

Tuesday, January 17, 2023

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Washington Utilities & Transportation commission
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COMMISSION

Re: Docket U-210553 on Gas Decarbonization Pathways

Dear Executive Director and Secretary Amanda Maxwell,

Climate Solutions thanks you for the opportunity to submit comments on Docket U-210553, “Relating to Decarbonization Pathways”. Climate Solutions is a clean energy nonprofit organization working to accelerate solutions to the climate crisis. The Northwest has emerged as a hub of climate action, and Climate Solutions is at the center of the movement as a catalyst and advocate.

To achieve Washington’s statutory requirements of reducing greenhouse gas (GHG) emissions by 95% of 1990 levels by the year 2050, the Washington Utilities and Transportation Commission (UTC) must direct how utilities can equitably decarbonize the gas sector, focusing on how to best protect customers and overburdened communities. The current approaches outlined by SSG are insufficient, and we have three broad recommendations that we believe will lead to better outcomes for utility customers.

Recommendation 1: SSG should make the following changes in the hybrid pathway scenario to best maximize resources, protect customers, and comply with our statutory goals in a cost-effective manner.

While full electrification of all sectors would reduce carbon emissions while also significantly reducing air pollution, a pathway that only includes electrification options for industrial processes may be unrealistic. Many high-heat industrial processes do not currently have technically feasible or cost-effective ways to fully electrify. These are cases in which our limited quantities of alternative fuels like renewable natural gas (RNG) and electrolytic hydrogen could be decarbonization tools. A hybrid pathway that uses alternative fuels in hard-to-electrify sectors would allow those fuels to achieve their highest and best use, while using electric heat pumps, a proven and cost-effective technology, for use in homes and buildings.

We make the following recommendations on the demand-side actions in the UTC’s proposed hybrid pathway:

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1. Requirements for new sales of commercial heat pump water heating should match other heat pump requirements.

There is no justifiable reason why only 50% of new sales of commercial hot water appliances for existing buildings should be electric heat pumps by 2040. The “Electrification” scenario for decarbonization in Washington’s 2021 State Energy Strategy (SES) requires that 50% of water heating sales be “electric high-efficiency” (in effect, heat pump water heating) by 2030, not 2040¹. Additionally, the trajectories for increasing sales of high-efficiency electric appliances in the SES mirror each other - in fact, adoption of commercial heat pump hot water heating moves faster than commercial space heating. Therefore, if SSG plans to require 95% of new sales for commercial space heating to be heat pumps by 2040, which we support, then 95% of new sales of commercial hot water appliances should also be heat pump hot water by 2040.

2. New sales of commercial use zero-emission vehicles (ZEVs) should align with the Washington 2021 State Energy Strategy and California’s Clean Vehicles Rules, which Washington has adopted by reference per statute.

Washington follows California’s Clean Vehicles regulations, so the SSG’s goals need to reflect their targets, including that:

- a) 100% of medium- and heavy duty (MHD) vehicle sales should be zero-emission by 2040 per the forthcoming Advanced Clean Fleets regulation. The UTC’s goals for 2035 can be treated as prudent interim targets as long as they are in line with the 2040 goal.
- b) For Classes 2b-3 trucks, we support UTC’s goal to achieve 100% zero-emission sales by 2035, but this should be met by battery electric vehicles (BEVs). Hydrogen and other alternative fuels are not best used for Classes 2b-3 trucks, for which battery electric technology is well-suited, more efficient, and more cost-effective.²

3. Projections for injecting hydrogen into the natural gas grid should align with the technical and economic feasibility of using hydrogen.

SSG should clarify the assumptions used to determine that 15% green hydrogen can and should be injected into the gas grid by 2035, including costs, technical feasibility, and projected availability of green hydrogen.

¹ Washington State Department of Commerce, Energy Division, “Washington 2021 State Energy Strategy: Transitioning to an Equitable Clean Energy Future,” (December 2020). <https://www.commerce.wa.gov/growing-the-economy/energy/2021-state-energy-strategy/>

² California Air Resources Board, “Draft Advanced Clean Fleets Total Cost of Ownership Discussion Document,” (September 9, 2021). https://ww2.arb.ca.gov/sites/default/files/2021-08/210909costdoc_ADA.pdf.

