Natural Gas Factfinding: UM 2178
Comments on Workshop 3 – Preliminary Compliance Modeling Results

Dear PUC Staff,

The Metro Climate Action Team (MCAT) is a community of experienced volunteers working to steward significant greenhouse gas reductions in Oregon, and several of our members are following this Docket. Our comments are organized according to the four key questions you posed at the end of the last workshop.

Initial thoughts on the modeling results

The preliminary modelling analysis from each natural gas utility uses the same resource selection approach, where an assumed future gas demand is filled by "gas" options with no (or with minimal) regard to fuel switching. While this is understandable given the study guidelines, and the traditional PUC rate-making process, an analysis that ignores less expensive fuel switching options is of no value except to illustrate how expensive this compliance strategy would be. The PUC has authority over both gas and electric utilities, and we request the PUC, as a follow-on assessment, embark on an integrated analysis of our gas and electric system that will identify least-cost pathways to deep decarbonization while ensuring system reliability during extreme weather events.

Multiple studies by multiple organizations have shown that much less costly emission reduction pathways exist compared to the ones identified by the gas utilities. The analysis performed to support development of the Climate Protection Plan modeled Oregon's integrated energy system allowing competition between gas and electric options. Those results show natural gas consumption declining in all policy scenarios by 59 to 63% compared to more than 9% growth in the reference scenario. Furthermore, the policy scenarios show a much more limited contribution from renewable natural gas (RNG) compared to the analyses presented in the resource selection modeling results presented by the gas utilities.

The recent Oregon Clean Energy Pathways Analysis[1] found that "Oregon can meet its 2035 emission reduction targets by removing coal from electricity and replacing it with new clean resources while reducing energy consumption through electrification; the state's 80% emissions reduction below 1990 emissions by 2050 target can be reached with deep electrification of transportation and buildings, and 100% clean electricity."

Most recently, the International Energy Agency[2] released its most recent report on the prospects for reducing global greenhouse gas emissions, which concluded that in order to reach global net-zero emissions by mid-century, we must immediately stop investing in new oil, gas and coal supply projects or power plants, new natural gas hookups in buildings should be banned by 2025, and new sales of gas-powered vehicles phase out by 2035.

In addition to using a siloed modeling approach, these compliance model results all rely on the implementation of new technologies like gas-fired heat pumps, green hydrogen and synthetic fuels.

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[1] Oregon Clean Energy Pathways Analysis (cleanenergytransition.org)

[2] Net Zero by 2050 – Analysis - IEA

However, there are many flaws in the assumptions behind these technologies being viable compliance mechanisms.

1. Gas-fired absorption heat pumps have been around for a long time, but they have higher installed costs and are more expensive to run compared to electric heat pumps, so there is little basis for assuming rapid growth in this technology. The cooling industry has already decided in favor of electric heat pumps based on cost and efficiency. For example, in most parts of the country, an electric heat pump system that provides both heating and cooling, has a lower installed cost for new construction when compared to a natural gas furnace and electric air conditioner[3].
2. The assumptions regarding the cost and availability of renewable natural gas (RNG), including biomethane and new energy forms like green hydrogen and synthetic methane are optimistic at best. These fuels have higher value competing markets, primarily for transportation and industry, and it does not appear that these competing demands have been factored into these analyses.
3. The models also identify a significant amount of new energy efficiency measures, but again without specification of the measures and without regard to possibly cheaper electrification alternatives.

The trend to convert our buildings and industry to electricity, where feasible, is being driven by both economic as well as climate concerns, and will have a major impact on the use of any form of gaseous energy carrier. Although there are possible alternatives to fossil natural gas that have the potential for technological improvements and cost reductions, given the facts that solar and wind are now the lowest cost sources of any new electricity generation, and that making hydrogen and synthetic methane requires significant amounts of electricity, it is very unlikely that these fuels will be cheaper than electric heat pumps for heating buildings. These facts lead to the conclusions that the markets for these synthetic fuels will be premium ones where electricity doesn't compete, and that we, as a society, must consider how to transition our gas pipeline infrastructure as the demand declines over time.

