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May 5, 2020

## MEMORANDUM

**TO: Power Committee**

**FROM: Gillian Charles**

**SUBJECT: Update on Existing System, Coal Retirements, and Policies**

### BACKGROUND:

Presenter: Gillian Charles

Summary: Staff will be presenting an update to the existing system resources and existing renewable and clean policies for the draft 2021 Power Plan. As you will recall, staff presented on both topics at Power Committee meetings in September and October of 2019. This presentation will focus on updates since then and describe how the data is interpreted and translated into data inputs for power plan development.

Between packet day and the Power Committee meeting, there is an advisory committee meeting on these same topics. Following the advisory committee meeting, this presentation may be updated with additional material or feedback from stakeholders. In this case, staff will send a follow-up email with an updated presentation.

Workplan: A.4.2 Develop environmental methodology, existing system, transmission availability, renewable portfolio standards, emissions and other datasets for the 2021 Plan

# Update on Existing System, Coal Retirements, and Policies

Gillian Charles

Power Committee - May 12, 2020



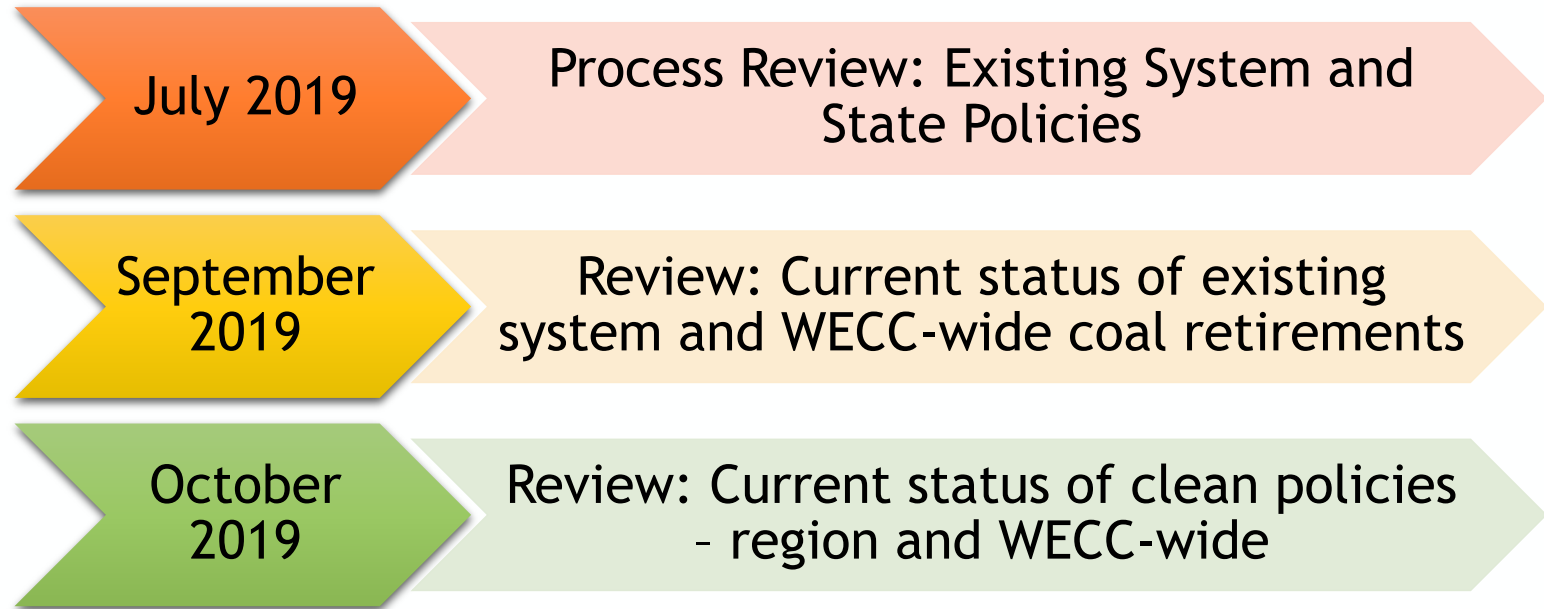
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THE 2021  
NORTHWEST  
POWER PLAN