Recommendation 2: SSG should make available the alternative fuels assumptions and ensure they are grounded in data and research that reflects reality.

A pathway that relies entirely on alternative fuels is likely to miss opportunities for cost-effective and equitable decarbonization, for the following reasons:

1. Electrification has been demonstrated as the most cost-effective strategy to decarbonize residential buildings, commercial buildings, and on-road transportation, which is supported by state policy. The SES determined that electrifying homes and buildings, and the majority of our transportation systems, is the most cost-effective and equitable way for Washington to meet our statutory climate goals. In the study's "Electrification" scenario, the net cost of energy of full electrification is almost 30% lower by 2050 than the scenario where we continue to use gas in buildings³. Electrification has the following benefits:

- a) **Climate mitigation:** Thanks to Washington's Clean Energy Transformation Act (CETA), Washington's already-clean electricity will be free of fossil fuels by 2045, allowing us to take advantage of our clean electricity for use in heating and cooling our buildings⁴.
- b) **Health:** Buildings currently emit twice as much nitrogen oxide (NOx) as all Washington's power plants combined. Indoor air pollution from gas cooking appliances has severe health risks – living in a home with gas cooking increases a child's chance of experiencing asthma symptoms by 42%⁵. And the health impacts of air pollution are already felt inequitably: Black, Latinx, and Asian people, as well as people with lower socioeconomic status, have higher risks of death from particle pollution⁶, in part due to the historical impacts of segregation and redlining that have led communities of color to be pushed to live in places with greater exposure to air pollution. Meanwhile, electric heat pumps not only have no adverse health impacts, but they also provide both heating and cooling, which can help to protect vulnerable populations from heat waves and wildfire smoke.
- c) **Safety and resilience:** Earthquake risk makes Washington state particularly vulnerable to gas leaks, fires, and explosions. because highly pressurized gas transmission pipelines run a high risk of exploding during earthquakes, and gas is responsible for at least 20% of post-earthquake fire ignitions. All-electric buildings are also more resilient following natural disasters as electricity

³ Washington State Department of Commerce, Energy Division, "Appendix B: Data Accompanying Deep Modeling Technical Report (Excel)," (December 2020). <https://www.commerce.wa.gov/growing-the-economy/energy/2021-state-energy-strategy/>

⁴ Washington State Department of Commerce, "Clean Energy Transformation Act," (2019). <https://www.commerce.wa.gov/growing-the-economy/energy/ceta/>

⁵ Weiwei Lin, Bert Brunekreef, Ulrike Gehring, "Meta-analysis of the effects of indoor nitrogen dioxide and gas cooking on asthma and wheeze in children," *International Journal of Epidemiology*, 42, 6 (December 2013), 1724–1737. <https://doi.org/10.1093/ije/dyt150>.

⁶ American Lung Association, "State of the Air," (2020). <https://www.stateoftheair.org/assets/SOTA-2020.pdf>

can be restored more quickly than repairs can be made to ruptured gas lines. Gas lines take 30 times longer to restore than the electric system after natural disasters⁷.

- d) **Costs:** A report by Energy & Environmental Economics (E3) prepared for the Washington State Department of Commerce in May 2022 found all-electric residential new construction cost-effective across the state. Compared to a mixed-fuel new home that needs air conditioning, an all-electric new home saves about \$2,000 in upfront costs⁸. A cost-benefit analysis conducted by RMI for Washington’s residential energy code found that new mixed-fuel homes in both Seattle and Spokane cost more than \$7,200 more to build than all-electric homes⁹. Additionally, if new buildings continue to be built with gas infrastructure, low-income residents will bear the highest burden of costs for rising gas prices and retrofit conversion to all-electric buildings.
- e) **Jobs:** UCLA’s study on workforce needs and impacts for a full transition to electric buildings in California found that while there are impacts to a few sectors, the net impact was an overwhelming increase in job creation, at an estimated rate of 100,000 new annual positions in California per year¹⁰. Creating high-road local jobs for electrification will be key to achieving a just climate transition.

2. Depending on the assumptions incorporated into UTC’s analysis, a pathway that solely uses alternative fuels may not achieve our climate goals.

