

Mike Milburn
Chair
Montana

Doug Grob
Montana

Jeffery C. Allen
Idaho

Ed Schriever
Idaho



Northwest Power and Conservation Council

Thomas L (Les) Purce
Vice Chair
Washington

KC Golden
Washington

Margaret Hoffmann
Oregon

Charles F. Sams III
Oregon

April 1, 2025

MEMORANDUM

TO: Council Members

FROM: Tomás Morrissey and Annika Roberts

SUBJECT: Out-of-region load forecasts and existing resources

BACKGROUND:

Presenter: Tomás Morrissey and Annika Roberts

Summary: This presentation reviews the process used to create the out-of-region load forecast and existing resource assumptions. These inputs feed into the Council's market availability forecast (made in Aurora), the regional capital expansion model (OptGen/SDDP), and the adequacy model (GENESYS).

Relevance: The Northwest power system is part of the larger Western Interconnection. There is frequent trading between Northwest utilities and out-of-region entities. Future resource development in the Northwest, as well as resource adequacy, is impacted by these market dynamics. As a result, it is necessary to provide our power planning models with information about loads and resources outside of the Northwest.

Out-of-region load forecasts and existing resources feed into three of our models. First, they inform Aurora when it builds out the resources of the Western Interconnection. Second, they are included in the regional capital expansion model, OptGen/SDDP, to help inform Northwest resource selection. Lastly, they feed the GENESYS model to help inform out-of-region market availability estimates (the model also uses a market reliance limit). This presentation will

discuss where we draw our assumptions for these out-of-region loads and existing resources.

Workplan: B.2.5. Develop a forecast of WECC-wide loads and existing resources, as well as related assumptions, for plan analysis.



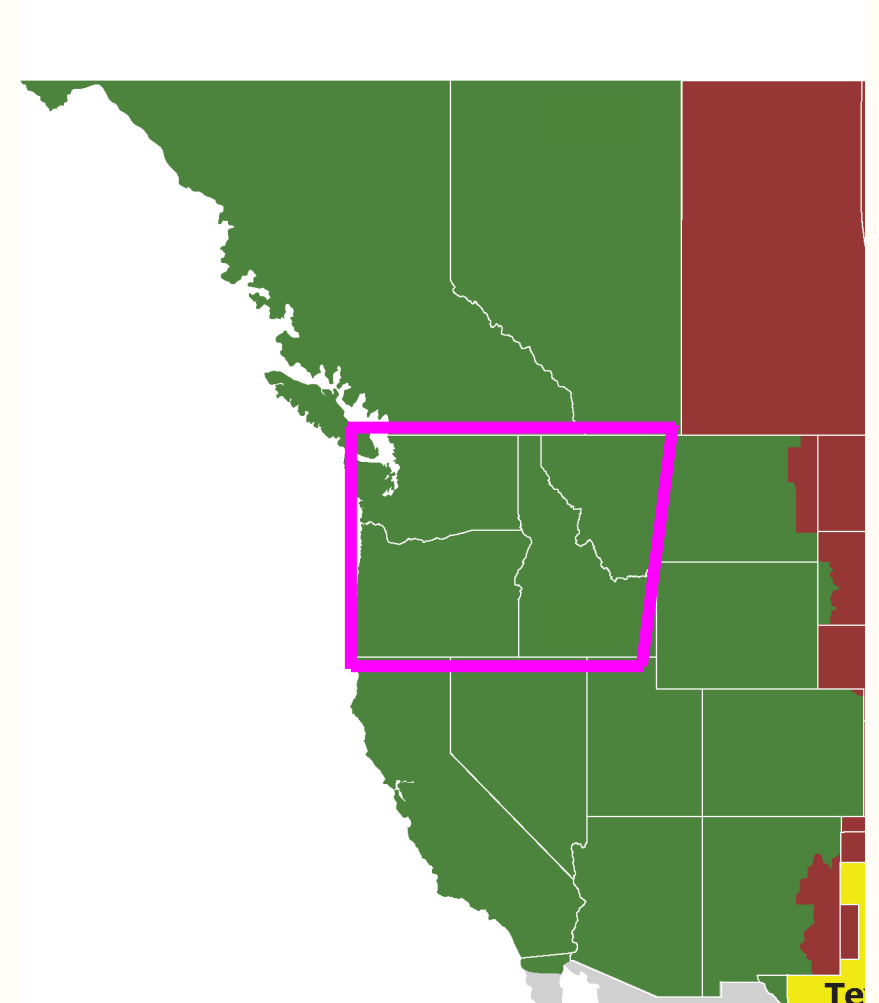
Outside the Northwest loads and resources



