



IMPLICATIONS AND ACTIONS: WHERE WE GO FROM HERE

This report illustrates a range of potential carbon reduction scenarios for NW Natural to use as we strive towards our vision of becoming a carbon-neutral utility by 2050. These models have not been optimized for cost or risk, nor a particular preference from a resource planning perspective.

What these scenarios do reflect are those technologies and measures that could be implemented today. Most of these have been incorporated into NW Natural's current operations, resource plans, or market-transformation investment initiatives.

Just as our 2016 Low Carbon Pathway helped articulate a need for renewable natural gas and the potential for clean hydrogen, this analysis highlights near-term actions required to enable progress on the measures identified.

We firmly believe the right answer for a net-zero future is renewable electrons in the wires overhead paired with renewable molecules running through the pipes underground—and joint energy system planning to find the best solutions.

This type of approach would be a leap forward toward realizing Oregon and Washington's climate goals and it's within reach. We just need to think and plan differently.

Advancing Policy and New Innovations

NW Natural has initiated progress on multiple fronts in support of this vision.

We're pursuing solutions like gas heat pumps, efficient furnaces and water heaters that don't require electric ignition, hybrid systems and hydrogen-ready appliances and processing equipment.

Our RNG procurement is ramping up following finalization of legislation and rulemaking in 2020. Through November 2021, we've signed options or agreements for approximately 3% of our total supply portfolio, and sightlines to reaching 10% over the next several years. We're pleased with this early progress. To put it into perspective, wind and solar generation now supply 11% of our nation's electricity—with more than two decades of active development and enabling policies.

NW Natural is also actively supporting the development of clean hydrogen in the Pacific Northwest. We've joined with utilities, research universities and industry partners to develop standards and practices for safely blending hydrogen into our natural gas pipeline network. At our Sherwood Operations and Training Center we're testing how different blends of hydrogen and natural gas work in our equipment and various types of appliances.

In our pursuit of these advancements, we believe in the opportunity found in new ideas and the value in diverse perspectives. As we face decisions about the future of our energy system and our environment, it's critical that customers, communities, and other stakeholders take part in those discussions and decisions. In this report we've shared a vision for how NW Natural intends to contribute to this common future.

Building on 162 years of success, we are looking forward—channeling the advantages of our modern infrastructure, our expertise, and our innovative spirit toward what's next: Destination Zero.

Learn more: www.nwnatural.com/destinationzero.

Forward-Looking Statements

This report and other materials prepared by NW Natural Holdings and NW Natural from time to time, may contain forward-looking statements within the meaning of the U.S. Private Securities Litigation Reform Act of 1995, which are subject to the safe harbors created by such Act. Forward-looking statements can be identified by words such as "anticipates," "intends," "plans," "seeks," "believes," "estimates," "expects" and similar references to future periods. Examples of forward-looking statements include, but are not limited to, statements regarding the following: plans, objectives, estimates, assumptions, timing, goals, strategies, future events, projections, expectations, outlooks, commitments, intentions, acquisitions and timing, completion and integration thereof, infrastructure investments, safety and implementation of safety initiatives, system modernization, improvements and reliability, infrastructure resiliency, risk management programs, commodity costs and sourcing, competitive advantage, marketing, service territory, customer service, customer and business growth, customer satisfaction ratings, weather, customer rates, customer preference, business risk, efficiency of business operations, business development and new business initiatives, financial positions and performance, economic and housing market trends and performance, capital expenditures, technological innovations and investments, strategic goals and visions, environmental initiatives, decarbonization and the role of natural gas and the gas delivery system, including use of renewables, carbon emissions, targets, reductions, and savings, timelines for implementing decarbonization strategies and achieving goals, renewable natural gas projects or investments and timing and completion thereof, renewable hydrogen projects and programs, procurement of renewable natural gas for customers, energy efficiency initiatives, carbon offset projects, investments and funding, energy usage and savings, adoption of demand-side technologies including gas heat pumps, hybrid heating systems and building improvements, industrial energy efficiency measures, carbon capture technology and adoption, the regulatory environment, timing or effects of future regulatory proceedings or future regulatory approvals, effects of legislation and changes in laws and regulations, including but not limited to carbon, renewable natural gas and renewable hydrogen regulations, effects, extent, severity and duration of the COVID-19 pandemic and resulting economic disruption, the

impact of efforts to mitigate risks posed the spread of COVID-19, ability of our workforce, customers or suppliers to operate or conduct business, reopening and remote work plans, governmental actions and timing thereof including actions to reopen the economy, and other statements that are other than statements of historical facts.