Alternative fuels like clean, electrolytic hydrogen and renewable natural gas (RNG) may be key transitional fuels for decarbonizing high-heat industrial processes, as well as some transportation uses that are hard-to-electrify, such as heavy-duty long haul and maritime. However, electrification is the most cost-effective and equitable way to decarbonize homes and buildings.

Without more information on the cost and technological assumptions made in the alternative fuels pathway, it is difficult to evaluate whether an alternative fuels-only pathway is feasible or cost-effective. Broadly speaking, alternative fuels have the following limitations for use in residential and commercial buildings:

⁷ John Sarter, “Electrification is an all-around winner,” *PV Magazine* (September 17, 2019). <https://pv-magazine-usa.com/2019/09/17/electrification-is-an-all-around-winner/>

⁸ Charles Li, Dan Aas, Jared Landsman, Michaela Levine, John de Villier, Fangxing Liu, Amber Mahone, Arne Olson, “Financial Impact of Fuel Conversion on Consumer Owned Utilities and Customers in Washington: Final Report,” Energy + Environmental Economics (E3) (May 2022). <https://www.commerce.wa.gov/wp-content/uploads/2022/06/Financial-Impact-of-Fuel-Conversion-on-Consumer-Owned-Utilities-and-Customers-in-Washington-Final-Report.pdf>

⁹ Jonny Kocher, “Updated Energy and Cost Benefit Analysis in Support of Heat Pump Proposals 21-GP2-065 and 21-GP2-066,” RMI (October 14, 2022). <https://www.sbcc.wa.gov/sites/default/files/2022-10/RMI%20WSEC-R.pdf>

¹⁰ Betony Jones, Jason Karpman, Molly Chlebnikow, and Alexis Goggans, “California Building Decarbonization: Workforce Needs and Recommendations,” *UCLA Luskin Center for Innovation* (November 2019). https://innovation.luskin.ucla.edu/wp-content/uploads/2019/11/California_Building_Decarbonization.pdf



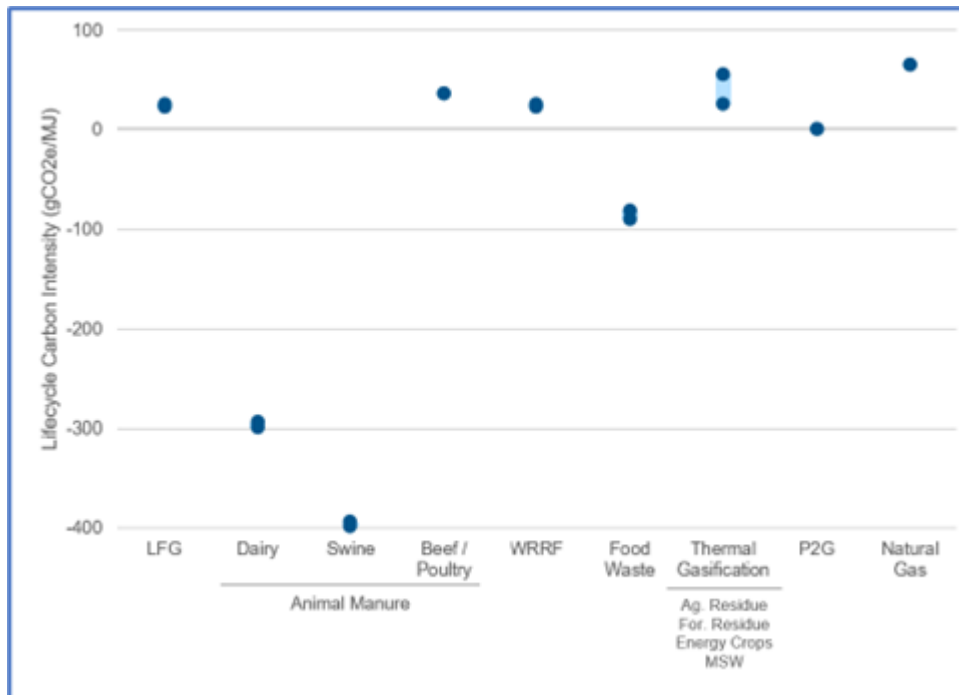
- a) **Costs.** RNG costs between 4 and 17 times more than gas¹¹. Unlike renewable energy technologies such as solar PV, RNG is non-modular. Economies of scale allow for more efficient production of modular technologies, leading to cost declines. RNG cannot achieve similar cost declines since projects are customized based on location, type of input, and size. Each RNG site requires connection to a gas pipeline and capital investments tailored to site specifications. In fact, RNG costs will rise as the cheapest sources are captured first. Building pipelines to small and remote sources of RNG will not achieve cost-effective decarbonization. Similarly, the present cost of green hydrogen is high compared to alternative resources, and the highest value of hydrogen will be in sectors that are currently difficult to decarbonize. A report prepared for the California Energy Commission finds that “[e]ven under optimistic cost assumptions, the blended cost of hydrogen and synthetic natural gas is 8 to 17 times more expensive than the expected price trajectory of natural gas.¹² Green hydrogen, the only zero-carbon method of hydrogen production, is far more expensive than fossil-based methods of hydrogen production.¹³ Due to these incremental costs, green hydrogen accounted for less than 1 percent of total hydrogen production in 2021.¹⁴ Moreover, converting low-carbon electricity into hydrogen is inherently less energy efficient than the direct use of electricity.
- b) **Not all hydrogen and RNG reduce greenhouse gas emissions.** Green electrolytic hydrogen is made through electrolysis powered by clean electricity (either a renewable energy source and/or our decarbonizing electric grid). Virtually all current hydrogen production in the US is made using fossil fuels – these are referred to as gray, brown, blue and turquoise hydrogen. These carbon-intensive processes actually emit more greenhouse gases to make those forms of hydrogen than the fossil gas they seek to replace, and we do not support their expansion. Similarly, most sources of RNG have net positive lifecycle emissions, as denoted in the figure below. The impact of RNG is often overstated because of combustion-based approaches to measuring the greenhouse gas impacts of alternative fuels. Some sources of RNG prevent the release of methane, such as animal manure, and thus avoid natural gas consumption. Conversely, large landfills are required by law to capture methane, so acquiring RNG from those landfills does not avoid emissions. Actual emissions benefits also vary widely due to the emissions involved in capturing and delivering the alternative fuel.