Northwest **Power** and
Conservation Council

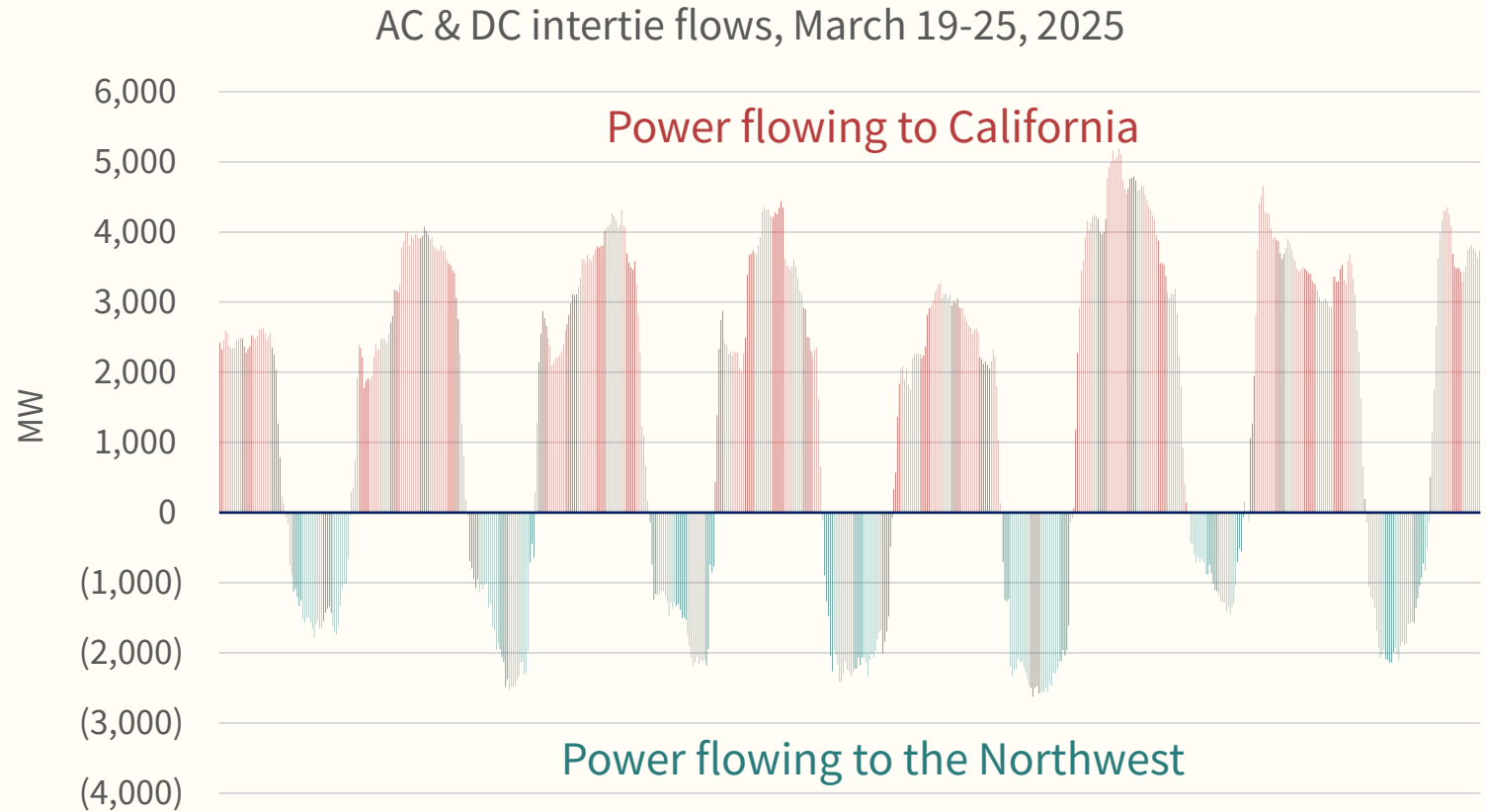
What is outside the region?

- The Northwest, as defined by the Power Act, includes all of Idaho, Oregon, Washington, and Western Montana
- The Northwest is part of the larger Western Interconnection (often referred to as the Western Electric Coordinating Council, or WECC)
- The Northwest today represents around 20% of the load in the Western Interconnection



Utilities trade power across the WECC

- Sometimes we rely on other parts of the West to ensure resource adequacy (like in January 2024)
- Most of the time we trade power for economics (the cheapest resources to operate get used the most)