The forward-looking statements contained in this report are provided for the general information of our stakeholders and are not intended to induce any sales or purchases of securities or to be used in connection therewith for any investment purposes. Forward-looking statements are based on our current expectations and assumptions regarding our business, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict. Our actual results may differ materially from those contemplated by the forward-looking statements, so we caution you against relying on any of these forward-looking statements. They are neither statements of historical fact nor guarantees or assurances of future performance. Important factors that could cause actual results to differ materially from those in the forward-looking statements are discussed by reference to the factors described in Part I, Item 1A "Risk Factors," and Part II, Item 7 and Item 7A "Management's Discussion and Analysis of Financial Condition and Results of Operations," and "Quantitative and Qualitative Disclosure about Market Risk" in the Company's most recent Annual Report on Form 10-K, and in Part I, Items 2 and 3 "Management's Discussion and Analysis of Financial Condition and Results of Operations" and "Quantitative and Qualitative Disclosures About Market Risk", and Part II, Item 1A, "Risk Factors", in the Company's quarterly reports filed thereafter.

All forward-looking statements made in this report and all subsequent forward-looking statements, whether written or oral and whether made by or on behalf of the Company, are expressly qualified by these cautionary statements. Any forward-looking statement speaks only as of the date on which such statement is made, and we undertake no obligation to publicly update any forward-looking statement, whether as a result of new information, future developments or otherwise, except as may be required by law.

References

RENEWABLE NATURAL GAS AND CLEAN HYDROGEN p. 7, 14-17

- Coalition for Renewable Natural Gas: <https://www.rngcoalition.com/>
- Gas for Climate Report: Extending the European Hydrogen Backbone, April 2021, https://gasforclimate2050.eu/sdm_downloads/extending-the-european-hydrogen-backbone
- Road Map to a U.S. Hydrogen Economy, McKinsey and the Fuel Cell and Hydrogen Energy Association, Oct. 2020, www.ushydrogenstudy.org.
- Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment. An American Gas Foundation report prepared by ICF, 2019, <https://gasfoundation.org/2019/12/18/renewable-sources-of-natural-gas/>.

NORTHWEST POWER GRID AND RESOURCE ADEQUACY p. 8-9

- Northwest Power and Conservation Council, Resource Adequacy Planning: <https://www.nwcouncil.org/energy/energy-advisory-committees/resource-adequacy-advisory-committee>
- EIA Weekly Natural Gas Storage Report - Withdrawals are calculated and aggregated from a weekly regional report. This understates the total volumes withdrawals if data was available for daily withdrawals from individual storage facility.
- To convert natural gas volumes to MWh for comparison, this figure uses a national average heat content of 1036 btu/cf and a direct energy conversion of 0.29307 MWh/MMBtu.

SYSTEM SAFETY AND EMISSIONS p. 8-9

- NW Natural's reporting of fugitive methane emissions from our pipeline network to EPA via Subpart W reporting shows that roughly 0.08% of our total gas deliveries is emitted as fugitive methane from our system. Northwest Natural Holding Company SASB Disclosures, year ending Dec. 31, 2020, <https://www.nwnatural.com/-/media/nwnatural/pdfs/esgreport2020finalv3.pdf?la=en&hash=2D091D294C7F037D2B904F34866DB466>.

