

**February 14, 2025**

**RE: Opposition to SB 685**

**Chair Sollman, Vice Chair Brock-Smith Honorable Members of the Senate Committee on Energy and Environment,**

NW Natural appreciates the opportunity to submit our written testimony regarding Senate Bill 685 and the recently provided -1 Amendments. We appreciated the opportunity to provide verbal testimony on February 10<sup>th</sup> and will include both our points made as well as information requested by committee members during that hearing.

NW Natural sees the role of clean hydrogen technology as a key element in the company's and the region's carbon emission reduction achievement. Clean hydrogen will play a critical role in helping the company meet its goal of decarbonizing the energy system by 2050.

Policies that add unnecessary complication to reducing emissions and developing clean energy resources do not serve Oregonians. Instead, they cost our customers additional time and money. Oregon should not add additional and unnecessary requirements that don't improve safety at a time of extreme pressure on utility rates.

This bill was initially created on the assumption that blending hydrogen is not safe and that the utility is not currently regulated to do so. This assumption is not accurate and is at odds with more than 50 years of global experience<sup>i</sup> that prove clearly that blending hydrogen does not increase safety risks in a meaningful way. Singling out hydrogen with punitive and preventative measures does not have a scientific or policy justification.

We have been working with hydrogen directly since 2020, where we started with simple experiments using 5% premixed hydrogen gas, to now providing most of our Sherwood Service Center with 20% hydrogen since 2023. We have verified what many other gas utilities throughout the world have found: blends of 20% or less have no significant impact on the distribution infrastructure (i.e., no retrofits to NW Natural's system are needed), no

significant impact to operations or downstream appliances, and most importantly, no significant impact to safety<sup>1</sup>.

Hydrogen blends behave very similarly to natural gas, as their characteristics skew heavily towards those of natural gas itself. For example, the flammability range of natural gas in air is about 5-15%, while a 20% blend of hydrogen is about 5-18%<sup>2</sup>. It is well known that if systems are natural gas tight, they are hydrogen blend tight; hydrogen does not leak preferentially over natural gas in distribution systems<sup>3</sup>.

Research has also shown that using hydrogen blends does not significantly increase NO<sub>x</sub> emissions from appliances. In fact, data show decreased emissions due to the cooling effect from partial pre-mixed burners, which are ubiquitous in residential and commercial equipment<sup>4,5</sup>.

Because of this compatibility and the fact that hydrogen does not have carbon emissions when combusted, it is an excellent tool to help decarbonize the natural gas system. A 20% blend could provide about a 7% reduction in greenhouse gases, which is significant. It equates to approximately 400,000 MT of CO<sub>2</sub> per year for the energy being delivered by

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<sup>1</sup> Oxford Institute for Energy Studies, *Oxford Energy Forum: The Role of Hydrogen in the Energy Transition, Issue 127*, May 2021. Available at: <https://www.oxfordenergy.org/publications/oxford-energy-forum-the-role-of-hydrogen-in-the-energy-transition-issue-127/> [Accessed 13 Feb. 2025].

<sup>2</sup> Van den Schoor, Filip & Hermanns, Roy & van Oijen, Jeroen & Verplaetsen, Filip & Goey, Philip. (2008). Comparison and evaluation of methods for the determination of flammability limits, applied to methane/hydrogen/air mixtures. *Journal of hazardous materials*. 150. 573-81. 10.1016/j.jhazmat.2007.05.006.

<sup>3</sup> MacKinnon, M., et al., *Hydrogen leaks at the same rate as natural gas in typical low-pressure gas infrastructure*, 2020. Available at:

[https://www.researchgate.net/publication/339420288\\_Hydrogen\\_leaks\\_at\\_the\\_same\\_rate\\_as\\_natural\\_gas\\_in\\_typical\\_low-pressure\\_gas\\_infrastructure](https://www.researchgate.net/publication/339420288_Hydrogen_leaks_at_the_same_rate_as_natural_gas_in_typical_low-pressure_gas_infrastructure) [Accessed 13 Feb. 2025].