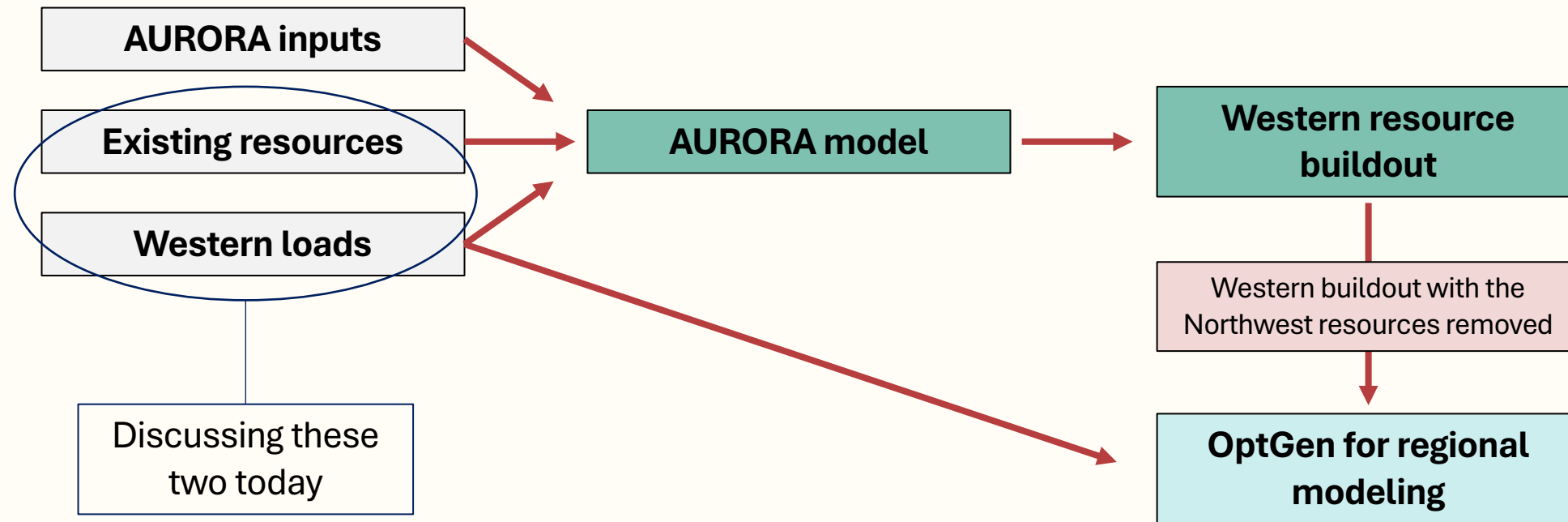
We try to capture these dynamics

- We include existing resources in the Western Interconnection in our models
- We add new resources across the Western Interconnection in future years to:
 - Meet public policies (like renewable portfolio standards and carbon targets)
 - Ensure resource adequacy
 - Improve system efficiency
- There are many components that dictate how we build out the West, including:
 1. Assumptions about future load growth
 2. Assumptions about existing resources
 3. Inputs into Aurora (resource costs developed with the Generating Resources Committee, policies that get met, reserve margins – some of these items were discussed in the March Council meeting)

Assumption sources

- **Out-of-region loads:**
 - Utility integrated resource plans (IRPs) and other planning documents
 - The California Energy Commission
 - FERC Form 714
 - EIA Form 930
- **Existing resources:**
 - EIA: Form 860 & Form 892
 - WECC Anchor Dataset
 - S&P Global

9th Plan impacts: market price flow



9th Plan impacts: market prices

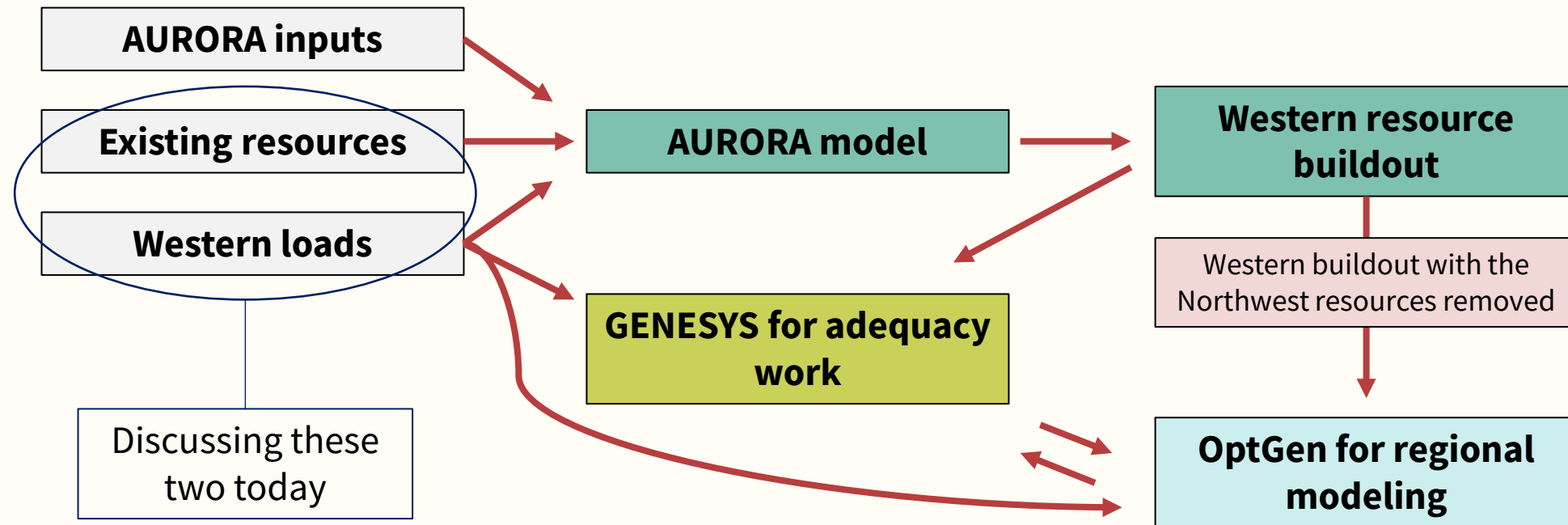
- The load forecast, existing resources, and Aurora inputs affect the Western resource buildout, and thus power prices:
 - We've seen prices shapes change in the past decade (see graph)
 - We expect price shapes will continue to change as more resources are added
 - **The Western resource mix and resulting price shape impacts what resources Optgen selects for the Northwest**



9th Plan impacts: market prices, cont.

- We are planning to use one out-of-region load forecast and existing resource database in the Ninth Plan
 - In prior studies, higher levels of out-of-region loads have led to more resources being built in the models, which led to lower market prices and higher market availability
- We will test different market prices by altering other model inputs, like resource costs (via tax credit alterations), transmission changes, resource availability changes, etc.

