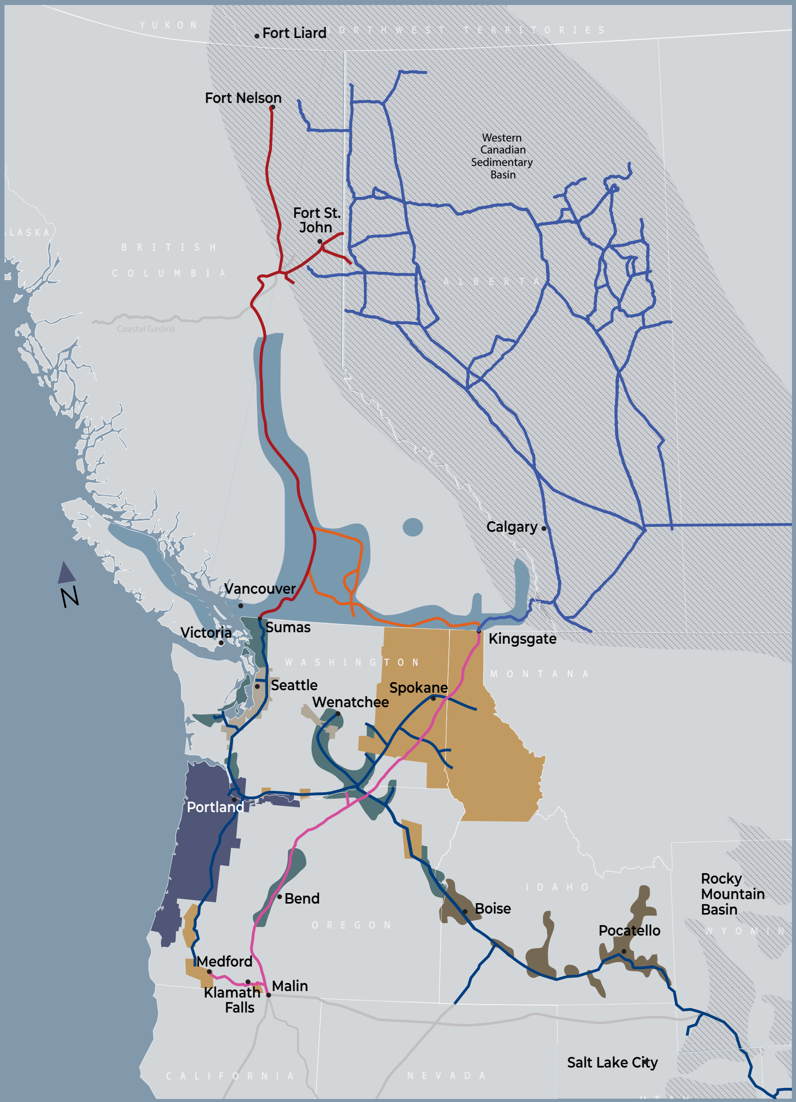
2026

Pacific Northwest Gas Market Outlook

Natural Gas Supply, Prices, Demand and Infrastructure Projections through October 2035

This report, compiled by the Northwest Gas Association (NWGA), provides a consensus industry perspective on the current and projected natural gas supply, prices, demand and delivery capabilities in the Pacific Northwest through the 2034/35 heating year (Nov-Oct). It includes a synopsis of the ongoing regional Gas-Electric Coordination Initiative facilitated by NWGA in partnership with Pacific Northwest Utilities Conference Committee (PNUCC) and a summary of the themes from the Initiative's October 2025 Regional Energy Symposium. For purposes of this report, the Pacific Northwest includes British Columbia (BC), Idaho, Oregon and Washington.



NWGA
Northwest Gas Association

The Natural Gas System

While the grid transmits and distributes electrons, the gas system transports, stores and distributes molecules. Just as the grid is increasingly delivering renewable electrons (e.g. wind, solar), the gas system is increasingly delivering low-carbon molecules (i.e. renewable natural gas, blended hydrogen and hydrogen products like syngas) and can employ carbon capture technologies at scale. While electrons can be stored in batteries and discharged over several hours, gas molecules can be stored until needed and deployed over days, even weeks.

Introduction

The release of NWGA's 2026 Outlook comes at a pivotal moment for the Pacific Northwest's energy system. Across the region, growing energy demand and increasing peak-day consumption highlight the critical role that the gas and electric systems are playing in meeting the region's energy needs.

At the same time, policymakers and energy providers are navigating the generational challenge of balancing reliability, affordability, and sustainability amid rapidly evolving market fundamentals. How these objectives are aligned will shape the regional energy landscape in 2026 and beyond.

As the Pacific Northwest pursues its energy ambitions, the critical role of the natural gas system is being reinforced. The ability of gas infrastructure to deliver reliable, dispatchable, and scalable energy has become essential to managing peak demand, mitigating volatility, and supporting grid stability.

This Outlook examines that role in depth, focusing on how the gas system is evolving as a critical part of the region's expanding energy system and how it is increasingly being called on to meet demand when it matters most.

Two developments since the 2024 Outlook demand heightened attention in this edition:

- The region's electric grid increasingly depends on natural gas-fired generation for the successful deployment of renewable resources with intermittent capabilities—a dependence that deepens as coal retires and new firm capacity lags.
- The January 2024 cold snap and the cross-sector, executive-led coordination that it catalyzed demonstrate the imperative that energy adequacy is a shared responsibility requiring more integrated thought and planning, not parallel siloes.

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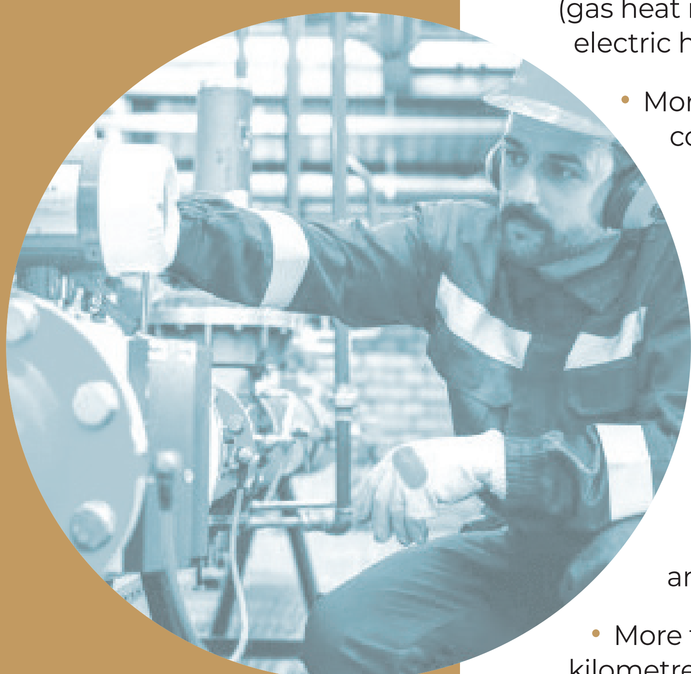
2025 Energy Symposium Theme:

Interdependence is Real and Growing

Natural gas and electric systems are increasingly interdependent. Both are required to meet regional reliability needs. Historically, the sectors planned separately; today that is no longer viable.



The Value of Natural Gas in the Pacific Northwest

Regional energy policies are increasingly targeting ways to reduce greenhouse gas (GHG) emissions. But the devil is in the details. Rather than policies that prioritize a single solution (e.g., renewable forms of electricity) for all possible uses, NWGA advocates for a more thoughtful, affordable and reliable solution that employs ever-cleaner natural gas in the mix, using already established, extensive and valuable infrastructure. Consider how natural gas systems currently benefit our region by providing:

- Warmth and comfort to almost 10 million people (3.7 million households).
- Efficient and affordable space heating, water heating, and heat for cooking and laundry (gas heat is about one-third the cost of electric heat—see Market Fundamentals).
- More than half of the total energy consumed in the region—either used directly for space and water heat or in industrial processes, or as gas-generated electricity. (Excludes transportation uses.)
- A low carbon footprint—natural gas used for space and water heat in 3.7 million homes and more than 350,000 non-industrial businesses accounts for less than 10% of the region's total carbon emissions, according to national, state and provincial emissions inventories.
- More than 130,000 miles (220,000 kilometres) of installed pipeline infrastructure that safely and reliably delivers energy, supplemented by underground and above-ground storage facilities capable of delivering up to 40% of required gas energy during the coldest days.
- An invaluable input to some industrial processes for which there are currently no suitable substitutes, including glass recycling and the manufacture of perlite (a common soil additive), steel and aluminum, paper products, and food processing, among many others.
- An alternate fuel source for medium and heavy-duty vehicles that is commercially available, more economical and cleaner than diesel engines.
- Reliable 24/7 electricity production to replace retired coal plant generation and balance the region's growing sources of intermittent renewable power, such as wind and solar.

And our source of natural gas is increasingly renewable itself—market forces and government policy are driving the development of renewable natural gas (RNG), which transforms human and agricultural waste into useful energy, and development of renewable hydrogen, which uses excess wind, solar or hydroelectric power to separate water molecules into hydrogen and oxygen, with the hydrogen then being incorporated into the gas system. This provides even greater prospects for a cleaner mix of natural gas resources to contribute to our energy and environmental future.

Executive Summary

The Pacific Northwest's energy system is undergoing one of the most significant periods of transition in its history. Demand for energy is rising, supply portfolios are changing, and the operational boundaries between gas and electric systems, once largely treated as separate, are increasingly blurred. Concurrently, policy objectives are reshaping long-term investment and planning assumptions. NWGA's 2026 Outlook examines these dynamics and the implications to the region's ability to deliver affordable, dependable energy now and into the future.

Against this backdrop, the 2026 Outlook identifies several findings that are central to understanding near- and medium-term energy risks in the Pacific Northwest:

SUPPLY

North America's natural gas supply basins remain low-cost and enduring. The Pacific Northwest has access to vast reserves from Western Canada and the U.S. Rockies, sufficient for meeting decades of demand. Increasing volumes of RNG are also coming online, diversifying the supply mix (see Market Fundamentals for detailed resource assessments).

PRICES

Regional gas prices are projected to remain below \$6/Dth through at least 2040 under base-case conditions. However, short-term price volatility risks remain. Spikes could occur due to growing demand (e.g., LNG exports, power generation) and pipeline constraints exacerbated by extreme weather events (See Market Fundamentals).

DEMAND

Total regional demand grows at 1.3%/yr in the expected case. Generation demand is a critical variable: natural gas-fired generation is the region's primary firm capacity backstop as coal retires and load grows. (See Leaning on Gas.)

CAPACITY

A defining challenge for the Northwest is the mismatch between rapidly increasing peak energy needs and the lengthy timeline to expand infrastructure. The region's major pipelines and storage facilities already operate at near maximum capacity during winter peaks, averaging above 90% of capacity during winter months. Yet permitting and constructing new pipelines, storage, or compressor upgrades typically requires years of regulatory process and stakeholder engagement. By the time capacity shortfalls become apparent in operational data, the window for timely infrastructure development may be limited. (See Capacity is Critical.)

New or revised sections in this Outlook include:

GAS-ELECTRIC INTERDEPENDENCE

The Region's Hidden Dependency

Across the Northwest, energy system adequacy is increasingly determined not by annual averages, but by peak day performance. System stress emerges during extreme weather days when electric demand surges and renewable output is constrained. On days like that, the gas system is not a marginal fuel source—it is the backbone of electric reliability. Gas infrastructure is critical to support coincident winter peaks even under high renewable penetration and evolving load profiles.

From Siloes to Coordination

After energy disruptions that occurred during the January 2024 cold snap, regional utility executives convened to confront reality: the gas and electric systems are one inextricably interdependent energy delivery system. Where they have historically planned and operated in parallel, the stakes demand greater coordination to ensure energy adequacy. This section recaps the past and ongoing work of the NWGA-PNUCC Gas-Electric Coordination Initiative.

DELIVERING DECARBONIZATION

GHG emissions from the use of gas in homes and non-industrial businesses accounts for less than 10 percent of total regional emissions and is expected to decline supported in part by RNG, hydrogen, and growing efficiency investments. NWGA members prioritize energy affordability for their customers while also pursuing energy reliability and emission reductions. They are implementing targeted emissions reduction programs focused on methane intensity, operational efficiency, and system modernization while maintaining safe and dependable service. A diversified energy system offers the most reliable, affordable path to deep decarbonization.

Regional Economic Outlook

Dr. Grant Forsyth, Chief Economist, Avista Corp

In 2025, I lamented it would be great to have a boring decade. Sadly, that's still not likely. In 2026 and beyond, the world will continue to remake itself in surprising and mostly uncomfortable ways. Ultimately, I think the world will settle down into something less uncertain, but it will take time with significant policy mistakes along the way.

In this context, North America's near-term growth prospects can be described as modest with downside risks dominating. U.S. and Canadian Gross Domestic Product (GDP) growth in 2025 came in at 2.1% and 1.7%, respectively. U.S. Consumer Price Index (CPI) inflation came in at 2.7% with Canada following at 2.1%. Averaging across forecasters, expectations for GDP growth in 2026 have weakened due to the Iranian energy shock: forecasters see U.S. growth in in the 1.5% to 2% range and Canadian growth in the 1% to 1.5% range. Forecasters expect the energy shock to have a material impact on 2026 inflation, with CPI inflation rising to 3% to 3.5% in the U.S. and to 2.5% to 3% in Canada. After 2026, most forecasters see North America returning to pre-shock inflation and GDP growth.

Because of 2026's higher forecasted inflation, there are growing expectations that the Federal Reserve (the Fed) and Bank of Canada will not rush to the rescue with rate cuts that risk worsening inflation. With on-going national debt problems, long-term rates will likely remain elevated in both countries. In the U.S., the outlook for interest rates is also clouded by the Trump Administration's attempts to reduce the Fed's independence.

Although most forecasters don't expect a recession in 2026, employment growth in both countries has been weak and is expected to remain so through 2026. This reflects the impact of multiple shocks: tariffs, energy (both fuel and electricity prices), artificial intelligence (AI), state and provincial level taxation and regulation, and what I like to call "institutional shocks." Institutional shocks reflect the erosion of post-WWII political norms and institutions in the absence of well-formed alternatives. This is making it difficult for many businesses in North America to commit to employment-expanding investment decisions.

The U.S. Pacific Northwest (Idaho, Oregon, and Washington) saw employment growth at just 0.4% in 2025, which was slightly below the 0.5% generated by the U.S. Idaho continued to be strongest with 2% growth, followed by Washington at 0.5% and Oregon at -0.5%. In Western Canada, Alberta's 2.5% employment growth was again above BC's 1.1% and Canada's 1.4%. In 2026, forecasters see U.S. and Canadian employment growth only in the 0% to 0.5% range. This will also be the case for Washington, Oregon, and BC. Only Idaho and Alberta are expected to see employment growth above 0.5% in 2026.

Beyond the challenges already discussed, Canada has significantly lowered its immigration targets for 2026-2028; there is a growing dependence of North American GDP on AI investments and high-income household consumption; and North America is again facing abnormally dry conditions. For Canada, without a pick-up in labor productivity, the lower levels of immigration may mean lower GDP growth. North America's growing reliance on AI investment and high-income households means GDP growth is susceptible to pull-backs by a small number of economic actors. Finally, the on-going dry conditions mean more wildfires and a tougher environment for agriculture and insurance markets. So, keep those seat belts on.

Sources: Bank of Canada, Bank of Montreal; BC Stats; Bloomberg; Business Council of BC; CBC; Chicago Mercantile Exchange; CIBC; Department of Finance Canada; The Economist; Immigration.ca; International Monetary Fund; Organization for Economic Cooperation and Development; Oregon Employment Department; Scotiabank, Statistics Canada; Royal Bank of Canada; Reuters; S&P Connect; T.D. Economics; U.S. Bureau of Labor Statistics; U.S. Census; U.S. Federal Reserve; Wall Street Journal; Washington Economic and Revenue Forecast Council; Washington Employment Security; and World Bank.

Market Fundamentals

This section discusses the sources (supply) and prices of natural gas resources serving the Pacific Northwest, as well as how the diverse sources provide supply redundancy and pricing options for regional consumers.

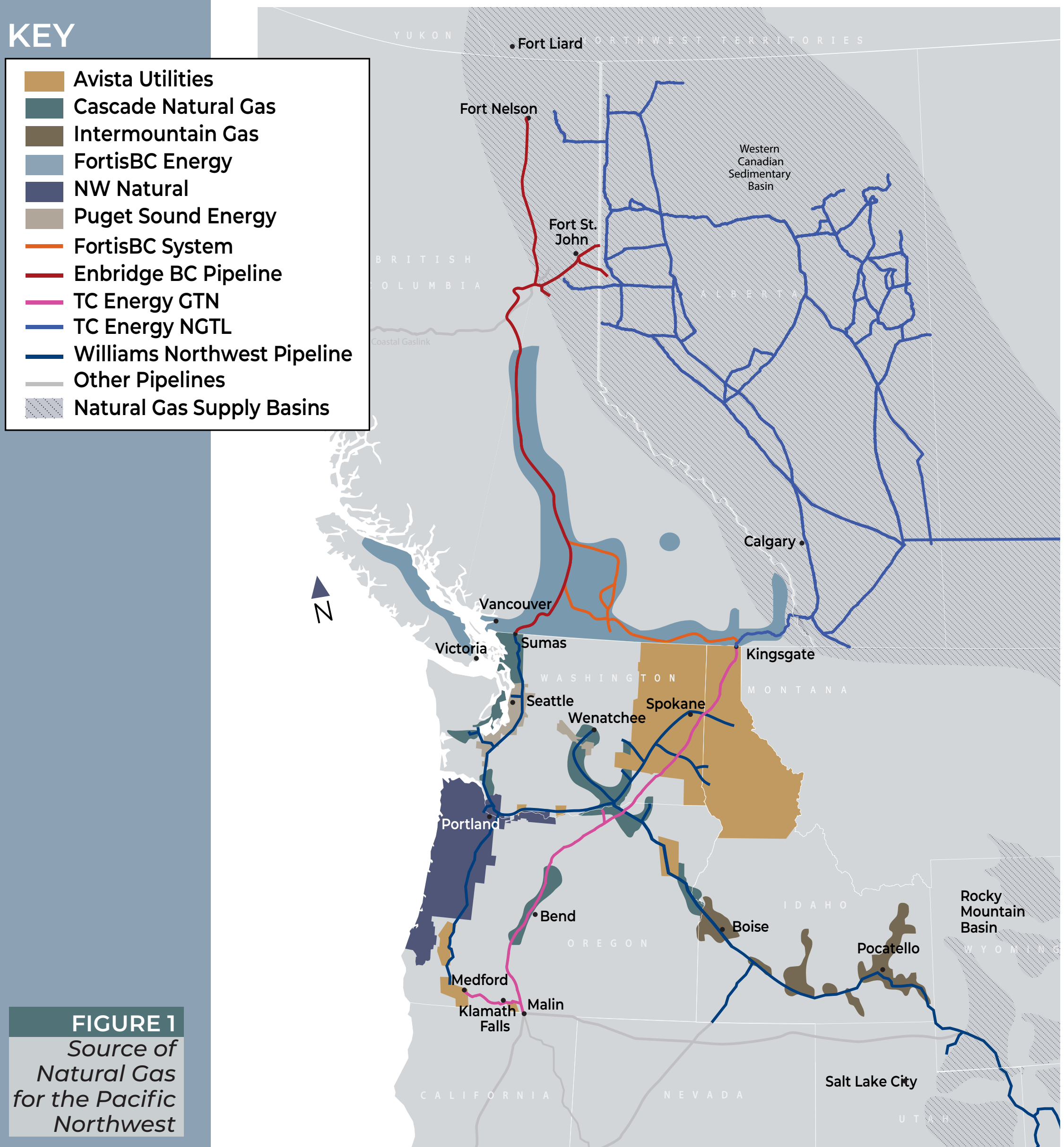


FIGURE 1
Source of Natural Gas for the Pacific Northwest

SUPPLY

Like most of North America, regional natural gas consumers benefit from innovations in production technologies. In its latest 2024 biennial report, the Potential Gas Committee (PGC) assessed the U.S. technically recoverable natural gas supply (i.e., using current technology, industry practices, and geological knowledge) at 3,870 trillion cubic feet (Tcf) in 2024, an increase of 15% over the 2022 estimate.[1] Proven reserves, recoverable with reasonable certainty (90% confidence) under existing economic and operating conditions are 584 Tcf[2] or more than 100 years of readily available supply at current consumption rates.[3]

Canada demonstrates similar supply abundance with a total marketable natural gas resource potential of 1,566 Tcf or almost 300 years of supply at current production rates[4] Canada's natural gas resource is largely concentrated within the Western Canada Sedimentary Basin (WCSB) spanning Alberta, British Columbia (BC) and a small part of Saskatchewan. The Montney Formation in Northeast BC is the dominant play, making up more than a quarter of total WCSB natural gas production. Production from the WCSB is projected to increase by 50% over current levels by 2050.[5]

The U.S. Rocky Mountain states are another robust source of natural gas for the Northwest. This region—primarily Wyoming, Colorado and Utah—encompasses seven major basins: the Green River, Uinta-Piceance, Powder River, Raton, Denver-Julesburg (DJ), Piceance, and San Juan. While Wyoming natural gas production has historically dominated, a new frontier is emerging: The U.S Geologic Survey recently released a survey of the Mowry Composite System spanning parts of Wyoming, Colorado, and Utah, estimating 27 trillion cubic feet of natural gas in undiscovered, technically recoverable resources from just this one formation.[6]

Figure 1 illustrates that the Pacific Northwest is strategically located between and well connected to these two prolific natural gas production areas.

