U-210553

Received
Records Management
Jul 31, 2023

July 31, 2023

Amanda Maxwell
Executive Director
Washington Utilities & Transportation commission
621 Woodland Square Loop SE
Lacey, WA 98503
Submitted Via UTC Web Portal

Re: Docket No. U-210553 - Examination of Energy Decarbonization Impacts and Pathways for Electric and Gas Utilities to Meet State Emissions Targets - Written Comments on Dashboard

Dear Executive Director Maxwell,

On behalf of Sierra Club and its nearly 27,000 members in Washington, thank you for the opportunity to provide these comments on the Dashboard presenting preliminary results of the Utility and Transportation Commission's examination of decarbonization pathways for the State's gas utilities. Based on our review of the Dashboard, we offer three main recommendations to the Commission:

1. Clarify the risks and costs of the alternative fuels pathway, and the pathway's minimal use of alternative fuels in buildings, to avoid the misleading impression that alternative fuels are equally viable as electrification.
2. Provide greater transparency and explanation of modeling inputs and assumptions, and address any potential errors that led to counterintuitive modeling results.
3. Consider relevant findings about the scale of resource needs under different decarbonization pathways when evaluating the pathways' viability and developing policies.

I. The Commission should clarify the risks and costs of alternative fuels

We recommend that the Commission's final report to the State Legislature clarify the risks and costs of the alternative fuels pathway—particularly those related to the commercialization and availability of alternative fuel technologies—as well as the extent to which they are and are not addressed by SSG's modeling analysis. This clarification is important to avoid the misleading impression that relying on alternative fuels to decarbonize buildings is equally viable as electrification. As discussed in previous Sierra Club comments in this proceeding,[1] the

[1] Comments of Sierra Club at 2-4 (Jan. 17, 2023).

Commission's commitment to objectively examining decarbonization strategies and policies does not mean it should inaccurately suggest that pathways focused on building electrification and alternative fuels are equally viable. These comments discuss developments in the growing body of evidence about alternative fuels' risks (which do not appear to be addressed in SSG's modeling analysis), and why the Commission's report should clearly describe these risks alongside the Dashboard's similarly clear statements and policy recommendations on other issues.

The Dashboard's alternative fuels pathway relies on several noncommercial technologies whose future availability and prices are highly uncertain, and which are unlikely to be used in buildings due to significant competing demand from hard-to-electrify sectors. These technologies include hydrogen electrolysis and blending, production of biomethane (which is sometimes referred to as renewable natural gas or RNG), and gas heat pumps. Over-relying on these unproven technologies while failing to advance existing solutions like building electrification has been aptly termed "tech-crastination."[2] Specific risks and obstacles associated with each of these technologies are summarized below. These risks are further detailed in recent comments on NW Natural's gas IRP that Sierra Club and several other organizations jointly submitted to the Oregon Public Utility Commission.[3] Additional concerns about reliance on alternative fuels are detailed in recent Commission Staff comments on Puget Sound Energy's Gas IRP.[4]

Hydrogen: For hydrogen to serve as a decarbonization resource, it must be green hydrogen that satisfies the three pillars of (1) production using new clean energy supply, (2) hourly matching between energy generation and hydrogen production, and (3) deliverability.[5] This requires electrolysis, which has not yet been deployed at scale and currently faces a high cost premium. Green hydrogen costs an estimated $3-8 per kilogram to produce, roughly 2-4 times as much as higher carbon-intensity production methods.[6] As a result, green hydrogen accounted for less than one percent of total hydrogen production in 2021.[7] And recent analysis from Wood Mackenzie projects that low-carbon hydrogen production will fall well short of Department of Energy goals, especially in the near-term.[8]

While policy support could reduce green hydrogen prices and enable it to play a role in decarbonizing certain hard-to-electrify sectors, hydrogen will remain unsuitable for use in homes