9th Plan impacts: resource adequacy flow



9th Plan impacts: resource adequacy

- Our adequacy model, GENESYS, also models the full Western Interconnection
- The resource build out of Aurora, and the out-of-region load forecast, are both brought into GENESYS for adequacy work
- GENESYS has a market reliance limit to cap the use of net imports for resource adequacy
- GENESYS sets the planning reserve margins that are used in OptGen to make sure enough resources get built

Out of region load forecast

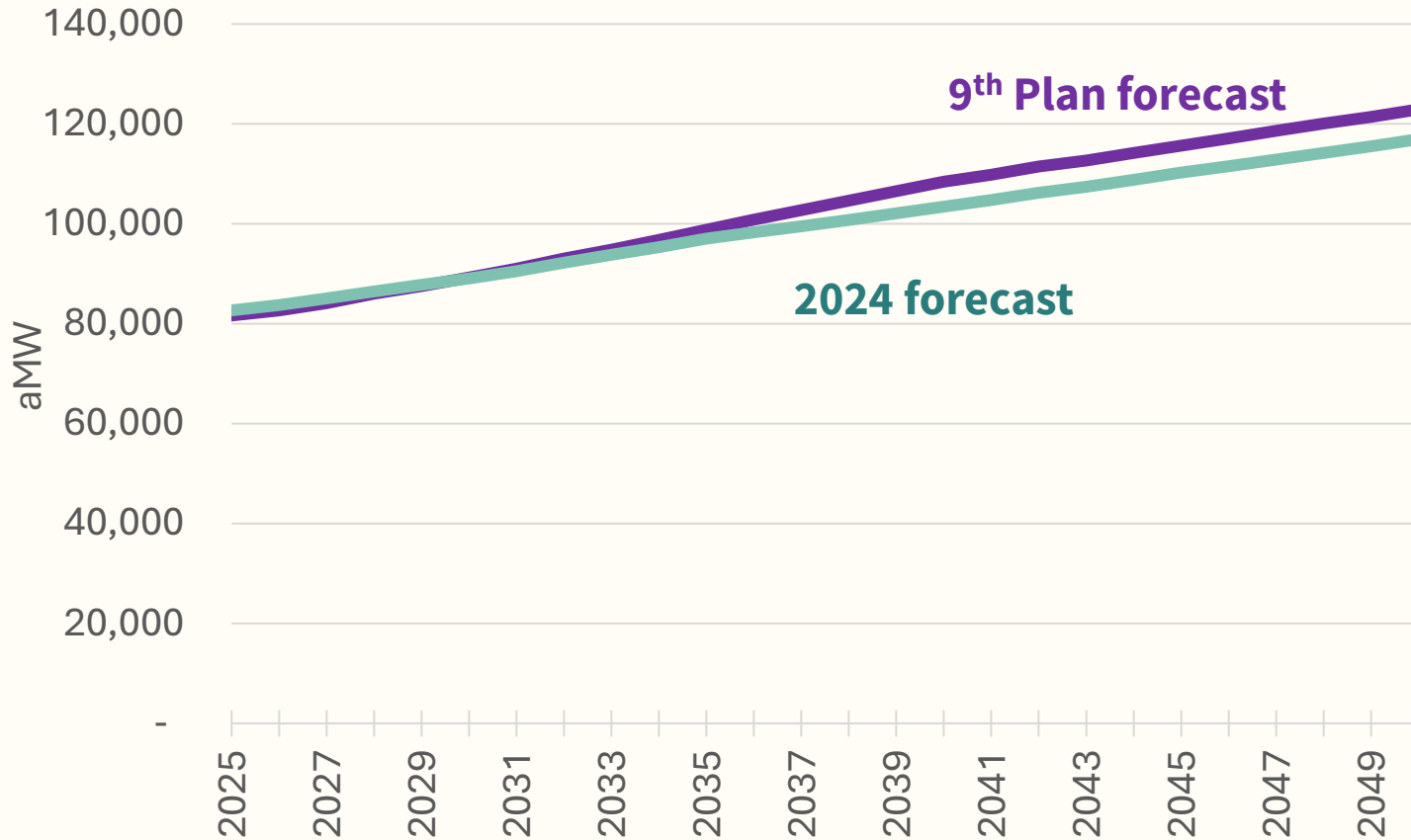
Out of region load forecast

- **Goal:** provide a reasonable load trajectory for non-Northwest areas of the Western Interconnection (we have another load forecasting process for Northwest loads)
- **Challenge:** we don't have the time or expertise to create load forecasts for each area of the West
- **Solution:** we source our out-of-region load forecast from utility planning documents, the California Energy Commission, and other sources

Outside the region loads update process

- **Q4/Q1 2023/2024:** Compile various load forecast sources (IRPs, California CEC, FERC data, EIA data) to create new forecast
- **Q1 2024:** Discuss results with the System Analysis Advisory Committee
 - This forecast was used in the 2024 Adequacy Assessment
- **Q1 2025:** Load forecast updated (not all areas had updates available)
- **Today:** Share the forecast with the Council

