# Resource Adequacy Risks in the Pacific Northwest

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PGP PUBLIC GENERATING POOL

# Resource Adequacy and the Energy Transition in the Pacific Northwest

Final Report

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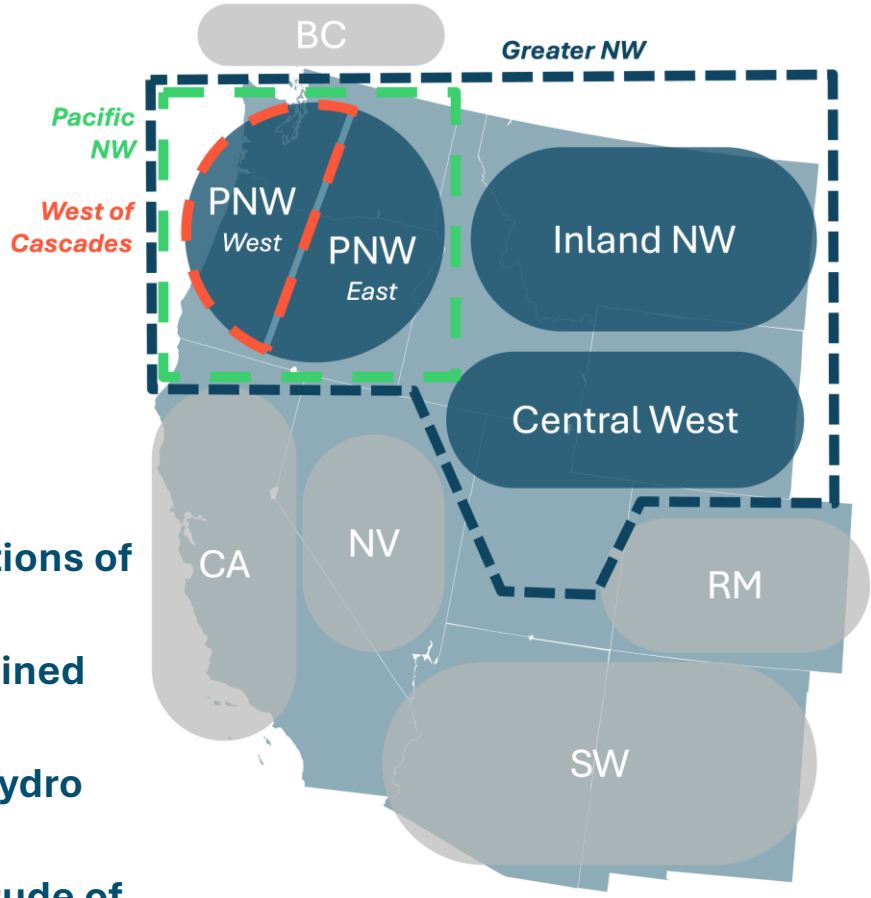
# E3 Project Overview

STUDY SPONSORS

- Puget Sound Energy
- Public Generating Pool
  - Chelan Public Utility District
  - Clark Public Utilities
  - Cowlitz Public Utility District
  - Eugene Water & Electric Board
  - Grant Public Utility District
  - Lewis Public Utility District
  - Seattle City Light
  - Snohomish Public Utility District
  - Tacoma Power
- Avista Corporation
- Benton Public Utility District
- Douglas Public Utility District
- Emerald People's Utility District
- Franklin Public Utility District
- Idaho Power
- Klickitat Public Utility District
- Mason Public Utility District No. 3
- Northwest & Intermountain Power Producers Coalition
- NorthWestern Energy
- Okanogan Public Utility District
- Pacific Public Utility District
- Portland General Electric

**E3 was retained by regional utilities and generation owners to evaluate the state of resource adequacy in the Pacific Northwest today and into the future**

- **Greater Northwest Region includes utility footprints across OR, WA, ID, MT, and portions of UT and WY**
- **Study assesses two transmission-constrained subregions**
- **Key inputs include loads, resources and hydro operations**
- **Key outputs are reliability metrics, magnitude of any shortfalls, and how different resource types contribute to filling shortfalls**