[2] Borgeson, M., and Fakhry, R., Hydrogen in Buildings: The Poster Child of Tech-Crastination, September 7, 2021. https://www nrdc.org/experts/rachel-fakhry/hydrogen-buildings-poster-child-techcrastination.
[3] Oregon Public Utility Commission Docket No. LC 79, Opening Comments of Green Energy Institute at Lewis & Clark Law School, Climate Solutions, Columbia Riverkeeper, Community Energy Project, Electrify Now, Metro Climate Action Team, Natural Resources Defense Council and Sierra Club, at 19-34, 39-44 (Dec. 30, 2022) [hereinafter NWN IRP Comments], https://edocs.puc.state.or.us/efdocs/HAC/lc79hac14421.pdf.
[4] UTD Docket UE-220242, Staff Comments on Puget Sound Energy's 2023 Gas Integrated Resource Plan, at 17-20 (June 5, 2023).
[5] Rachel Fakhry, *New Analysis: The 3 Pillars Will Support Large Hydrogen Deployment*, NRDC (June 20, 2023), https://www.nrdc.org/bio/rachel-fakhry/new-analysis-3-pillars-will-support-large-hydrogen-deployment.
[6] IEA, *Global Hydrogen Review 2021*, at 7 (2021), https://www.iea.org/reports/global-hydrogenreview-2021; NWN IRP Comments at 23-25.
[7] *Id.*
[8] David Iaconangelo, *U.S. to Miss DOE's Hydrogen Goals by Wide Margin – Report*, E&E News (June 28, 2023), https://subscriber.politicopro.com/article/eenews/2023/06/28/u-s-to-miss-does-hydrogen-goals-by-wide-margin-report-00103826; https://www.woodmac.com/press-releases/us-japan-hydrogen/.

and buildings for several reasons. First, it is far more efficient to directly use clean energy in buildings than to produce hydrogen with that energy.[9] And because hydrogen is less energy-dense and more leak-prone and embrittling than methane gas, there are significant limits to how much hydrogen can be blended into the system before gas distribution equipment and appliances must be replaced.[10] These retrofit requirements add to the economic case for electrification of buildings, rather than reliance on alternative fuels. Finally, hydrogen blending exposes customers to unknown and potentially severe risk of explosions,[11] air pollution, and health harms. Because hydrogen burns hotter than methane, its use may significantly increase emissions of nitrogen oxide pollution (NOx). A 2022 meta-analysis found "a huge range of possible changes in NOx emissions from [hydrogen/gas] fuel blends" used in residential equipment.[12] In a mean case that reflects the results across the relevant literature, hydrogen blends of over 5%–20% led to NOx emission increases of 7%–30%.[13] These serious health and safety concerns have led to significant community opposition to hydrogen blending projects in the Pacific Northwest, which can be expected to continue with any future project proposals.[14]

Biomethane/RNG: Biomethane is unlikely to be available affordably or in sufficient quantities to meaningfully reduce emissions from buildings. A study by the American Gas Foundation found that even after fully ramping up production of RNG, the fuel could only supply between 6 and 13% of current gas demand.[15] Utility experience is similarly unpromising: A recent report revealed that NW Natural met only 0.15% of its Oregon customers' demand with biomethane in

[9] Cara Bottorff, *Hydrogen: Future of Clean Energy or a False Solution?,* Sierra Club (Jan. 4, 2022) ("Using renewables to produce hydrogen is about 20 to 40 percent less efficient than using renewable energy directly."), https://www.sierraclub.org/articles/2022/01/hydrogen-future-clean-energy-or-false-solution. The Dashboard partially acknowledges that hydrogen production is a less efficient use of clean electricity than direct electrification, stating that "[d]emand for electricity for green hydrogen production could compete with decarbonizing other end uses, both for capital and installations." Dashboard, Energy Use tab.

[10] NWN IRP Comments at 20-21 (collecting sources).

[11] *See, e.g.*, Andee Krasner & Barbara Gottlieb, *Hydrogen Pipe Dreams: Why Burning Hydrogen in Buildings Is Bad for Climate and Health*, at 13, Physicians for Social Responsibility (June 2022) ("In the United Kingdom, a comprehensive risk assessment conducted by Hy4Heat evaluating a theoretical methane-hydrogen blend predicted that the number of explosions per year and the risk of injuries from in-home explosions would be four times higher with a 20 percent blend of hydrogen compared to methane alone."), https://psr.org/wp-content/uploads/2022/07/hydrogen-pipe-dreams.pdf.

[12] Madeleine L. Wright & Alastair C. Lewis, *Emissions of NOx from blending of hydrogen and natural gas in space heating boilers*, at 7, 11, Elementa: Science of the Anthropocene (May 31, 2022), https://doi.org/10.1525/elementa.2021.00114.

[13] *Id.*

[14] Sierra Club, *NW Natural Withdraws Application for Controversial Hydrogen Blending Experiment following Community Uproar* (Nov. 2, 2022), https://www.sierraclub.org/press-releases/2022/11/nw-natural-withdraws-application-controversial-hydrogen-blending-experiment.