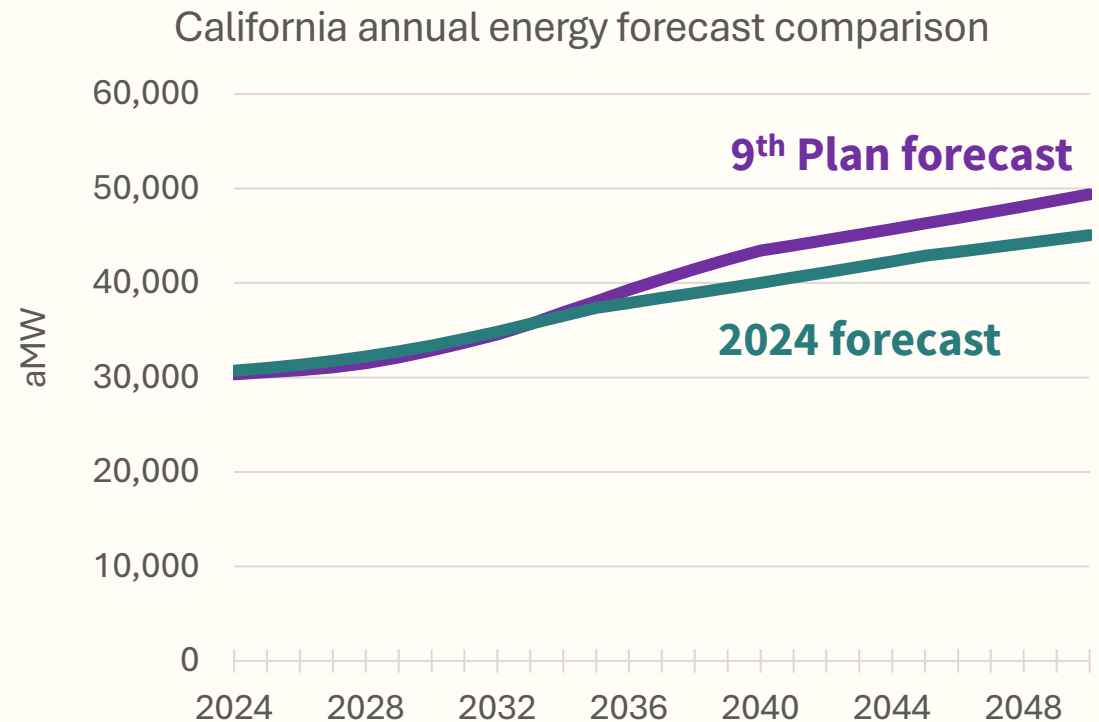
Forecast compared to last year's





- Forecast shown excludes the Northwest (~22,000 aMW today)
- Forecasts are similar through 2035
- By 2040 around 5,000 aMW increase in 9th Plan forecast
- Similar peak trends, slightly smaller peak gap (energy growth from 2025-2050 of 1.6%/year, peak growth at 1.3%)
- Similar load drivers to the Northwest (data centers earlier, electrification later)

Main changes between 2024 & 2025 forecast

- California adds more energy load starting around 2035 (but peaks stay similar due to demand side measures)
- Increased loads in Nevada starting around 2030 due to data centers
- Increased loads in Utah due to data centers



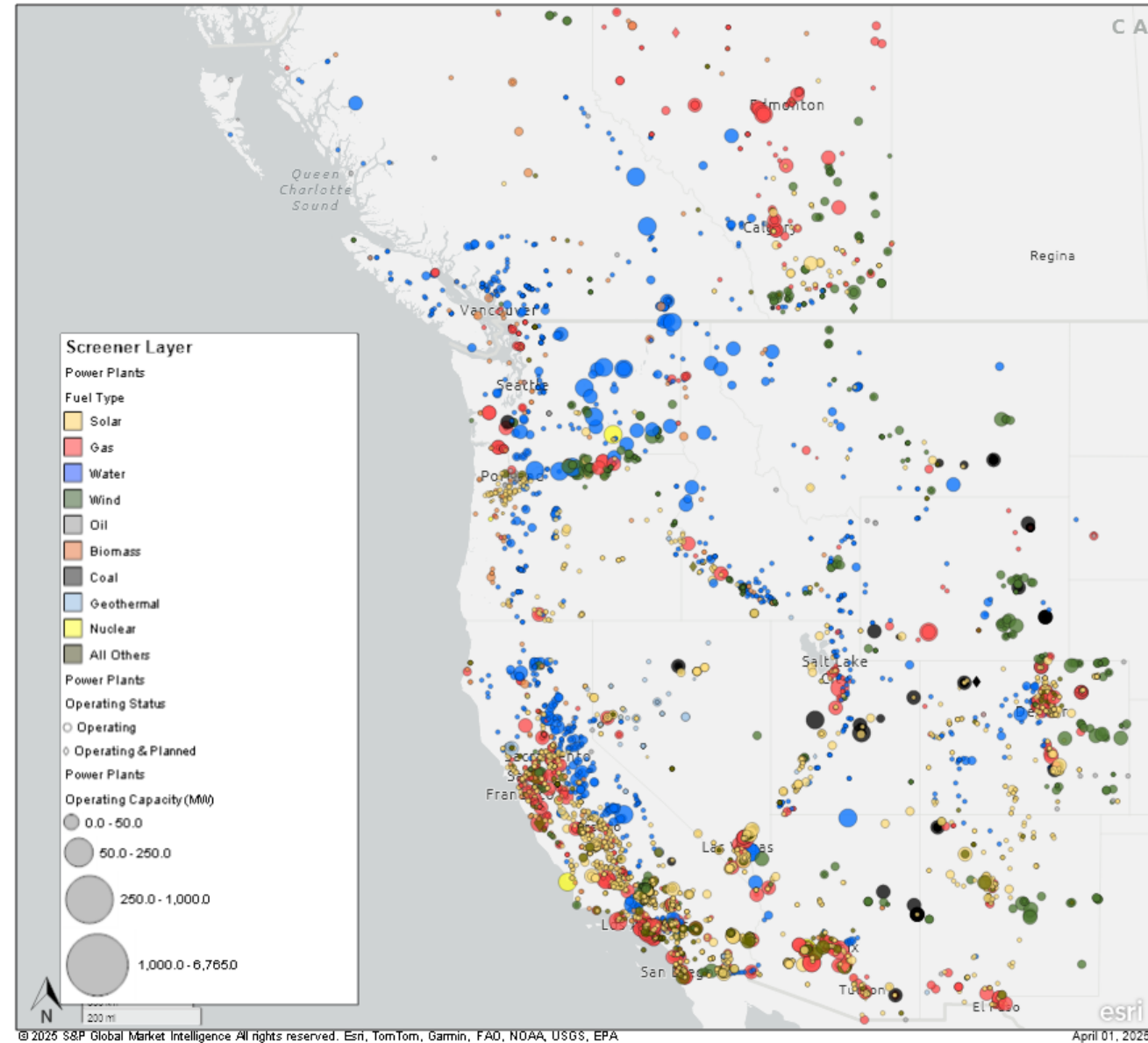
Forecast comparisons to actuals and others