FOR A SECURE & AFFORDABLE  
ENERGY FUTURE



# Power Committee Meetings: Existing System and Policies



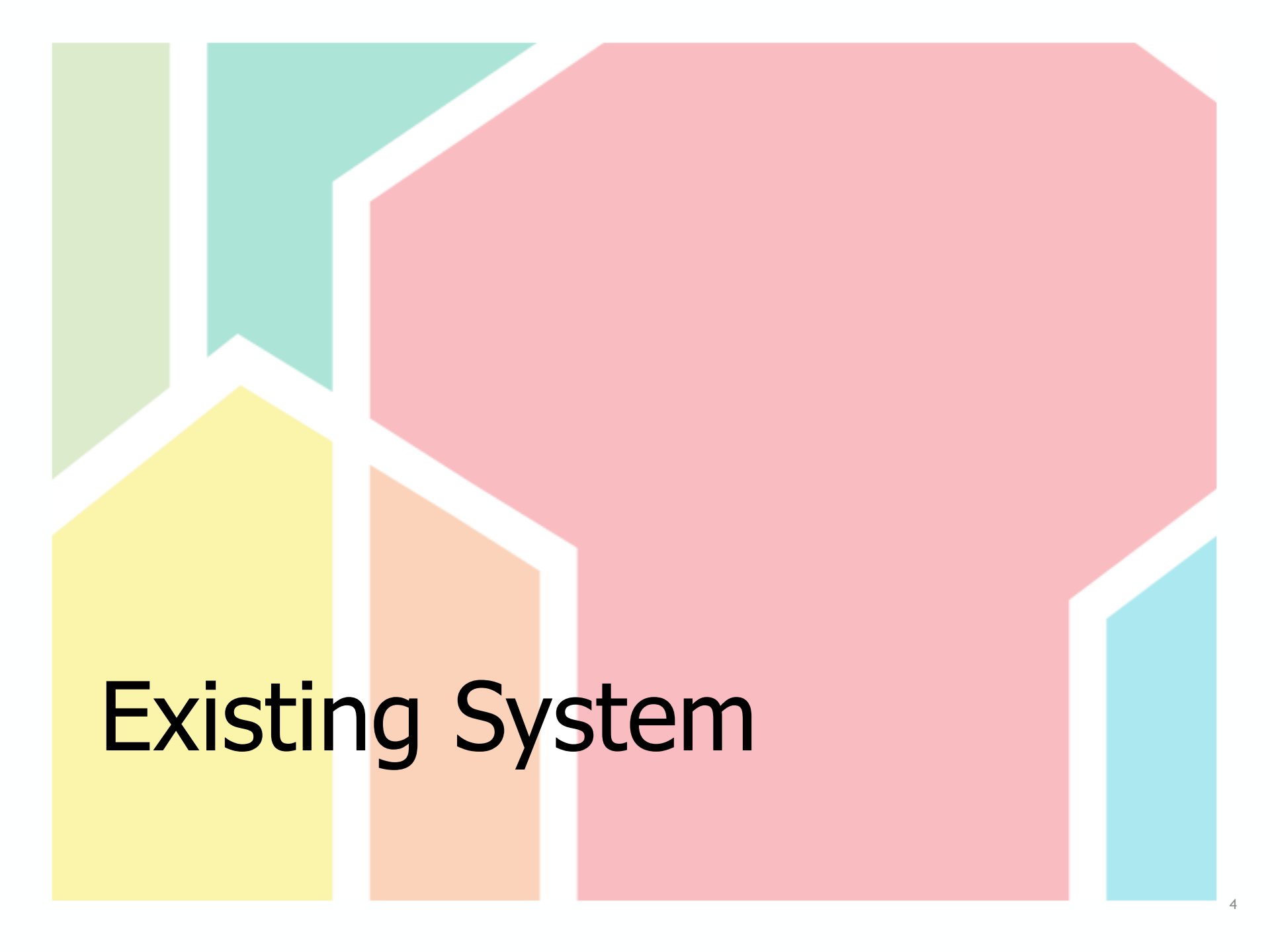
Note: The work products that staff presents to the Power Committee have all been vetted with the Generating Resources Advisory Committee (GRAC) and when applicable the System Analysis Advisory Committee (SAAC).



# Starting at the beginning...

The existing power system resources, including known future retirements, and the state policies that govern current resource operation and future resource development serve as the foundation and guideposts when determining the power plan's future resource strategy





**Existing System**

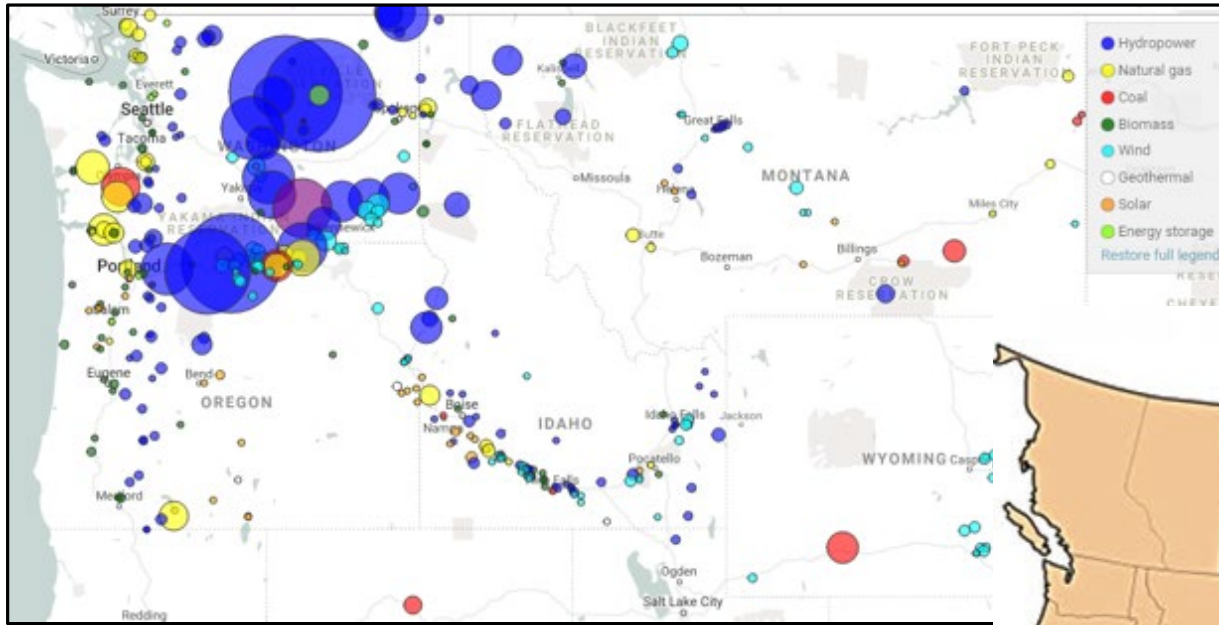
# Determining what constitutes the “Existing System”

A lot like a decision flow chart, with key questions that narrow and fine tune the answer...