¹¹ Sasan Saadat, Matt Vespa, and Mark Kresowik, “Rhetoric vs. Reality: The Myth of ‘Renewable Natural Gas’ for Building Decarbonization,” Earthjustice and Sierra Club (July 14, 2020). <https://earthjustice.org/features/report-building-decarbonization>

¹² Dan Aas, Amber Mahone, Zack Subin, Michael Mac Kinnon, Blake Lane, Snuller Price, “The Challenge of Retail Gas in California’s Low-Carbon Future – Technology Options, Customer Costs, and Public Health Benefits of Reducing Natural Gas Use,” California Energy Commission (2019). <https://www.energy.ca.gov/publications/2019/challenge-retail-gas-californias-low-carbon-future-technology-options-customer>

¹³ IEA, “Global Hydrogen Review 2021,” IEA (2021). <https://www.iea.org/reports/global-hydrogen-review-2021>

¹⁴ IEA, “Hydrogen,” IEA (2022). <https://www.iea.org/reports/hydrogen>



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- c) Air pollution. RNG, like fossil gas, is still primarily methane and does not reduce harmful air pollution when combusted indoors. Using RNG does not solve for potentially huge climate and air pollution harms of methane leaks along the supply chain and in homes and buildings¹⁶, nor the combustion of harmful air and climate pollutants like NO_x indoors and outdoors¹⁷. Similarly, blending hydrogen into natural gas as a combustion fuel will require a higher temperature for combustion, as hydrogen burns at a higher temperature than methane, and this increase in temperature will result in higher NO_x emissions as well¹⁸.
- d) Limited availability. Both RNG and green hydrogen are currently very limited in supply. A 2018 Washington state study found limited technical and economic potential for RNG in the state, estimating that “adequate opportunities exist for RNG production equivalent to 3 percent to 5

¹⁵ Michigan Public Service, “Michigan Renewable Natural Gas Study: Draft Final Report v1,” ICF Resources, L.L.C. (June 7, 2022), 113.