UTILITY SCALE BATTERY COSTS AND STORAGE p. 9

- Cole, Wesley, and A. Will Frazier. 2019. Cost Projections for Utility-Scale Battery Storage. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-73222. <https://www.nrel.gov/docs/fy19osti/73222.pdf>.
- EIA 923 Form – Hydroelectric and battery generation are pulled from generator level data identified with prime movers "HY" and "BA", respectively. Net generation is aggregated for hydroelectric generators and gross generation is aggregated for batteries. The figure for hydroelectric generation is the total net generation from hydroelectric facilities and does not distinguish between what can and cannot be stored.

GAS-FIRED HEAT PUMPS AND WATER HEATERS p. 18-19

- Northwest Energy Efficiency Alliance | Emerging Technology reports: <https://neea.org/resources-reports/browse?resourceType=emerging-tech-reports>
- The Gas Heat Pump Technology and Roadmap, Industry White Paper, Brio and Gas Technology Institute, Nov. 2019: https://www.gti.energy/wp-content/uploads/2020/09/Gas-Heat-Pump-Roadmap-Industry-White-Paper_Nov2019.pdf
- Opportunities for Reducing Greenhouse Gas Emissions Through Emerging Natural Gas Direct-Use Technologies. An American Gas Foundation report prepared by Enovation Partners, 2019: <https://gasfoundation.org/2019/12/18/opportunities-for-reducing-greenhouse-gas-emissions-through-emerging-natural-gas-direct-use-technologies/>.
- Glanville, P. et al. (2020) Integrated Gas-fired Heat Pump Water Heaters for Homes: Results of Field Demonstrations and System Modeling, ASHRAE Transactions; Vol. 126 325-332.

- Glanville, P. et al. (2019) Demonstration and Simulation of Gas Heat Pump-Driven Residential Combination Space and Water Heating System Performance, ASHRAE Transactions; Vol. 125 264-272.
- Glanville, P. (2020) Innovative Applications of Thermal Heat Pumps in Multifamily Buildings and Restaurants, Presented at the ACEEE 2020 Hot Water Forum.
- Note: Energy efficiencies are greater than 100% where the output heating energy is greater than the input energy to the appliance. This is accomplished by using the input appliance energy to move heat rather than simply create it.

HYBRID HEATING EQUIPMENT p. 18-19

- This E3 report discusses the emissions-reduction potential for dual-fuel systems and the lack of alignment with climate reduction goals under current market conditions, pp. 81-83: https://www.ethree.com/wp-content/uploads/2020/11/E3-EFI_Report-New-England-Reliability-Under-Deep-Decarbonization_Full-Report_November_2020.pdf

ENERGY EFFICIENCY, BUILDING CODES AND STANDARDS p. 20-21

- Northwest Energy Efficiency Alliance | Codes and Standards: <https://neea.org/resources-reports/browse?resourceType=emerging-tech-reports>
- Northwest Energy Efficiency Alliance | Industrial Facilities Site Assessment: <https://neea.org/data/industrial-facilities-site-assessment>
- Energy Trust of Oregon: 2020 Annual Report and Savings Data: <https://energytrust.org/2020-annual-report/>

CARBON OFFSETS AND SMART ENERGY p. 22

- Today nearly 9% of our customers—over 67,000—are enrolled in the Smart energy program. In 2020, they funded approximately 174,000 metric tons in emission reductions, equivalent to removing about 38,000 cars from the road. Since its inception, the Smart Energy program has funded over 1.5 million metric tons of CO₂e emissions reductions. <https://www.nwnatural.com/about-us/carbon-offset-program/smart-energy-projects>
- The Climate Trust employs the following criteria to ensure that Smart Energy dollars are going to credible projects that have a positive impact on the climate: <https://climatetrust.org/>.

CARBON CAPTURE UTILIZATION AND STORAGE (CCUS) p. 23

- CARBiN-X is a carbon capture, sequestration and reuse technology manufactured by Canadian-based CleanO2: <https://cleano2.ca/pages/carbinx>.
- Additional data provided via interviews with representatives at three utilities running pilot projects: CenterPoint Energy (Minneapolis), ATCO (Alberta) and Fortis (Vancouver, BC)
- Additional reports produced by University of British Columbia and Gas Technology Institute.