[1] Potential Gas Committee
[2] U.S. Energy Information Administration (EIA)
[3] *According to the EIA, proven reserves have a 90 percent or greater probability of being recovered from known reservoirs under current economic and technical conditions.*
[4] Natural Resources Canada (NRCan)
[5] *Canada Energy Regulator, Canada's Energy Future 2026, March, 2026*
[6] *U.S. Geologic Survey, Assessment of Mowry Composite System, May 2025*

Supply Highlight

More than two-thirds of regional gas is sourced from the Western Canadian Sedimentary Basin. Canada holds almost 300 years of estimated supply at current consumption rates. North American supply remains the foundational strength of regional energy affordability and reliability.

The supply optionality resulting from our connection to these basins provides regional shippers with flexibility to source natural gas from some of the most abundant and economic natural gas in North America, subject to available transport capacity. Figure 2 illustrates both that optionality and that more than two-thirds of regional gas supply originates from the WCSB in Canada. TC Energy's Gas Transmission Northwest (GTN) and Enbridge's BC Pipeline (BCP) provide primary pathways into and through the Pacific Northwest from the WCSB. Williams' Northwest Pipeline (NWP) is a primary pathway for gas from the Rockies and receives WCSB gas from both BCP and GTN.

FIGURE 3 *Historic Natural Gas Prices[8]*

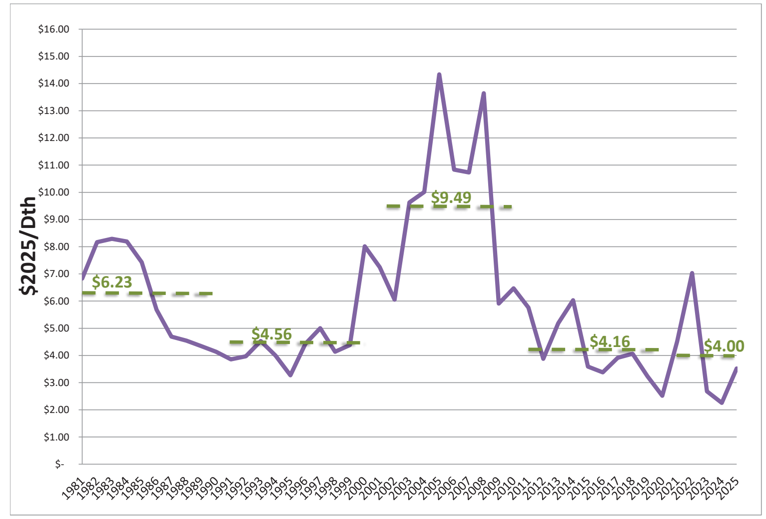
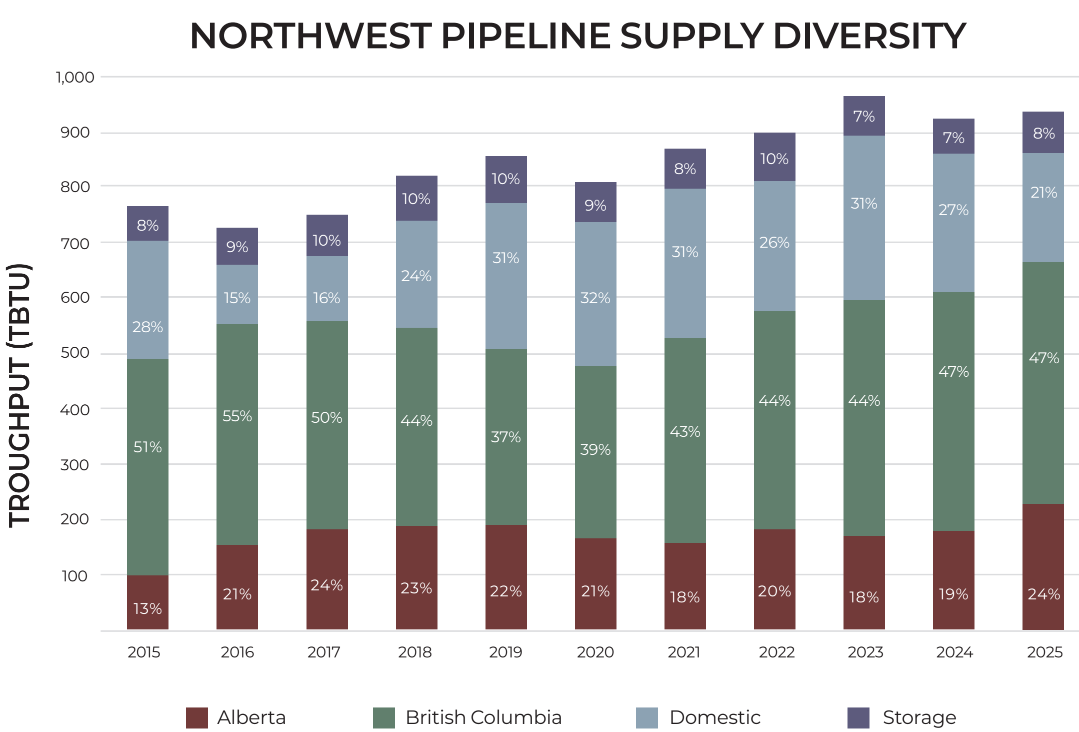


FIGURE 2 *Connection to Three Basins Provides Supply & Price Optionality[7]*



PRICES

The commodity cost of natural gas has plummeted with the surge in North American supply over the last decade and a half (see Figure 3), saving regional consumers across all economic sectors hundreds of millions of dollars. The price spike in 2022 reflects the onset of Russia's invasion of Ukraine.

According to the EIA, electricity delivered to residential and commercial consumers in our region is twice as costly as natural gas for the same unit of energy (Dth; see Figure 4).

The commodity price of natural gas is expected to hover around $5/Dth through 2040 (see Figure 5). The regional trading hubs at Sumas (BC/WA) and AECO (Alberta) experienced historically low prices in 2024 and 2025, driven by robust production and mild weather mitigating demand.

[7] *Figure 2 depicts sources of supply delivered to the region by NWP, including supply delivered to NWP from both GTN and BCP. It does not include the supply GTN and BCP deliver directly to the region.*

[8] *EIA, Natural Gas Spot and Futures Prices*

Price Note

The regional price of the natural gas commodity is expected to remain moderate as production ramps up to meet both domestic and export demand. Limited infrastructure capacity during periods of high demand, not supply sufficiency, is the primary cause of regional price volatility and could worsen over time until additional capacity is added. (See Capacity is Critical, page 14.)

FIGURE 4 *Historic Residential and Commercial Delivered Gas/Electricity Prices*[9]

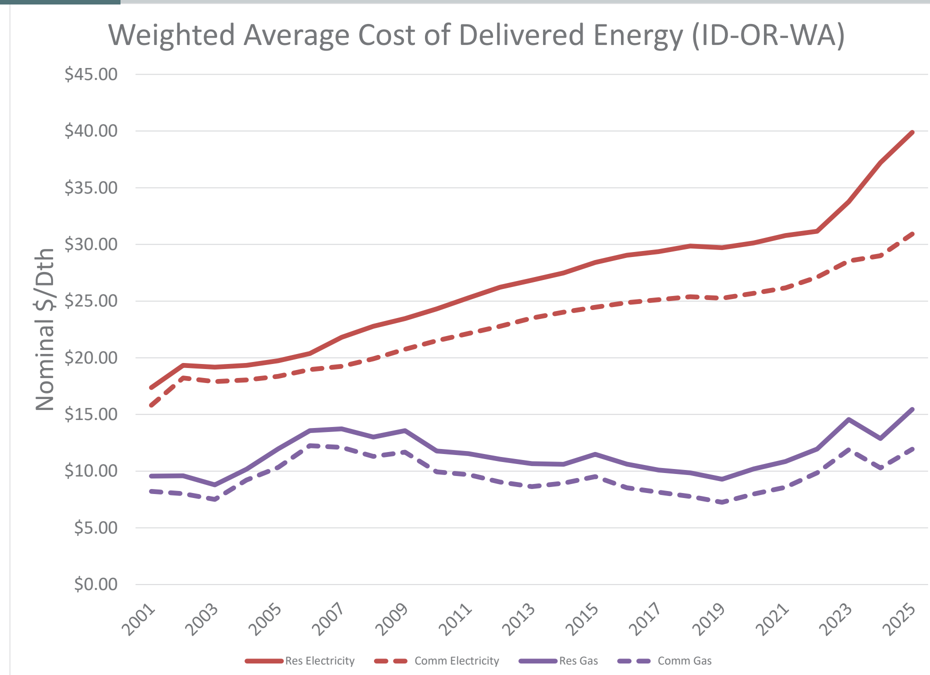
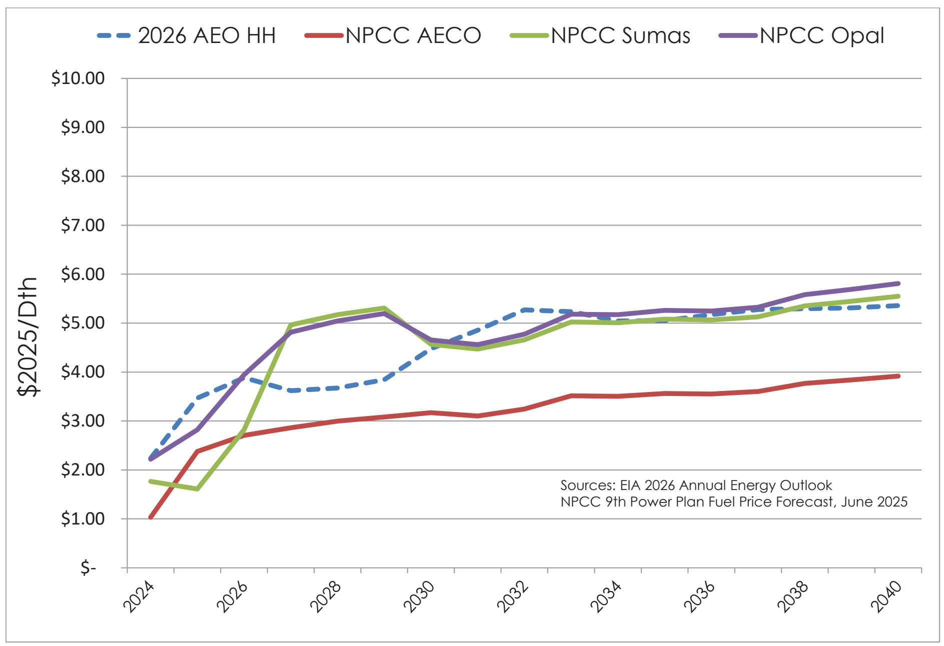


FIGURE 5 *Natural Gas Price Forecast Comparisons*



[9] EIA data sets for Idaho, Oregon and Washington including the average retail costs of delivered gas and electricity to residential commercial consumers and the numbers of those consumers (for weighting purposes).

Leaning on Gas

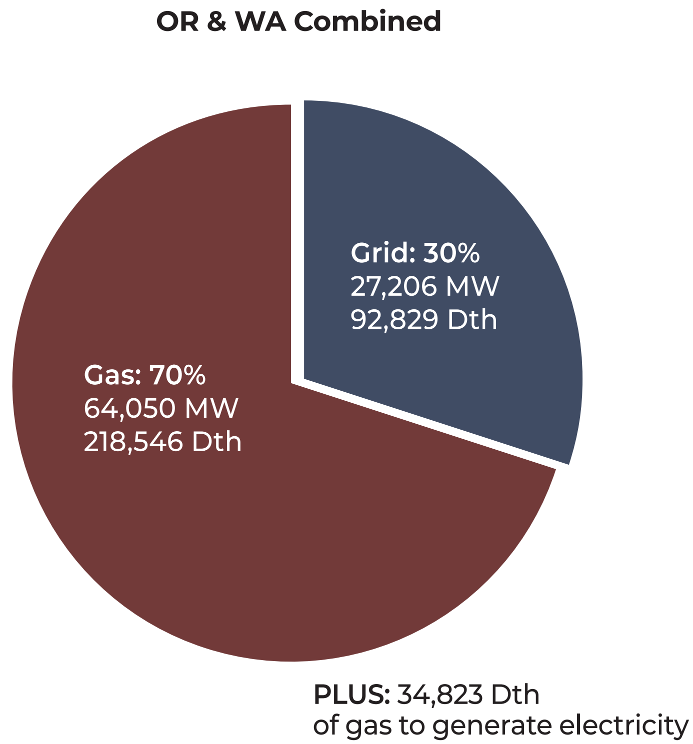
This section presents regional demand forecasts by sector, with particular attention to the growing role of natural gas-fired generation in meeting electric reliability needs as the grid transitions away from coal.

Natural Gas Demand in the Northwest

The natural gas system delivers energy in the form of heat for homes and businesses across the region, fuel to generate electricity and for transportation, productive energy for industrial processes and feedstock to produce chemicals, plastics, fertilizers and hydrogen. It is vitally important to the region, never more so than during extreme weather.

NWGA commissioned the energy consulting firm Energy Strategies to work with NWGA's pipeline members and publicly available sources to chart the hourly energy deliveries for end use by the grid and gas systems respectively in Oregon and Washington during the regionwide cold snap in January 2024 (Figure 6).[10] Electricity consumption was less than a third (30%) of the total end-use energy consumed in Oregon and Washington, which amounted to 27 Gigawatt hours (GWh) or 92,829 Dth during the coldest hour of the event. In contrast, the natural gas system delivered more than twice that amount (70%) of energy, totaling 64 GWh or 218,546 Dth during that same hour. The proportion of energy delivered by both systems were not limited to the one hour but similar across the entire cold snap and were reflected in BC as well.

FIGURE 6 *Gas vs Electricity Consumption During Cold Weather*



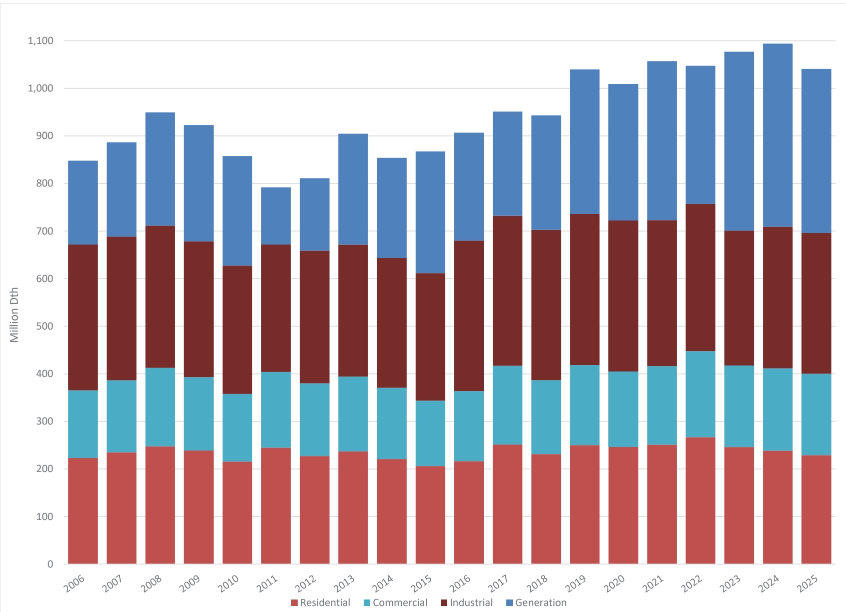
Natural gas-fired generation plays a critical balancing role in the regional power system, providing dispatchable electricity when variable resources such as hydro, wind, and solar are constrained by weather, hydrology, or system conditions. During extreme cold events, gas generation supports electric reliability by meeting peak power demand, including serving electric heating loads. It is also critical during the hottest days of the year when air conditioning loads, which are increasing across the region, ramp up to provide space cooling.

[10] *Not including liquid fuels or the gas used to generate electricity.*

Overall Demand Outlook

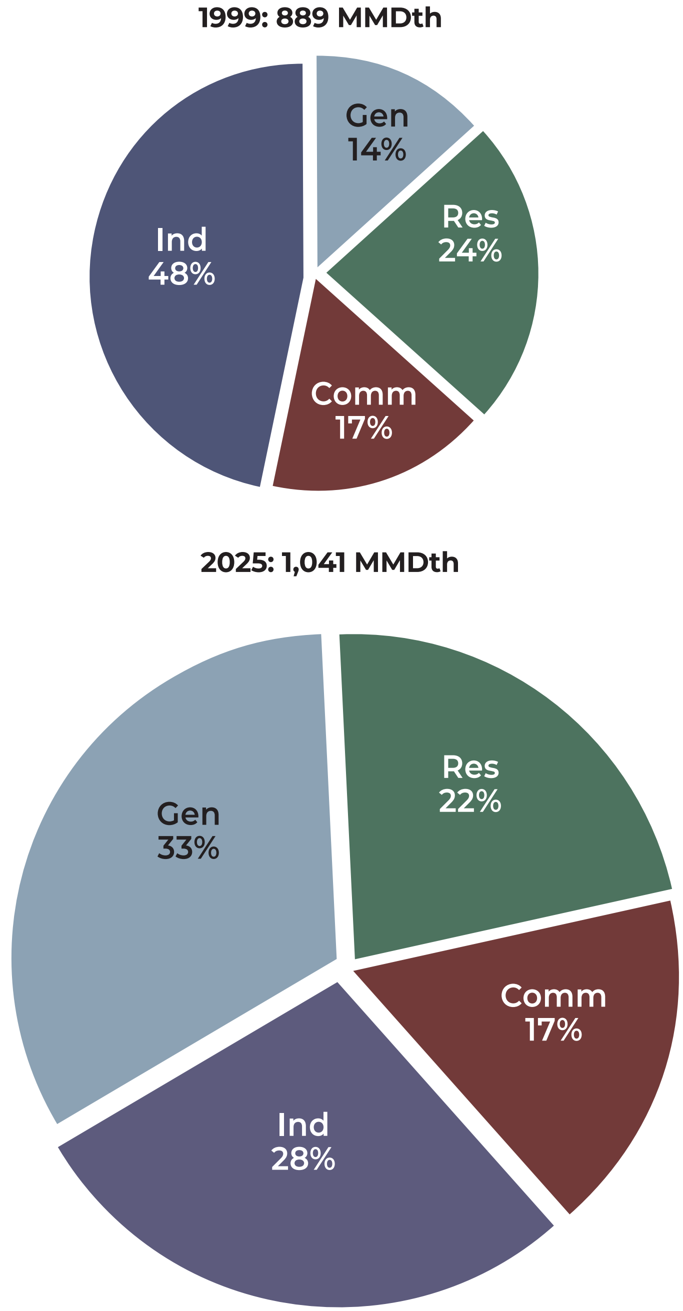
The gas system directly delivers warmth and comfort to more than 3.6 million homes and productive energy for almost 350,000 businesses across the region. As noted above, it also fuels a portion of the electricity regional consumers need. Figure 7 illustrates how regional demand has grown over the last two decades.

FIGURE 7 *Historic Demand for Natural Gas in the Northwest by Sector*



On average, natural gas satisfies almost 50% of the annual non-transportation end-use energy demand in the region (home/business space and water heat and industrial uses). Regional residential and commercial consumption varies with the weather but has generally seen modest growth. The region has lost industrial loads over the same time frame, while demand for natural gas to fuel electricity generation has grown steadily as economics and public policy have prompted the closure of other on-demand generation resources (see Focus: Generation Demand—The Critical Variable). Figure 8 depicts the results: annual loads have grown 30% since 1999, while the nature of those loads has shifted from 50% constant loads (irrespective of weather) to 75% weather dependent loads (e.g. space heat during cold weather; power generation when renewable resources are insufficient to meet demand) dominated by gas-to power loads.

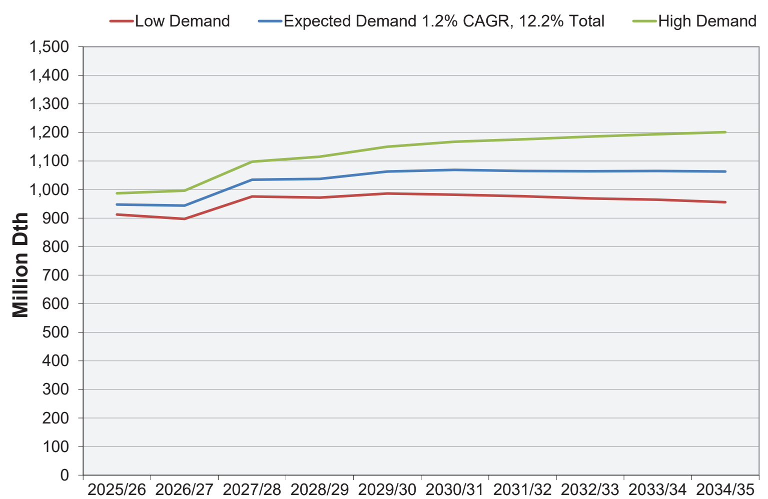
FIGURE 8 *Changing Load Composition, 1999-2025*



Demand Forecast

The expected forecast growth in overall demand for natural gas in the Pacific Northwest is 1.3% per year or a total of 12.2% cumulative growth over the 10-year forecast window. Annual growth rates in the low and high cases are 0.5% to 2.2% respectively. Figure 9 depicts overall demand by case.