Source	aMW		
2023 actual	101,941		Starting point of the forecast tracks with recent actuals
2024 Council forecast	102,425		
2034 WECC forecast	129,452		Lower 2034 forecast than forecasted by the WECC
2034 Council forecast	124,217		

**Out of region existing
resources**

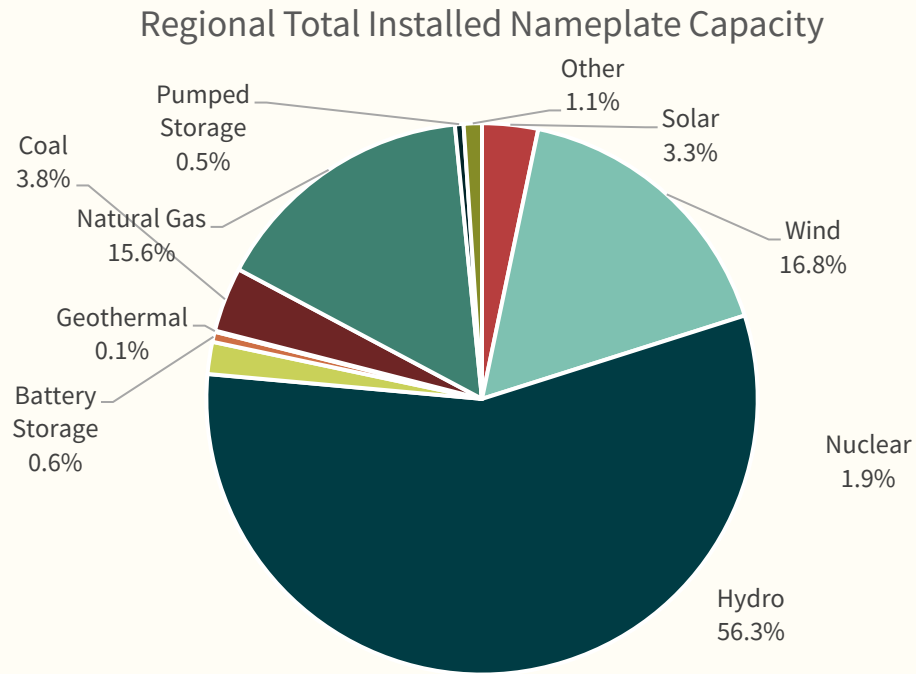
The Existing System

- Resources operating or under construction are input to the models to capture the existing system we're planning in (planned retirements/conversions are also represented)
 - New resources are selected by the models
- Splitting out the NW from the WECC
 - Why: Resources in vs out of the region are treated differently and represented in the model with a different level of detail
 - How: Not always a case of where the resource is built. Some resources are built outside the region but serve regional load or vice versa. We work with individual utilities to parse those plants as best we can