Unfortunately, it appears that our public utilities are engaged in an attempt to sustain an outmoded business model rather than embrace the need for a transition. Indeed, there are important industrial consumers of natural gas with applications that are not easily electrified. These industries will become the core consumers of the final remnants of our natural gas infrastructure, and eventually they will need to transition to a clean alternative, such as green hydrogen. Furthermore, the seasonal storage capacity that our natural gas system currently provides will also need to be transitioned to a clean alternative that has similar long-term storage potential. Again, green hydrogen fits that storage requirement.

How do these results inform your thoughts about the upcoming webinars on regulatory tools?

From a regulatory perspective, the compliance model results using IRP projections for customer and load growth do not provide the PUC with any information requiring new regulatory approaches. There

[3] How to Avoid a Climate Disaster, Bill Gates, Knopf, 2021, p154.

are many technology and market challenges that the utilities will face with such a compliance pathway, but these are issues of cost and supply that are manageable under existing PUC regulations.

The risks that the PUC needs to explore pertain to a situation where few new customers sign-up for gas, and existing customers leave the gas grid, either quickly or gradually over time, and where the gas utilities' need to adjust their business models to:

1. Plan for decommissioning parts of their gas distribution network.
2. Continue serving their remaining core customers, who will eventually need to transition to a clean alternative, such as green hydrogen or synthetic fuels.
3. Develop long-term plans to identify the best ways to transition the seasonal storage capacity that our natural gas system currently provides to a clean alternative that has similar long-term storage potential, such as green hydrogen.

Electrification -- Suggestions for inputs and methodology

One of our members, Dr. Pat DeLaquil, is an energy system modeling and policy analysis expert and has considered several possible ways to mimic customer competition from electrification and decided that none were better than doing a set of sensitivity analyses around customer fuel switching. However, given the central importance of electrification to the question of decarbonizing our energy system, we repeat our recommendation that the PUC, as a follow-on assessment, embark on an integrated analysis of our gas and electric system that will identify least-cost pathways to deep decarbonization while ensuring system reliability during extreme weather events.

Alternative Scenarios for Regulatory Tools Discussion

The current Customer Growth sensitivity is a mild step in this direction, but it only results in a 13% drop in total customers, and doesn't distinguish between residential, commercial and industrial customers. We suggest the following scenarios examining a slow and fast rate of electrification.

1. **Customer Growth Slow Electrification Sensitivity**
   - The fraction of new buildings (residential and commercial) using gas goes from its present share to zero in 2030 and stays zero thereafter.
   - The fraction of existing buildings converting to electricity goes from its present share to 90% in 2050
   - Light industry converts to 90% electricity by 2050
   - Heavy industrial customers convert to 90% hydrogen or synthetic fuels by 2050
   - Gas utilities invest in hydrogen storage for hydrogen-fired peaking plants

2. **Customer Growth Fast Electrification Sensitivity**
   - The fraction of new buildings (residential and commercial) using gas goes from its present share to zero in 2025 and stays zero thereafter.
   - The fraction of existing buildings converting to electricity goes from its present share to 90% in 2040
   - Light industry converts to 90% electricity by 2040
   - Heavy industrial customers convert to 90% hydrogen or synthetic fuels by 2040
   - Gas and electric utilities invest in hydrogen storage and hydrogen-fired peaking plants

3. **Incentives for electric heat pump-based air conditioning**

   Many existing homes and buildings in Oregon were built without air conditioning because of the relatively mild summer climate, but the climate change has already changed the summer climate enough that air conditioning is becoming a necessity. This sensitivity would incentivize installation of heat pump-based space cooling, especially for low-income groups. In addition to the needed air conditioning, the heat pump would provide up to 80% of the space heat demand significantly decreasing natural gas use. Such a program would also generate bill savings.

Conclusion

The Climate Protection Plan is only one factor that will drive down natural gas use. Economic realities are already incentivizing people to switch to electric heat pump options, and as this trend accelerates, the markets for gas fuels will ultimately shrink the traditional residential and commercial markets for natural gas, and this fact-finding is a critical first step in determining how we, as a society, will manage this coming transition.

Sincerely,

Metro Climate Action Team Steering Committee:

Brett Baylor, Rick Brown, Pat DeLaquil, Dan Frye, Debbie Garman, Mark McLeod, KB Mercer, Michael Mitton, Rich Peppers, Rand Schenck, and Jane Stackhouse