[15] Sasan Saadat, Matt Vespa & Mark Kresowik, *Rhetoric vs. Reality: The Myth of "Renewable Natural Gas" for Building Decarbonization*, at 11, Earthjustice and Sierra Club (July 2020), https://earthjustice.org/wp-content/uploads/report_building-decarbonization-2020.pdf (citing AGF*, Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment* (Dec. 2019), https://www.gasfoundation.org/wp-content/uploads/2019/12/AGF-2019-RNG-Study-Executive-Summary-Final-12-18-2019-AS-1.pdf) ; *see also* NWN IRP comments at 36-39 (discussing limited biomethane availability).

2022, none of which was produced in-state.[16] This fell dramatically short of NW Natural's target to deliver 20 times that amount of biomethane.[17]

Moreover, the emissions intensity of biomethane can vary widely based on the process used to produce it, and many of these processes produce net emissions, rather than net reductions.[18] Overreliance on biomethane can incentivize unsustainable practices at factory farms and other biomethane sources, harming local communities and potentially undermining any climate benefits.[19] Finally, biomethane produces many of the same harms as traditional fossil gas, including methane leakage throughout the distribution system and emissions of health-harming pollution inside and outside of homes and buildings where it is used.[20]

Gas Heat Pumps: The alternative fuels scenario assumes that existing gas heating systems are replaced by gas heat pumps, presumably because the limited available quantities of alternative fuels cannot come close to meeting current demand from less efficient gas equipment. Gas heat pumps are not commercially available, and it is unlikely that they will ever become competitive with the large and growing range of existing electric heat pump offerings.[21] Even if manufacturers develop commercially-available models, a successful gas heat pump market would require industry support, customer demand, and workforce development.[22] These developments are exceedingly unlikely, in part because these market actors are rapidly moving away from gas and toward available electric heat pump equipment.

* * *

The Commission's final report should describe the significant risks of using alternative fuels in buildings extremely clearly and prominently. This is necessary to avoid creating the impression that a pathway based on alternative fuels is equally as viable as one based on building electrification, which relies on existing, commercial technologies whose popularity is rapidly growing and whose mass-produced, modular nature better enables them to benefit from learning curves and economies of scale.[23] The Dashboard and available supporting materials do not appear to address the risks of alternative fuels, or to disclose SSG's assumptions about those

[16] Monica Samayoa, *NW Natural on Slow Start Toward Climate Goals Using Renewable Natural Gas, New Report Shows*, Oregon Public Broadcasting (July 14, 2023), https://www.opb.org/article/2023/07/14/new-report-nw-natural-slow-start-climate-goals-using-renewable-natural-gas/.
[17] *Id.*
[18] NWN IRP comments at 36; Emily Grubert, *At Scale, Renewable Natural Gas Systems Could Be Climate Intensive: The Influence of Methane Feedstock and Leakage Rates*, 15 Environ. Res. Lett. 084041 (2020), https://doi.org/10.1088/1748-9326/ab9335.
[19] NWN IRP comments at 36; *Rhetoric vs. Reality: The Myth of "Renewable Natural Gas" for Building Decarbonization*, at 8-10.
[20] *See, e.g.*, Merrian Borgeson, *A Pipe Dream or Climate Solution? The Opportunities and Limits of Biogas and Synthetic Gas to Replace Fossil Gas*, at 6, NRDC (June 2020), https://www nrdc.org/sites/default/files/pipe-dream-climate-solution-bio-synthetic-gas-ib.pdf.
[21] NWN IRP Comments at 39-44.
[22] NWN IRP Comments at 39-44.
[23] *See* NWN IRP Comments at 29-31.

fuels' cost and availability.[24] It is critical that the Commission's final report correct these omissions.