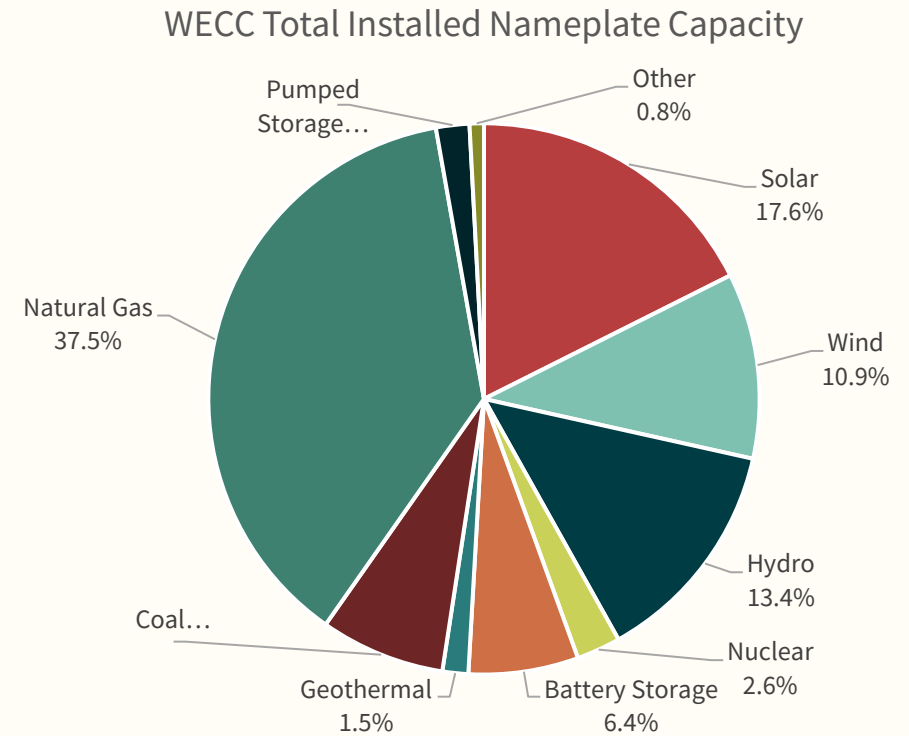


Total Resource Mix

- In-Region: ~62,000 MW



- Out-of-Region: ~242,000 MW

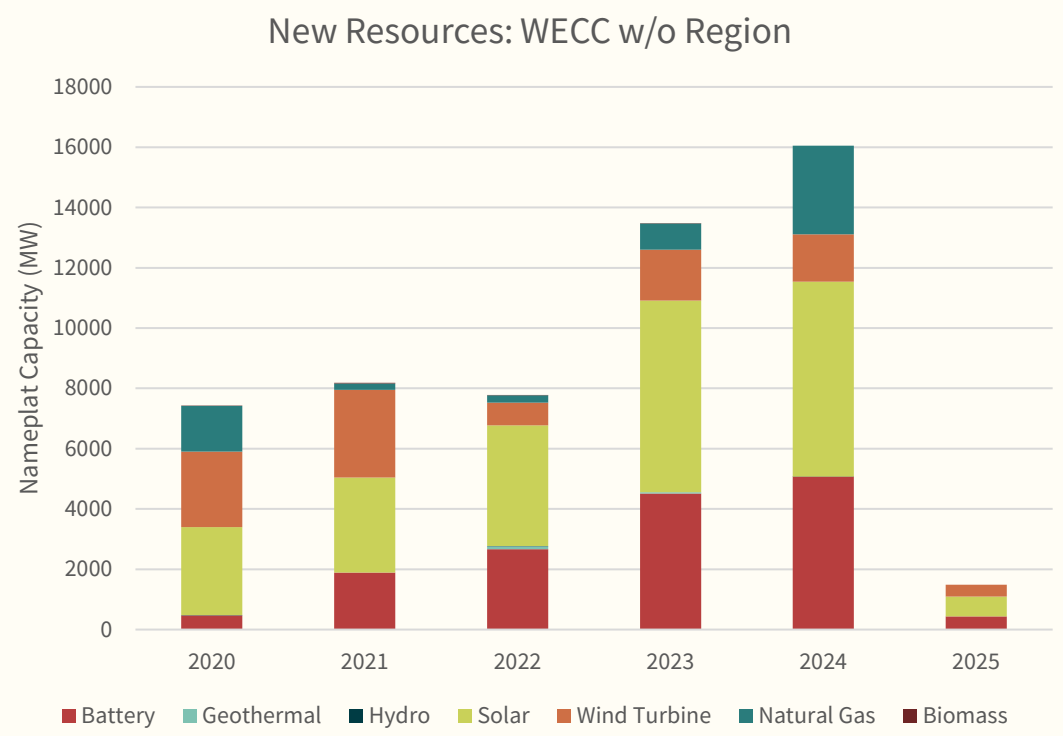
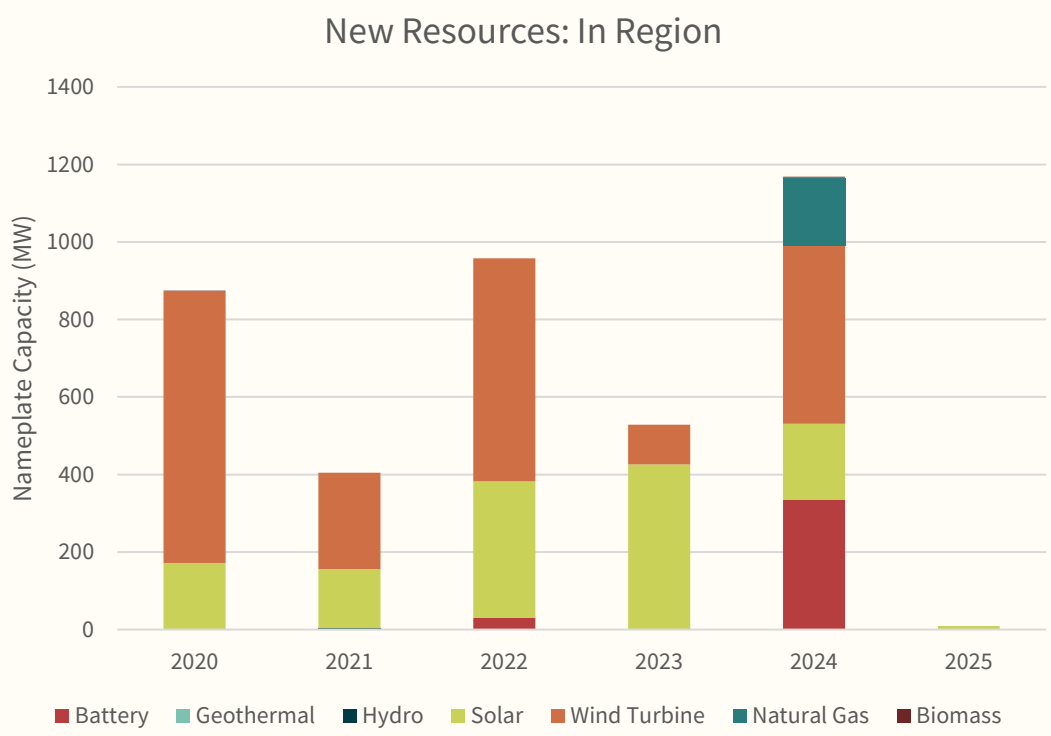