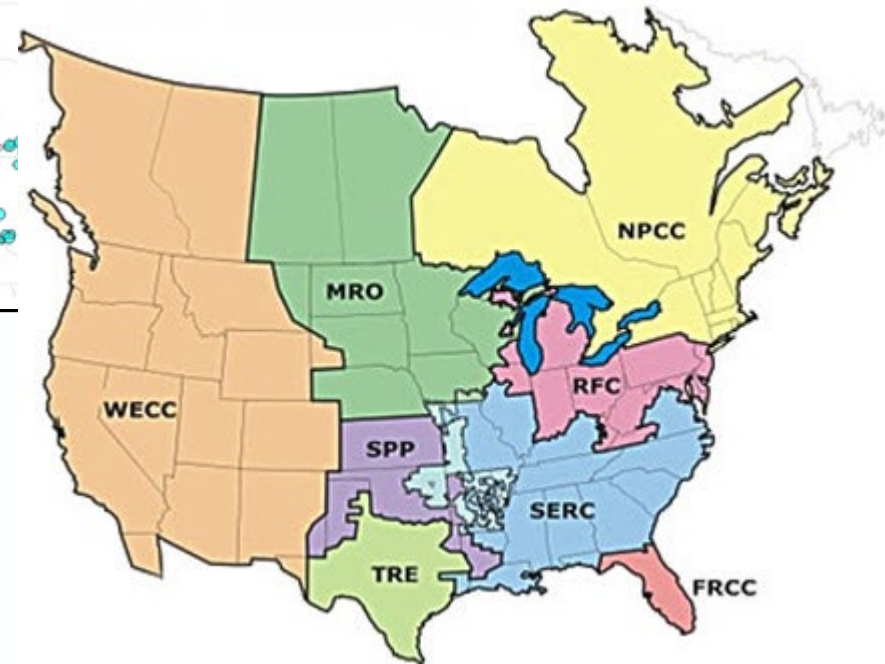
Start with Council’s project database and narrow the field based on location, project status, ownership, load, etc.



# Existing system = Resources physically located in region and out of region serving regional load



Power Plan is a plan *for the region...*

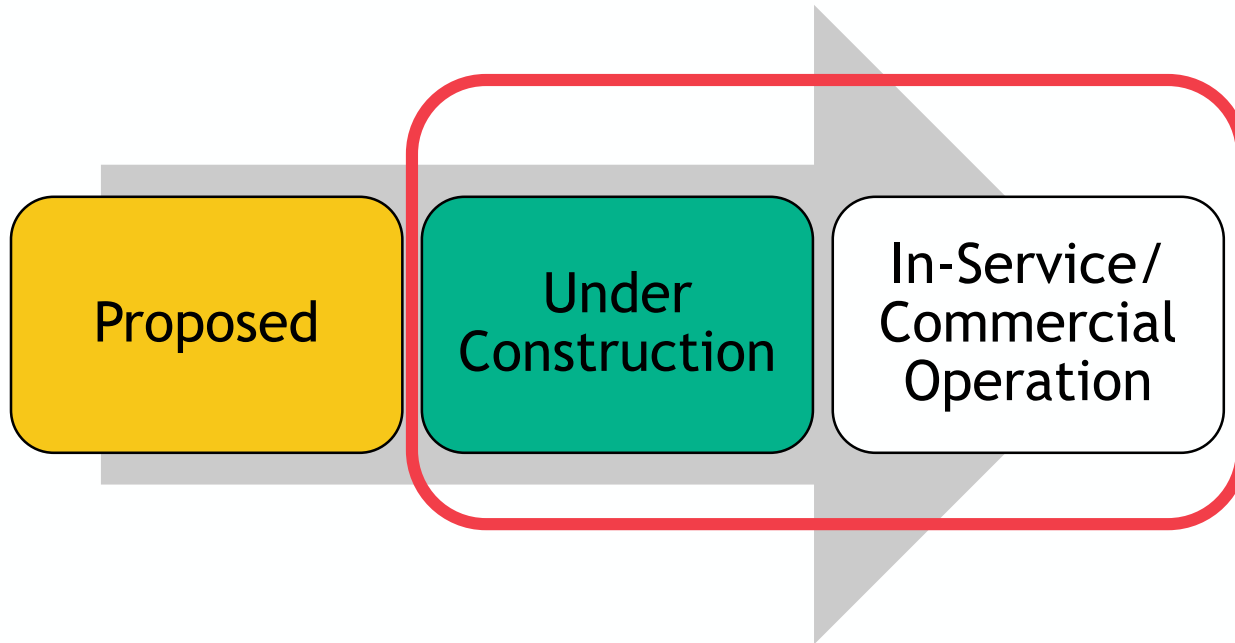


...however the Northwest is obviously directly affected by the resources and policies that exist in the surrounding states and markets

It is our intent to capture both - to the *extent possible*



# What projects and resources qualify as the “Existing System”?



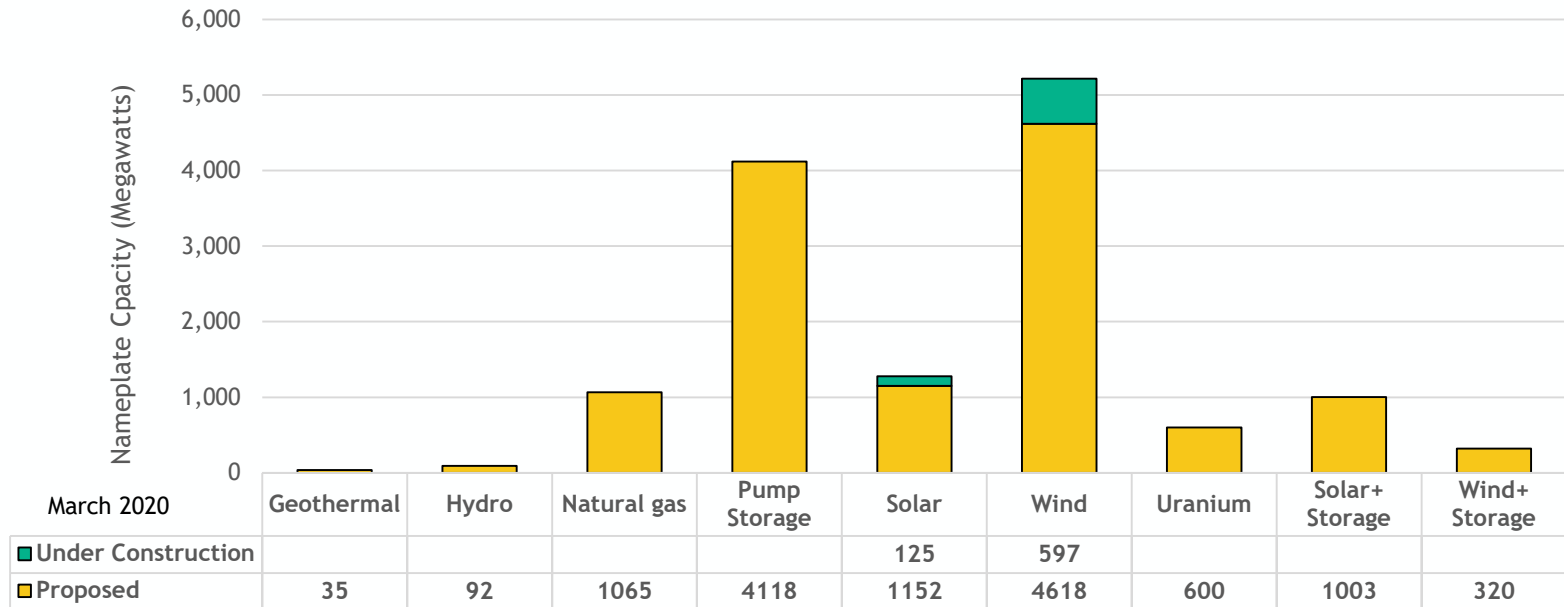
Resources that are **operating or under construction at the beginning of the power planning period (Q4 2021)** - however we need to “freeze” the dataset for the draft, so this is more akin to a **project’s status as of March 2020**.





