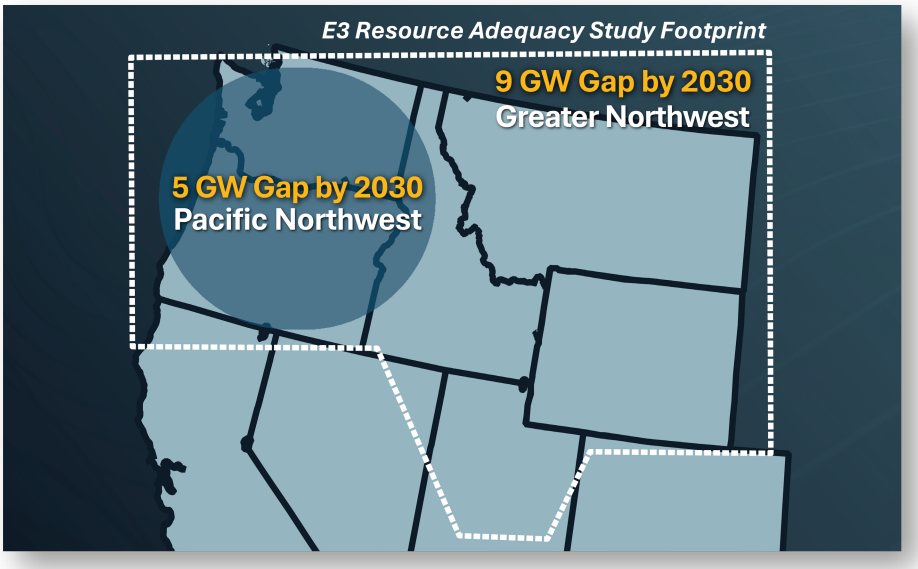
Resource Adequacy and the Energy Transition in the Northwest

Phase 1 Results: Summary and FAQ

Updated November 2025

Background

A group of Pacific Northwest electric utilities and trade organizations – led by the Public Generating Pool (PGP) and Puget Sound Energy (PSE) – has commissioned a study by esteemed consulting firm E3 to gain more information about the risk of power supply shortages in the region. The full study will publish in January, but **the initial results are striking.**



Key Message

The Northwest faces an **elevated risk of power supply shortfalls**, which could lead to rolling blackouts during extreme conditions creating **an immediate need to take action to maintain reliability**.

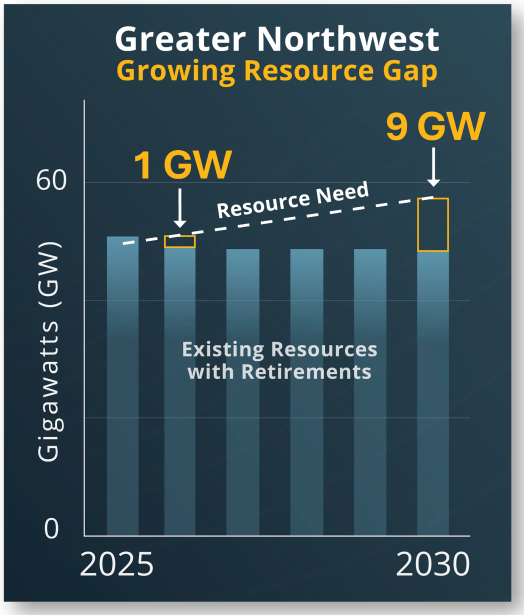
Supporting Messages

This study shows why rolling blackouts could happen. The risk comes from a combination of rising electricity demand, retirement of firm generation, delays in building new resources, and most new resources having low effective capacity. Shortfalls are most severe during winter cold snaps when solar and wind output are low, especially if they occur during years with low river flow leading to lower hydropower production.