At least two factors significantly heighten the risk that the pathway analysis presented in the Dashboard will give a misleading picture of the outlook for alternative fuels. First, **the modeled alternative fuels pathway appears to make very little use of alternative fuels in buildings**. By 2050, only 6.2% of the pathway's residential energy use and 17.8% of its commercial energy use are met by RNG, biomass, and hydrogen combined.[25] Grid electricity and geothermal energy account for the vast majority (93%) of 2050 residential energy use in the alternative fuels pathway, while electricity alone accounts for 81% of the pathway's 2050 commercial energy use.[26] For comparison, the alternative fuels pathway's residential sector uses just 15% more RNG, biomass, and hydrogen in 2050 than the electrification pathway.[27] The reasons for the pathway's low rate of alternative fuel use in buildings are not clear from the available materials—perhaps the model selects very little of these fuels due to their high costs, low availability, and demand from harder-to-electrify sectors.[28]

Whatever the explanation, the Commission's final report must make clear that any conclusions drawn from the "alternative fuels" pathway do not reflect the feasibility of using alternative fuels in buildings at scale as a decarbonization strategy. Readers of the report might conclude that if the pathway labeled "alternative fuels"[29] is projected to have similar overall costs as the pathway labeled "electrification," then policies and investments supporting alternative fuel use in buildings could be as beneficial as those supporting building electrification. It would of course be inappropriate to base such a conclusion on a pathway that meets only 6% of residential energy demand with alternative fuels, which is why the final report must clarify what the scenario does and does not address. The Commission should strongly consider renaming the alternative fuels pathway, and in any case should clearly describe the amount of alternative fuels actually used in that pathway, along with the risks of extrapolating any findings from the pathway analysis to broader conclusions about the viability of alternative fuel use in buildings.

Second, the Dashboard includes several policy recommendations and policy-relevant conclusions. For example, the Executive Summary tab states that "energy efficiency is essential

---

[24] It is also not fully clear whether the alternative fuels pathway relies on additional unproven technologies, such as synthetic methane production or carbon capture and storage. To the extent the scenario does rely on these technologies, they will make it even more expensive and risky, for reasons detailed in the NWN IRP Comments at 22-34.

[25] Data downloaded from UTC Energy Decarbonization Pathways Dashboard [hereinafter "Dashboard"], washington_output.xlsx, Total Energy tab, https://cis-community.ssg.coop/washington/energy.

[26] *Id.*

[27] *Id.* (showing 59.2 million MMBtu used by these fuels in the residential sector in 2050 under the alternative fuels pathway, compared to 51.3 MMBtu under the electrification pathway).

[28] The Dashboard includes statements suggesting that this is the case. *See, e.g.*, Dashboard, Emissions tab ("Applying the principle of best use ensures that supply-constrained fuels (RNG) and more energy intensive fuels (hydrogen) are available for hard to electrify sectors such as industry and heavy vehicles."). If the high costs and low availability of alternative fuels do in fact drive their minimal use in buildings in the alternative fuels scenario, the Commission's final report should say so much more clearly than the Dashboard does.

[29] The Dashboard describes the alternative fuels pathway as "focusing on the use of alternative fuels such as renewable natural gas and hydrogen" (Executive Summary tab) and as being "[d]esigned to replace fossil fuels such as renewable natural gas and hydrogen" (Modelling Overview tab), often without any accompanying indication of how alternative fuels are used in the pathway or how little they are used in buildings.

to any pathway," that "new strategies for managing and measuring resource adequacy are required," and that "there are compelling economic reasons to implement a decarbonization pathway as quickly as possible."[30] Conclusions such as these, combined with statements about the Commission's interest in objectively describing decarbonization pathways rather than making recommendations between them,[31] could give the impression that any clearly-demonstrated conclusions or "no regrets" policy actions are stated explicitly, and that issues where the report declines to offer recommendations (such as electrification-focused vs. alternative fuel-focused pathways) are matters of policy preference rather than technical or economic viability.

As discussed above, there are numerous technical, economic, and safety-related barriers to widespread use of alternative fuels in buildings. These barriers are well-documented and often undisputed—no one has claimed that green hydrogen or gas heat pumps are commercially available in Washington. The Commission's final report should describe the clear risks and obstacles to alternative fuel use, as well as their policy implications, as plainly and prominently as the Dashboard describes the essential role of energy efficiency. For example, the final Report's introduction or executive summary could include the observation that "under all pathways, electrification is the dominant strategy for decarbonizing the vast majority of residential and commercial buildings."[32]

II. The Commission should provide greater transparency and explanation of modeling inputs and assumptions, and address any potential errors that led to certain counterintuitive modeling results

The information and modeling results available on the Dashboard and supporting materials do not answer important questions about the inputs, assumptions, and methods informing SSG and the Commission's analysis. For example, the emissions factor for RNG listed in the Data, Methods, and Assumptions Manual reads "?? depends on the source?" and the Manual provides no information about assumed alternative fuel costs.[33] As detailed in other comments submitted to this docket by Sierra Club and many other entities, this lack of transparency and explanation makes it difficult to meaningfully comment on the analysis and conclusions that may appear in

[30] Dashboard, Executive Summary Tab; *see also id.* ("Regardless of the pathway, key potential regulatory policies that could facilitate decarbonizing gas utility services while also meeting Washington's regulatory requirements include enabling and supporting improvements in energy efficiency, improved utility planning and coordination, transmission planning, electricity and gas rate regulation, and emphasis on linking equity outcomes and energy resource development.").