¹⁶ Eric Lebel, Colin J. Finnegan, Zutao Ouyang, and Robert B. Jackson, “Methane and NO_x Emissions from Natural Gas Stoves, Cooktops, and Ovens in Residential Homes,” *Environmental Science & Technology*, 56, 4 (January 27, 2022), 2529-2539. <https://doi.org/10.1021/acs.est.1c04707>

¹⁷ Yifang Zhu, Rachel Connolly, Yan Lin, Timothy Mathews, and Zemin Wang, “Effect of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California,” *UCLA Fielding School of Public Health* (April 2020), <https://ucla.app.box.com/s/xyzt8jc1ixnetiv0269qe704wu0ihif7>

¹⁸ Mehmet Salih Cellek and Ali Pınarbaşı, “Investigations on performance and emission characteristics of an industrial low swirl burner while burning natural gas, methane, hydrogen-enriched natural gas and hydrogen as fuels,” *International Journal of Hydrogen Energy*, 43, 12 (January 11, 2018), 1194-1207. <https://doi.org/10.1016/j.ijhydene.2017.05.107>

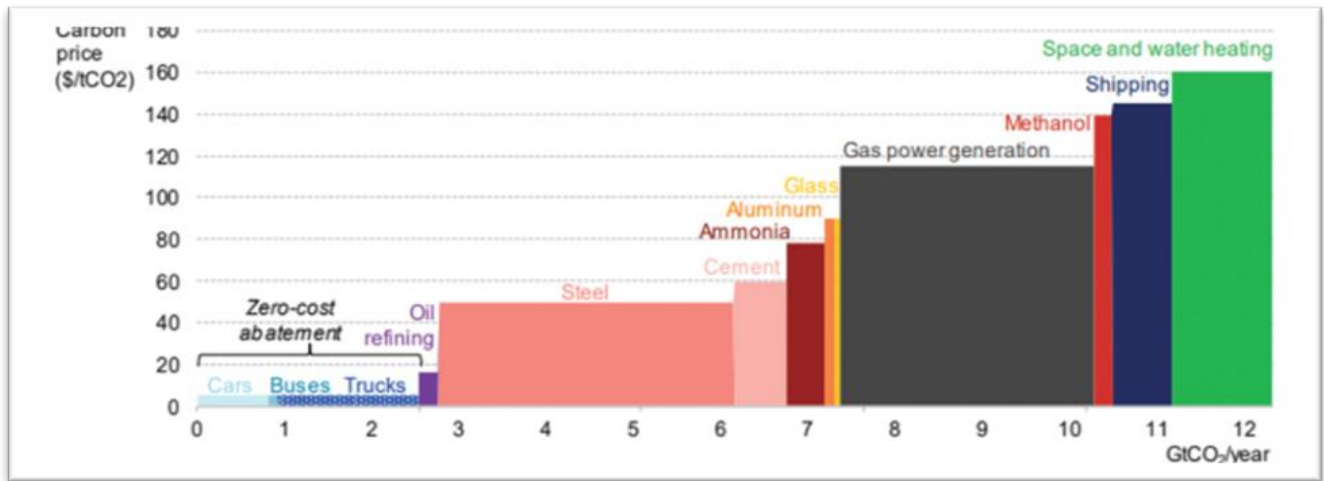
percent of current natural gas consumption in Washington”¹⁹. Moreover, the vast majority of RNG currently being produced is used in the transportation sector for compliance with west coast low carbon fuel standards. The transportation sector uses an estimated 75% of the RNG produced, which suggests that this sector will continue to compete aggressively for RNG supply²⁰.

Hydrogen is also limited in its availability to decarbonize gas utility operations. Only low levels of hydrogen (5-20% by volume, up to 7% by energy delivered) can be blended into existing gas systems without requiring pipeline upgrades and end-use appliance replacements that are prohibitively expensive. The expansion of infrastructure and associated cost for hydrogen to scale at a level necessary to meet our climate goals reduce its viability as a decarbonization tool for homes and buildings. We are also skeptical that, in a rapidly decarbonizing society, hydrogen will be a cost-effective decarbonization fuel available to natural gas utilities. Other harder-to-electrify sectors of the economy face greater decarbonization challenges, such as heavy industry and transportation, and will likely be players in the hydrogen market. Figure 7 below details the results of a BloombergNEF study that evaluated the impact of \$1/kg hydrogen on emissions reductions²¹. The BloombergNEF study demonstrates that it is more cost effective to use hydrogen for emissions reductions in vehicles and industrial applications like steel and cement production than in space and water heating applications because the latter two use cases have cost-effective electrified alternatives. Ultimately, hydrogen’s versatility will render it more challenging to procure for pipeline use.

