Chair Decker and Commissioners Tawney and Thompson,

Please accept these written comments on OPUC Staff Recommendations 1 and 28.   They follow my oral testimony but include the table and charts I was referencing. I hope this helps clarify my somewhat abstract testimony.

Best regards,
Dr. Pat DeLaquil, MCAT
Cllimate Advocates

June 1, 2023: Testimony to the Oregon Public Utilities Commission on the NWN Integrated Resource Plan

Chair Decker and Commissioners Tawney and Thompson,

My name is Dr. Pat DeLaquil. I am an energy systems modeler and climate policy analyst.   I have analyzed and developed deep decarbonization pathways in over a dozen countries. I am part of the Climate Advocates group, and organize with the Metro Climate Action Team. I will focus my comments on OPUC Staff Recommendations 1 and 28.

Climate Advocates strongly support Recommendation 1 to direct the Company to include four years of planning detail in its next Action Plan.

NWN responded that it is not supportive of this recommendation if it is applied to resources that are expected to be re-evaluated in the next IRP, specifically volumes of RNG for SB 98 or Energy Trust of Oregon energy efficiency targets.

As we understand this recommendation, it is intended primarily to allow a better comparison of infrastructure expansion versus efficiency and demand response programs that often take more than 2 years to develop and implement. The Forest Grove Feeder uprate is a good example of the need for a longer action plan time horizon that would allow all available supply side and demand-side options to be fully considered. The longer action plan time horizon as also consistent with the need to better understand how the near-term action plan fits into the longer term decarbonization plan.

We believe the question whether the action plan is measured from the IRP filing date or the expected acknowledgement is irrelevant to the requirement that the planning period for the action plan be long enough to allow for an analysis of non-pipe alternatives.

With regard to RNG and ETO energy efficiency options, NWN recognizes that acknowledgment is not pre-approval.   Perhaps for such activities, a 4-year action plan could be structured in two blocks, with the latter block "acknowledged subject to future IRP updates".

Finally, with regard to the LNG coldbox replacement, we support the comments submitted by the Linnton Neighborhood Association to defer acknowledgement of this action until seismic concerns related to this facility, which is located in the CEI Hub, can be addressed.

I want to state that I believe NWN has done an advanced modelling analysis and is charting new territory, where no one knows the best approach.   However, we have questioned many of their assumptions, and after digging into their analysis,
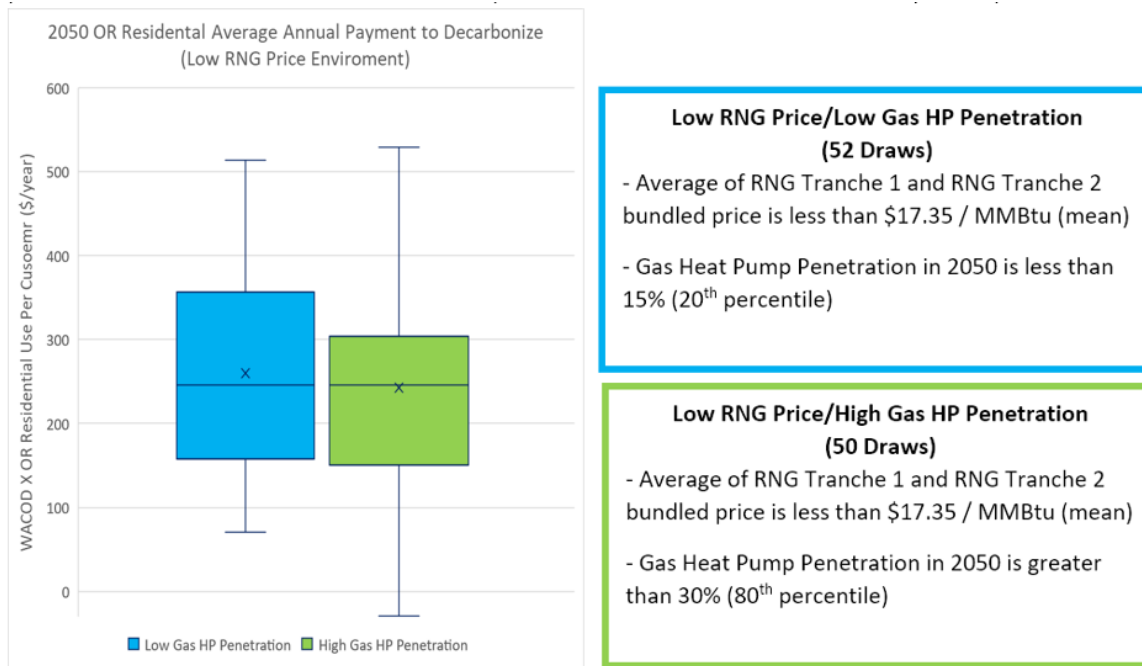
Climate Advocates strongly support Recommendation 28, which recommends that the Company be required to do a Monte Carlo analysis of the top scenarios rather than across scenarios.