FIGURE 9 *Demand Growth Under Low, Expected and High Cases*



Compared to the expected case, the low and high demand cases are driven by a variety of economic and policy factors and forecasts including regional growth, commodity cost, cost of carbon, and LNG exports. See Appendix B for forecast assumptions used by several regional utilities. The demand bump in Figure 9 correlates to the Woodfibre LNG export facility in BC, slated to come into service in late 2027.

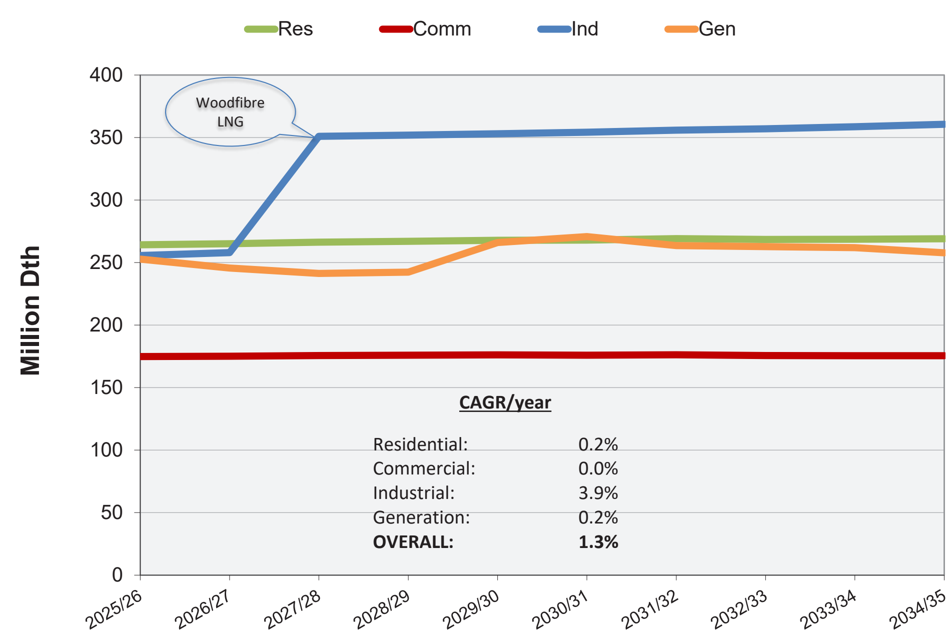
Table 1 lists the compound annual growth rate and cumulative growth for each sector by case. Figure 10 illustrates forecast demand by sector in the expected case.

TABLE 1 *Growth Rates and Cumulative Demand Changes by Case and Sector*

2026	Low		Expected		High	
	Annual Rate	Cumulative	Annual Rate	Cumulative	Annual Rate	Cumulative
TOTAL	**0.5%**	**4.8%**	**1.3%**	**12.2%**	**2.2%**	**21.7%**
Residential	-1.0%	-8.5%	0.2%	1.8%	0.4%	3.7%
Commercial	-1.2%	-10.2%	0.0%	0.4%	0.3%	2.7%
Industrial	3.6%	37.9%	3.9%	41.1%	5.3%	58.9%
Generation	-0.5%	-4.6%	0.2%	2.0%	1.5%	14.8%

Figure 10 illustrates expected forecast demand by sector. In a reflection of state and provincial policies, codes and regulations, end-use demand by households and businesses across the region are essentially flat in both the expected and high cases, while they decline in the low demand case. Industrial demand, however, grows in every case over the next decade, driven largely by Woodfibre LNG, which is expected to come online in 2027.[11] In a change from the previous two Outlooks, natural gas demand for power generation is forecast to modestly grow instead of decline (see Focus: Generation Demand—The Critical Variable).

FIGURE 10 *Expected Case Forecast by Economic Sector*



- Residential: Population growth provides some uplift, which is largely offset by efficiency mandates, decarbonization policies and appliance codes.
- Commercial: No expected growth in commercial demand.
- Industrial: Onset of Woodfibre LNG remains dominant driver.

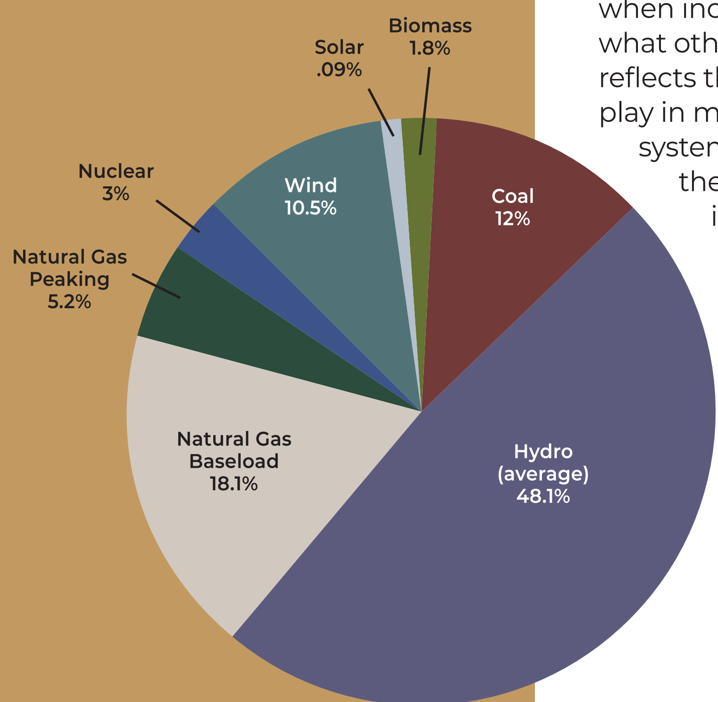
[11] *Enbridge, Woodfibre LNG*

Expanded Focus in 2026 Outlook

Generation demand is no longer declining slowly—it is the most volatile growth sector as the region's reliability needs escalate.

FIGURE 11 *Regional Generating Capability*[12]

Pacific Northwest Generating Capability: 33,828 aMW

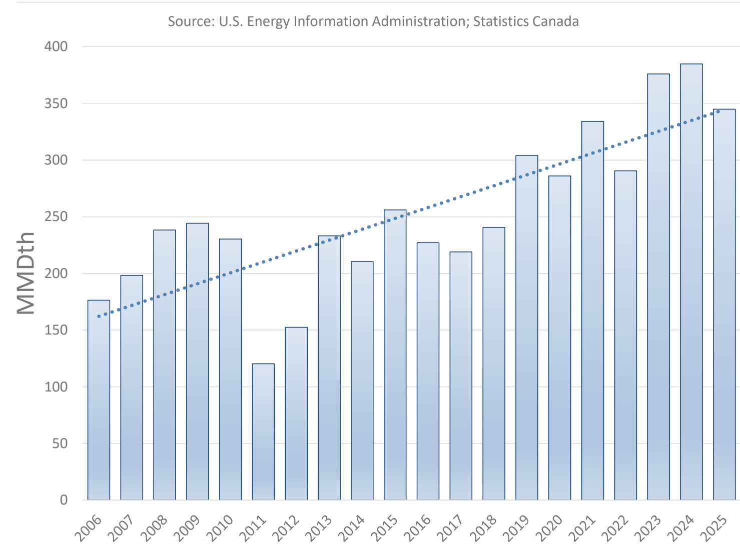


Focus: Generation Demand The Critical Variable

As a flexible, dispatchable resource, natural gas-fired generation is integral to the operation of the Northwest power system—enabling the integration of intermittent wind and solar resources while providing firm capacity during periods when hydropower is limited. The Northwest Power and Conservation Council reports that natural gas-fired baseload and peaking resources comprise approximately 23% of the region's generating capability, second only to hydropower.

Natural gas–fired generation has played a critical role in meeting regional electricity demand. Output rises during periods of grid stress (e.g., extreme cold events, low-water conditions, low renewable-capacity factors) when incremental energy is required beyond what other resources can supply. This pattern reflects the operational role gas-fired resources play in managing short-term and long-term system reliability. Figure 12 highlights both the variability of gas-fired generation and its growing importance to the region's ability to meet demand under a wide range of operating conditions. Between 2006 and 2025, power generation demand for natural gas increased by 96 percent.

FIGURE 12 *Northwest Generation Demand for Natural Gas*



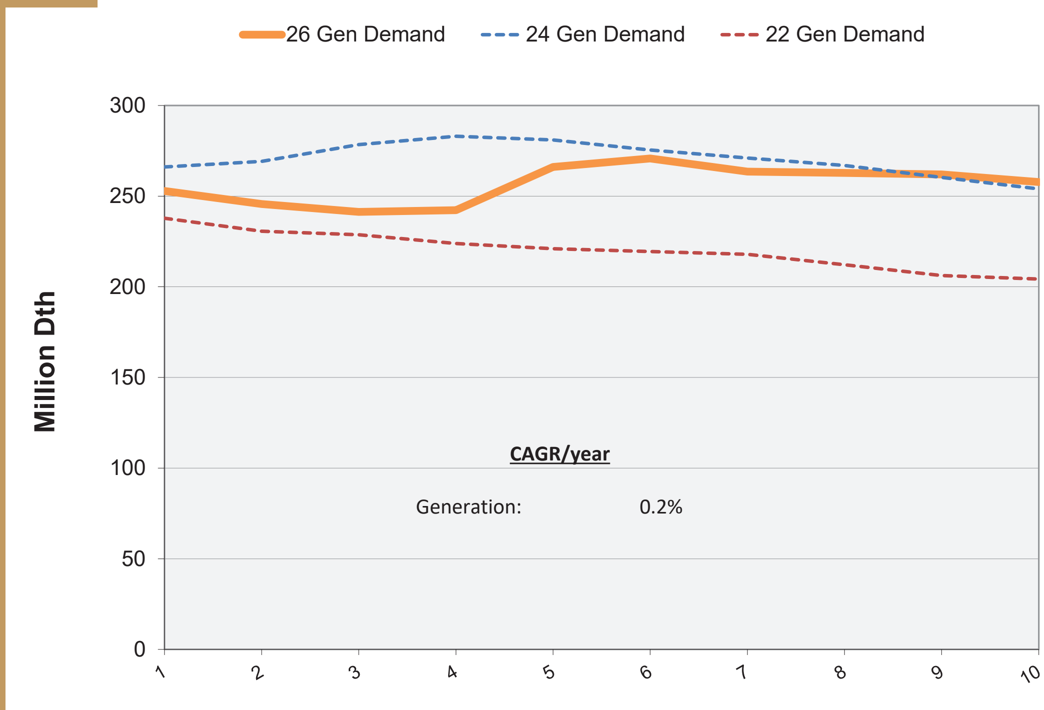
Every iteration of the Outlook prior to 2022 forecasted growth in demand for natural gas to generate electricity. For the first time, the 2022 Outlook forecast a –1.7%/yr annual decline in generation demand for gas, reflecting state and provincial policies. The 2024 Outlook included a more moderate but still declining generation demand forecast of –0.5%/yr. The 2026 Outlook forecasts modest growth of 0.2%/year.

[12] *Northwest Power and Conservation Council, Power Supply*

Figure 13 compares the last two Outlook forecasts for gas-to-power demand with this 2026 Outlook forecast. The forecast trend reflects both regional carbon policies and a growing awareness that natural gas remains a critical resource in the generation mix due to:

- Accelerating coal retirements across the region, removing firm dispatchable capacity.
- Rising load growth from data centers, EV adoption and electrification mandates.
- Insufficient new firm renewable and storage capacity to cover winter peak periods.
- Increasing reliance on gas peakers to backstop the grid during cold snaps.

FIGURE 13 *Northwest Generation Demand for Natural Gas*



Capacity is Critical

The region's natural gas pipelines and storage facilities are the infrastructure backbone for both direct gas consumers and the electric grid. This section examines current capacity, utilization trends, and the infrastructure investments required to maintain adequacy.

Current Infrastructure & Storage

The region's gas system—comprised of high-pressure pipelines, storage facilities and distribution networks—safely and reliably delivers energy to more than 3.6 million homes and 350,000 businesses across the Pacific Northwest (Figure 14). The gas system continues to play a critical role in meeting both average-day and peak-day demand across the region, providing essential flexibility and reliability during periods of elevated need. Given the long lead times required to develop infrastructure (five or more years), ongoing evaluation of capacity needs remains critical.

Natural gas storage facilities are a crucial component of the region's gas system, offering flexibility to meet demand during extreme weather conditions and enabling the purchase and storage of lower-cost gas for future use during periods of high demand. Underground storage is a cost-effective solution to serve seasonal and severe weather loads. Above ground storage, usually LNG, is designed to serve the last measure of demand as needed during the most extreme weather events. Both types of storage enhance the region's available supply, and can do so for days or even weeks. Table 2 lists storage capacity and withdrawal rates for facilities within the Pacific Northwest market area.

FIGURE 14 *Pacific Northwest Natural Gas Infrastructure and Capacities (MDth/day)*

TABLE 2 *Regional Storage Facilities: Serving the Last Measure of Demand*

Facility	Owner	Capacity (MDth)*	Max Withdrawal (MDth/day)**
Jackson Prairie, WA	Avista, NW Pipeline, PSE (operator)	25,584	1,196
Mist, OR	NW Natural	23,549	693
	Underground Storage Subtotal		
Plymouth	NW Pipeline	2,388	305
Newport LNG	NW Natural	1,097	78
Portland LNG	NW Natural	512	134
Nampa LNG	Intermountain Gas Co. (MDU)	610	60
Gig Harbor Satellite LNG	PSE	11	3
Swarr Station Propane***	PSE	128	30
Tacoma LNG	PSE	538	85
Tilbury LNG	FortisBC Energy	1,634	155
Mount Hayes LNG	Fortis BC Energy	1,530	153
	Peak Storage Subtotal (above ground)		
Total Storage			

* Working gas capacity; gas that can be used to serve the market

** Start of season or full rate; withdrawal rates decline as working gas volumes decline reducing reserv

*** Swarr Station in-service scheduled for 2029/30

Capacity Utilization and the Adequacy Gap

Natural gas utilities are obligated to deliver energy to their firm sales customers whenever they need it, even during the most severe weather conditions. Fixing an electrical power outage is usually accomplished by neighborhood or area, but restoring gas service after an outage requires a manual, door-to-door process to ensure safety and relight appliances. Because it can take days, weeks or even months to restore service after an outage, gas utilities design their systems to accommodate the most extreme, while still plausible, weather conditions, called peak or design days (see Appendix B for a comparison of NWGA member company weather design standards). In our region, the highest demand for natural gas occurs in the winter when NWGA members are simultaneously delivering warmth to homes, productive energy to businesses and fuel to generate required electricity.

Figure 15 aggregates the projected design day volumes of NWGA members across the region and plots them against available capacity. The chart reflects current capacities including recently completed expansions like GTN XPress, as well as permitted increases in pipeline and peak storage capacities from the Enbridge Westcoast Sunrise expansions and PSE's Swarr Station Propane facility.

One can see that the region's delivery system has very little excess capacity to serve peak loads, which can be challenging during an extended, region-wide, cold weather event, such as what occurred in February 2019 and ,more recently, January 2024. While Figure 15 assumes that all delivery infrastructure is operating at maximum first-of-season (November) deliverability, both events demonstrated the limitations of that assumption. In fact, when combined with depleted underground storage inventories (February 2019) and unplanned infrastructure curtailments (January 2024) prolonged cold weather currently severely tests the limits of the region's deliverability.

FIGURE 15 *Peak and Average Day Supply/Demand Balance*

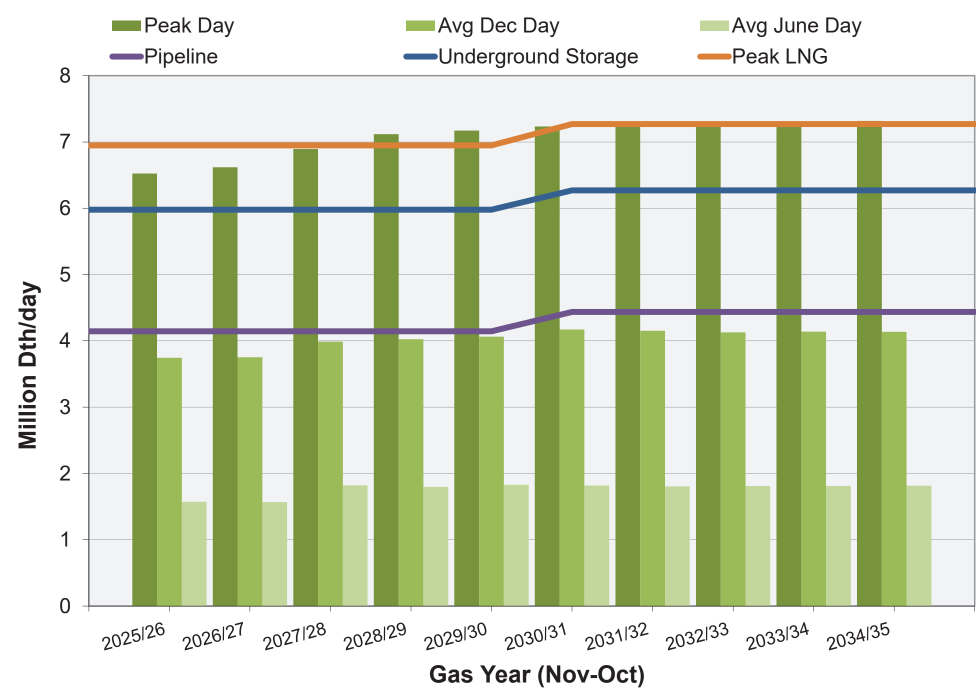
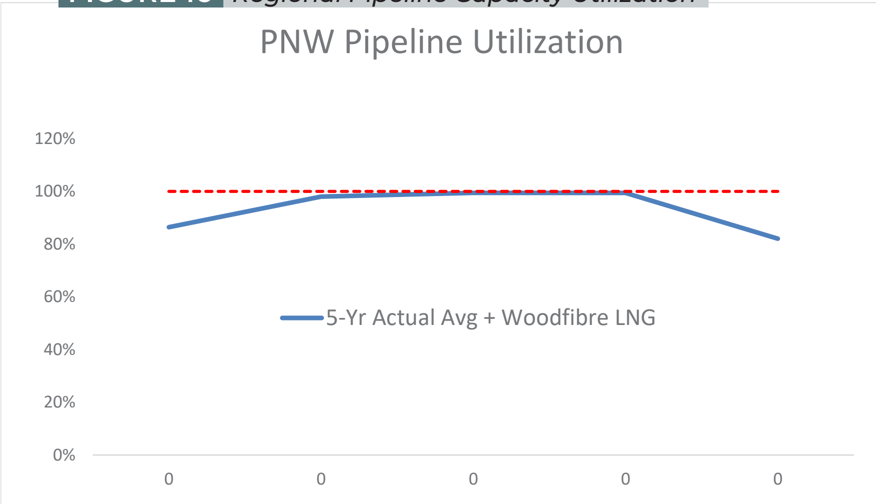


FIGURE 16 *Regional Pipeline Capacity Utilization*



Load Factor	Nov	Dec	Jan	Feb	Mar
Max	88%	**101%**	**100%**	**99%**	85%
Min	75%	86%	89%	88%	67%
5-Yr Average Actual	80%	**92%**	**93%**	**93%**	76%
5-Yr Avg + WF LNG	86%	**98%**	**99%**	**99%**	82%

Another way to think about deliverability is to consider capacity utilization. Figure 16 illustrates that average utilization of the region's interstate pipeline system during the winter months (Dec-Feb) exceeded 90% over the last five years, leaving scant system flexibility to accommodate unplanned for events. When the Woodfibre LNG facility in BC becomes operational, utilization of current capacity could exceed 100%, not including new loads like the projected growth in demand for gas to generate electricity.

2025 Symposium Theme: Build Stuff Now!

Investing in Energy Infrastructure: Modernizing and expanding the region's energy infrastructure is critical to meeting growing demand and integrating new resources. Streamline permitting and siting to accelerate development while maintaining public participation and environmental protections.

Capacity Alert

Average pipeline utilization exceeded 90% during winter months over the past five years with current demand. New infrastructure is urgently needed to serve anticipated load growth and to accommodate competing demands during severe weather. Additional storage and/or pipeline capacity will also provide critical flexibility to absorb unplanned outages and demand surges.

Lessons from Cold Weather Events

The February 2019 cold snap and the January 2024 cold snap both demonstrated that the region's gas and electric systems operate at their limits during extended severe weather. Key areas of focus include:

- Unplanned infrastructure curtailments (pipeline or compressor outages) during peak demand.
- Depleted underground storage inventories entering the coldest period of winter.
- Sumas market hub constraints amplified by simultaneous gas and electric peak demand.
- Insufficient firm electric capacity requiring large-scale imports that are not always available.

Getting through both events required strict demand response and interruptible contract curtailments. The margin for error is narrowing, not widening.

Infrastructure Expansion Projects: Status Update

Enbridge WestCoast

Sunrise Expansion—The Sunrise Expansion Program will add 300 million cubic feet (MMcf) per day of natural gas transportation capacity from Station 2 to the Huntingdon Delivery Area, ensuring delivery of affordable and reliable energy to customers in the Pacific Northwest. The project includes the installation of pipeline loops, facility modifications, and additional compression at select existing compressor station sites including the use of electric-driven compressors, which will would require associated new powerline infrastructure. Regulatory approval was received in April 2026, with an anticipated in-service date in late 2028.