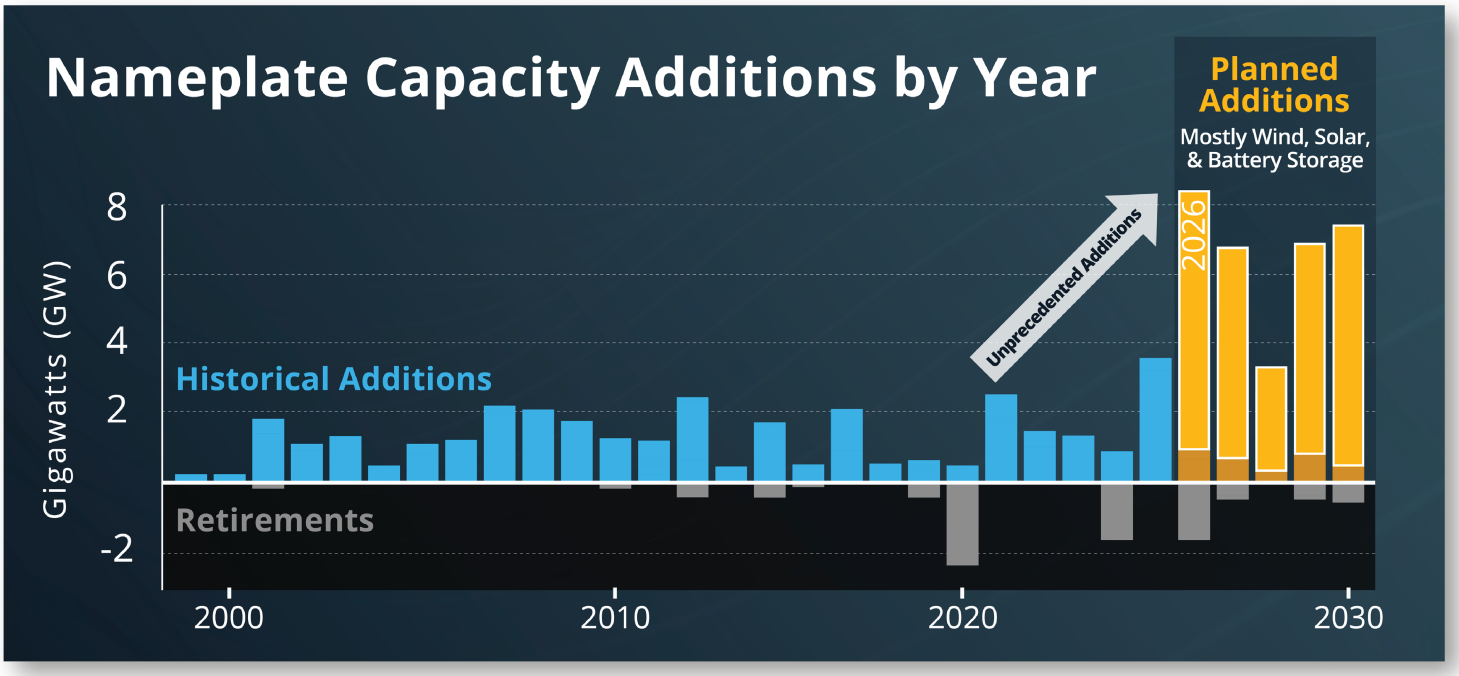
Demand for electricity is outpacing supply. Electric demand is climbing rapidly, driven by data centers and the electrification of transportation and buildings. Electric supply is decreasing due to the retirement of existing firm generation. Planned resource additions are not keeping up, **creating a widening gap that threatens near-term reliability.**

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

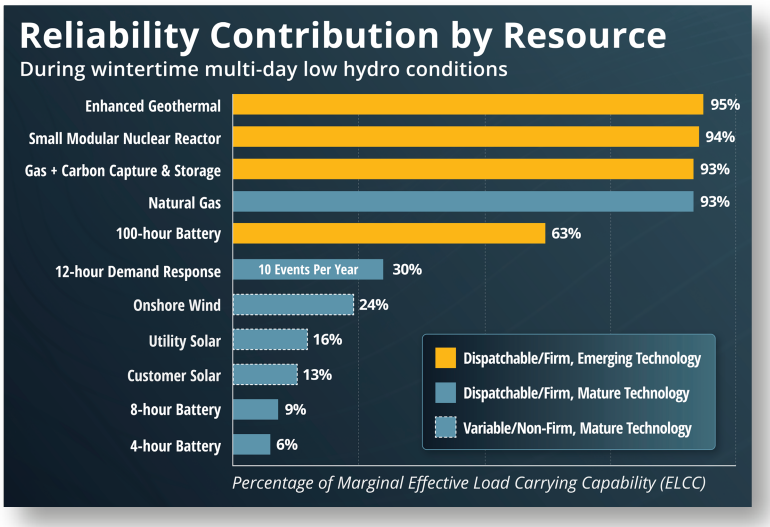


Past approaches to the energy transition have increased vulnerability. Adding weather-dependent resources without balancing them with reliable backup has left the grid more exposed to extreme conditions. The shift toward renewables has prompted the region to retire on-demand resources faster than they have been replaced. Timely development of all resources is extremely challenging; however, utility resource plans are calling for **unprecedented annual capacity additions of primarily wind, solar, and battery storage.**



Different energy resources play different roles. Weather-dependent resources like wind and solar provide valuable clean energy, but they cannot always produce power when needed most. On-demand resources, such as natural gas, can run at any time, making them critical for reliability during multi-day winter events. This availability also depends on investing in winterization and gas-electric system coordination.

The Northwest is different from other regions. Unlike California or Arizona, which struggle with short summer peaks, the Northwest's biggest risk is **multi-day winter events.** In addition, the region's hydropower base provides lots of low-cost clean energy, but less power is available during low water years. Because of this, quick solutions like short-duration batteries are less effective here than in other places.