¹⁹ Washington Department of Commerce and Washington State University, “Promoting Renewable Natural Gas in Washington State,” Report to the Washington State Legislature (December 2018). <https://www.commerce.wa.gov/wp-content/uploads/2019/01/Energy-Promoting-RNG-in-Washington-State.pdf>

²⁰ Bentham Paulos, “Analysis: Why Utilities Aren’t Doing More with Renewable Natural Gas,” *Energy News Network* (February 14, 2019). <https://energynews.us/2019/02/14/analysis-why-utilities-arent-doing-more-with-renewable-natural-gas/>

²¹Bloomberg Finance, “Hydrogen Economy Outlook: Key messages,” Bloomberg NEF (March 30, 2020). <https://data.bloomberglp.com/professional/sites/24/BNEF-Hydrogen-Economy-Outlook-Key-Messages-30-Mar-2020.pdf>



Since RNG and green hydrogen, collectively, cannot supply a majority of gas supply, Washington will continue to rely on fossil gas for heating. Even if Washington achieved 20 percent hydrogen blends by volume and sourced the maximum feasible RNG supplies, natural gas will continue to account for the majority of energy delivered. Allowing the natural gas utilities to continue making investments in gas infrastructure for RNG and hydrogen will entrench the gas network, leading us down a path of not meeting our decarbonization targets, or result in significant stranded assets as customers choose electric alternatives.

Recommendation 3: The results of the analysis should guide the Commission’s regulatory policies and actions, both from a climate perspective and a customer protection perspective.

The Climate Commitment Act requires that Washington reduce emissions to 95% below 1990 levels and achieve net-zero emissions. UTC needs to pursue regulatory changes that are in customers’ best interest and provide guidance to utilities on how to decarbonize in a way that does not leave customers, particularly low-income customers and overburdened communities, behind.

The UTC should further examine policies that will protect customers in the clean energy transition, including, but not limited to:

1. Directing dual-fuel utilities to better integrate their gas and electric Integrated Resource Plans (IRPs). Combining a dual-fuel utility’s electric and gas IRP processes holistically will ensure that what’s being considered on the gas side – particularly around the potential for electrification to be a cost-effective decarbonization strategy – can be incorporated into the electric IRP, and vice versa. We see a strong interaction between the demand forecasts for each side of the utility as well as Conservation Potential Assessments. An increase in electric load due to building electrification should be reflected in the gas

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utility's load forecast and conservation potential assessment as decreased load and potential, respectively. Dual-fuel utilities should also consider gas and electric together when looking at how the social cost of greenhouse gas (SCGHG) and Climate Commitment Act (CCA) price will impact resource decisions, particularly in considering not only energy efficiency as strategy, but electrification as well.

The Commission should also consider how it can facilitate data sharing between separate electric and gas utilities with overlapping service territories. Given the state's building code changes and the decreasing cost of electric heating, building electrification will play a major role in helping the state achieve its emissions reduction goals. Furthermore, electrification is an increasingly attractive non-pipeline alternative resource for gas utilities. The gas and electric utilities must be considering the impacts of electrification in their resource planning. We are skeptical that a single fuel utility could accurately forecast the impacts to the other fuel's system without collaboration from the other utility. This type of gas and electric utility collaboration will require a new level of coordination and data sharing that has not been traditionally practiced at the UTC. We recommend the Commission begin its inquiry by researching the British Columbia Utilities Commission (BCUC) requirement for British Columbia Hydro and Power Authority (BC Hydro) and Fortis BC Energy Inc. to share the data required to file load forecast results based on each other's scenarios contained in their respective resource plan.²² That is, each utility must demonstrate to the BCUC the impact to their own load forecast if the other utility's scenario were to pass. The UTC could then build upon the BCUC's requirement to share information to develop load forecasts and require the Washington utilities to share cost and other relevant assumptions to better inform each other's scenarios.

2. Incorporating a broader set of public interest and equity metrics in the gas utility planning and procurement processes.

