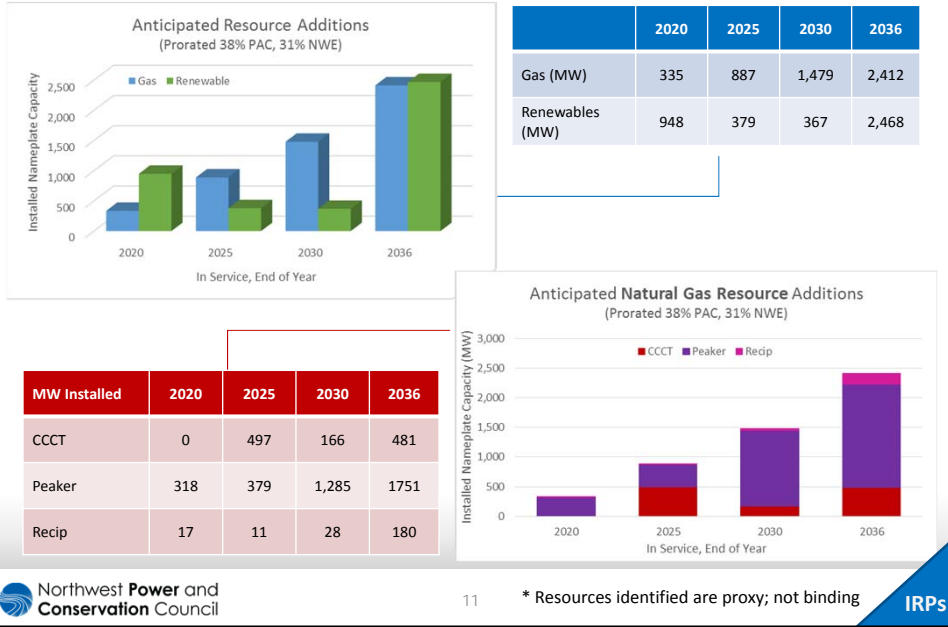
- Aggregates **new** physical resources only
- Does **not include** anticipated EE, DR, energy storage, market purchases, transmission development, repowered wind
- Resources identified are proxy; not binding
- The farther out, the greater the uncertainty
- Includes IOUs only:



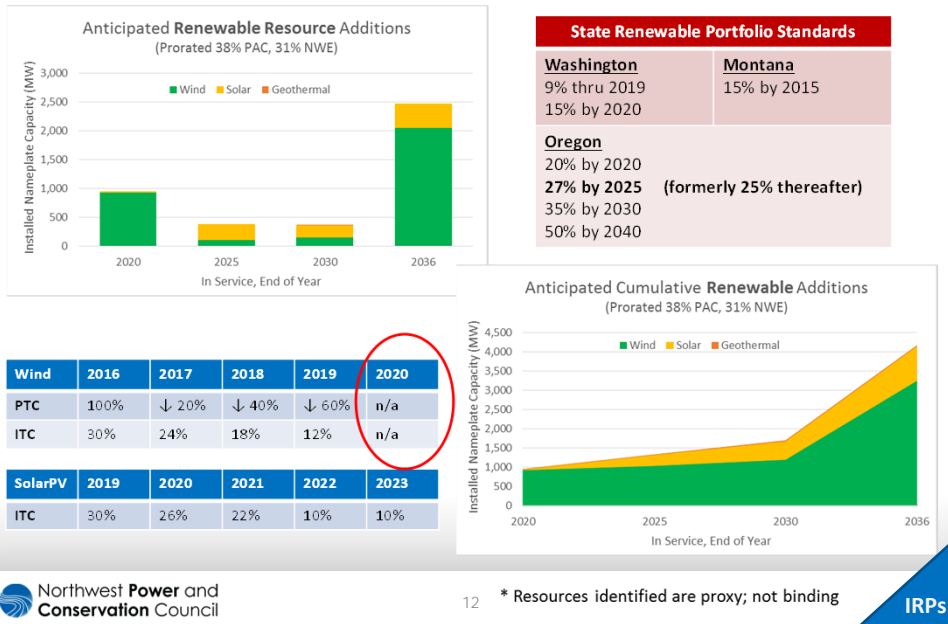
(many grains of salt)

Utility	% New Resources Included
Avista 2017 IRP	100%
Idaho Power 2017 IRP	100%
NorthWestern 2015 IRP	31%
PacifiCorp 2017 IRP	38%
Portland General 2016 IRP	100%
Puget Sound 2017 IRP	100%

# Anticipated New Resources\*



# Renewable Resource Breakout\*



## Current Activities, Highlights: Acquisitions, Requests for Proposals

- PGE signed (2) PPAs with BPA for 200 MW of annual capacity (surplus hydro) and (1) PPA w/ Avangrid for 100 MW of seasonal capacity
- Avista issued RFP for solar in April 2017
  - Adams-Neilson solar project (28MWdc), EOY 2018
- PacifiCorp released RFP for 1,000+ MW wind and solar (projects must be operational by EOY 2020)
  - Wyoming wind projects
  - Repowering existing wind
- PGE to issue RFP for 310 MW renewable resources in 2018
- PSE to release “all source” RFP in 2018 (for delivery in 2022)
- Idaho Power pursuing Boardman to Hemingway transmission in its action plan

## Observations

- Energy efficiency and demand side strategies pursued first, keeping load growth low and delaying the need for resource acquisition
- Changes in Oregon RPS, combined with expiring federal tax credits have accelerated renewable resource acquisition
- Uncertainty over environmental regulations and carbon legislation → a lot of retirement and replacement scenarios for existing coal plants
- Fundamental change in treatment/analysis of resource acquisition in IRPs: less resource-specific, more generic capacity vs. energy need
- Overall – resource planning and development very much in line with Seventh Power Plan