# PNW Project Pipeline: Under Construction and Proposed\*

\* Not exhaustive; there are likely many QF projects not included until more solid evidence of development

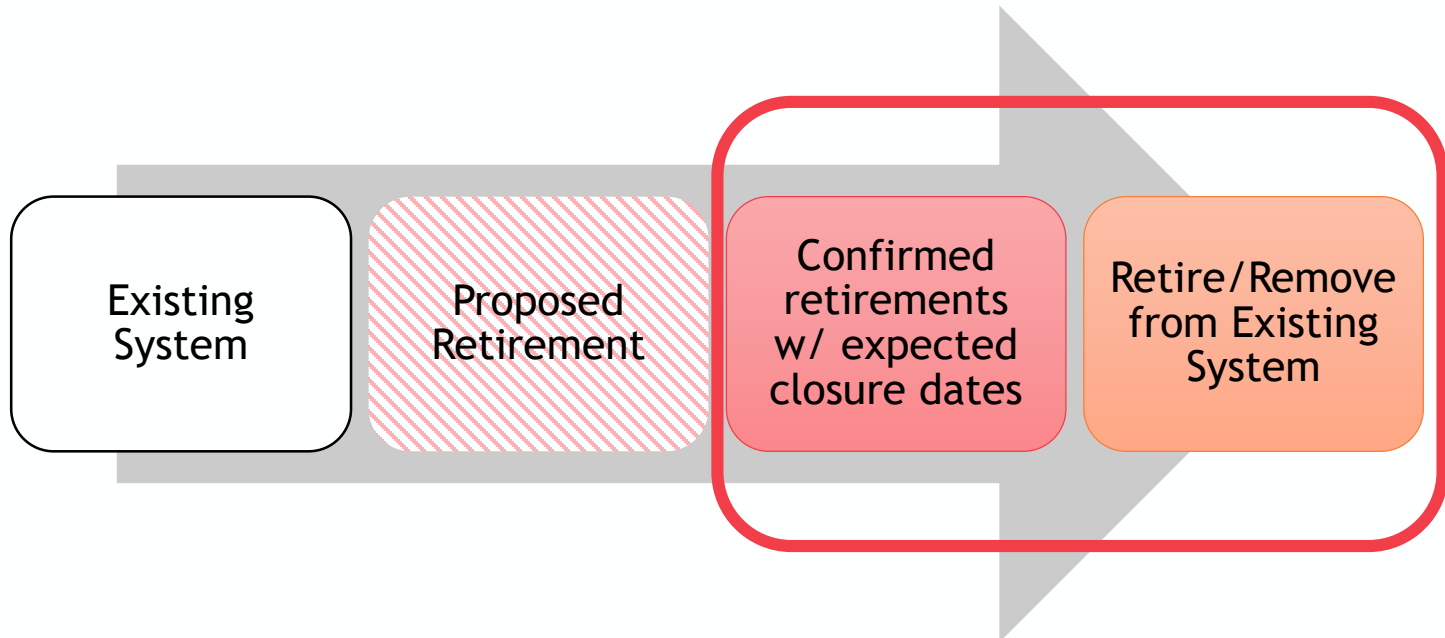


- Some projects in the pipeline are further along in the planning process - for example, a project may have a power purchase agreement or completed the siting and licensing process
- Propose to describe these projects qualitatively in the narrative; if the model options renewables early, it serves as a reality check to the actual projects in the queue

Caveat: Between draft and final, existing system data can be updated to reflect interim project development