[31] *See, e.g.*, Dashboard, Modelling Overview Tab ("This project does not recommend a particular pathway.").

[32] And because all pathways rely heavily on building electrification and nearly eliminate the use of pipeline fuels, the report should prominently note that gas utility business models will need to dramatically transition under any decarbonization pathway. The Commission, the State Legislature, and other policymakers should be planning for this transition and implementing policies to facilitate it as soon as possible.

[33] SSG, Washington Decarbonization Pathways Study Data, Methods, and Assumptions Manual, Version 1, at , 33, https://www.utc.wa.gov/sites/default/files/2022-11/Washington%20Data%20Methods%20and%20Assumptions%20Report.pdf; *id.* at 14 (noting that "[a] detailed description of the Alternative Fuels Production model will be included in the final DMA," but including no substantive information about the model or its assumptions).

the Commission's final report. It is especially difficult to understand and comment on the factors that may have led to some counterintuitive modeling results presented on the Dashboard.

An especially counterintuitive result presented on the Dashboard is that projected health benefits are somewhat greater under the alternative fuels pathway than under the electrification pathway.[34] In public meetings on the decarbonization pathways analysis, SSG stated that health benefits are estimated using the Environmental Protection Agency's Co-Benefits Risk Assessment Health Impacts Screening and Mapping Tool (COBRA).[35] COBRA estimates changes in health outcomes that result from changes in emissions of various air pollutants (namely, fine particle pollution, or $PM_{2.5}$, and its precursor pollutants).[36] These pollutants are primarily emitted from fuel combustion.[37] Alternative fuels emit at least as much of these air pollutants as traditional fossil methane, and some alternative fuels such as hydrogen could significantly increase these emissions.[38] It is highly counterintuitive that the alternative fuels pathway, whose defining characteristic is its greater reliance on fuel combustion than the electrification pathway, is projected to have greater air pollution-related health benefits (as measured by EPA's COBRA tool) than the electrification pathway.

The reason for this counterintuitive result is not clear from the available materials. One possibility is an error in the analysis.[39] Because the public does not have access to the information needed to determine whether an analytic error caused this modeling result (or others), the Commission should closely review SSG's analysis, address any errors to the extent possible, document the extent of its review in the final report, and clearly describe the limitations on the Commission's and the public's review of the SSG analysis in the final report.

Any other counterintuitive findings in SSG's analysis should be subject to similar scrutiny. One such finding is the conclusion that "[t]he Alternative Fuels scenario shows the lowest capital

---

[34] Dashboard, Financials Tab, Total Investment tables (showing, for example, $5.1 billion in health benefits in 2050 under the alternative fuels pathway, compared to $4.4 billion under the electrification pathway), https://cis-community.ssg.coop/washington/financial.

[35] SSG, *Washington Energy Decarbonization Examination Public Technical Meeting 4 Slides*, at 34 (Feb. 22, 2023), https://www.utc.wa.gov/sites/default/files/2023-02/Washington%20Tech%20meeting%204.pptx.

[36] EPA, *COBRA Questions and Answers*, https://www.epa.gov/cobra/cobra-questions-and-answers#2.

[37] *See, e.g.*, EPA, *Particulate Matter (PM) Basics* ("Most particles form in the atmosphere as a result of complex reactions of chemicals such as sulfur dioxide and nitrogen oxides, which are pollutants emitted from power plants, industries and automobiles."), https://www.epa.gov/pm-pollution/particulate-matter-pm-basics; EPA, *Basic Information About NO_2* (NO_2 primarily gets in the air from the burning of fuel"), https://www.epa.gov/no2-pollution/basic-information-about-no2#What%20is%20NO2.

[38] Madeleine L. Wright & Alastair C. Lewis, *Emissions of NOx from blending of hydrogen and natural gas in space heating boilers*, at 7, 11, Elementa: Science of the Anthropocene (May 31, 2022), https://doi.org/10.1525/elementa.2021.00114.