<sup>4</sup> Glanville, P.; Fridlyand, A.; Sutherland, B.; Liszka, M.; Zhao, Y.; Bingham, L.; Jorgensen, K. Impact of Hydrogen/Natural Gas Blends on Partially Premixed Combustion Equipment: NO<sub>x</sub> Emission and Operational Performance. *Energies* **2022**, *15*, 1706. <https://doi.org/10.3390/en15051706>

<sup>5</sup> CSA Group. *Appliance and Equipment Performance with Hydrogen-Enriched Natural Gases*. CSA Group Research, 2020. Available at: <https://www.csagroup.org/wp-content/uploads/CSA-Group-Research-Appliance-and-Equipment-Performance-with-Hydrogen-Enriched-Natural-Gases.pdf> [Accessed 13 Feb. 2025].

NW Natural, which is about 85,000<sup>6</sup> cars taken off the road every year. Compare this to solar electricity in Oregon, which at just 4%<sup>7</sup> we view as significant.

Blending also enables scale-up of hydrogen production to help other markets, such as transportation, decarbonize at lower costs, and provides a backstop for distributed hydrogen projects, just like the electric grid does today for wind and solar.

There is also concern that requiring notice for blending safe, low levels of hydrogen contradicts public health best practices. As an example, the levels of minerals and other substances can fluctuate wildly every day. Not to mention that different sources of water can contain different mineral and chemical makeups depending on the origin of the water. However, water is constantly tested, and if certain parts exceed established safety limits and propose a health risk, water companies and public health agencies send out boiling notices. However, if boiling notices were required every time the mineral and chemical makeups fluctuated it would lead to customers constantly boiling their water for no material safety benefit. As a result, boiling notices only go out when mineral and chemical levels pose an actual safety risk.

Additionally, if the premise underlying both the base bill and the –1 amendments is that using hydrogen is dangerous, why do the –1 amendments only apply to blending hydrogen in natural gas systems? If hydrogen presented an increased safety risk, why wouldn't all users of hydrogen be required to provide notice? For instance, shouldn't cars and buses running on hydrogen be required to provide notice to all passengers and other drivers on the road?

Gas utilities are already regulated by Federal and State regulations that inherently include hydrogen. The Pipeline and Hazardous Materials Safety Administration (PHMSA) Part 192 regulation has been successfully applied to distribution systems that include hydrogen for decades. Oregon tariffs limit the amount of hydrogen to approximately 10% through minimum energy requirements. And Public Utilities Commission as an economic and safety

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<sup>6</sup> [https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle#:~:text=2%20per%20mile.-,What%20is%20the%20average%20annual%20carbon%20dioxide%20\(CO2\)%20emissions,around%2011%2C500%20miles%20per%20year.](https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle#:~:text=2%20per%20mile.-,What%20is%20the%20average%20annual%20carbon%20dioxide%20(CO2)%20emissions,around%2011%2C500%20miles%20per%20year.)

<sup>7</sup> <https://www.eia.gov/state/analysis.php?sid=OR>

regulator for utilities, which covers all projects including hydrogen. In short, we do not need additional regulation for something that is already working.

It is also worth noting that Oregon's budding renewable hydrogen industry is already facing serious headwinds not felt by projects developed in some other states. In December of 2024 the Biden Administration issued their final guidance on the tax credit for renewable hydrogen – 45V. As written, the tax credit expires after 36 months. However, there is now an exception for projects developed in those states with cap-and-trade programs. This means projects developed in California and Washington are eligible for exception, but projects developed in Oregon are not because Oregon does not have a cap-and-trade system. As a result of the guidance developers are already incentivized to overlook Oregon as a place to develop renewable hydrogen projects, singling out blending renewable hydrogen is yet another signal to the market that developing renewable hydrogen in Oregon is less preferable than developing projects in our neighboring states.