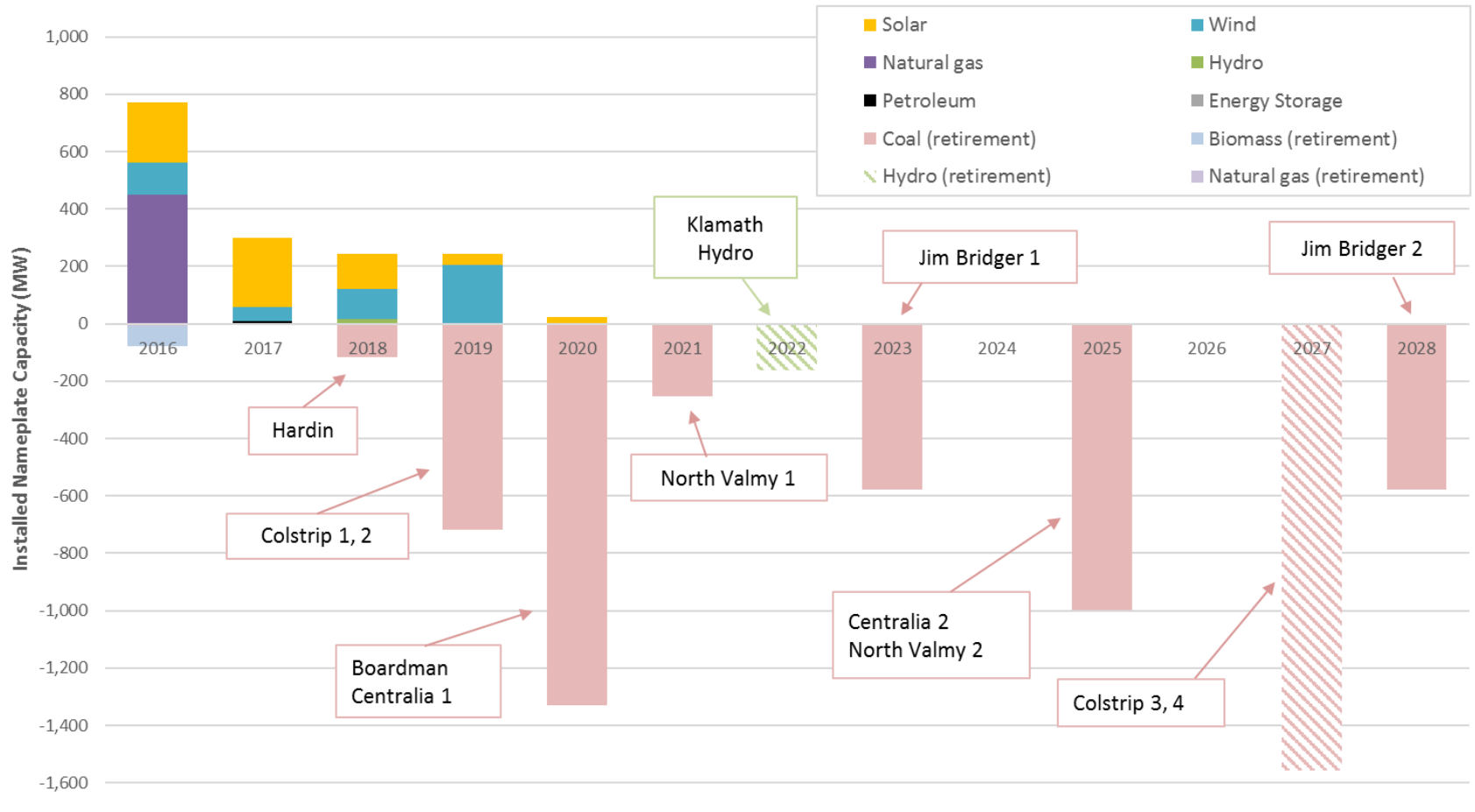
# Existing System Retirements



Resources that have a confirmed retirement date during the **power planning period (2021 Q4 -2041 Q3)** are retired from the existing system base. Proposed retirements are not included in the base, however scenarios may be representative of additional retirements (e.g. early coal retirement scenario).



## Additions and Retirements since the Seventh Power Plan (incl. announced planned retirements)



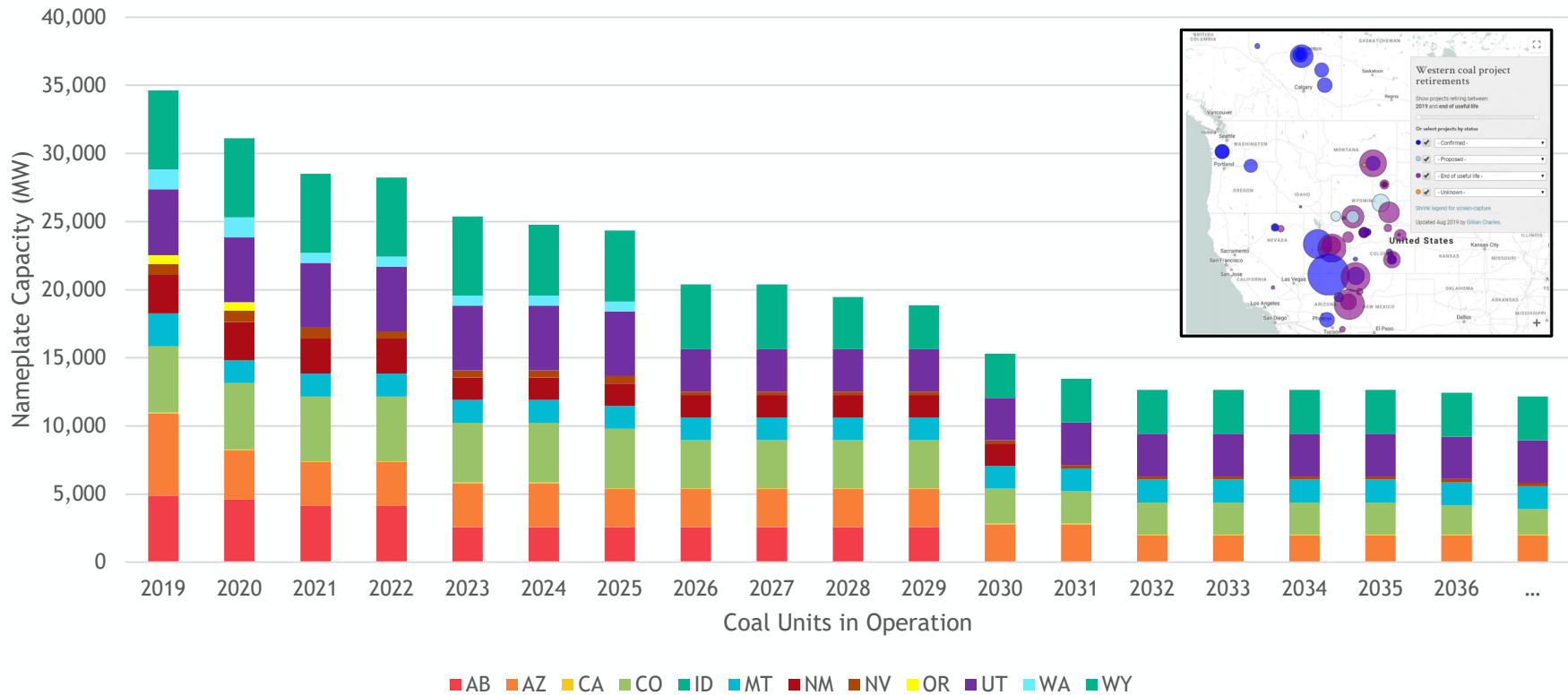
Planned retirements based on agreements, announcements, IRPs; subject to change  
 Idaho Power intends to end its participation in North Valmy 1 in 2019  
 Uncertainty remains over timing of Jim Bridger 1,2 potential accelerated retirements  
 Hardin Generating Station was sold to an out-of-region cryptocurrency company; therefore no longer “counts” towards the region  
 Colstrip 3,4 should be considered *very tentative*