TC Energy

GTN XPress—The GTN XPress project is an expansion of the existing Gas Transmission Northwest (GTN) pipeline, owned by TC Energy. Completed in 2024, GTN XPress upgrades compressor stations in Idaho, Washington, and Oregon, allowing for an additional 150 MMcf of natural gas per day to move into the Pacific Northwest.

Williams NW Pipeline

Silver Spur—The Silver Spur Project is an integrated expansion of the Northwest Pipeline mainline designed to provide approximately 275 MDth/d[13] of incremental firm transportation capacity. The project would facilitate access to Rocky Mountain supply at Opal, Wyoming, with delivery points in Idaho to support regional energy demand growth. The projected in-service date is 2030.

Kelso-Beaver—The Kelso Beaver Reliability Project is designed to provide firm bi-directional lateral transportation service to support the state-approved expansion of the existing North Mist Storage facility. In combination with the North Mist Project, the Kelso-Beaver Reliability Project is expected to enhance system resiliency, reliability, and flexibility by providing an alternative supply source during periods of peak demand or capacity constraints, reducing the risk of supply interruptions, and expanding market access.

[13] 1 MDth equals approximately 0.963 MMcf.

Gas-Electric Interdependence: The Region's Hidden Dependency

New Section in 2026 Outlook

This section is expanded substantially from the brief 2024 reference to reflect the work of the Gas-Electric Coordination Initiative co-hosted by NWGA and the PNUCC. It references findings from recent regional energy forecasts and analyses.

How the Electric Grid Depends on Natural Gas

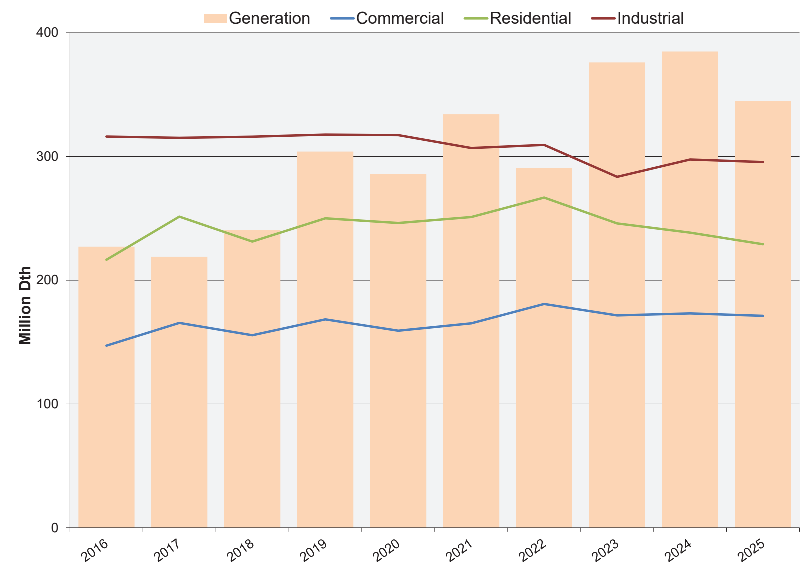
The Pacific Northwest has long relied on hydropower as its primary electricity source, with natural gas-fired generation as a secondary, on-demand resource. That model is changing fundamentally. As coal plants retire and intermittent renewables (wind, solar) grow as a share of the portfolio, natural gas-fired generation has become the critical firm resource—available to meet baseload and peak demand even when the wind is not blowing, the sun is not shining, and rivers run low.

In fact, Figure 17 illustrates that the only significant growth in regional gas demand is in the Gas to Power sector (more than 50% over the last 10 years; 95% over the last 20 years). This reliance is particularly evident during severe weather events, especially during winter months when the gas system is already operating near its limits to provide heat and hot water to millions of households and businesses that depend on it.

"After decades of slow growth, the Pacific Northwest has entered a new era of electricity demand that is placing strain on the power system and requires urgent, coordinated action."

— PNUCC 2026 Northwest Regional Forecast

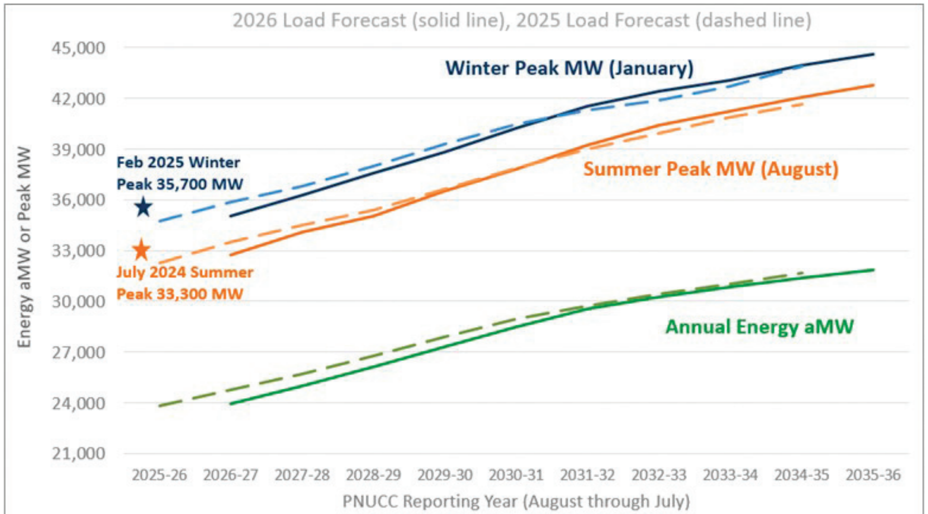
FIGURE 17 *Demand for Natural Gas by Sector (BC, ID, OR, WA)*



Natural gas is expected to remain central to meeting generation needs through the next decade as demand for power increases. Recent regional forecasts and analyses indicate that demand for electricity could experience robust growth, driven by air conditioning, transportation and building electrification, advanced manufacturing, and large loads like data centers. Figure 18 shows the aggregated utility-reported seasonal peak load projections in PNUCC's 2026 Northwest Regional Forecast (NRF).[14]

[14]PNUCC, *2026 Northwest Regional Forecast*, April 2026

FIGURE 18 *Peak Electricity Demand Growth*[15]



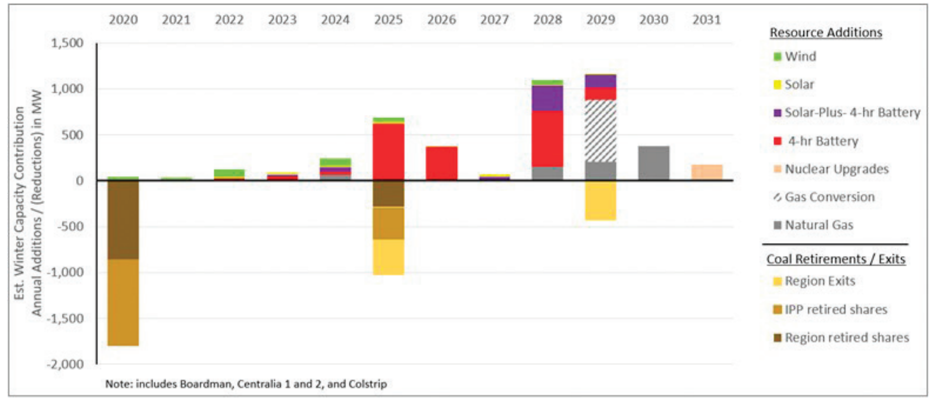
Growth Rates

Energy	10 year	Summer Peak	10 year	Winter Peak	10 year
2026 Forecast	3.2%	*2026 Forecast*	3.0%	*2026 Forecast*	2.7%
2025 Forecast	3.2%	*2025 Forecast*	2.9%	*2025 Forecast*	2.6%

Solid lines in Figure 18 represent 2026 NRF data, while the dashed lines refer to the 2025 NRF. Note that actual summer (2024) and winter (2025) peak loads already exceed the forecast.

Figure 19 illustrates that natural gas generation, coal-to-gas conversion, batteries and solar are crucial components of regional utilities' plans to meet growing peak demand while coal-fired generation is being phased out in Washington and Oregon due to state policy requirements. In some cases, this includes utilities exiting ownership interests or power purchase arrangements from coal plants that may continue operating in other states.

FIGURE 19 *Winter Capacity Resource Reductions and Additions*[16]



[15]PNUCC, 2026 Northwest Regional Forecast, April 2026
[16]Ibid

2025 Energy Symposium Theme: Don't Take Options Off the Table

Keep flexibility in resource choices and timing. A balanced, best-of-the-above portfolio is needed to navigate the transition to a cleaner energy future.

Energy Adequacy: A Growing Risk

A landmark resource adequacy study conducted by Energy & Environmental Economics (E3) [17] and sponsored by a broad coalition of electric utilities and independent power producers through the Public Generating Pool (PGP) includes these conclusions:

- Beginning in 2026, the Pacific Northwest faces an elevated risk of power supply shortfalls that could lead to rolling blackouts during winter cold snaps.
- Shortfalls are most severe during winter cold events, when solar and wind output is reduced and hydropower generation is lower due to low river flows.
- This is due to retirement of firm, on-demand legacy resources (coal), a lag in building enough replacements, and accelerating load growth.
- There is an immediate need to take action to maintain reliability.

Key Finding from PGP/E3 Study

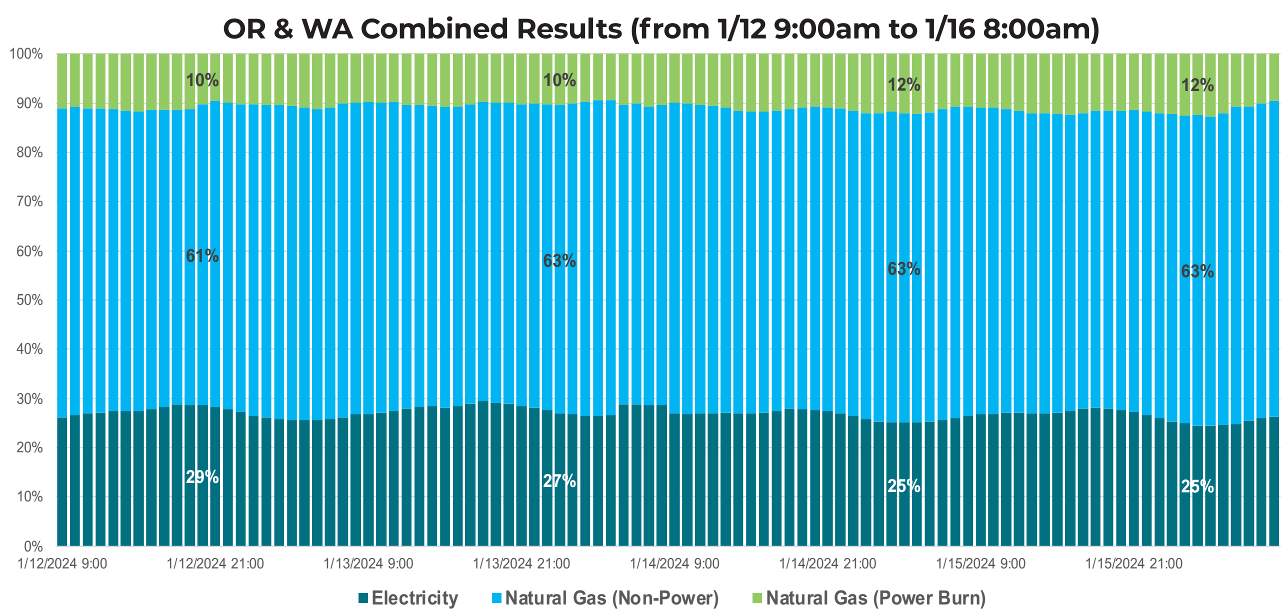
A single-source solution cannot solve this problem. A portfolio approach is needed. Streamlining permitting and siting of energy infrastructure will be vital, as will having state support for energy infrastructure development.

The Gas System Is Indispensable

History, planning forecasts and modeling exercises all lead to the same conclusion: for the foreseeable future, the gas system is essential to ensuring that people and businesses across the Pacific Northwest can access the energy they need, when and where they need it.

Figure 20, from an analysis of hourly natural gas and electricity deliveries to Oregon and Washington commissioned by NWGA, demonstrates the importance and magnitude of the gas system to the regional energy picture. Across the cold snap that spanned January 12-15, 2024, natural gas directly served more than two thirds of the total energy demand throughout the period. It also provided the fuel to generate the last measure of electricity needed to serve the remainder.

FIGURE 20 *Share of OR/WA Demand Served During the January 2024 Cold Snap*



[17] E3, Resource Adequacy and the Energy Transition in the Pacific Northwest, April 2026

According to an electrification analysis filed by NW Natural, supplemental to its 2025 Integrated Resource Plan, it would be costly and duplicative to build the infrastructure needed to electrify the peak winter heating load that is currently safely and reliably being served by the gas system. Furthermore, the additional load would compound the resource adequacy challenge currently confronting our region. The analysis also demonstrated the potential cost savings and other benefits of dual-fuel heating systems compared to full electrification.[18]

Similarly, FortisBC, a provider of gas and electricity to Kelowna, BC, submitted an analysis to the BC Utilities Commission (BCUC) that showed replacing the current gas system would triple peak electricity demand by 2040.[19] More recently, FortisBC submitted analysis to the BCUC demonstrating that residential dual-fuel heating systems can avoid up to 490 MW of peak demand across its shared service area compared to installing air-source heat pumps only.[20]

The gas system's unique strength is its ability to store and deliver large volumes of energy on demand during sustained cold periods—a capability no current electric storage technology can replicate at scale or cost. However, it is currently operating at or near its limits during severe winter weather as detailed in the Capacity is Critical section. There is no wiggle room to accommodate unplanned disruptions, which can affect both the gas system and the grid, as we see in the section From Siloes to Coordination.

If the grid's dependence on the gas system continues to grow during severe weather, as indicated by the studies referenced herein and others, gas system capacity must be expanded to accommodate it. Given long lead times needed to bring capacity expansions online, maintaining a forward-looking approach to capacity needs is critical.

2025 Energy Symposium Theme: Build Stuff Now

The region faces a "now problem." Load growth, aging infrastructure and permitting delays mean we must act faster. During the January 2024 cold snap, the Northwest relied on nearly 5,000 MW of imported electricity on average to avoid power outages.

Dual-Fuel Heating Systems

A dual-fuel (or hybrid) heating system is a space heating and cooling setup that pairs an electric heat pump with a gas furnace. It automatically alternates between the two energy sources based on outdoor temperatures to maximize energy efficiency and comfort.

[18]NW Natural, *Electrification Analysis, Appendix L.1 to the 2025 Integrated Resource Plan*, November 2025

[19]FortisBC, *Kelowna Electrification Case Study*, February 2023

[20]FortisBC, *2026 Long Term Gas Resource Plan*, Sections 4.6 and 4.7, March 2026

New Section in 2026 Outlook

Drawn directly from the experiences that led to the NWGA/PNUCC Gas-Electric Coordination Initiative, this section explores the initial work of the Initiative, which spans the Pacific Northwest including both U.S. and Canadian energy providers, and the actionable recommendations of the October 2025 Pacific Northwest Regional Energy Symposium, co-hosted by NWGA, PNUCC, Western Power Pool and Public Generating Pool.

Gas-Electric Interdependence: From Siloes to Coordination

Warnings and a Wakeup Call: Case Studies in System Stress

A cold snap in late February/early March 2019 coupled with constrained upstream pipeline capacity and low underground storage levels after a long, cold winter caused operators some concern. During the 2022-2023 winter, sustained cold weather led to historically high power and gas demand in the region during December and January. Gas infrastructure serving California, which was also unusually cold, was constrained. Both events led to a surge in wholesale prices during the winter months at Sumas, Washington, a key Northwest trading hub. While the average monthly price at Sumas is typically under $5/Dth, the monthly average in March 2019 was $9.23/Dth and $21.97 in January 2023. Together, these events were warning bells that the Pacific Northwest gas system was approaching its limits and under increasing stress during severe weather.

In 2024, the entire region experienced an intense cold snap over the January 13-15 weekend when two separate disruptions on the gas system on successive days caused the curtailment of gas-fired generation units that would otherwise have run. Regional electric utilities issued Emergency Action Alerts strongly urging conservation and imported electricity from the Southwest to fill the gap. Large gas users with interruptible supplies were curtailed. Fortunately, the disruptions were short-lived, the system was quickly restored, and pilot lights remained lit. This was the wakeup call that threw the interdependency of the region's gas and electric systems into stark relief.

Call to Action

Led by Scott Kinney, Vice President of Energy Resources and Planning at Avista, and Camilo Amezquita, then Vice President and General Manager of Williams Northwest Pipeline, regional energy executives convened in May 2024 to confront reality: the gas and electric systems are one inextricably interdependent energy delivery system. Where they have historically planned and operated in parallel, the stakes demand greater coordination to ensure energy adequacy.

Made up of a broad swath of the entities responsible for transmitting and delivering energy across the Pacific Northwest, the group identified the need to collaborate on addressing the on-the-ground reality of a regional energy system at risk. The group convened workgroups to carry out four work streams:

1. Operational—Consistently coordinate for seasonal readiness by convening in October to share preparations for the winter heating season and again in April to debrief winter operations. The October winter readiness session features a tabletop exercise designed to posit and solve for challenging but plausible energy disruption scenarios.
2. Analytical—Review and synthesize regional energy analyses including retrospectives, forecasts, pathways and strategies to identify commonalities, differences and gaps. See Appendix D for a summary of the Guidehouse literature review commissioned by NWGA and PNUCC.

3. Build Awareness—Identify and amplify common messages in concert. Key themes include (see Appendix E for the full version):
   - **a.** Increasing interdependence between natural gas and electricity providers demands greater awareness and enhanced coordination to mitigate risks to the region's energy system.
   - **b.** The region is dangerously close to experiencing significant energy supply disruption during peak demand events (e.g., severe weather).
   - **c.** Demand for energy in the Pacific Northwest is projected to surge.
   - **d.** Regional assessments rely on capacity additions that are at risk of not being deployed.
4. Convene—Host regional energy symposiums to share work to date and identify next steps to maintain momentum toward closer coordination that mitigates risks to the energy system.

Maintaining Momentum

The October 2025 Pacific Northwest Regional Energy Symposium brought together utility executives, state lawmakers, regulators, power producers and pipeline operators to confront an uncomfortable reality: the gas and electric sectors have historically planned in parallel, but the stakes of continued siloed planning are now too high.

Speakers at the Symposium acknowledged that the sectors did not "talk enough" in the past. The events of January 2024—and the adequacy study findings presented at the Symposium—changed the conversation. The following framework represents the actionable starting points that emerged.

Coordinated Planning

- Plan together, not in parallel—shared assumptions about extreme weather and load growth.
- Coordinate operations during tight system conditions so power plants and consumers get gas when reliability is most at risk.
- Assess fuel supply risks as part of both power and gas planning, including storage access and delivery constraints.

Better System Visibility and Data Sharing

- Improve transparency about grid and pipeline constraints, particularly during cold snaps.
- Enable more timely data exchange between gas and power operators to avoid surprises when demand spikes.
- Develop improved modeling tools that reflect real-world interdependencies and can stress-test the system under extreme conditions.

Policy Alignment

- Clarify reliability expectations across state and federal jurisdictions.
- Support firm, flexible capacity, including demand-side solutions, storage and fast-ramping resources.
- Enable coordinated investments across states and resource types.
- Align incentives so reliability is appropriately valued alongside emissions reductions.
- Provide additional flexibility to meet end-state emission policy objectives without compromising near-term adequacy.

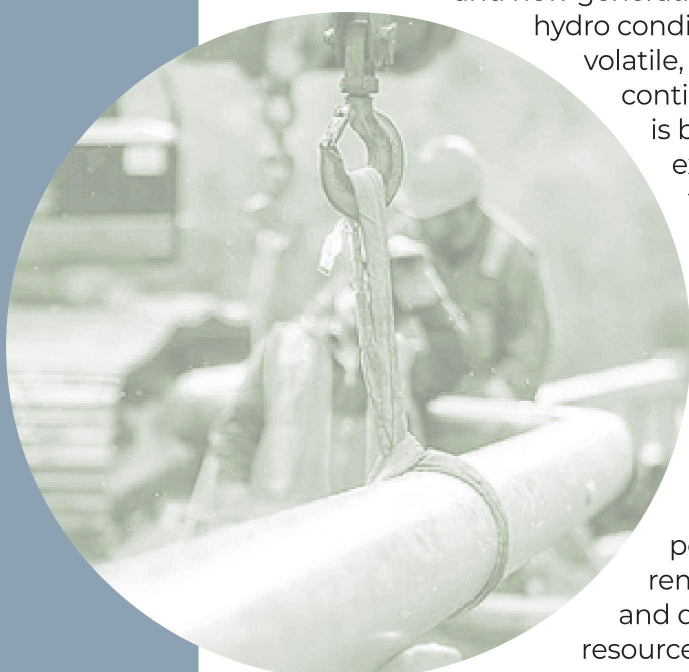
2025 Energy Symposium Theme: Coordination and Communication Matter

A single-source solution cannot solve this problem. A portfolio approach is needed. Streamlining permitting and siting of energy infrastructure will be vital, as will having state support for energy infrastructure development.

Rising Regulatory Barriers: Constraining Natural Gas and Complicating the Energy Transition

The Northwest energy system is at the center of a growing tension among climate policy, affordability, and resource adequacy and reliability. These objectives are increasingly on a collision course, and decisions in one area now have direct consequences for the others. Electricity is the region's largest consumer of natural gas, making the electric and gas systems deeply interdependent. Systems that were historically planned in "silos" must now be planned and operated in far closer coordination to maintain reliability, control costs, and support an orderly transition.