NOTE: 2021 Plan existing system dataset was frozen end of March 2020

Resources Built Since the Last Plan

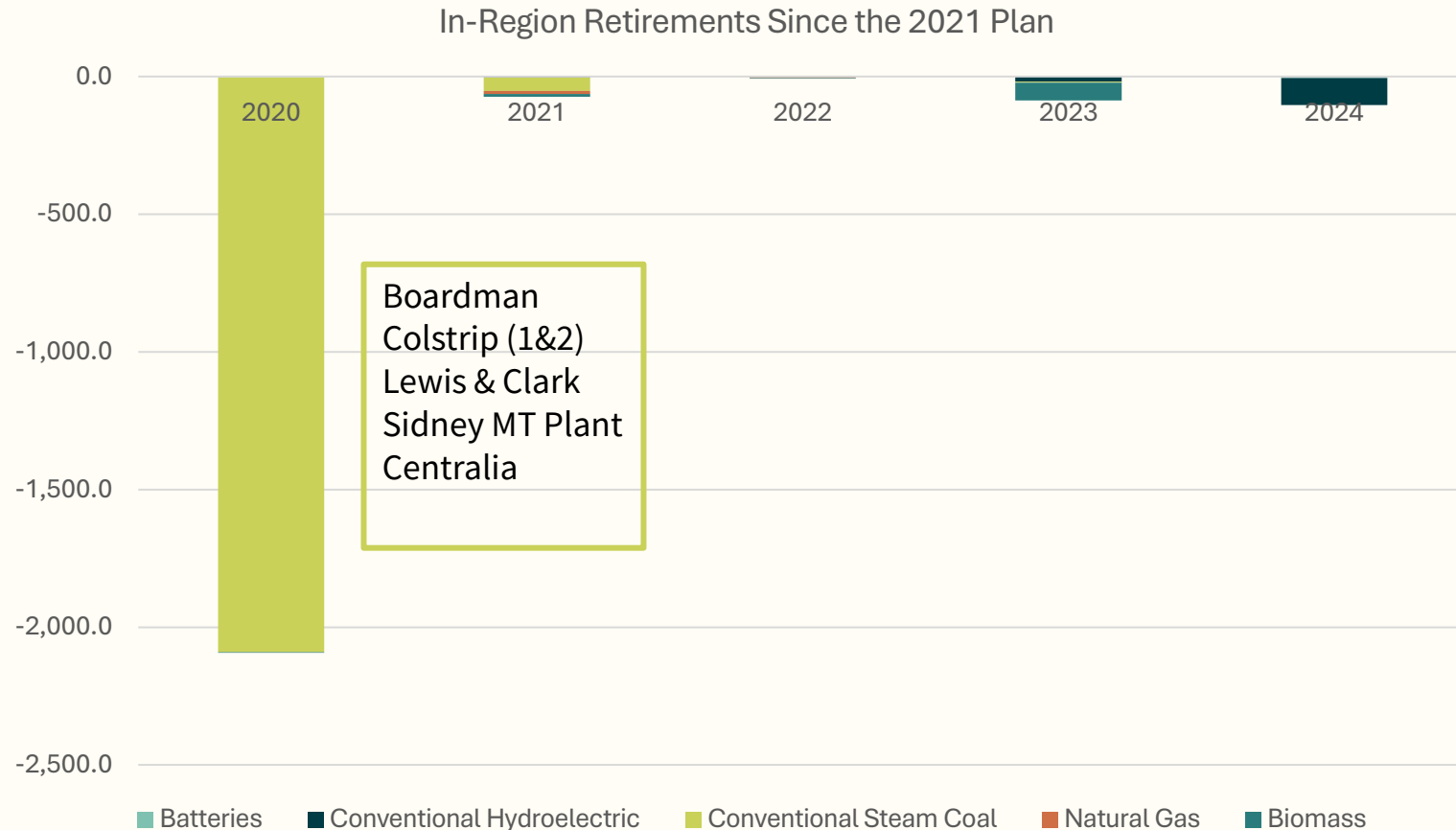
• In-Region: ~4000 MW

• WECC-Wide: ~55000 MW



Future: Retired

- Why:
 - We represent the planned retirement of resources so that the models aren't depending on a resource that won't be there in the future
- Coal plants are often the largest capacity retirements
- Planned conversions (to NG by 2030 at latest)
 - Jim Bridger 1&2
 - North Valmy 1&2
 - Jim Bridger 3&4
- Colstrip 3&4 is the only coal plant in the region with no planned retirement or conversion



Future: Planned