# Greater Northwest region faces a resource shortfall in 2026 and beyond

## Greater Northwest Load and Resource Balance

Effective Capacity (ELCC) MW

| | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|
| Total Resource Need* | 49,245 | 50,737 | 52,499 | 54,184 | 55,879 | 57,195 |
| Existing Portfolio w/ Retirements | 46,716 | 45,666 | 45,395 | 45,388 | 45,098 | 44,757 |
| Firm Imports | 3,750 | 3,750 | 3,750 | 3,750 | 3,750 | 3,750 |
| **Reliability Position Surplus (+) / Shortfall (-)** | **+1,221** | **-1,321** | **-3,354** | **-5,046** | **-7,031** | **-8,689** |
| ELCC from "In-Development"** Firm Resources | - | 296 | 407 | 580 | 770 | 1,114 |
| ELCC from "In-Development" Wind, Solar and Battery projects | - | 645 | 1,015 | 1,316 | 1,508 | 1,934 |

Available resources includes firm imports from other regions

The region faces a power supply shortfall starting in 2026 that grows to almost 9 GW by 2030

In development resources amount to only 3 GW of effective capacity, leaving 6 GW shortfall

** Total Resource Need includes median peak load + 9% PCAP planning reserve margin as well as obligation to serve the Columbia River Treaty Regime*

*** In-development resources are based on WECC ADS 2034 facilities with confirmed project location, project name, or can be verified online*

**** Centralia unit 2's repower from coal to gas was not in the WECC ADS data source and is not included here; it would bring down the shortfall by ~700 MW in 2029 and 2030*

# Key Finding #1: Near-term resource needs are significant

**1. Accelerated load growth and continued retirements create a resource gap that grows to *9 GW of effective capacity by 2030* and *14-18 GW by 2035***

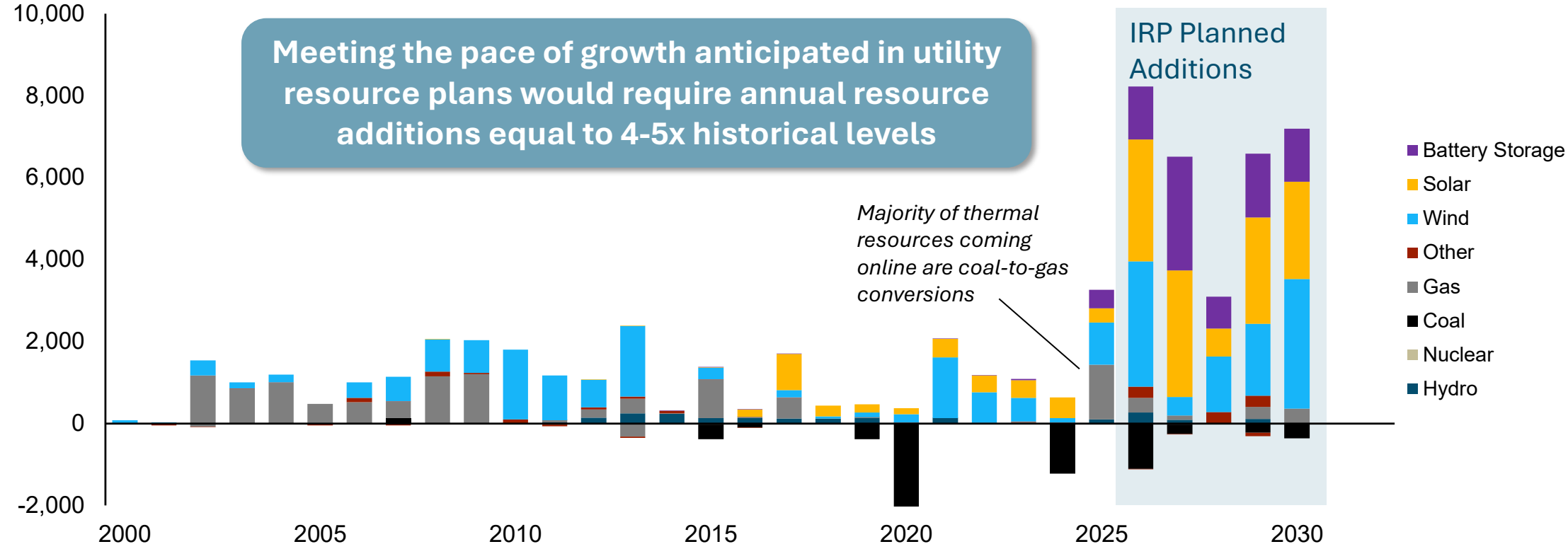
- **Load forecasts continue to increase**
- **Retiring firm capacity is mostly being replaced with wind, solar, and batteries**
- **Few resources have been added in Washington or Oregon**
- **The region faces a multi-day reliability challenge driven by cold snaps and low hydro conditions**

# Planned additions would meet need through 2030, but require an unprecedented pace of resource development

**Retirements and New Installed Capacity Additions by Year**

Annual Additions (Nameplate MW)