[39] Another factor that may have contributed to this result is that the alternative fuels pathway does not actually use very much alternative fuels, especially in buildings, as discussed above. A third possibility is that SSG's estimated health benefits include factors other than the effects of air pollution: its slides indicate that factors like physical activity, noise exposure, accessibility, and indoor air quality were considered. *See* SSG, *Washington Energy Decarbonization Examination Public Technical Meeting 4 Slides*, at 36. But SSG has not indicated that it quantified or monetized these health co-benefits, or what tools it would have used to do so. Moreover, it is not clear why an alternative fuels pathway would produce greater benefits in these areas than an electrification pathway—indeed, an electrification pathway would be expected to produce greater improvements in indoor air quality and greater reductions in noise from electric vehicle use.

investment of the three scenarios."[40] Other statements on the Dashboard indicate that SSG may have found the alternative fuels pathway to have the lowest total scenario cost as well, although this is difficult to confirm from the data on the Dashboard. A finding that the alternative fuels pathway is lower-cost than an electrification pathway would be counterintuitive in light of the contrary findings in the State Energy Strategy,[41] the 2023 Biennial Energy Report,[42] and other expert analyses.[43] These analyses include a recent report finding that it would cost one utility's ratepayers more than 5 times as much per ton of avoided emissions to decarbonize using alternative fuels than to decarbonize by investing in electrification.[44] Possible explanations for such a counterintuitive result include failure to account for the risks and costs of alternative fuels discussed above, minimal use of alternative fuels in buildings under the alternative fuels pathway, or potential analytical errors. As with SSG's counterintuitive conclusion about the scenarios' relative health impacts, there is not enough information available to understand SSG's findings on the scenarios' capital investment and total scenario costs, so it must fall to the Commission to scrutinize these findings and describe any anomalies in its final report.

III. The Commission should consider relevant findings about the scale of resource needs under different decarbonization pathways in evaluating the pathways' viability and developing policies

Despite the issues with SSG's analysis, it includes some findings about the scale of resources needed under the electrification and alternative fuel scenarios that could be valuable in assessing the pathways' viability and in developing decarbonization policies. In particular, the analysis gives a sense of how much alternative fuels would need to be available for those fuels to have a role in decarbonizing buildings, and it indicates that electric demands are likely similar across the different pathways.

---

[40] Dashboard, Financials tab.

[41] Washington State Department of Commerce, *Washington 2021 State Energy Strategy* at 15,46, 66 (Dec. 2020), (finding that "decarbonizing the building sector requires the state to maximize electrification," which is the least-cost way to achieve decarbonization goals), https://www.commerce.wa.gov/wp-content/uploads/2020/12/Washington-2021-State-Energy-Strategy-December-2020.pdf.

[42] Washington State Department of Commerce, *2023 Biennial Energy Report* at 46 (March 2023) ("Decarbonizing the building sector requires the state to: Maximize energy efficiency [and] Maximize electrification [among other actions].), https://deptofcommerce.app.box.com/s/uohdamh5qd1fwal543x78elme2w0pr0h.

[43] See, e.g., Charles Li et al., *Financial Impact of Fuel Conversion on Consumer Owned Utilities and Customers in Washington*, E3 (May 2022), https://www.commerce.wa.gov/wp-content/uploads/2022/06/WA-COU-Building-Electrification-Final-Report.pdf; Poppy Storm et al., *Operation 2030: Scaling Building Decarbonization in Washington State*, Clean Energy Transition Institute & 2050 Institute (Jan. 2022), https://uploads-ssl.webflow.com/5d8aa5c4ff027473b00c1516/61d7a479ba34328152be6239_CETI-2050%20Institute%20Operation%202030%20White%20Paper_2022-01-05.pdf; Jonny Kocher & Talor Gruenwald, *Washington State Could Lead the Nation on Building Electrification Codes*, RMI (Jan. 2022), https://rmi.org/washington-state-could-lead-the-nation-on-building-electrification-codes/; Rewiring America, *Bringing Infrastructure Home: A 50-State Report on U.S. Home Electrification* at 108 (June 2021), https://www.rewiringamerica.org/policy/bringing-infrastructure-home-report.

[44] Meera Fickling et al., *A Path to Pollution-Free Buildings: Meeting Xcel's 2030 Gas Decarbonization Goals*, at 12, Western Resource Advocates, Southwest Energy Efficiency Project, and Natural Resources Defense Council (with cost analysis from Synapse Energy Economics, Inc.) (July 2023), https://westernresourceadvocates.org/publications/a-path-to-pollution-free-building/.