Updated Mar 2020



# WECC coal units in operation, decreasing over time

WECC Coal Units in Operation - By State/Province



Overall, coal operating in the WECC falls from about ~34GW in 2019, to ~15GW in 2030 and ~13GW in 2032 (and thereafter)



# Project Database & Components

POWER PLANTS IN THE PACIFIC NORTHWEST & SYSTEM PLANNING ASSUMPTIONS									
Name	NWPCC Unit ID	EIA (ORIS) Plant Code	EIA Generator Unit ID	FERC Project ID	Technology	Primary Fuel	Alternate Fuel	Resource Type	Nameplate Capacity (MW)
10th Street (Springfield Ics, Springfield Gen Farm)	1000				IC	NG		Natural gas	9.5
45-Mile Hydroelectric Project	2095	58455	0001 0002 0003	P-13817	HY	WAT		Hydro	3.0
Adams Solar Center	2159	61496	ADAMS		PV	SOL		Solar	10.0
Adams-Nielson Solar Farm	2272	61933	ADAMS		PV	SOL		Solar	20.0
Aflon Generating Co. 1	1002				STCG	WW		Biomass	7.5
Agate Bay Solar (OR Solar 2)	2160	61200	ORSR2		PV	SOL		Solar	10.0
Airport Solar Project	2287	62360	APS		PV	SOL		Solar	47.3
Albani Falls 1-3	1003	651	1,2,3	FCRPS	Storage	WAT		Hydro	42.6
Alden Bailey (Wauna Peaking/Loki)	1004	56223	LOKI		GT	NG		Natural gas	10.9
Alder 1 & 2	1005	5913	11,12	1862B	Storage w/Div	WAT		Hydro	50.0
Amalgamated Sugar (TASCO) (Nampa) 1 - 3	1006	54690	2250,500,6500		STCG	NG	COL	Natural gas	8.7
Amalgamated Sugar (TASCO) (Nyassa) 1 - 3	1007	54612	1,2,3		STCG	COL		Coal	14.0
Amalgamated Sugar (TASCO) (Paul)	1008				STCG	NG	COL	Natural gas	5.1
Amalgamated Sugar (TASCO) (Twin Falls) 1-3	1009	10504	1500,2500,4000		STCG	COL	NG	Coal	10.2
American Falls 1 - 3	1010	609	1,2,3	2736	Storage w/Div	WAT		Hydro	92.3
American Falls Solar	2101	60011	PAF		PV	SOL		Solar	20.0
American Falls Solar II	2102	60012	PAF2		PV	SOL		Solar	20.0
Amy Ranch	1011			8700	Conduit	WAT		Hydro	0.7
Anderson Ranch 1 - 2	1012	6395	1,2	FCRPS	Storage	WAT		Hydro	40.0

## Project/Unit-level data

- Resource fuel
- Technology type
- Nameplate capacity
- Operating status
- Location
- Ownership/electrical load
- Historical energy
- ... and many more!

## Assumptions

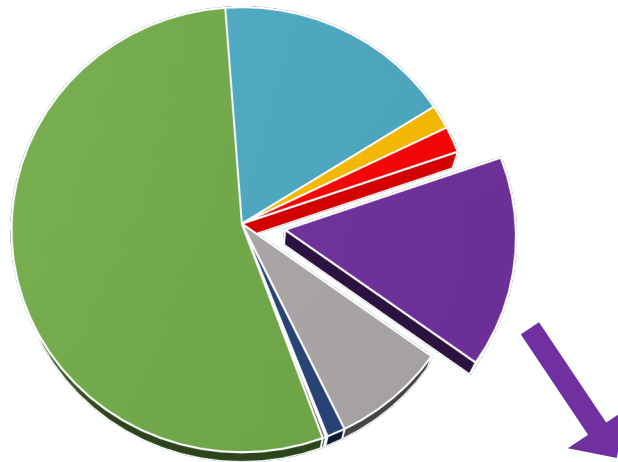
- Heat rate
- Seasonal outages
- ... and many more!



# Existing System – Starting Point

Existing System Resources - Nameplate Capacity  
~ 63,000 MW

- Hydro
- Wind
- Solar
- Nuclear
- Natural Gas
- Coal
- Biomass
- Geothermal
- Petroleum



Aggregate unit-level data and sort into resource blocks

- Some resources have multiple blocks
- Some resources are aggregated into one block

Example: natural gas

Gas West 1	Gas East 1
Gas West 2	Gas East 2
Gas West 3	Gas East 3



# Existing System – Resource Blocks



- Each resource block has attributes that have been aggregated from unit-level data
  - Nameplate capacity (MW), average heat rate, average fixed O&M, average variable O&M, average forced outage rate, etc.
- The model dispatches resources by block to meet load; dispatch considers the heat rate and VOM, along with fuel and electricity prices