The solution is a portfolio approach. While the challenges are serious, solutions exist; better conservation and demand management, stronger regional coordination, new transmission lines, and new resources such as long-duration storage, geothermal, or advanced nuclear. A portfolio approach is needed. Streamlining permitting and siting of electric infrastructure will be vital, as will having state support for infrastructure development.

The region will continue to be reliant on the legacy infrastructure until new, on-demand clean generation is available at scale. This means continued investments in, and expansion of the region's natural gas delivery and power generation infrastructure may be unavoidable. **Phase 2 of the study will explore this in depth,** including assessing the emissions consequences and stranded cost risk associated with natural gas generation.

Frequently Asked Questions

1. **Q. What is "resource adequacy" and why is it important?**
   A. Resource adequacy is the ability of the power system to meet customer demand in all hours of the year, even under stressful conditions like extreme weather. In short: it's the measure of whether we have "enough power when we need it."

2. **Q. What causes the Northwest's elevated risk of power supply shortfalls?**
   A. The biggest driver is **extended winter cold snaps combined with low hydro, wind, and solar output**. These can last for days, unlike the short, summertime peak-hour shortfalls seen in places like California.

3. **Q. How much shortfall are we talking about?**
   A. The Greater Northwest study region faces a **shortfall of roughly 8,700 MW of effective capacity by 2030**—approximately the load of the state of Oregon. This shortfall accounts for load growth and resource retirements. After considering resource additions from all projects currently in active development the shortfall is reduced to 5,600 MW by 2030. The Pacific Northwest study subregion faces a shortfall of roughly 5,000 MW of effective capacity by 2030, reducing to 2,700 MW after considering planned resources additions in active development.

4. **Q. Why can't we just rely on imports from other regions?**
   A. The Greater Northwest study region already assumes about **3,750 MW of firm imports** (about 8% of needs). But transmission bottlenecks and competing demand limit how much more we can count on. In short: imports help, but they can't be the whole solution.

5. **Q. How does the mix of resources affect reliability?**
   A. Different resources play very different roles. Weather-dependent resources like wind and solar are essential for decarbonization and for low-cost production but can't always deliver during peak demand. Hydropower is flexible but limited by river conditions. On-demand resources like natural gas provide the highest reliability but are declining in the region due to retirements. Balancing these traits is critical to keeping the grid stable.

6. **Q. How does this compare to what happened in Texas and California?**
   A. Texas in 2021 saw widespread outages during a winter storm when large amounts of natural gas generation failed due to lack of winterization. California has experienced summer shortfalls during heat waves. The Northwest's risks are different—multi-day winter shortages—but the lesson is the same: lack of preparation can result in blackouts.

7. **Q. Why can't batteries solve this problem?**
   A. Batteries provide only **3–9% of their nameplate capacity** specifically during multi-day winter events in the Northwest, because they are designed for short bursts (usually 4 hours). They are valuable for multiple purposes, including local grid stability and firming up renewables in short spans, but cannot directly substitute for resources in our region that can run for days at a time in low hydro years. They also need grid energy for charging, which may not be available during multi-day energy shortfall events in the Northwest in low hydro years.

8. **Q. What are the main drivers of electricity demand growth?**
   A. Rapid expansion of data centers, plus electrification of cars, trucks, and buildings, is pushing demand up nearly **3% per year**. Supply additions are not keeping pace, leaving a widening gap.

9. **Q. How does this affect customers in Oregon and Washington specifically?**
   A. These states are most exposed because they house most of the population centers west of the Cascades. Only 25% of recent new generation has been built here, and current transmission limits make it hard to bring in power from Montana or Idaho.

10. **Q. Isn't the Western Resource Adequacy Program (WRAP) supposed to solve this?**
    A. WRAP sets common standards across the West, which is critical for entities participating in the program. But it does not guarantee that enough new resources or transmission get built. Some Northwest utilities will need to build new capacity whether they are in the program or not.

11. **Q. How credible is this study?**
    A. The study was conducted by E3, a nationally recognized independent consultant with extensive experience modeling resource adequacy for energy systems in the Pacific Northwest, California, New England, and elsewhere. The study draws on detailed modeling across multiple weather, hydro, and demand scenarios. It does not analyze any single utility but evaluates the region as a whole, providing a broad and reliable picture of regional risks.

12. **Q. Are state clean energy goals still achievable?**
    A. Our Phase 1 analysis only assessed today's reliability risks. The upcoming Phase 2 report will examine multiple resource pathways—including scenarios with and without new natural gas generation—showing how states can meet clean energy targets while keeping the lights on.

13. **Q. What are possible solutions?**
    A. A balanced portfolio of solutions will be required.
    Conservation and demand response (customers reducing use during peak stress).
    Emerging technologies (long-duration storage, geothermal, small modular nuclear).
    Conventional generation (potentially as bridge resources).
    Expanded transmission (to connect remote renewables and other resources).
    Regional coordination (to share resources more efficiently).