Regional electric utilities are relying more heavily on natural gas generation as coal units retire, transmission and new generation development lag, hydro conditions become more volatile, and electricity demand continues to rise. Load growth is being driven by economic expansion—including high-tech manufacturing and data centers—as well as policies that accelerate the electrification of transportation, homes, and buildings. At the same time, utilities are planning additional gas-fired generation to meet sustained winter peak demand because it remains the most affordable and dependable dispatchable resource available. Yet this growth in gas-fired generation has not been matched by commensurate expansion of an already capacity-constrained natural gas system, creating a critical planning and infrastructure challenge across both sectors.



Until a viable alternative for dispatchable generation emerges at scale, Northwest electric utilities will continue to depend on natural gas to serve rising demand during severe weather, when reliability is most critical. That reality requires a more integrated approach to planning electric generation, pipeline capacity, and local distribution infrastructure. The natural gas distribution system that heats homes and businesses is itself a significant capacity resource and should be strategically leveraged to support a balanced transition—one that protects reliability and affordability while the region advances a more decarbonized energy system. Specific policies impacting electric system resource choices include:

Washington

- Clean Energy Transformation Act (CETA): requires 80% clean energy delivery by 2030 (100% carbon neutral) and 100% delivery by 2045 along with no coal generation serving Washington loads beginning in 2026.
- Climate Commitment Act (CCA): a market-based cap-and-invest program that reduces carbon emissions by requiring covered entities, including electric and gas utilities, to buy allowances for their greenhouse gas (GHG) emissions under a steadily declining annual cap.
- Emission Performance Standard: Limits baseload gas plants to 876 pounds of CO_2 per megawatthour if designed to operate at a 60% or greater capacity factor.
- Building Codes: new building construction has an increasingly limited ability to use natural gas in homes and businesses.

Oregon

- Climate Protection Program (CPP): caps emissions for natural gas utilities to 50% by 2035 and 90% by 2050.
- Clean Energy Targets: electric generation must be 80% below baseline emissions by 2030, 90% below by 2035, and no emissions by 2040.
- Local government ordinances: local governments in Oregon continue to adopt ordinances to discourage or prevent continued natural gas use in new construction.

British Columbia

- Building Codes and Equipment Standards: Affecting both new customers (e.g., the Zero Carbon Step Code) and existing customers (e.g., the Highest Efficiency Equipment Standard), which increasingly limits the use of natural gas in homes and businesses.
- Climate Change Accountability Act: Legislated GHG reduction targets based on a 2007 baseline, including commitments to reduce emissions by 40% by 2030, 60% by 2040, and 80% by 2050.

Delivering Decarbonization

A diversified energy mix can help enable progress toward decarbonization in the Pacific Northwest, combining electricity systems with cost-effective, reliable natural gas. This section presents NWGA member decarbonization commitments and highlights some of the decarbonization technologies that enable decarbonization through the gas system.

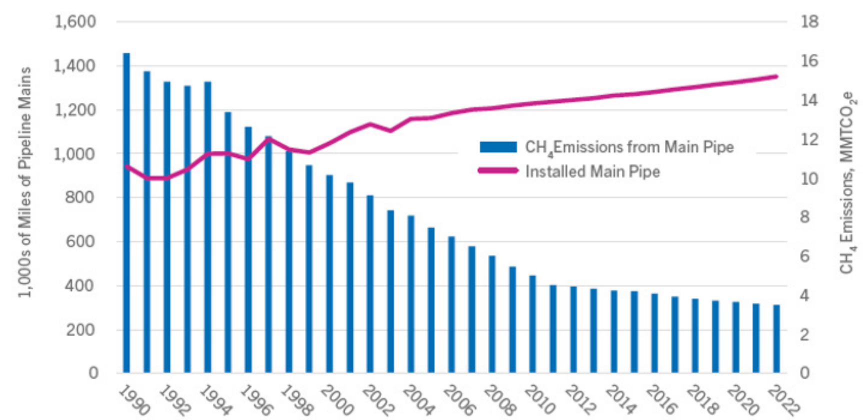
Pacific Northwest (PNW) policymakers have charted a course toward aggressive decarbonization. Understanding that a diversified energy system—including both natural gas and electricity infrastructure—is vital to affordably and reliably achieving regional decarbonization ambitions.

Greenhouse Gas Emissions

It is important to set the context regarding greenhouse gas (GHG) emissions and the role that natural gas continues to play. A summary of the U.S. Environmental Protection Agency's (EPA) latest Inventory of U.S. GHG Emissions and Sinks: 1990-2022 indicates that total carbon dioxide equivalent (CO2e) emissions from natural gas systems have declined 17% since 1990. System emissions of methane have decreased 21% over the same time frame and accounted for less than 1% of total U.S natural gas gross withdrawals.[21]

These trends reflect an industry-wide commitment and on-the-ground effort to reduce CO2e emissions. Figure 21 shows that methane emissions from natural gas distribution systems—the systems that deliver gas the last mile to homes and businesses—have declined even as the miles of installed distribution mains increased by more than 50% since 1990.[22]

FIGURE 21 *Distribution Main Pipe Additions and CH4 Emissions from Main Pipe*



Source: Derived from Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022. Annex Table 3.6.1 Environmental Protection Agency

Enhanced control technologies, system modernization, and robust industry practices have contributed to significant emissions reductions, even as annual natural gas production and consumption have hit record highs.

Regionally, Figure 22 depicts an aggregation of the latest state and provincial GHG emissions data (2022), demonstrating that the use of gas in the built environment is a small part of the overall regional GHG emissions profile. GHG emissions from the direct use of natural gas in homes and commercial buildings across the PNW account for 10% of total regional emissions. Industrial applications of natural gas produce 6% of regional CO2e emissions but are difficult to decarbonize because in many cases there are no feasible alternatives for the high heat produced by natural gas.

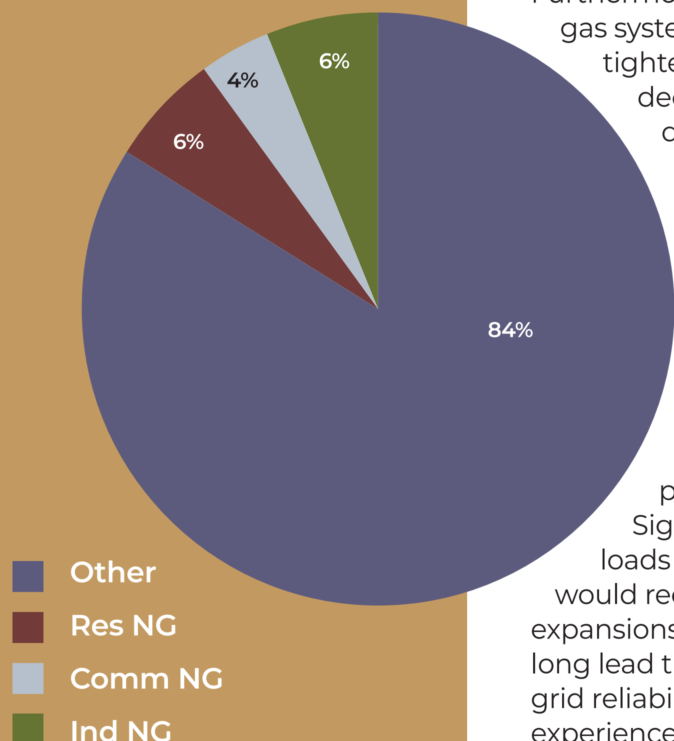
[21]American Gas Association, Understanding GHG Emissions from Natural Gas – EPA 2024 Inventory

[22]Ibid

2025 Energy Symposium Theme: Don't Take Options Off the Table

A balanced, best-of-the-above energy portfolio and a diversified energy delivery system will ensure energy affordability and reliability as the region decarbonizes.

FIGURE 22 *PNW CO2e Emissions*[23]



Two Systems Working Together

Achieving the region's ambitious GHG emission reduction goals will require a range of solutions working together. The power grid plays an important role in helping the region achieve its decarbonization targets, alongside other complementary solutions. The gas system serves two equally important functions in regional decarbonization: directly heating homes and businesses with unmatched efficiency and reliability, and serving as the firm, dispatchable fuel that enables intermittent renewables on the electric grid. Leveraging both systems interdependently is essential to reducing overall GHGs.

Both the electric and gas systems peak in winter. The gas system was purpose-built for this need—reliably heating homes and businesses during the coldest days of winter. Furthermore, GHG emissions from the gas system are declining as systems are tightened, more RNG is added, and other decarbonization technologies are deployed (see *Tools to Decarbonize Through the Gas System*).

PNW grid operators are managing a significant transition: reducing emissions, replacing aging infrastructure, and scaling up to meet rapidly growing demand. While renewable electricity is clean, it is intermittent and therefore not well-suited to meeting peak winter heating demand. Significant electrification of heating loads currently served by the gas system would require large, complex and costly expansions of electrical infrastructure with long lead times and would exacerbate power grid reliability issues that the region already experiences during periods of peak demand.

Natural gas offers a "shovel ready," cost-effective, and highly reliable solution for both roles—heating homes and businesses through existing infrastructure and providing the firm generation backstop and long-duration storage that enables a resilient, highly renewable grid. The benefits of the gas and electricity systems working together in a diversified approach are evident.

Refer to *Gas Electric Interdependency – A Hidden Dependency and From Siloes to Coordination* for more information about how regional grid and gas system operators are collaborating to build awareness of and mitigate risks to regional energy adequacy including more coordinated planning between the systems.

Tools to Decarbonize Through the Gas System

Demand-Side Management (DSM) and Energy Efficiency

DSM continues to be a foundational component to lower GHG emissions across the energy system. Energy efficiency, conservation, and demand response programs reduce gas consumption while maintaining reliable service, helping to moderate system demand and defer or avoid higher-cost supply-side investments.

Across the Pacific Northwest, utilities have a long-standing track record of delivering DSM that supports system efficiency and customer affordability, while contributing to emissions reductions. These programs are typically prioritized based on cost-effectiveness and reliability, ensuring value for customers over the long term.

As the energy system evolves, DSM remains a critical tool that complements supply-side actions, including the integration of lower-carbon gases and other emerging

[23] BC GHG Inventory, OR GHG Inventory, WA GHG Inventory, U.S EPA GHG Inventory Data Explorer - ID

technologies. By reducing overall energy demand and improving system utilization, DSM supports an efficient and coordinated pathway to emissions reductions while maintaining affordability and reliability for customers.

To learn more, click here for an overview of gas utility energy-efficiency programs from the American Gas Association (AGA), or click here for an overview of DSM policies and programs in BC.

Renewable Natural Gas (RNG)

Also called biogas or biomethane, RNG is made by capturing and purifying methane released from decomposing organic wastes. RNG has a few emissions-reduction benefits including: 1) it prevents methane emissions from organic waste streams, 2) it displaces conventional natural gas across a range of applications (space heating, transportation, etc.), and 3) it is currently being deployed and volumes will continue to grow.

Regionally, gas utilities and pipelines continue to ramp up efforts to work with farmers, developers and local governments to capture and inject RNG into existing natural gas systems and are delivering increasing volumes of RNG to PNW consumers. Governmental policies and incentives will help encourage further development. To learn more, click here for the U.S. EPA's RNG page or click here for the Canada Energy Regulator's RNG page.

Hybrid Heating Systems

Another option is pairing a natural gas furnace with a heat pump. These hybrid HVAC systems work by using the furnace to provide heat when the heat pump's efficiency drops below a predetermined set point (these set points vary depending on the region and the specific system). Hybrid systems effectively leverage the strengths of each component: they offer highly efficient heat from the heat pump during milder weather conditions and provide the consistent, efficient, and warm heat delivered by a furnace when temperatures drop. This combination leads to emission reductions because the heat pump operates most of the time, while the furnace only activates when it is most needed. Additionally, furnaces play a crucial role during the coldest weather by relieving the power grid from delivering heat when it is already stretched to its limits. Click here to read a NWGA blog on the benefits of hybrid HVAC systems.

Certified Natural Gas

Also called Responsibly Sourced Gas (RSG), Certified Natural Gas is natural gas that has been independently verified by a third party to meet strict environmental and social standards. It primarily guarantees low methane emissions during extraction and production, helping energy companies reduce their carbon footprint. Click here to view the one-page white paper on Certified Natural Gas produced by the AGA.

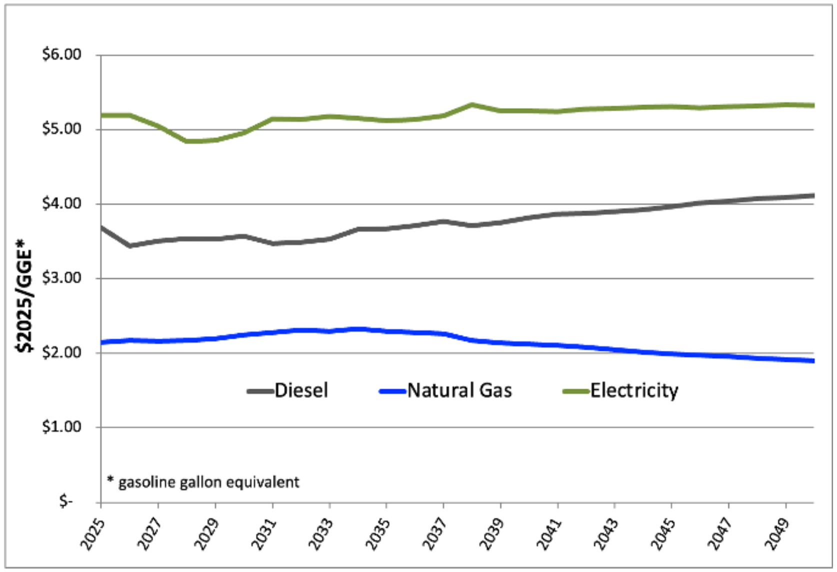
Low Carbon Transportation Solutions

The transportation sector is the largest contributor to GHG emissions in the PNW. Natural gas, RNG and, in the future, hydrogen, can play a meaningful role in reducing transportation-related GHG emissions. The economic and emissions benefits of natural gas are perhaps most notable in the transportation industry. As illustrated in Figure 23, natural gas offers substantial economic value now and in the future relative to other transportation fuels. There is also a clear opportunity for targeted growth in the marine sector along the West Coast, where LNG is emerging as a viable fuel for ferries, coastal shipping and port operations.

Pipes Matter

What they deliver will evolve. Just as the electric grid can deliver renewable resources like wind and solar, natural gas infrastructure can deliver lower-carbon fuels like RNG and hydrogen blends.

FIGURE 23 *Transportation Delivered Fuel Price Forecast* [24]



The best Natural Gas Vehicles (NGV) application is in heavy-duty trucking, where natural gas engines match the performance of diesel engines while producing superior environmental performance. GHG emissions from natural gas engines can be from 5% to 100% lower than diesel and gasoline engines depending on the source. Click here to read the NWGA brief on NGV emissions.

In short, converting to natural gas engines is currently the only commercially and technologically viable way to decarbonize heavy-duty fleets. Contact the Alliance for Clean Transportation for more information.

Other Ways to Reduce Emissions

Carbon Capture—One way to reduce emissions is to capture the carbon before it enters the atmosphere. Carbon capture refers to the suite of technologies designed to do just that. The captured CO2 is either permanently stored deep underground or repurposed to manufacture products like low-carbon concrete and synthetic fuels. Click here to learn more about carbon capture from the Massachusetts Institute of Technology's Carbon Capture webpage.

Gas Heat Pumps—Ready for primetime, a gas heat pump (GHP) is a highly efficient heating and cooling system that utilizes natural gas, renewable gas, or propane to drive a refrigerant cycle, rather than relying solely on mechanical electricity. Instead of creating heat, it moves thermal energy, drastically reducing energy costs and cutting CO2 emissions. Click here to learn more from the North American Gas Heat Pump Collaboration.

Hydrogen—A natural gas molecule is made up of four hydrogen atoms and one carbon atom. When combusted, it's the hydrogen that produces energy, leaving behind CO2. When pure hydrogen is combusted, it leaves behind mostly H2O (water) instead of CO2. Hydrogen is currently produced at scale in locations where it will be used, e.g. refineries, or transported via truck to where it is needed. Future applications could include fueling hard-to-decarbonize industries and safely blending it with natural gas to enable to delivery of lower carbon fuel through the gas distribution system. For more information, visit the Renewable Hydrogen Alliance.

Committed to a Cleaner Future

NWGA members are committed to supporting state and regional decarbonization targets while providing consumers with choices and solutions that ensure they can depend on the energy they need when they need it at reasonable and predictable costs.[25] To that end, they are making investments in:

- Energy efficiency and demand-side management programs.
- The safe and reliable delivery of natural gas to homes and businesses and efficient gas-fired generation facilities.
- Opportunities for low-carbon energy technologies and infrastructure across the value chain.
- An ever tighter natural gas delivery system.

Here is a look at the actions already being taken by NWGA members to reduce their carbon footprint. Click on the company name for more information:

[24] *U.S. EIA, 2026 Annual Energy Outlook, Table 3*
[25] *NWGA, Decarbonization Policy Principles, June 2024*

Avista (WA, OR, ID)—Avista has set an aspirational goal for its natural gas systems to be carbon neutral by 2045. Avista's approach to reducing natural gas emissions includes investing in new technologies, reducing consumption via conservation and energy efficiency, and improving infrastructure. See pages 15-16 of Avista's 2025 Corporate Responsibility Report.

Cascade (WA, OR)—Cascade's priority is helping the communities it serves meet their GHG emissions reduction targets, while maintaining a system that is reliable and affordable for its customers. To that end, Cascade provides rebates to support customer investments in energy efficiency. Cascade also offers customers the opportunity to replace all or a portion of their natural gas usage with renewable natural gas through their voluntary RNG program. The company supports other innovations in partnership with organizations like GTI Energy, local community action agencies, and other key partners. Additionally, Cascade implemented Picarro's Advanced Mobile Leak Detection (AMLD) technology in Washington, which supports their commitment to reducing GHG emissions by improving leak detection, infrastructure integrity, and proactively identifying and mitigating methane leaks within their natural gas distribution system.

Enbridge (throughout Canada and U.S.)—Enbridge takes climate change seriously. To address the complexity of this multi-faceted challenge, Enbridge is deploying strategies to provide society with the energy it needs while reducing its GHG emissions. Enbridge aims for net zero GHG emissions from operations by 2050 and is actively pursuing its goal by modernizing its energy infrastructure, investing in renewables and advancing new technologies such as carbon capture and storage, and RNG.

FortisBC (BC)—FortisBC's approach to sustainability supports the energy transition and helps customers reduce emissions through DSM initiatives, energy efficiency, and the expansion of renewable and lower-carbon gas, including LNG for marine fueling. FortisBC has also advanced early hydrogen transportation demonstrations, including BC's first hydrogen-powered Class 8 truck deployed with Loblaw Companies Limited, enabling real-world evaluation of fuel cell performance, refueling logistics, and fleet integration.

Intermountain Gas Company (ID)—Intermountain recognizes its role in securing a lower carbon future for Idaho. While working to minimize its own emissions, Intermountain leads or participates in several programs to help ensure a sustainable environment, including supporting research on new technologies, and provides rebates to customers adopting energy-efficient technologies and building practices.

NW Natural (OR)—NW Natural remains committed to its core value of environmental stewardship by helping the region move to a lower-carbon, renewable-energy future in the most resilient and affordable way. Current company efforts include RNG procurement, aggressive energy efficiency programs, reducing natural gas supply chain emissions, exploring new technologies and fuels, and providing customers with a voluntary carbon offset and RNG program.

Puget Sound Energy (WA)—PSE aspires to reach net zero carbon emissions for natural gas used in customer homes and businesses by 2045. Beyond its direct emissions, PSE is also committed to working with customers and industry to further reduce carbon across sectors and the state through various programs and initiatives.

TC Energy (throughout Canada, the U.S. and Mexico)—TC Energy is committed to supporting global efforts to address climate change and managing the risks and opportunities of the transition to a lower-carbon economy. Its approach aims to balance meeting growing energy demand and addressing rising global emissions through focusing on three areas: reducing operational emissions through a 40 to 55% methane intensity reduction target by 2035 (vs. 2019 baseline); investing in low-carbon energy via nuclear expansion, pumped hydro storage, and building strategic capabilities in complementary low carbon technologies; and supporting broader decarbonization by leveraging its expansive natural gas infrastructure to facilitate the displacement of higher emitting fuels through coal-to-gas conversions and global LNG adoption.

Williams Northwest Pipeline (WA, OR, ID) – Williams was the first North American midstream company to announce comprehensive and actionable climate targets in 2020. Williams remains committed to addressing climate change in a pragmatic and economically feasible manner to successfully leverage its natural gas-focused business to reduce emissions and build a clean energy economy.

These actions by NWGA members will help deliver lower emissions through innovation while maintaining a healthy and diversified energy system across the PNW. They will help support system reliability and optimize the region's robust gas infrastructure and abundant, low-priced natural gas supply.