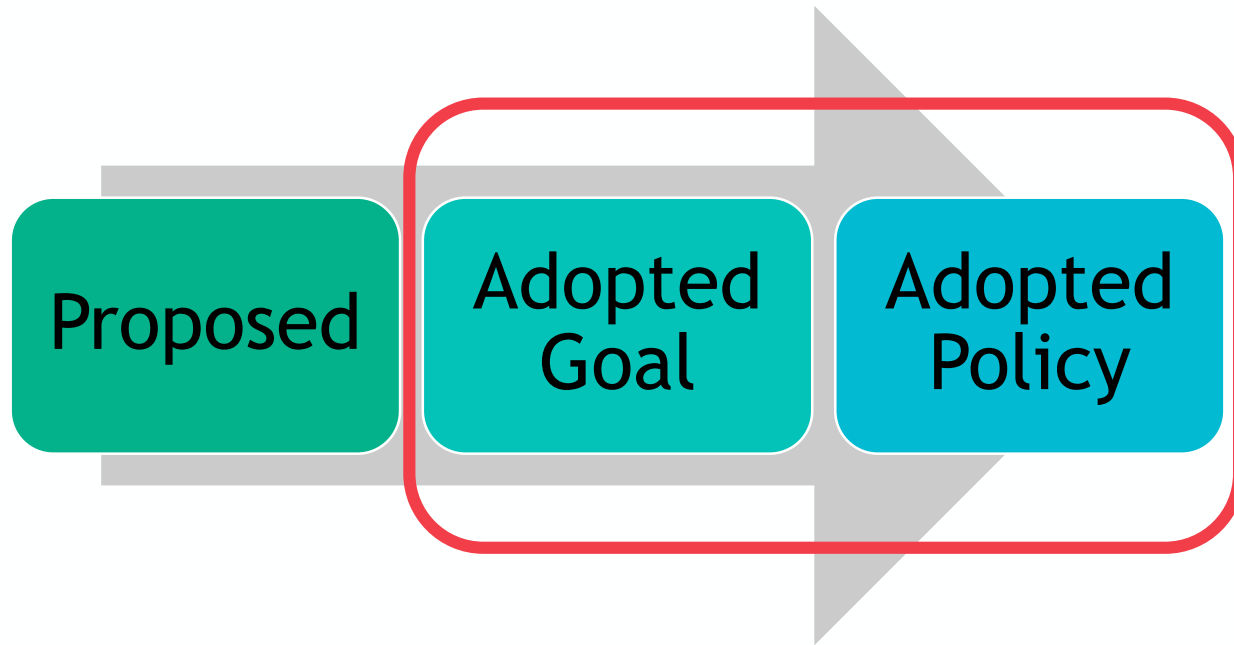




# Policies



# Clean Policy Requirements

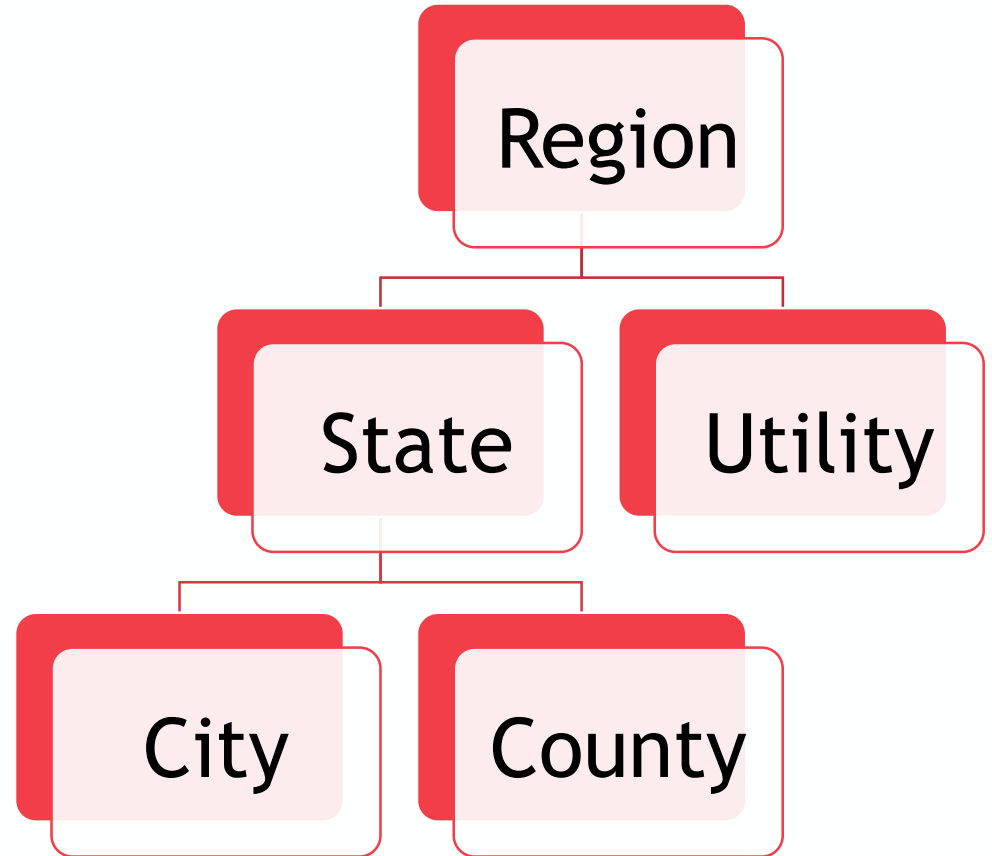


Policies (or goals) that have been adopted by **the beginning of the power planning period (Q4 2021)** - however we need to “freeze” the dataset for the draft, so this is more akin to the **status as of March 2020**. Policies that have been adopted, but still must undergo rulemakings, are included and reflected to the best of our ability (and with advisory committee input)