We wish to communicate our appreciation for the efforts undertaken by the bill sponsor to coordinate with developers and stakeholders to narrow requirements in the –1 amendments. However, the slimmed down version that is not reflective of utility operations, the composition of the pipelines in our region, dynamics of clean hydrogen technologies and end user needs still threatens to have negative consequences, not least of which is additional workload for the OPUC at a time when they are asking for a fee increase to allow them to staff up to meet their ever-growing workload.

NW Natural communicates with customers regularly on material changes to their energy supplies and uses its best judgment when non-material changes are made. For example, in our proposed 5% hydrogen blending project in Eugene we held two community meetings and performed outreach to local community groups and of course elected officials well before ground was broken, even though data showed a 5% blend would have no significant impact.

Our team has identified a number of specific concerns with the notice guidelines that remain following the -1 amendment.

The constituents in natural gas change hourly and seasonally. We do not generally inform customers about these changes for a number of reasons: there is no significant impact on downstream equipment and it could cause messaging fatigue, where customers receive so many notices they ignore the most important ones.

- The reported hydrogen amounts in 3 (b) should be estimated hydrogen amounts, as hydrogen amounts can fluctuate with gas flow
- 3 (d) is not required as gas utilities obtain applicable permits and regulatory approvals for all projects, there are no exceptions for hydrogen
- For section (4) we are not entirely sure what the intent is, more clarity is needed
- And for section (5), hydrogen blends change with gas flow – reporting these to the commission would be burdensome and are not required as they do not materially change anything for the distribution system nor for downstream customers. It would also increase costs to customers.
- There are no provisions for multiples of the same hydrogen projects. There could be hundreds of hydrogen project installations in very short periods of time that would be almost identical.
- There are no provisions for sole recipients of hydrogen blending, which should be exempted from this regulation

In response to NW Natural and other bill opponent testimony regarding costs of notice committee members requested that the company elaborate on what notice could cost the company and customers.

Reading the plain language of the bill it is not possible to discern what notice would meet the regulatory requirement. Costs could range from moderate to significant depending on interpretation of the rules to determine frequency and medium used. To fully deliver cost estimates the utility would need to further confer with the OPUC regarding notice as well as with the bill sponsor to fully encapsulate intention. However, to provide context for reference a message sent to customers, with prior notice and planning, costs approximately \$400,000.00.

Moreover, we remain concerned about customer message fatigue. We must provide safe and reliable energy to our customers. Our concern is that too many communications with customers regarding will lead to customers tuning out or not paying attention to the most critical communications we provide them with – namely around safety.

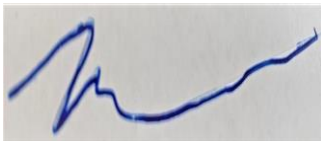
Finally, the company has also included information about global hydrogen blending projects that we are aware of at the end of this testimony document. All this information is compiled

using publicly available information. Many of these blending projects and sites have been in place for decades and use a variety of hydrogen resources. Industry research and experience has indicated that hydrogen blend projects do not have any increased safety concerns.

Please let us know if we can provide additional information or answer questions.

Thank you for your time.

Respectfully Submitted,



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Hydrogen Blending Sites Around the World:

Gas Distributor	Location	Hydrogen Blend (by volume)	Service Year	Customers
Redexis	Mallorca Spain	2%	2024	117,000
ATCO Australia	Cockburn Australia	10%	2024	3,000
Enbridge	Markham Ontario	2%	2021	3,600
New Jersey Natural Gas	Howell New Jersey	1-3%	2021	>100
CenterPoint	Minneapolis Minnesota	5% (before it hits the city, then it is diluted)	2022	>1000
ATCO	Fort Saskatchewan Alberta	5%	2022	~2100
Dominion Energy Utah	Delta Utah	5%	2023	1,800
Hawaii Gas	Oahu Hawaii	12-15%	1976	70,000
City Energy	Singapore	40%	Prior to 1976	870,000
Town Gas	Hong Kong	46-51%	Prior to 1986	1,900,000