Appendices

Appendix A1: Max Supply (Capacities—Dth/day)

SUPPLY	2025 / 2026	2026 / 2027	2027 / 2028	2028 / 2029	2029 / 2030	2030 / 2031	2031 / 2032	2032 / 2033	2033 / 2034	2034 / 2035
Pipeline Interconnects	**4,144,264**	**4,144,264**	**4,144,264**	**4,144,264**	**4,144,264**	**4,436,063**	**4,436,063**	**4,436,063**	**4,436,063**	**4,436,063**
WCSB via TCPL/GTN	**1,565,059**	**1,565,059**	**1,565,059**	**1,565,059**	**1,565,059**	**1,565,059**	**1,565,059**	**1,565,059**	**1,565,059**	**1,565,059**
Stanfield (NWP from GTN)	692,920	692,920	692,920	692,920	692,920	692,920	692,920	692,920	692,920	692,920
Starr Rd (NWP from GTN)	165,000	165,000	165,000	165,000	165,000	165,000	165,000	165,000	165,000	165,000
Palouse (NWP from GTN)	70,459	70,459	70,459	70,459	70,459	70,459	70,459	70,459	70,459	70,459
GTN Direct Connects	511,568	511,568	511,568	511,568	511,568	511,568	511,568	511,568	511,568	511,568
Kingsgate/Yahk BC Interior from TCPL	125,112	125,112	125,112	125,112	125,112	125,112	125,112	125,112	125,112	125,112
Rockies via NWP	**495,000**	**495,000**	**495,000**	**495,000**	**495,000**	**495,000**	**495,000**	**495,000**	**495,000**	**495,000**
NWP north from NWP south	655,000	655,000	655,000	655,000	655,000	655,000	655,000	655,000	655,000	655,000
Max Demand on Reno Lateral	-160,000	-160,000	-160,000	-160,000	-160,000	-160,000	-160,000	-160,000	-160,000	-160,000
WCSB via DEGT	**2,084,205**	**2,084,205**	**2,084,205**	**2,084,205**	**2,084,205**	**2,376,004**	**2,376,004**	**2,376,004**	**2,376,004**	**2,376,004**
T-South to Huntingdon	1,854,000	1,854,000	1,854,000	1,854,000	1,854,000	2,163,000	2,163,000	2,163,000	2,163,000	2,163,000
T-South to BC Interior (Including Kingsvale)	230,205	230,205	230,205	230,205	230,205	213,004	213,004	213,004	213,004	213,004
Storage	**2,805,119**	**2,805,108**	**2,805,108**	**2,805,108**	**2,805,108**	**2,835,108**	**2,835,108**	**2,835,108**	**2,835,108**	**2,835,108**
Jackson Prairie (NWP from JP)	1,196,000	1,196,000	1,196,000	1,196,000	1,196,000	1,196,000	1,196,000	1,196,000	1,196,000	1,196,000
Mist Storage (NWN)	637,800	637,800	637,800	637,800	637,800	637,800	637,800	637,800	637,800	637,800
Plymouth (NWP from LNG)	305,300	305,300	305,300	305,300	305,300	305,300	305,300	305,300	305,300	305,300
Newport LNG (NWN)	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000
Portland LNG (NWN)	130,800	130,800	130,800	130,800	130,800	130,800	130,800	130,800	130,800	130,800
Nampa LNG (IGC)	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Gig Harbor Satellite LNG (PSE)	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Swarr Stn Propane (PSE)	-	-	-	-	-	30,000	30,000	30,000	30,000	30,000
LNG Tacoma (PSE)	153,042	153,042	153,042	153,042	153,042	153,042	153,042	153,042	153,042	153,042
Tilbury LNG (FortisBC)	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000
Mount Hayes LNG (FortisBC)	155,466	155,466	155,466	155,466	155,466	155,466	155,466	155,466	155,466	155,466
On-System	1,211	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Total Available Supply	**6,949,383**	**6,949,372**	**6,949,372**	**6,949,372**	**6,949,372**	**7,271,171**	**7,271,171**	**7,271,171**	**7,271,171**	**7,271,171**

Appendix A2: Annual Demand - Expected Case (Dth/year)

REGION/ SECTOR	2025 / 2026	2026 / 2027	2027 / 2028	2028 / 2029	2029 / 2030	2030 / 2031	2031 / 2032	2032 / 2033	2033 / 2034	2034 / 2035
BC Lower Mainland & Van. Island	**144,383,447**	**145,151,874**	**236,287,999**	**236,895,692**	**237,677,580**	**238,431,759**	**239,404,819**	**239,859,820**	**240,540,055**	**241,199,165**
Residential	59,096,344	59,485,741	59,851,743	60,195,497	60,518,700	60,820,581	61,098,517	61,352,990	61,588,184	61,805,112
Commercial	49,113,990	49,569,133	50,026,100	50,484,907	50,944,176	51,396,474	51,845,165	52,292,126	52,737,167	53,179,349
Industrial	36,173,113	36,097,000	126,410,156	126,215,288	126,214,704	126,214,704	126,461,137	126,214,704	126,214,704	126,214,704
Power Generation	-	-	-	-	-	-	-	-	-	-
W. Washington	**232,043,908**	**232,296,789**	**230,938,518**	**229,201,757**	**235,306,406**	**242,551,677**	**242,987,170**	**241,561,568**	**241,314,442**	**242,299,073**
Residential	69,712,250	69,294,166	69,255,192	69,090,781	69,117,532	69,000,412	69,417,058	68,597,379	68,418,996	68,396,826
Commercial	43,971,907	43,926,238	44,087,867	44,139,451	44,102,196	43,868,247	43,977,125	43,444,568	43,240,417	43,113,971
Industrial	68,881,960	70,575,025	72,449,763	72,626,077	72,696,799	72,742,799	72,861,660	72,841,274	72,900,594	72,964,497
Power Generation	49,477,791	48,501,360	45,145,696	43,345,448	49,389,879	56,940,218	56,731,327	56,678,347	56,754,435	57,823,779
W. Oregon	**156,584,938**	**155,532,531**	**154,366,069**	**153,250,594**	**151,957,606**	**150,528,586**	**148,900,943**	**147,160,360**	**145,415,631**	**139,536,074**
Residential	44,061,466	43,764,011	43,461,904	43,156,498	42,740,417	42,264,503	41,687,570	41,031,900	40,374,085	39,705,600
Commercial	27,309,270	27,087,894	26,793,742	26,478,162	26,116,020	25,729,447	25,290,463	24,817,149	24,322,662	23,852,376
Industrial	45,948,420	45,414,843	44,844,640	44,350,152	43,835,386	43,268,853	42,657,127	42,045,528	41,453,101	40,881,406
Power Generation	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	35,096,692
BC Interior	**61,484,218**	**61,647,154**	**61,923,247**	**62,123,542**	**62,286,646**	**62,455,038**	**62,616,352**	**62,770,694**	**62,919,653**	**63,065,184**
Residential	19,441,907	19,613,379	19,775,815	19,929,601	20,075,752	20,215,059	20,346,592	20,470,078	20,587,244	20,698,368
Commercial	12,453,700	12,486,226	12,517,038	12,546,141	12,574,172	12,603,257	12,633,038	12,663,894	12,695,687	12,730,094
Industrial	29,588,611	29,547,549	29,630,394	29,647,800	29,636,722	29,636,722	29,636,722	29,636,722	29,636,722	29,636,722
Power Generation	-	-	-	-	-	-	-	-	-	-
E. Washington & N. Idaho	**81,287,811**	**80,391,239**	**79,954,977**	**79,129,273**	**80,678,370**	**77,501,111**	**75,790,847**	**75,126,763**	**74,743,633**	**74,611,915**
Residential	24,035,155	24,222,641	24,298,535	24,160,538	24,003,887	23,652,165	23,610,712	23,273,435	23,076,483	22,959,264
Commercial	16,178,015	15,979,782	15,761,771	15,555,892	15,345,951	14,985,020	14,887,637	14,579,065	14,360,360	14,190,286
Industrial	24,466,517	24,572,921	24,685,211	24,793,657	24,896,355	24,985,756	25,105,778	25,198,042	25,304,430	25,413,233
Power Generation	16,608,124	15,615,895	15,209,460	14,619,185	16,432,177	13,878,171	12,186,720	12,076,220	12,002,361	12,049,132

Appendix A2: Annual Demand - Expected Case (Dth/year) cont.

E. Oregon & Medford	**150,979,008**	**145,828,755**	**142,420,154**	**139,476,507**	**138,369,398**	**134,584,035**	**129,511,384**	**128,910,388**	**128,099,629**	**127,150,107**
Residential	8,829,703	8,882,374	8,976,924	9,100,834	9,173,113	9,093,182	9,249,460	9,242,612	9,258,974	9,342,166
Commercial	5,606,686	5,586,710	5,612,495	5,649,800	5,653,420	5,581,993	5,644,300	5,611,165	5,591,488	5,616,427
Industrial	9,008,679	9,030,685	9,060,940	9,095,042	9,118,326	9,130,161	9,169,575	9,194,241	9,216,490	9,248,370
Power Generation	127,533,939	122,328,987	118,769,796	115,630,831	114,424,538	110,778,700	105,448,049	104,862,369	104,032,678	102,943,144
S. Idaho	**120,728,112**	**122,861,964**	**128,429,614**	**137,030,320**	**156,710,870**	**162,740,116**	**165,570,254**	**168,567,733**	**171,749,594**	**175,134,611**
Residential	39,051,529	39,806,711	40,744,492	41,333,411	42,132,554	42,932,486	43,732,418	44,532,350	45,332,281	46,132,213
Commercial	20,195,969	20,491,665	20,885,725	21,086,753	21,382,378	21,677,416	21,972,454	22,267,492	22,562,530	22,857,568
Industrial	41,564,656	42,668,324	43,875,074	45,195,391	46,640,827	48,224,114	49,959,281	51,861,791	53,948,682	56,238,730
Power Generation	19,915,958	19,895,264	22,924,323	29,414,765	46,555,111	49,906,100	49,906,100	49,906,100	49,906,100	49,906,100

PNW Annual Demand - Expected	**947,491,442**	**943,710,307**	**1,034,320,577**	**1,037,107,686**	**1,062,986,876**	**1,068,792,322**	**1,064,781,768**	**1,063,957,327**	**1,064,782,637**	**1,062,996,130**
Residential	264,228,354	265,069,022	266,364,605	266,967,160	267,761,955	267,978,388	269,142,328	268,500,743	268,636,247	269,039,550
Commercial	174,829,536	175,127,648	175,684,738	175,941,107	176,118,314	175,841,854	176,250,182	175,675,460	175,510,311	175,540,071
Industrial	255,631,957	257,906,347	350,956,177	351,923,407	353,039,119	354,203,109	355,851,280	356,992,304	358,674,723	360,597,662
Power Generation	252,801,596	245,607,289	241,315,057	242,276,012	266,067,487	270,768,971	263,537,979	262,788,820	261,961,356	257,818,847

Appendix A3: Annual Demand - High Case (Dth/year)

REGION/ SECTOR	2025 / 2026	2026 / 2027	2027 / 2028	2028 / 2029	2029 / 2030	2030 / 2031	2031 / 2032	2032 / 2033	2033 / 2034	2034 / 2035
BC Lower Mainland & Van. Island	**148,358,806**	**151,484,693**	**245,161,750**	**248,449,744**	**252,058,062**	**255,805,896**	**259,949,558**	**263,762,564**	**267,999,297**	**272,425,114**
Residential	59,096,344	59,485,741	59,851,743	60,195,497	60,518,700	60,820,581	61,098,517	61,352,990	61,588,184	61,805,112
Commercial	49,113,990	49,569,133	50,026,100	50,484,907	50,944,176	51,396,474	51,845,165	52,292,126	52,737,167	53,179,349
Industrial	40,148,472	42,429,819	135,283,907	137,769,340	140,595,186	143,588,841	147,005,876	150,117,448	153,673,946	157,440,653
Power Generation	-	-	-	-	-	-	-	-	-	-
W. Washington	**237,320,797**	**237,570,384**	**236,385,599**	**234,386,605**	**240,196,202**	**247,259,937**	**247,484,542**	**245,564,586**	**245,497,768**	**246,150,544**
Residential	70,182,883	69,792,714	69,785,033	69,643,046	69,692,125	69,582,242	70,035,058	69,228,466	69,074,723	69,083,353
Commercial	44,258,247	44,230,153	44,418,154	44,494,561	44,481,339	44,262,697	44,403,827	43,889,687	43,711,855	43,612,980
Industrial	72,047,642	73,757,260	75,657,593	75,855,606	75,949,081	76,019,055	76,166,018	76,171,946	76,257,689	76,347,253
Power Generation	50,832,025	49,790,257	46,524,819	44,393,392	50,073,657	57,395,943	56,879,638	56,274,486	56,453,501	57,106,958
W. Oregon	**156,967,625**	**156,560,337**	**156,134,956**	**155,663,369**	**155,006,718**	**154,259,952**	**153,344,779**	**152,305,555**	**151,267,144**	**146,071,741**
Residential	44,312,862	44,187,641	44,064,180	43,898,514	43,599,157	43,240,648	42,771,686	42,218,230	41,660,294	41,097,494
Commercial	27,562,209	27,481,940	27,386,580	27,284,227	27,132,468	26,952,021	26,720,655	26,445,402	26,175,542	25,918,065
Industrial	45,826,771	45,624,973	45,418,413	45,214,846	45,009,310	44,801,500	44,586,656	44,376,140	44,165,525	43,959,489
Power Generation	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	35,096,692
BC Interior	**64,729,067**	**66,820,778**	**69,173,201**	**71,556,026**	**74,025,393**	**76,639,397**	**79,390,881**	**82,288,491**	**85,342,863**	**88,565,541**
Residential	19,441,907	19,613,379	19,775,815	19,929,601	20,075,752	20,215,059	20,346,592	20,470,078	20,587,244	20,698,368
Commercial	12,453,700	12,486,226	12,517,038	12,546,141	12,574,172	12,603,257	12,633,038	12,663,894	12,695,687	12,730,094
Industrial	32,833,460	34,721,173	36,880,348	39,080,284	41,375,469	43,821,081	46,411,251	49,154,519	52,059,932	55,137,079
Power Generation	-	-	-	-	-	-	-	-	-	-
E. Washington & N. Idaho	**86,389,856**	**86,667,758**	**87,147,597**	**87,761,355**	**90,398,028**	**87,622,624**	**86,611,761**	**86,516,751**	**86,119,158**	**86,313,024**
Residential	24,730,650	24,979,105	25,148,845	25,100,329	25,034,923	24,821,549	24,926,761	24,671,723	24,555,480	24,479,016
Commercial	16,654,206	16,622,028	16,639,471	16,509,563	16,312,389	15,955,610	15,877,887	15,578,549	15,375,412	15,225,962
Industrial	25,665,063	25,780,238	25,902,118	26,021,674	26,135,595	26,235,687	26,368,055	26,471,396	26,589,677	26,710,598

Appendix A3: Annual Demand - High Case (Dth/year) cont.

Power Generation	19,339,936	19,286,387	19,457,163	20,129,789	22,915,122	20,609,778	19,439,057	19,795,083	19,598,588	19,897,447
E. Oregon & Medford	**169,978,181**	**171,500,154**	**172,060,881**	**176,341,295**	**177,181,393**	**178,389,557**	**178,391,847**	**180,610,041**	**179,289,436**	**179,548,750**
Residential	9,236,132	9,349,291	9,529,636	9,707,182	9,817,161	9,783,105	9,989,918	10,022,762	10,076,042	10,208,600
Commercial	5,838,618	5,835,647	5,871,001	5,930,207	5,959,656	5,903,553	5,993,280	5,984,497	5,994,423	6,050,095
Industrial	9,349,602	9,372,925	9,405,259	9,441,898	9,467,230	9,480,535	9,522,793	9,549,579	9,573,828	9,608,185
Power Generation	145,553,828	146,942,290	147,254,984	151,262,008	151,937,345	153,222,365	152,885,856	155,053,203	153,645,143	153,681,871
S. Idaho	**123,049,181**	**125,574,013**	**131,586,986**	**140,645,995**	**160,812,063**	**167,338,229**	**170,672,880**	**174,183,241**	**177,887,202**	**181,804,477**
Residential	39,210,490	40,188,755	41,383,830	42,235,269	43,312,253	44,393,240	45,474,228	46,555,215	47,636,202	48,717,189
Commercial	20,279,844	20,688,254	21,210,005	21,540,800	21,971,830	22,403,569	22,835,307	23,267,046	23,698,784	24,130,522
Industrial	43,642,889	44,801,740	46,068,828	47,455,160	48,972,868	50,635,319	52,457,246	54,454,881	56,646,116	59,050,666
Power Generation	19,915,958	19,895,264	22,924,323	29,414,765	46,555,111	49,906,100	49,906,100	49,906,100	49,906,100	49,906,100

PNW Annual Demand - High	**986,793,513**	**996,178,116**	**1,097,650,970**	**1,114,804,389**	**1,149,677,858**	**1,167,315,592**	**1,175,846,247**	**1,185,231,229**	**1,193,402,868**	**1,200,879,190**
Residential	266,211,269	267,596,626	269,539,083	270,709,438	272,050,072	272,856,424	274,642,760	274,519,463	275,178,170	276,089,132
Commercial	176,160,814	176,913,382	178,068,349	178,790,407	179,376,030	179,477,180	180,309,159	180,121,201	180,388,870	180,847,068
Industrial	269,513,900	276,488,127	374,616,466	380,838,808	387,504,739	394,582,019	402,517,894	410,295,909	418,966,714	428,253,923
Power Generation	274,907,530	275,179,981	275,427,072	284,465,736	310,747,017	320,399,968	318,376,434	320,294,655	318,869,115	315,689,068

Appendix A4: Annual Demand - Low Case (Dth/year)

REGION/SECTOR	2025 / 2026	2026 / 2027	2027 / 2028	2028 / 2029	2029 / 2030	2030 / 2031	2031 / 2032	2032 / 2033	2033 / 2034	2034 / 2035
BC Lower Mainland & Van. Island	**137,208,060**	**133,974,867**	**221,171,350**	**217,918,213**	**214,918,626**	**211,968,612**	**209,315,402**	**206,222,025**	**203,430,743**	**200,694,854**
Residential	55,380,875	53,686,057	52,020,537	50,386,173	48,784,993	47,216,805	45,680,000	44,175,393	42,706,241	41,273,144
Commercial	46,950,995	46,180,447	45,420,373	44,670,719	43,930,207	43,192,607	42,461,134	41,737,549	41,021,811	40,313,302
Industrial	34,876,190	34,108,363	123,730,440	122,861,321	122,203,426	121,559,200	121,174,268	120,309,083	119,702,691	119,108,408
Power Generation	-	-	-	-	-	-	-	-	-	-
W. Washington	**229,747,245**	**229,822,148**	**228,433,803**	**226,244,511**	**231,864,723**	**238,781,738**	**238,725,388**	**236,643,469**	**236,398,340**	**236,866,999**
Residential	69,219,670	68,760,201	68,668,690	68,448,870	68,420,889	68,267,648	68,624,157	67,773,037	67,557,240	67,496,319
Commercial	43,559,485	43,448,473	43,548,661	43,540,600	43,444,192	43,160,106	43,204,644	42,622,194	42,363,236	42,178,582
Industrial	66,136,066	67,823,217	69,691,633	69,861,649	69,925,985	69,967,015	70,078,815	70,053,409	70,106,505	70,164,116
Power Generation	50,832,025	49,790,257	46,524,819	44,393,392	50,073,657	57,386,970	56,817,773	56,194,829	56,371,359	57,027,983
W. Oregon	**155,774,291**	**154,295,389**	**152,795,723**	**151,354,628**	**149,767,637**	**148,065,668**	**146,180,690**	**144,202,666**	**142,236,111**	**136,147,198**
Residential	43,717,648	43,281,034	42,845,461	42,397,774	41,865,621	41,290,517	40,623,846	39,890,009	39,162,974	38,432,962
Commercial	26,842,441	26,333,730	25,839,840	25,340,920	24,800,848	24,240,517	23,633,936	23,001,351	22,354,258	21,736,140
Industrial	45,948,420	45,414,843	44,844,639	44,350,151	43,835,385	43,268,852	42,657,125	42,045,524	41,453,097	40,881,403
Power Generation	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	39,265,783	35,096,692
BC Interior	58,672,568	57,273,833	56,010,577	54,708,828	53,404,095	52,135,906	50,892,880	49,675,002	48,483,228	47,318,695
Residential	18,230,347	17,711,596	17,198,429	16,691,755	16,192,890	15,702,778	15,220,968	14,747,524	14,283,901	13,830,366
Commercial	11,912,306	11,639,572	11,371,449	11,107,921	10,849,514	10,597,947	10,352,728	10,113,988	9,881,422	9,656,119
Industrial	28,529,915	27,922,665	27,440,699	26,909,152	26,361,691	25,835,181	25,319,184	24,813,490	24,317,905	23,832,210
Power Generation	-	-	-	-	-	-	-	-	-	-
E. Washington & N. Idaho	**76,770,020**	**75,513,658**	**74,331,735**	**73,362,863**	**73,642,637**	**70,643,709**	**69,619,369**	**68,796,171**	**68,305,416**	**67,930,512**
Residential	23,788,882	23,952,447	23,992,633	23,820,696	23,633,056	23,257,783	23,180,392	22,820,408	22,597,627	22,453,041
Commercial	15,716,017	15,369,211	14,959,968	14,579,376	14,209,518	13,711,169	13,474,765	13,052,557	12,724,541	12,451,534
Industrial	23,297,581	23,398,728	23,505,438	23,608,327	23,705,743	23,790,499	23,904,337	23,991,797	24,092,695	24,195,887
Power Generation	13,967,540	12,793,271	11,873,696	11,354,463	12,094,321	9,884,258	9,059,875	8,931,409	8,890,551	8,830,050

Appendix A4: Annual Demand - Low Case (Dth/year) cont.