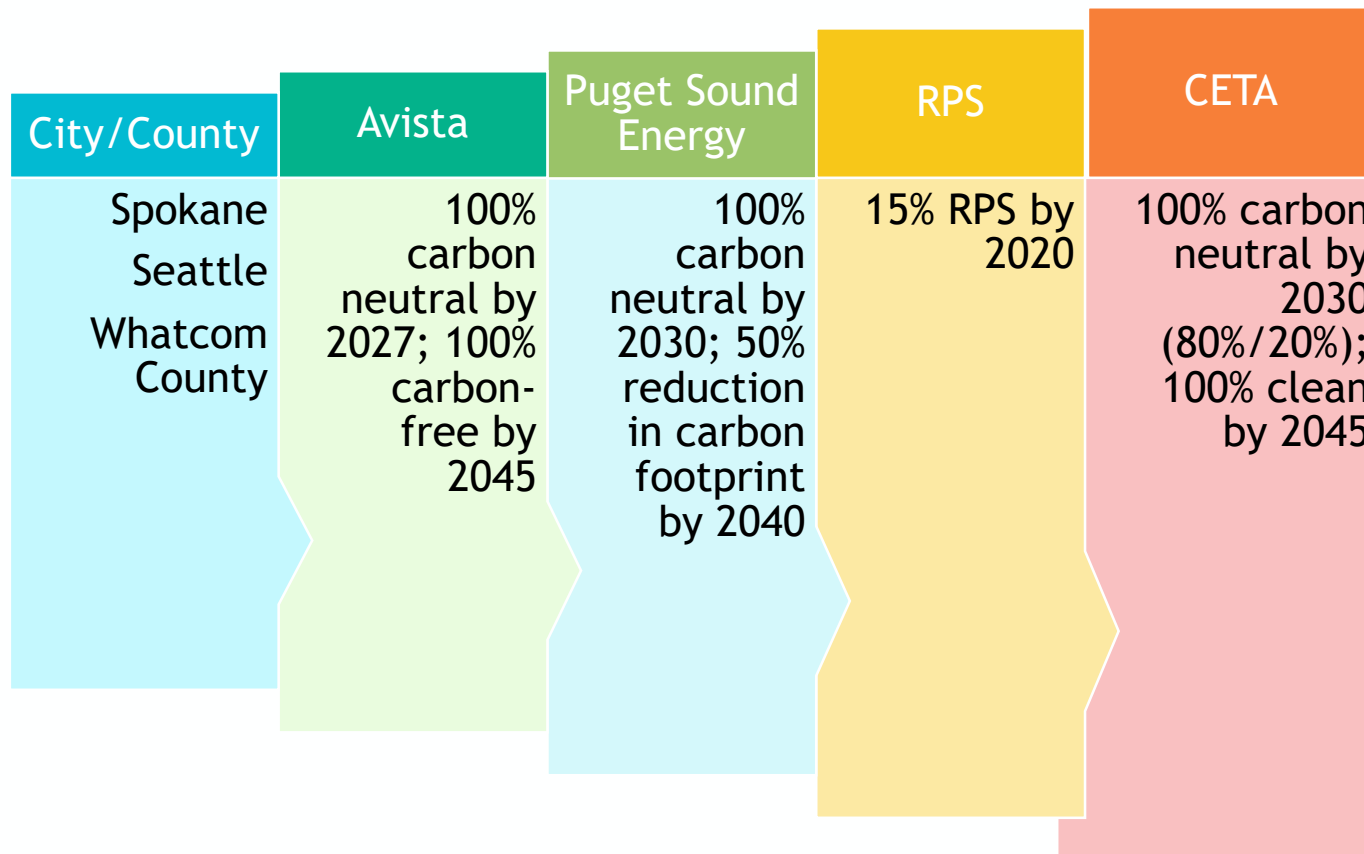
# Aggregating Clean Policies

- Multi-layered approach
  - Track policies at the state level (RPS, WA CETA), city/county goals\*, and utility goals (PGE, IPC, Avista, etc.)
- Aggregate % of load within the region that is obligated to meet clean and renewable targets throughout the planning period



\* To the extent possible!

# Washington: ex. of state-wide policy “absorbing” other policies (for modeling purposes)



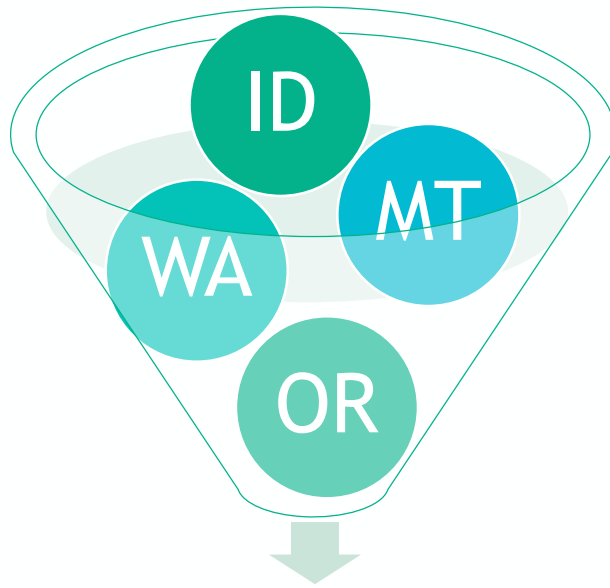
# Idaho: ex. of utility goals creating a “pseudo” state policy

City/County	Avista	Idaho Power
Boise Pocatello	100% carbon neutral by 2027; 100% carbon-free by 2045	100% clean by 2045



# Model inputs: State, utility, and city policies aggregated to the region

1.



Regional % load obligated to meet RPS; regional % load obligated to meet clean policy

2.

	RPS	Clean Energy
2021	0.075	0.094
2022	0.075	0.128
2023	0.075	0.162
2024	0.075	0.195
2025	0.075	0.229
2026	0.082	0.27
2027	0.082	0.304
2028	0.082	0.338
2029	0.082	0.371
2030	0.082	0.405
2031	0.095	0.453
2032	0.095	0.453
2033	0.095	0.453
2034	0.095	0.453
2035	0.095	0.453
2036	0.109	0.466
2037	0.109	0.466
2038	0.109	0.465
2039	0.109	0.464
2040	0.11	0.463
2041	0.117	0.47

Regional RPS obligation per year; regional clean energy per year



# Coming up next...

- GRAC - May 21
  - Proxy emerging tech reference plant
- SAAC – June 2
  - Translating reference plants into models
- June Power Committee
  - Review generating resource reference plants and proxy emerging tech reference plant