The Dashboard gives a sense of the rate at which alternative fuel production would need to ramp up for those fuels to be used in buildings. For example, in 2030, the alternative fuels pathway uses 79 million MMBtu of total hydrogen and 40 million MMBtu of total RNG.[45] In that year, the pathway delivers 5 million MMBtu of hydrogen to the residential sector (representing about 2.2% of total residential energy use) and 5 million MMBtu of hydrogen to the commercial sector (representing about 2.5% of total commercial energy use). The pathway delivers 8 million MMBtu of RNG each to the residential and commercial sectors in 2030, representing 3.5% and 4% of those sectors' total energy use, respectively. So in order for alternative fuels to meet just 5-7% of Washington's residential and commercial energy demand, roughly 79 million MMBtu of hydrogen and 40 million MMBtu of RNG would need to be available in Washington. Similar calculations can be performed for other years, such as 2035, when the alternative fuels pathway uses 126 million MMBtu of total hydrogen and 83 MMBtu of total RNG. And because the alternative fuels pathway is expressly designed to focus on using alternative fuels in Washington, these values should be considered an upper-bound on the overall statewide availability of alternative fuels and the rate at which those fuels are used in Washington's buildings.

Accordingly, the Commission should be highly skeptical of any proposals in gas utility IRPs, decarbonization plans, etc., to use more alternative fuels in a given year than the pathway indicates will be available, or to deliver a greater share of available alternative fuels than the pathway allocates to buildings. For example, a proposal to meet 5% of total residential energy demand with RNG by 2030 would likely not be feasible based on SSG's analysis. Similarly, a proposal to meet 3.5% of total residential energy demand with RNG by 2030 would not be feasible unless roughly 80 million MMBtu of total RNG is projected to be available statewide. By contrast, rapidly increasing penetration of electric heating equipment is not only necessary under any pathway, but achievable thanks to strong incentive support and a rapidly-maturing market.

Finally, SSG's analysis finds that peak electricity demand is generally consistent across scenarios, and that it can be managed through measures like demand response.[46] This finding needs to be taken with a grain of salt, since even the alternative fuels pathway relies primarily on electricity to meet buildings' energy needs, as discussed above. Nevertheless, this finding suggests that the Commission should be skeptical of claims that building electrification presents unique or insurmountable issues with peak electric load.

SSG's analysis likely gives stronger support for these findings about the amount of alternative fuels and electricity used under different pathways than for its findings about the pathways' expected costs. Modeling analysis is generally better suited to address questions about expected energy needs than questions about whether alternative fuel technologies will become commercially available and how much they will cost. Nevertheless, more information about SSG's inputs, assumptions, and methodology is needed to fully assess these findings, and we hope to see that information provided with the Commission's final report to the legislature.

[45] Dashboard, Energy Sankey tab, https://cis-community.ssg.coop/washington/energy-sankey.
[46] Dashboard, Demand Summary tab ("Peak electricity demand … is relatively consistent across all the scenarios, with one notable exception in the hybrid scenario in 2040."); *id.* ("The electricity demand from space heating and space cooling is relatively the same across all three scenarios.").

IV. Conclusion

We urge the Commission to be clear about the risks and limitations of alternative fuel use in buildings in its final report to the State Legislature. Some of these limitations may already be incorporated into SSG's pathways analysis, as evidenced by the minimal use of these fuels in buildings even under the "alternative fuels" pathway. However, the Commission's final report must be much clearer and more explicit than the Dashboard in describing the risks discussed in Section I of these comments, and in clarifying that electrification is the primary decarbonization strategy for buildings under all scenarios. Without these important clarifications, the report could give the false and misleading impression that electrification and reliance on alternative fuels are equally viable approaches for buildings. We also urge the Commission to address any errors that led to the Dashboard's counterintuitive findings about the pathways' health benefits and possibly their costs. Finally, we encourage the Commission to consider the Dashboard's findings about how much alternative fuels are likely to be available for use in buildings when evaluating utility decarbonization strategies and policy proposals that rely on widespread use of those fuels.

Thank you for considering these comments, and Sierra Club's earlier comments in this proceeding.

Sincerely,

Jim Dennison
Associate Attorney
Sierra Club
jim.dennison@sierraclub.org