Greater NW



# Key Finding #2: The region is not on track to meet near-term needs

**2. In the near-term, the region is not on track to fill the resource adequacy gap due to market and institutional barriers to resource development**

- Planned resource additions are sufficient to fill the gap through 2030 but would require a pace of resource development that is unprecedented in the Northwest
- There are significant institutional barriers to accelerating build rates, including transmission interconnection, siting/permitting, uncertainty related to evolving regional capacity markets, and policy prohibitions
- Planned solar, wind, battery and demand response resources provide clean energy but limited RA value.
- There are significant policy and regulatory barriers to investing in new firm resources that are powered by fossil fuels

# Phase 1 Near-Term Resource Adequacy Assessment: Recommendations

1. **Consider demand management strategies that can address winter resource adequacy needs:**
   - Develop all cost-effective energy efficiency, with an emphasis focus on load reduction during cold snap conditions
   - Consider DR programs that could minimize risk to residential customers should load shed conditions emerge
   - Carefully manage large load interconnections to align timing with available generation
2. **Firm up imports:**
   - Work with WRAP and others to enhance the availability of firm import capacity into the region, particularly during winter
3. **Prepare for potential emergency conditions:**
   - Mobilize existing backup generation to be available to meet regional needs if necessary
   - Expand gas-electric operational coordination to minimize fuel disruptions during critical conditions
   - Re-evaluate hydro emergency operations during extreme cold weather events, especially under low hydro conditions
   - Prepare utility load shedding practices to minimize disruption during a load shed event
4. **Address barriers to new resource development:**
   - Mobilize state government resources to help avoid potential project delays
   - Continue BPA interconnection reforms and state level transmission planning support
   - Streamline permitting practices and proactive land use planning activities

# Phase 2 Long-Term Optimal Portfolio Evaluation: Recommendations (1 of 3)

1. **Continue to address barriers to new resource development**
   - Coordinated regional transmission planning to support proactive grid buildout and reduced interconnection challenges
   - Ensure policy support for the resources needed to meet reliability and clean energy needs
   - Continue to streamline resource permitting processes
2. **Address energy and capacity risks unique to the Pacific Northwest in regional programs**
   - Work with WRAP, NWPCC, WECC, and other regional organizations to ensure ongoing regional resource adequacy assessments appropriately capture the risk of energy shortfalls associated with low hydro conditions along with potential capacity shortfalls
3. **Consider strategic investments in new clean firm technologies**
   - Strategic investments in market transformation may help emerging "clean firm" technologies such as advanced nuclear, carbon capture and sequestration, enhanced geothermal, clean fuels or multi-day energy storage achieve commercialization
   - Policy actions should recognize the limited impact that Northwest entities alone are likely to have and leverage the potential for industry and geographical partnerships

# Phase 2 Long-Term Optimal Portfolio Evaluation: Recommendations (2 of 3)

4. **Ensure that regional planning efforts appropriately consider the growing need for new delivery capability into the I-5 corridor**
   - West-side needs are more difficult to serve due to geographic barriers; however electric loads are expected to continue to grow on the west side due to building and transportation electrification policies and new large loads on top of organic population and economic growth
   - West-side capacity needs can be met with demand management programs, new supply resources, and/or new transmission; regional planning efforts should consider the cost and environmental tradeoffs among all these options
5. **Develop a coordinated process to consider electricity and natural gas delivery needs**
   - Northwest consumers currently rely on both electricity and natural gas to meet heating needs during severe cold weather events; electric reliability during these events will be dependent on natural gas combustion for the foreseeable future
   - Increased policy focus on building electrification may exacerbate this dependence due to higher peak electric loads, requiring investment in new gas delivery capability
   - A coordinated planning process should identify the lowest societal cost solutions for meeting the needs of consumers across the combined electricity and natural gas systems

# Phase 2 Long-Term Optimal Portfolio Evaluation: Recommendations (3 of 3)

## 6. Continue to support regional coordination and markets for energy, capacity, clean energy, and transmission

- Portfolio optimization modeling, including the conclusions of limited costs to reach 96% GHG reduction, assumes efficient and seamless regional markets
- Organized regional wholesale energy markets support efficient commitment and dispatch
- Organized regional capacity constructs capture load and resource diversity to reduce overall resource adequacy build requirements
- Coordinated transmission planning is needed to identify new projects that support subregional resource adequacy needs and renewable energy interconnection and delivery
- Regional clean energy markets support achieving clean energy policy goals at least-cost versus higher cost pathways where each utility is forced to meet its load with its own clean energy portfolio on an hourly basis