NWN's response to this recommendation conflates policy choices and more truly stochastic variables. In their response, they list every component that can be treated as a stochastic variable (Table 7.4). Some of the parameters, such as weather, are highly stochastic, while others, such as future technology and supply costs, and technology adoption rates, have both stochastic and policy driven aspects. When stochastic analysis is used across all scenarios, the policy insights are lost and one is left with statistical data that provides little insight into what policy approaches are least-cost and least-risk.

Stochastic Variables		
Demand Drivers	**Supply Costs and Prices**	**Capacity Resource Costs**
- Weather Daily Temperatures	- Price of Conventional Natural Gas	- Mist Recall
By Load Center: *Albany,*	By hub: *AECO, Opal, Sumas*	- Newport Takeaway 1
Astoria, Coos Bay, The Dalles,	*West Coast Station 2*	- Newport Takeaway 2
Eugene, Lincoln City, Portland,	- Price of RNG Tranche 1	- Newport Takeaway 3
Salem, Vancouver	- Price of RNG Tranche 2	- Upstream Pipeline Expansion
- Customer Growth Rates	- Price Path of Hydrogen	- Mist Expansion
- Growth Moratorium Start Dates	- Cost Adder and Path for Methanation	- Portland LNG Alternative
- Customer Losses	- Allowance Prices	Portland LNG - Cold Box
- Gas Heat Pump Penetration	- Offset Prices	Middle Corridor Mist Takeaway
- Hybrid Heating Penetration	**Supply Availability**	Williams NWP Enhancement
- Building Shell Improvements	- Max Allowable Hydrogen Blend	
- Industrial Energy Efficiency	- Max Annual Quantity of RNG Tranche 1	
	- Max Annual Quantity of RNG Tranche 2	

In fact, the chart provided in NWN's response to this recommendation is a good example of providing model results but no policy insights. The chart was built using their current IRP results, where they charted NPVRR results for scenarios with a low RNG price and either a low or a high adoption rate for gas heat pumps.

Low RNG Price/Low Gas HP Penetration (52 Draws)
- Average of RNG Tranche 1 and RNG Tranche 2 bundled price is less than $17.35 / MMBtu (mean)
- Gas Heat Pump Penetration in 2050 is less than 15% (20th percentile)

Low RNG Price/High Gas HP Penetration (50 Draws)
- Average of RNG Tranche 1 and RNG Tranche 2 bundled price is less than $17.35 / MMBtu (mean)
- Gas Heat Pump Penetration in 2050 is greater than 30% (80th percentile)

Of the 500 simulations, 52 have the Low RNG Price and a Low Gas HP Penetration, while 50 different simulations have the Low RNG Price and a High Gas HP Penetration. The impact on the NPVRR shows a very slight reduction, but with wider extremes. However, what does this model result mean? What policy insight is revealed? One could examine the specific scenarios within each of the two sets of model cases, but what we found upon doing this is that each set is comprised of a mix of scenarios without any policy consistency. For example, within either set there are likely to be cases with high customer growth and low customer growth, or significant difference in other parameters. So without consistency, no real insights can be gleaned.

The goal of this recommendation is to have the stochastic analysis within a consistent policy framework, so that comparisons can be made of the stochastic impacts between different policy options. We believe the next IRP should identify key policy variables related to customer growth, including current electric

heat pump incentives, possible moratoriums on new gas infrastructure, new building performance standards, etc. Within each policy scenario, only those variables not impacted by the policy would be treated stochastic.

Thank you for the opportunity to testify.

Dr. Pat DeLaquil