E. Oregon & Medford	**135,679,256**	**126,098,092**	**117,414,371**	**114,565,961**	**109,805,633**	**102,244,779**	**101,385,060**	**100,343,098**	**99,741,371**	**98,200,162**
Residential	8,554,994	8,586,936	8,652,413	8,746,166	8,791,626	8,692,503	8,818,256	8,789,243	8,782,632	8,839,641
Commercial	5,430,624	5,380,962	5,366,446	5,362,374	5,326,884	5,221,022	5,243,071	5,175,906	5,122,254	5,111,231
Industrial	8,669,941	8,690,724	8,719,301	8,751,521	8,773,467	8,784,534	8,821,818	8,845,099	8,866,095	8,896,270
Power Generation	113,023,696	103,439,471	94,676,210	91,705,900	86,913,656	79,546,719	78,501,916	77,532,851	76,970,390	75,353,020
S. Idaho	**118,407,013**	**120,153,496**	**125,283,475**	**133,440,763**	**152,655,516**	**158,209,440**	**160,556,662**	**163,062,859**	**165,744,217**	**168,618,575**
Residential	38,892,616	39,426,712	40,112,402	40,447,600	40,981,421	41,513,852	42,046,283	42,578,714	43,111,145	43,643,577
Commercial	20,112,016	20,296,612	20,565,430	20,642,777	20,810,199	20,976,580	21,142,961	21,309,343	21,475,724	21,642,105
Industrial	39,486,423	40,534,908	41,681,321	42,935,621	44,308,786	45,812,908	47,461,317	49,268,702	51,251,248	53,426,793
Power Generation	19,915,958	19,895,264	22,924,323	29,414,765	46,555,111	49,906,100	49,906,100	49,906,100	49,906,100	49,906,100

PNW Annual Demand - Low	**912,258,453**	**897,131,483**	**975,441,033**	**971,595,766**	**986,058,866**	**982,049,852**	**976,675,451**	**968,945,290**	**964,339,426**	**955,776,995**
Residential	257,785,032	255,404,984	253,490,565	250,939,034	248,670,495	245,941,886	244,193,902	240,774,327	238,201,761	235,969,049
Commercial	170,523,883	168,649,006	167,072,167	165,244,688	163,371,362	161,099,947	159,513,239	157,012,888	154,943,245	153,089,013
Industrial	246,944,536	247,893,448	339,613,470	339,277,742	339,114,482	339,018,190	339,416,864	339,327,105	339,790,237	340,505,088
Power Generation	237,005,002	225,184,045	215,264,832	216,134,303	234,902,527	235,989,829	233,551,446	231,830,971	231,404,183	226,213,844

Appendix A5: Peak Day Supply-Demand Balance (Expected Case—Dth/day)

PEAK DAY DEMAND (REGION/SECTOR)	2025 / 2026	2026 / 2027	2027 / 2028	2028 / 2029	2029 / 2030	2030 / 2031	2031 / 2032	2032 / 2033	2033 / 2034	2034 / 2035
BC Lower Main & Van. Island (I-5 Corridor)	**1,105,895**	**1,111,976**	**1,366,931**	**1,374,609**	**1,381,279**	**1,387,633**	**1,393,754**	**1,399,659**	**1,405,385**	**1,410,931**
Residential	508,214	511,566	514,717	517,676	520,458	523,057	525,449	527,639	529,663	531,529
Commercial	392,724	396,493	400,278	404,081	407,890	411,646	415,375	419,090	422,792	426,471
Industrial	204,957	203,917	451,935	452,851	452,930	452,930	452,930	452,930	452,930	452,930
Power Generation	-	-	-	-	-	-	-	-	-	-
W. Washington (I-5 Corridor)	**1,948,881**	**1,959,818**	**1,966,760**	**2,138,680**	**2,135,612**	**2,102,632**	**2,108,080**	**2,115,899**	**2,122,061**	**2,127,740**
Residential	754,254	758,927	761,366	763,501	766,230	767,300	769,507	773,014	775,617	777,950
Commercial	366,802	370,296	372,367	374,208	376,431	376,608	377,326	378,921	379,874	380,579
Industrial	355,119	357,888	360,317	362,765	365,275	367,647	370,168	372,887	375,493	378,134
Power Generation	472,706	472,706	472,710	638,206	627,677	591,077	591,079	591,077	591,077	591,077
W. Oregon (I-5 Corridor)	**1,126,212**	**1,147,670**	**1,149,337**	**1,151,575**	**1,152,224**	**1,154,562**	**1,152,081**	**1,152,368**	**1,149,816**	**1,148,016**
Residential	605,409	619,485	620,855	622,483	623,178	624,950	623,657	624,151	622,826	621,989
Commercial	270,000	277,589	278,180	278,956	279,258	280,065	279,583	279,814	279,252	278,865
Industrial	138,998	138,791	138,497	138,331	137,983	137,743	137,036	136,598	135,933	135,357
Power Generation	111,805	111,805	111,805	111,805	111,805	111,805	111,805	111,805	111,805	111,805
BC Interior	**429,654**	**432,001**	**434,291**	**436,537**	**438,520**	**440,398**	**442,200**	**443,927**	**445,597**	**447,231**
Residential	209,933	211,785	213,539	215,199	216,778	218,282	219,702	221,036	222,301	223,501
Commercial	142,510	142,922	143,316	143,690	144,053	144,427	144,808	145,202	145,606	146,040
Industrial	77,211	77,294	77,436	77,647	77,689	77,689	77,689	77,689	77,689	77,689
Power Generation	-	-	-	-	-	-	-	-	-	-
E. Washington & N. Idaho	**539,067**	**537,945**	**534,923**	**532,556**	**529,509**	**524,570**	**521,438**	**520,227**	**517,150**	**514,339**
Residential	292,537	293,034	292,220	291,129	289,380	286,732	284,832	283,745	281,826	280,120
Commercial	171,535	169,001	166,028	163,967	161,881	158,965	156,930	155,817	153,844	151,912
Industrial	74,995	75,911	76,675	77,460	78,247	78,873	79,676	80,666	81,480	82,307
Power Generation	-	-	-	-	-	-	-	-	-	-

Appendix A5: Peak Day Supply-Demand Balance (expected case—Dth/day) cont.

E. Oregon & Medford (Non I-5 Supply)	**525,490**	**557,775**	**559,180**	**560,634**	**562,092**	**562,149**	**563,547**	**566,398**	**567,847**	**569,253**
Residential	69,870	90,162	90,711	91,211	91,769	91,492	91,870	93,111	93,528	93,974
Commercial	40,701	51,711	51,726	51,807	51,820	51,347	51,426	51,952	51,948	51,919
Industrial	38,302	39,284	40,125	40,999	41,885	42,692	43,633	44,716	45,752	46,742
Power Generation	376,618	376,618	376,618	376,618	376,618	376,618	376,618	376,618	376,618	376,618
S. Idaho	**849,291**	**872,198**	**881,434**	**921,963**	**973,454**	**1,062,338**	**1,071,789**	**1,081,191**	**1,090,634**	**1,100,207**
Residential	353,137	361,208	367,676	374,459	381,887	389,263	396,287	403,206	410,242	417,339
Commercial	165,468	167,875	170,342	172,812	175,268	177,708	180,135	182,548	184,955	187,361
Industrial	161,014	173,444	173,744	174,484	175,374	175,444	175,444	175,514	175,514	175,584
Power Generation	169,672	169,672	169,672	200,209	240,925	319,923	319,923	319,923	319,923	319,923
Total Design (Peak) Day Demand	**6,524,491**	**6,619,383**	**6,892,855**	**7,116,553**	**7,172,690**	**7,234,282**	**7,252,888**	**7,279,670**	**7,298,490**	**7,317,716**
Total Supply	**6,949,383**	**6,949,372**	**6,949,372**	**6,949,372**	**6,949,372**	**7,271,171**	**7,271,171**	**7,271,171**	**7,271,171**	**7,271,171**
Supply Surplus/(Shortfall)	**424,892**	**329,989**	**56,517**	**(167,181)**	**(223,318)**	**36,889**	**18,283**	**(8,499)**	**(27,319)**	**(46,545)**

Appendix B: Regional Utility IRP Characteristics

Company	Region/Area	Customer Classes	Forecast Period	Econometrics	Economic Source
Avista	2 divisions (WA/ ID, OR); 5 service territories (WA, ID, Roseburg/ Medford, Klamath Falls, La Grande); 11 demand areas according to available pipeline capacity.	Residential, commercial, industrial (transport, emissions only).	20 years	Separate forecast for customers and use per customer. Key drivers: Population growth, service area residential permitting; U.S., California, and service area employment growth; U.S. industrial production; U.S. GDP growth; non-weather seasonal factors; and real natural gas prices. An end-use model was developed for years 6 through 20 of the forecast, which accounts for changes in weather, appliances, and building codes.	S&P Connect; Bureau of Labor Statistics; Oregon Employment Department; Washington Employment Security Department; Idaho Department of Labor; U.S. Census; Bureau of Economic Analysis; NOAA; Construction Monitor; U.S. Federal Reserve; The Economist; Wall Street Journal; IMF; World Bank; Bloomberg; Blue Chip Consensus; Washington Office of Financial Management.
Cascade	CNGC forecasts at the pipeline zone level for the 2025 IRP. 6 regions; West, Central and East for market share; by county for economic forecasting.	Residential, commercial, industrial, core interruptible. LV customers are included for compliance modeling.	Out to 2050	Customer counts, household growth, employment rates, weather, natural gas price and other regional economic market intelligence.	Woods & Poole; SNL; Federal Reserve; Schneider Electric; Wood Mackenzie and other regional economic market intelligence.
Enbridge Gas UT/WY/ID	Utah, Wyoming and Idaho.	Residential by state; small commercial by state; large commercial, industrial, and electric generation gas demand all together; firm customer and transportation. All rate classes are forecasted by state, but non-GS (all but residential and small commercial) is only presented systemwide in the IRP document.	11 years for demand forecast;25 years for PLEXOS model.	Rate of natural gas service and housing starts are used in forecasting by state. Assumptions on changes to appliance efficiency and penetration of new technologies such as dual-fuel heat pumps within the residential sector are layered onto the forecast as well.	University of Utah's Kem C. Gardner Policy Institute Research; S&P Global; U.S. EIA; U.S. Census Bureau.

FortisBC	Lower Mainland (including City of Vancouver), Northern BC, Southern Interior, and Vancouver Island, Sunshine Coast and Whistler.	Residential, commercial, industrial, transportation, marine and ISO shipments.	20+ years	Residential forecast is based on a third-party housing starts growth rates by dwelling type forecast and a use rate forecast. Commercial forecast is based on recent customer additions trends and a use rate forecast, by class. Residential and commercial historic use rate data is normalized for weather by region. Industrial forecast is based on an end-user survey. Efficiency improvements are informed by the Conservation Potential Review and reflect recent trends.	Conference Board of Canada; user surveys.
Idaho Power	Southern Idaho and Eastern Oregon.	Residential, commercial, industrial, irrigation.	2026-2045	National, state, Metropolitan Statistical Area (MSA), and county economic and demographic projections tailored to Idaho Power are used to make forecasts. Specific demographic projections are also developed for the service area from national and local census data. Other sources of data are noted at right.	Moody's Analytics; Idaho Department of Labor; Woods & Poole; Construction Monitor (building permits); Federal Reserve economic databases.
Intermountain	Six regions (includes an "all other" category); West, Central, and East for Idaho market share rates; by county for economic forecasting.	Residential, commercial, and industrial (potato processors, other food processors, chemical and fertilizer, manufacturers, institutions, and all other).	One base year, and 5 forecast years	Customer counts, population growth, employment rates, weather, natural gas price and other regional economic market intelligence.	Woods & Poole; industrial customer survey.
NW Natural	Nine regions based on topology of the gas distribution system.	Residential, commercial, and industrial.	Out to 2050	Customer growth drivers: population, housing starts, nonfarm employment. Daily demand drivers: weather variables, customer count, and day of the week/holiday.	Oregon Office of Economic Analysis; U.S. Census Bureau; Portland State University Population Research Center; U.S. Bureau of Economic Analysis; Oregon Employment Department; U.S. Bureau of Labor Statistics.

Pacific Power	Six state service territory (Pacific Power: CA, OR, WA; Rocky Mountain Power: ID, UT, WY). 2 Balancing Areas (PACW, PACE). 3 IRP model jurisdictions (OR, WA, UIWC)(UIWC = UT, ID, WY, CA). 55 IRP topology nodes.	Residential, commercial, industrial, irrigation, and public street lighting.	20 years	Forecast by state and customer class. Key drivers: New technologies/end use, demographics, employment, income, weather, DSM, and energy efficiency mandates.	S&P Global; ITRON; AEG.
Portland General Electric	Single contiguous service area.	Industrial customers comprise approximately 35% of demand with residential at approximately 34% and commercial at approximately 31%.	20 years	Forecast for residential customers and use per customer. Non-residential modeled by class. Key drivers: Regional pop-ulation and demographics, building permits, and sector level employment including regional industrial trends and outlook. A trended, gradually warming, normal weather assumption.	Primarily Oregon Office of Economic Analysis economic forecast; S&P Global Market Insights.
Puget Sound Energy	Single contiguous service area.	Firm: residential, commercial, industrial, large volume commercial, large volume industrial. Interruptible: commercial and industrial.	Out to 2050	Regional and national economic growth, demographic changes, weather, climate change, seasonality, DSM, customer growth, and use per customer forecasts.	Moody's Analytics U.S. Macroeconomic Forecast; PSE's regional and economic forecasts; U.S. Bureau of Economic Analysis; U.S. Bureau of Census; Washington State Employment Security Department; Washington Office of Financial Management; NWPCC climate models.

Appendix C: Regional Utility IRP Characteristics

Company	IRP File Date	Jurisdiction	Year of Peak Day Deficiency	Preferred Supply Resources Selected
Avista	April 1, 2025	Idaho; Oregon; Washington	No deficiency in planning horizon	RNG or RTC after 2030
Cascade	May 23, 2025 (WA) May 30, 2025 (OR)	Washington; Oregon	No deficiencies	Energy efficiency; RNG acquisitions
FortisBC	March 2026	British Columbia	2031 – Interior Transmission System Vancouver Island Transmission System and Coastal Transmission System – No capacity constraints identified	Addressing capacity needs could require infrastructure upgrades either within the FEI system or in upstream infrastructure. Potential enhancements may include pipeline looping, additional compression, and Tilbury LNG storage projects, as needed, to ensure reliable delivery of gas to the FEI system
Intermountain	December 2025	Idaho	2030	Incremental Northwest Pipe south-to-north capacity
NW Natural	August 1, 2025	Oregon; Washington	2024-25 gas year	All current resources, plus energy efficiency, Mist recall, and acquisitions
Puget Sound Energy	April 1, 2021	Washington	2031-32	Energy efficiency

Appendix D: Guidehouse Review/ Synthesis of Regional Energy Analyses

GAS-ELECTRIC COORDINATION

NWGA Northwest Gas Association
PNUCC Bringing the Power of good ideas Together.

3rd PARTY REVIEW/SYNTHESIS OF REGIONAL ENERGY STUDIES

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Brian Robertson, Cascade Natural Gas
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Seth Wiggins, Portland General Electric
Ben Zwirek, Williams NW Pipeline

Contractor:

Guidehouse
Outwit Complexity

January 30, 2025

The Pacific Northwest energy landscape is evolving rapidly, with more frequent extreme weather events and increasing energy demand placing new pressures on reliability and resource adequacy. The January 2024 cold weather event revealed the Pacific Northwest's energy system is dangerously close to having insufficient supply and highlighted enhanced coordination between electric and natural gas systems is critical to ensuring a resilient and reliable energy supply.

Industry leaders came together in May 2024 to address the need for enhanced coordination of the gas and electric systems. Although several individual studies examining the changing regional landscape have been conducted in recent years, we identified a need to synthesize these studies to identify a common understanding of how the region is planning to meet demand and assess risks. This bird's-eye view across the analytical landscape could provide insights and recommendations to enhance gas-electric planning and coordination.

To execute on this vital task, we asked Guidehouse to conduct a thorough literature review. Guidehouse synthesized the key findings from relevant studies, including regional forecasts, adequacy assessments, and extreme weather retrospectives. Guidehouse developed gaps and recommendations based on the findings that serve as an essential foundation for improving coordinated strategies for regional planning.

The stakes are enormous – the reliability of energy supply to our customers, the achievement of our clean energy goals, and the continued economic vitality of our region require us to work together on the transition to a clean energy future. By proactively coming together to support this literature review, we are taking a crucial step in building a clearer understanding of what we need to do to secure a more sustainable and resilient energy future for the Pacific Northwest.

With thanks to and on behalf of the work group,

Steve Andersen, Clark Public Utilities and Shawn Hill, FortisBC
Work Group Co-leaders


Guidehouse
NWGA/PNUCC
Literature Review
Summary Findings
Danielle Vitoff, Director
outwit complexity™

THANK YOU

This report would not be possible without the support and input of the PNUCC/NWGA working group members who dedicated their time over 3 months to provide their feedback and expertise on this report

Workgroup Organizations

Cascade Natural Gas
Clark PUD
Enbridge
Euguene Water and Electric Board
Fortis BC
NW Natural
NorthWestern Energy
PNGC Power
Portland General Electric
Williams NW Pipeline

Workgroup Co-Leads

Steve Andersen (Clark PUD) and
Shawn Hill (Fortis BC)

Guidehouse

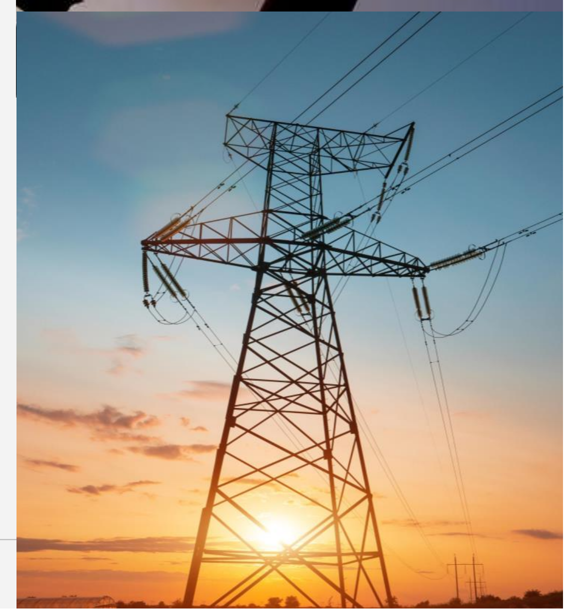
Purpose

Helping inform improvements in gas and electricity sector coordination with the goal of enhancing reliability and resilience at a time of rapid change.

The energy sector is experiencing unprecedented transformation due to rising data center demand, reshoring of manufacturing, advancements in robotics and automation, the proliferation of EVs, and changing climate patterns.

These emerging trends are challenging the traditional utility model, revealing cracks that threaten the high standards of reliability and affordability Americans are accustomed to.

Utilities must rethink how they are planning, collaborating, and coordinating both internally, with peer utilities, and across gas and electric sectors.



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Literature Review Report Scope

- Synthesize the key findings from 19 relevant studies, including regional forecasts, adequacy assessments, and extreme weather retrospectives
- Workgroup asked us to focus on the below key themes from the studies:
    - Theme 1: Demand and Load Growth
    - Theme 2: Resource Adequacy and Reliability
    - Theme 3: System Flexibility and Resilience
    - Theme 4: Gas/Electric System Interdependence
    - Theme 5: Extreme Weather Impacts
    - Theme 6: Regional Planning
- Developed gaps and recommendations based on the findings that serve as an essential foundation for improving coordinated strategies for regional planning

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MAY 4, 2026

Studies reviewed as part of the literature review

#	Title	Author	Year
1	2024 Pacific Northwest Loads and Resources Study	BPA	2024
2	Winter Conditions Report for January 2024	CAISO	2024
3	Net-Zero NW: Energy Pathways Technical Report	Clean Energy Transition Institute	2023
4	Northwest Regional Forecasts of Power Loads and Resources	PNUCC	2024
5	Pacific Northwest Gas Market Outlook	NWGA	2023
6	Pacific Northwest Pathways to 2050	E3	2018
7	Pacific Northwest Power Supply Adequacy Assessment for 2029	NPCC	2024
8	Analysis of the January 2024 Winter Weather Event	Powerex	2024
9	Assessment of January 2024 Cold Weather Event	WPP	2024
10	2024 Summer Reliability Assessment	NERC	2024

#	Title	Author	Year
11	2023 Long-Term Reliability Assessment	NERC	2023
12	2023 Western Assessment of Resource Adequacy	WECC	2023
13	Resource Adequacy in the Pacific Northwest	E3	2019
14	National Gas Reliability: Issues for Congress	Congressional Research Service	2024
15	2023-2024 Winter Reliability Assessment	NERC	2024
16	Year 10 Extreme Cold Weather Event Report	WECC	2023
17	EPRI AI Powering Intelligence	EPRI	2024
18	Kelowna Electrification Case Study	Fortis BC	2023
19	PNW Electric Utilities IRP Comparison Table	Fortis BC	2020

MAY 4, 2026

Key Findings

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Theme 1: Demand and Load Growth

- **Data Center expansion mentioned as the #1 driver of load growth.** Data center expansion (50-200% growth across the Northwest) main cause of load growth forecasts nearly doubling from previous forecasts (17% vs 10.3%).