Gas utilities should be subject to the same requirements for equitable distribution of benefits and burdens to overburdened communities as electric utilities are under the Clean Energy Transformation Act (CETA). This mandate would be consistent with both the obligation of the electric utilities, under CETA, and the state agencies subject to the 2021 Healthy Environment for All (HEAL) Act.²³ Customer benefit indicators should be designed to prioritize overburdened communities and accurately forecast health and safety impacts from continued gas use.

²² British Columbia Utilities Commission, "Energy Scenarios for BC Hydro and FEI, Re: FortisBC Energy Inc. – British Columbia Hydro and Power Authority – Energy Scenarios," (January 21, 2022).

https://docs.bcuc.com/Documents/Arguments/2022/DOC_65400_2022-01-21-FEI-BCH-Energy-Scenarios-Request.pdf

²³ Revised Code of Washington, "RCW 70A.02 - Environmental Justice,"

<https://app.leg.wa.gov/RCW/default.aspx?cite=70A.02>

3. Ensuring that efficiency programs do not lock in new fossil fuel appliances that will likely become stranded assets.

Utility-provided incentives for new appliances should prioritize highly efficient electric appliances over gas appliances, which will lock customers into continued use of fossil fuels for years afterwards.

4. Eliminating line extension subsidies for gas customers.

The UTC should require all gas companies to end the practice of subsidizing line extensions to new gas customers by amortizing the cost of the new installation across the entire customer base. This practice is incompatible with state emissions reduction requirements, updates the state building codes, hides the true cost of gas and burdens all gas ratepayers with costly extensions, and risks stranding assets as customers choose lower cost electrified heating. Although Avista and Puget Sound Energy have both agreed to phase out their gas line extension allowances, the other two natural gas utilities do not have similar agreements.

5. Leveraging federal and state investments, such as funding from the Inflation Reduction Act (IRA), to maximize opportunities for customers.

The IRA and other federal and state investments will provide millions of dollars in tax credits and incentives for customers to move towards all-electric homes. The UTC can play a key role in facilitating the process between utilities and customers. To start, the utilities can rethink how they construct their energy efficiency programs to maximize outside funding and reduce costs to customers. Another key obstacle for customers taking advantage of state and federal funding opportunities is informing customers of the resources available to them. Utilities can play a key role educating customers through their various communication channels, as well as educating their trusted contractors that install heating and cooking equipment in buildings and their customers. The Commission can play a crucial role in facilitating this work by dedicating its own time and resources to this cause. The Commission well understands that when it identifies an issue as a priority the utilities likewise make it a priority.

6. Investigating a managed decommissioning of gas distribution pipelines and limiting pipeline enhancements that are not necessary for safety or reliability.

All decarbonization pathways will require the eventual decommissioning of existing gas distribution infrastructure, with a likely accelerated timeline for the electrification and hybrid pathways. The UTC should begin an investigation into planned decommissioning of gas distribution infrastructure, similarly to what the California Public Utilities Commission is currently exploring²⁴. Among other questions, the UTC should formulate criteria to use to determine whether aging gas distribution infrastructure should be repaired or replaced when a gas utility requests ratepayer funds for this purpose, as well as criteria to determine which distribution lines should have the highest priority for proactive decommissioning.

²⁴ California Public Utilities Commission Staff, "Staff Proposal on Gas Distribution Infrastructure Decommissioning Framework in Support of Climate Goals," (December 21, 2022).

<https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M500/K158/500158371.PDF>



These criteria should align with other requirements, including the equal distribution of benefits for overburdened communities, cost savings for ratepayers, local policies around pruning the gas system, and more.

Finally, UTC should consider how to improve the process of sharing information and receiving stakeholder feedback during this investigation. It has been challenging to understand the assumptions underlying the pathways as outlined, without which they are difficult to evaluate. Additionally, the Miro board exercise put out at the last meeting has not only been challenging to use logistically, but it is also unclear what kind of feedback SSG aims to collect using that tool, which has not included the information on the pathways but instead on two “scenarios” for energy resources. Without better transparency and public engagement practices, UTC may miss opportunities to incorporate key input. We would recommend that UTC and SSG schedule additional stakeholder meetings to better share information and give stakeholders ample time and resources to give feedback.

Thank you again for the opportunity to provide comments.

Sincerely,

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