- **Electrification policies and trends are contributing to the increase in demand – limited analysis considering implications of direct use of natural gas** . The value of the direct use of natural gas during extreme weather events and the impact of attachment policies for new customers is an important topic that was not discussed in the studies reviewed

Theme 2: Resource Adequacy/Reliability

- **The Western Interconnection's resource adequacy is critically challenged by the dual impact of baseload retirements and renewable integration**, with WECC forecasting significant increases in demand-at-risk hours after 2026 while drought conditions are also already reducing hydro generation by 23% in the Northwest.

- As natural gas generation increasingly becomes the essential flexibility resource backstopping renewables, **current siloed planning approaches fail to recognize how fuel security and increasingly constrained pipeline capacity challenge grid stability and adequecy**—creating an urgent need for integrated resource planning that acknowledges gas infrastructure as a critical electric reliability asset.

Theme 3: Resilience and Flexibility

- **Enhancing system resilience requires addressing vulnerabilities related to natural gas fuel supply.** Fuel assurance is vital for grid stability and reliability during extreme weather events. To mitigate fuel-related risks, proactive emergency planning, infrastructure hardening, improved gas-electric communication, and increased storage capacity are essential.

- **Even under decarbonization pathways scenarios natural gas generation flexibility remains the essential backstop** during extreme weather events when variable renewables cannot meet demand. Even with emerging technologies like battery and hydrogen storage.

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Theme 4: Gas/Electric System Interdependence

- The **increasing interdependence of systems necessitates enhanced coordination to mitigate the risk of cascading failures.** The electric grid is becoming more reliant on natural gas-fired generation to meet peak demand and compensate for the intermittency of renewable energy sources. Join solutions (like HH) should be explored especially in infrastructure-constrained areas as they can yield significant cost savings through peak shaving.

- **Siloed planning in gas and electric systems, has a detrimental effect on overall energy reliability.** Planning often occurs in isolation from considerations related to natural gas supply, storage, and transportation.

Theme 5: Extreme Weather Events

- **Natural gas played a vital role in maintaining electricity supply during extreme cold snaps.** The January 2024 cold snap exposed critical vulnerabilities in the Western energy system when natural gas derates coincided with load shedding, demonstrating that reliable electric service during extreme weather increasingly depends on planning that traditional siloed forecasting methods are failing to address.

- **Electrification of heating is also creating unprecedented weather sensitivity in demand forecasting**—as temperature-dependent loads shift from gas to electric systems—requiring fundamentally new integrated modeling approaches that anticipate resource adequacy needs across both systems during extreme events.

Theme 6: Regional Planning

- Current regional planning frameworks are fundamentally **inadequate for managing the rapidly evolving interdependence between gas and electric systems**, requiring new collaborative structures that incorporate extreme weather and fuel security in planning, and understanding load shifting between systems as data centers and electrification accelerate beyond traditional forecasts.

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Planning Implications for Gas-Electric Utilities

Gaps, and Recommendations

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Planning Implications: Gaps Summary

1. **Varying gas and electric sector approaches to forecasting loads from electrification, demand side resources, consumer behavior drive uncertainty**
   - Direct use of natural gas in buildings is a key factor in meeting baseline demand and peak loads but is often overlooked in studies. Current approaches do not fully account for its impact, creating gaps in demand projections

2. **Insufficient understanding of peak demand and how gas/electric entities can jointly manage peak events**
   - Gas and electric utilities lack a coordinated understanding of how their systems interact during peak events, where gas systems may face space-heating-driven single-day peaks while electric systems simultaneously confront multi-day capacity challenges—creating dangerous reliability vulnerabilities that neither sector independently addresses.

3. **Traditional planning metrics are insufficient in capturing new risks**
   - Traditional metrics like Planning Reserve Margins (PRMs) fail to account for the energy limitations of variable renewables, fuel supply risks, and extreme weather impacts, with current resource adequacy models (based on 1-in-10 years) unable to capture compound risks that simultaneously affect resource availability.

4. **Lack of an integrated perspective on how to best serve customers' total energy needs across all sources**
   - Siloed regulatory approaches optimize for either gas or electric ratepayers rather than total cost and quality of energy services delivered, leading to suboptimal resource choices, missed infrastructure integration opportunities, and inability to evaluate cross-system tradeoffs.

5. **Planners have obscured visibility of gas-electric interdependencies**
   - System planners lack visibility into constraints, performance limitations, and interdependencies across sectors, with no standardized frameworks for sharing operational data that would enable joint management of coincident risks and proactive reliability planning.

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Planning Implications: Recommendations Summary

1. **Facilitate better coordination and collaboration through cross-sector platforms**
   - Expand existing working groups like PNUCC/NWGA to establish permanent platforms where gas-electric utilities, pipelines, ISOs/RTOs and stakeholders can align planning assumptions, challenges, and develop joint solutions.

2. **Engage stakeholders on benefits of assessing overall energy value instead of siloed gas vs. electric perspectives**
   - Create customer-centric metrics that evaluate total energy service value rather than siloed gas vs. electric perspectives, with fact-based case studies demonstrating consumer savings, peak demand reduction, and reliability benefits of coordinated infrastructure planning.

3. **Jointly plan and collaborate on understanding load growth and peak mitigation options**
   - Planners and policymakers should consider developing shared understanding of peak mitigation options like hybrid gas-electric heating systems. When effectively aggregated and dispatched, these systems can significantly reduce electric system peaks and manage gas demand better. A more aligned understanding of these options, can unlock substantial value.

4. **Better integrate gas and electric planning processes by reducing barriers and designing new models**
   - Identify changes needed to regulatory models and planning processes to enable more holistic, integrated approach optimizing customer value. This could include joint planning studies, investing in coupled gas-electric models, and enabling co-optimized gas-electric operations.

5. **Adopt more robust reliability indicators that go beyond traditional metrics**
   - Establish metrics to quantify the probability of coincident gas-electric system failures, adopt scenario-based planning for correlated outages, develop new approaches that account for fuel disruption risks, and create standardized methodologies for benchmarking coordination value.

Objective:

Northwest utilities, pipelines, and electricity generators join to communicate regional resource adequacy and reliability concerns and coordinate actions needed to address these risks throughout the transition to a clean energy economy.

Shared messages and data will inform regional forum discussions and integrate into regional forecast messages as part of the comprehensive strategy for communicating a clear, consistent and urgent need for solutions that mitigate risks to the region's energy system.

Appendix E: Common Gas-Electric Coordination Themes

Key Messages:

The increasing interdependence between natural gas and electricity providers demands greater awareness and enhanced coordination to mitigate serious risks to the region's energy system.[E1]

- Industry leaders recognize the need for enhanced coordination, emphasizing the importance of a shared understanding of regional energy planning and risk assessment.
- With natural gas serving as the region's second-largest power source after hydro[E2], its role will persist as electricity demand rises, and new generating resources are developed. The dependence on natural gas for power generation has never been higher[E3], demanding more from the existing constrained pipeline capacity network and highlighting the need for adequate storage.
- To ensure a resilient and sustainable energy future for the Pacific Northwest, stakeholders – including policymakers, utilities and customers—must collaborate on actionable solutions. This includes supporting clean energy projects at a realistic pace to balance affordability while also investing in the natural gas system.

The region is dangerously close to experiencing significant energy supply disruption, which could lead to blackouts during peak demand events.

- Energy emergencies during extreme weather events are increasing in frequency and threatening reliability. The multi-day cold snap in January 2024 is the most recent in a string of examples.
- Meeting peak demand for energy during the multi-day cold snap in January 2024 required execution of emergency operations and procedures, careful coordination between natural gas and electricity providers, customer response to energyconservation requests, and electricity imported from the Desert Southwest and the Rockies.
- The Western Power Pool (WPP) found peak load in many Balancing Authority Areas (BAA) during January 12-14, 2024 was consistently over historical peaks or at or nearpeak load for an extended period. The Pacific Northwest relied on nearly 5,000 MWs on average of electricity imports to maintain system reliability during the cold snap.[E4]
- The region's electric and natural gas delivery system has no excess capacity to serve increasing peak loads. When combined with unplanned infrastructurecurtailments and depleted underground storage inventories, prolonged events test the system. While the Pacific Northwest has endured cold weather events by rapid emergency response coordination, these situations demonstrate how close the region is to exceeding deliverability capacity.[E5]

Demand for energy in the Pacific Northwest is projected to surge.

[E1] *https://www.pnucc.org/wp-content/uploads/Guidehouse-analysis-of-regional-energy-reports-2025.pdf*

[E2] *https://www.nwcouncil.org/energy/energy-topics/power-supply/*

[E3] *U.S. Energy Information Administration, Oregon Natural Gas Consumption by End Use, https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_sor_a.htm*

[E4] *https://www.westernpowerpool.org/resources/assessment-of-january-2024-cold-weather-event*

[E5] *https://www.nwga.org/_files/ugd/054dfe_da78848821a448c1b897a5a32d94cbd8.pdf*

- PNUCC projected demandfor electricity in the Pacific Northwest could grow by over 30% in the next decade. This surge of over 7,800 average megawatts equates to enough electricity to power seven cities the size of Seattle. The increase in demand is attributed to the rapid expansion of data centers, high-tech manufacturing, and the trend toward electrification.
- PNUCC's 2025 Northwest Regional Forecast shows the region's utilities are planning for an additional 30 GW nameplate capacity of new resources in the next 10 yearsto meet this surge in demand.[E6]
- The Western Electricity Coordinating Council's (WECC) Assessment shows current resource plans across the entire Western Interconnection include 172 gigawatts of new generation capacity in the next ten years—more than double the generation capacity added in the last decade. Never has generation been built in the West at the rate called for in many current resource plans.[E7]
- Overall demand for natural gas in the Pacific Northwest is forecasted to grow, as demand for electricity grows. However, existing pipeline capacity utilization is already maxed during peak events. Meeting this new energy demand can't be done without adding new delivery capacity including natural gas pipelines and electric transmission and storage in both systems.
- Resource adequacy remains a critical risk—planned resources may be insufficient to meet future demand.

Regional assessments rely on capacity additions that are at risk of not being deployed.

- Siloed planning in gas and electric systems has a detrimental effect on overall energy reliability.[E8]
- Energy system failures are a public health issue. They also result in higher costs for consumers stemming from high market prices and the acquisition of emergency or unplanned capacity.[E9] These unnecessary cost increases make investment in the energy transition even more expensive for rate payers.
- We need help in removing barriers and addressing constraints at a faster pace. WECC warns if new resources are significantly delayed or cancelled, much of the Western Interconnection may not be resource-adequate over the next decade.
- According to WECC, between 2018 and 2023, approximately 76% of the proposed resource additions came online in the year scheduled. In 2023, only 53% of the new generation resources scheduled to come online that year actually came online; the rest were delayed or cancelled.
- Risks to planned resource additions include supply chain disruptions, uncertainty in the interconnection process, siting delays and increased costs. Each of those barriers introduces significant risks to reliability.
- Finally, in 2027 the Woodfibre LNG export facility in BC will come online and will require a significant amount of gas capacity, which will further strain the region's energy system capacity until any new contemplated capacity becomes available.[E10]

[E6] *https://www.pnucc.org/wp-content/uploads/2025-PNUCC-Northwest-Regional-Forecast-final.pdf*

[E7] *https://feature.wecc.org/wara/*

[E8] *https://www.pnucc.org/wp-content/uploads/Guidehouse-analysis-of-regional-energy-reports-2025.pdf*

[E9] *Joint Utility Comment Letter – Resource Adequacy, October 2024*

[E10] *https://www.nwga.org/_files/ugd/054dfe_da78848821a448c1b897a5a32d94cbd8.pdf*

Appendix F:
Pacific Northwest Regional Energy Symposium: A System Under Increasing Strain

October 2025

Recognizing that solutions to the region's energy adequacy challenges require a broad coalition, the Pacific Northwest Utilities Conference Committee (PNUCC) and the Northwest Gas Association (NWGA) partnered with the Western Power Pool (WPP) and the Public Generating Pool (PGP) to co-host a Regional Energy Symposium in Portland on October 9, 2025. The symposium brought together utility executives, state lawmakers, regulators, power producers and others to raise awareness of urgent reliability risks, assess barriers to progress and build consensus on necessary actions.

Speakers delivered a clear message: the time for urgency and action is now. Energy adequacy cannot remain a topic of discussion; it must be a shared commitment to act. Ensuring reliability in today's complex energy landscape requires more than coordination, it requires communication, trust and a willingness to tackle challenges together.

The symposium also highlighted the importance of regional self-determination. Communities and circumstances differ across the West, and solutions must reflect those differences. Above all, this moment calls for leadership, vision and courage to build the energy future the region needs. Meeting the challenges ahead will require all of us working together.

Key Themes from the Symposium

Interdependence is Real and Growing:

The natural gas and electric systems are increasingly interdependent—neither can meet regional reliability needs without the other. Historically, the gas and electric sectors planned separately; today that is no longer viable.

Joint Situational Awareness and Planning is Necessary:

Presenters called for integrated planning for both sectors, such as joint scenario development, shared resource adequacy modeling and coordinated emergency response plans. Utility and pipeline executives acknowledged that in the past the sectors did not "talk enough," but now the stakes demand it.

Build Stuff Now:

The region faces a "now problem." Load growth, aging infrastructure and permitting delays mean we must act faster. During the January 2024 cold snap, for example, the Northwest relied on nearly 5,000 MW on average of imported electricity to avoid power outages. Speakers stressed that to avoid major disruptions (or rising consumer costs), both gas and electric infrastructure, including pipelines, storage, transmission and distribution, require accelerated permitting and build-out.

Don't Take Options Off the Table:

Keep flexibility in resource choices and timing. A balanced, all-of-the-above portfolio is needed to navigate the transition to a cleaner energy future.

Coordination and Communication Matter:

Utilities, pipelines, regulators and policymakers must strengthen coordination—both for daily operations and long-term planning.

The State of Resource Adequacy in the Pacific Northwest

Arne Olson, Sr. Partner at Energy+Environmental Economics (E3), and Mary Wiencke, PGP Executive Director, presented the key findings from a new study that underscores the region has a growing gap in its ability to meet demand in all hours of the year. The study is led by PGP and Puget Sound Energy and sponsored by a coalition of electric utilities and independent power producers.

Beginning in 2026, the Pacific Northwest faces an elevated risk of power supply shortfalls, which could lead to rolling blackouts during winter cold snaps. Shortfalls are most severe during winter cold events, when solar and wind output is reduced and hydropower generation is lower due to low river flows—as the region experienced in January 2024. This is due to the retirement of firm, on-demand legacy resources, a lag in building enough replacements and an accelerating growth in demand. There is an immediate need to take action to maintain reliability. While the challenges are serious, a portfolio approach is needed. Streamlining permitting and siting of energy infrastructure will be vital, as will having state support for energy infrastructure development.

Actionable Solutions

The final session of the Symposium brought our shared responsibility into focus: strengthening reliability and addressing adequacy while maintaining affordability and transitioning to a cleaner energy future will require unprecedented collaboration across the Pacific Northwest. Each of us has a role to play in turning concern into coordinated action.

The recommended actions below are starting points for executive-led and directed workgroups to refine, prioritize and implement. The goal is to ensure alignment among utilities, state lawmakers, regulators, power producers and others as we move from discussion to action.

Coordinated Planning

The gas and electric systems are increasingly interdependent, especially during winter peaks. Resource planning must fully account for the realities of fuel availability. Utilities and pipeline operators should consider how to:

- Plan together, not in parallel, including shared assumptions about extreme weather and load growth.
- Coordinate operations during tight system conditions so power plants and consumers get the gas they need when reliability is most at risk.
- Assess fuel supply risks as part of power and gas planning, including storage access and delivery constraints.

Better System Visibility & Data Sharing

Operators can't manage what they can't see. Better information enables faster decisions and fewer reliability emergencies. The region could explore how to:

- Improve transparency about grid and pipeline constraints, particularly during cold snaps.
- Enable more timely data exchange between gas and power operators to avoid surprises when demand spikes.
- Develop improved modeling tools that reflect real-world interdependencies and can stress-test the system under extreme conditions.

Energy Infrastructure Investment

Modernizing and expanding the region's energy infrastructure is critical to meeting growing demand and integrating new resources. The region should evaluate opportunities to:

- Invest in transmission expansion and modernization to unlock access to new renewable resources and improve regional power sharing.
- Upgrade gas and electric delivery systems to handle more dynamic and flexible operations.
- Streamline permitting and siting to accelerate development of needed infrastructure while maintaining public participation and environmental protections.

Policy Alignment

Policies should enable the solutions needed to ensure energy adequacy. The region may need to modify policies to:

- Clarify reliability expectations.
- Support firm, flexible capacity, including demand-side solutions, storage and fast-ramping resources.
- Enable coordinated investments across states and resource types.
- Align incentives so reliability is appropriately recognized.
- Provide additional flexibility to meet end-state emission policy objectives.

We hope this summary of the Symposium helps extend the conversation and support continued collaboration across the region as we move from discussion to coordinated action.

About the NWGA

The NWGA is a bi-national trade organization of the Pacific Northwest (PNW) natural gas industry spanning British Columbia, Idaho, Oregon and Washington. **NWGA members serve the people and businesses of the PNW with the energy they need to thrive**. NWGA is the **regional voice** of that PNW gas industry and a **strong advocate** for its members. It is a **trustworthy partner** that builds strong relationships and a **responsible steward** that seeks to leverage and amplify available resources. NWGA is **focused** on prioritizing the utilization and optimization of the PNW's existing safe, dependable gas delivery infrastructure.

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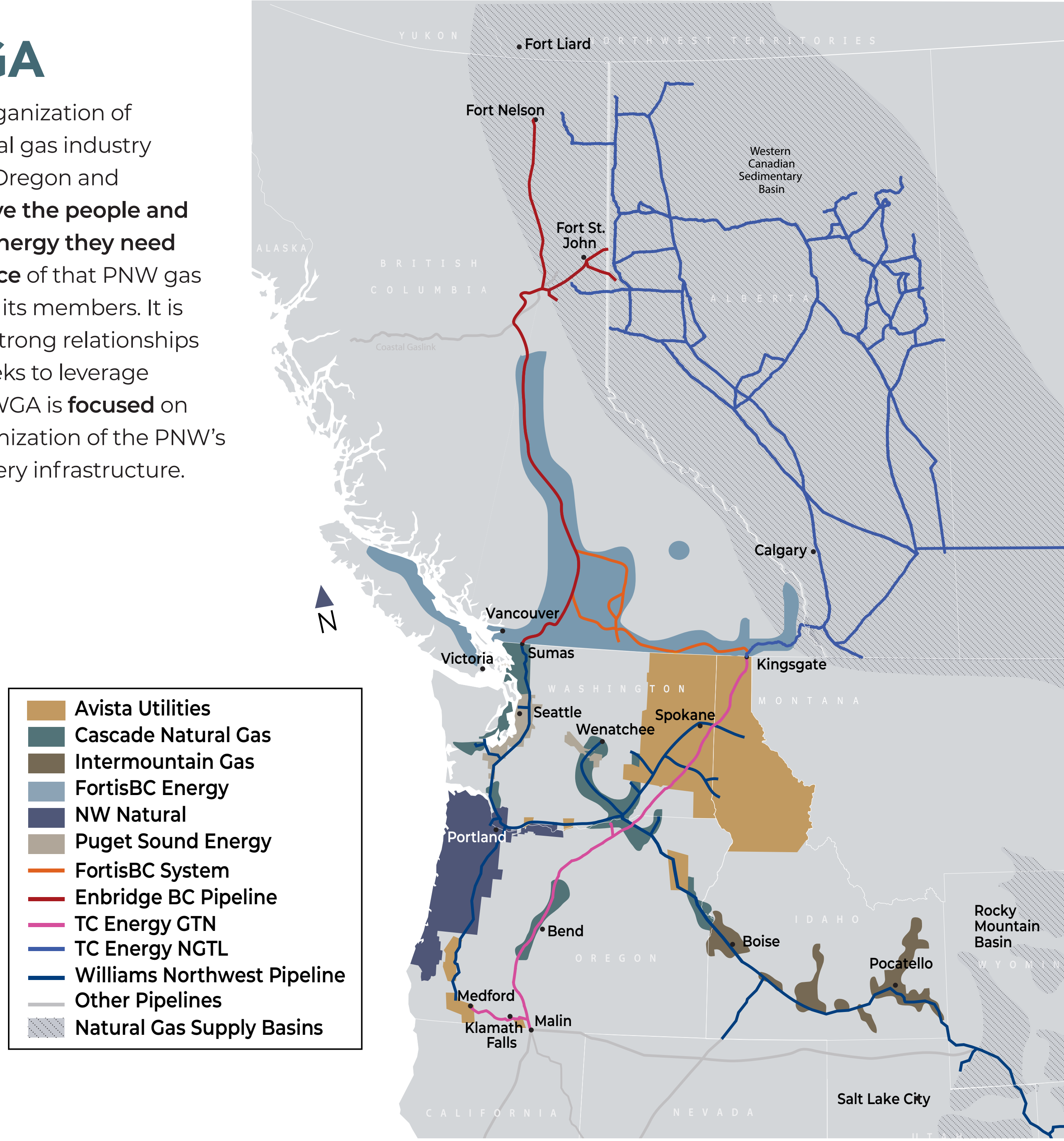

NWGA
Northwest Gas Association

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