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July 19, 2024

Will Seuffert, Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, Minnesota 55101-2147

Re: *In the Matter of a Commission Investigation into Gas Utility Resource Planning* (Docket No. G008, G002, G011/CI-23-117)

I am a pediatrician practicing in Minnesota and as such, am concerned about the relevance of future gas utility resource planning on the well-being of my patients and Minnesota children in general. I have also conducted research on natural gas but am submitting these comments on my own behalf as an individual.

I appreciate the opportunity to share this comment on the Commission's Investigation into Gas Utility Resource Planning. With this Investigation, the Commission has a unique opportunity to incorporate the broader costs and benefits of future resource plans. This letter briefly notes the impacts of natural gas use on air quality and public health, and encourages the Commission to incorporate health-based analyses and equity considerations into the gas utility planning process.

Natural gas impacts health through its effects on indoor and outdoor air quality

Minnesota's natural gas utilities are responsible for procuring and delivering supplies of natural gas to its customers through natural gas distribution systems. Distribution systems produce emissions through natural gas leaks and the operation of certain fuel-burning equipment (e.g., gas heaters at metering & regulating stations, compressor stations). Behind the meter emissions for utility customers can result from leaks and from combusting natural gas.

Outdoor air quality impacts and health

In the most recent National Emissions Inventory,[1] the combustion of natural gas in Minnesota's residential and commercial sectors produced 10,623 tons of nitrogen oxide emissions and 606 tons of volatile organic compound emissions in 2020. These emissions are released primarily into the outdoor air, except for incompletely ventilated gas stoves that affect indoor air quality. Furthermore, we know from a growing body of research that these air quality impacts are not fairly distributed.

[1] Available from the US Environmental Protection Agency at https://www.epa.gov/air-emissions-inventories/2020-nei-supporting-data-and-summaries

As a toxic gaseous byproduct of combustion, and a major pollutant regulated under the Clean Air Act, nitrogen dioxide has been consistently associated with increased mortality, cardiovascular disease, and pulmonary disease.[2]

Indoor air quality impacts and health

Research studies have shown a relationship between gas stoves, air pollution, and childhood asthma for over 30 years.[3] Based upon the epidemiologic evidence accrued during that time, more recent studies have shown that a significant proportion of childhood asthma cases in the U.S. can be attributed to gas stove use in the home.[4] More recent studies continue to demonstrate a relationship between gas stoves and childhood asthma.[5]

The impact of air pollution is inequitable

The health impacts noted above are not distributed equally along socioeconomic dimensions. Black and Hispanic residents face a higher health burden due to outdoor air pollution.[6] Smaller residences (i.e., rental units or smaller homes associated with lower income) are also more likely to have higher indoor nitrogen dioxide concentrations resulting from gas stove use relative to larger homes (i.e., homes associated with higher income).[7] Similarly, low-income rental housing was found to have indoor nitrogen dioxide concentrations that were 165% higher than concentrations in comparison homes.[8]

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[2] Huang S, Li H, Wang M, Qian Y, Steenland K, Caudle WM, Liu Y, Sarnat J, Papatheodorou S, Shi L. Long-term exposure to nitrogen dioxide and mortality: A systematic review and meta-analysis. Sci Total Environ. 2021 Jul 1;776:145968.
Stieb DM, Berjawi R, Emode M, Zheng C, Salama D, Hocking R, Lyrette N, Matz C, Lavigne E, Shin HH. Systematic review and meta-analysis of cohort studies of long term outdoor nitrogen dioxide exposure and mortality. PLoS One. 2021 Feb 4;16(2)

[3] Lebowitz MD, Collins L, Holberg CJ. Time series analyses of respiratory responses to indoor and outdoor environmental phenomena. Environ Res. 1987 Aug;43(2):332-41.

[4] Gruenwald T, Seals BA, Knibbs LD, Hosgood HD 3rd. Population Attributable Fraction of Gas Stoves and Childhood Asthma in the United States. Int J Environ Res Public Health. 2022 Dec 21;20(1):75.
Kashtan Y, Nicholson M, Finnegan CJ, Ouyang Z, Garg A, Lebel ED, Rowland ST, Michanowicz DR, Herrera J, Nadeau KC, Jackson RB. Nitrogen dioxide exposure, health outcomes, and associated demographic disparities due to gas and propane combustion by U.S. stoves. Sci Adv. 2024 May 3;10(18).

[5] Bédard MA, Reyna ME, Moraes TJ, Simons E, Turvey SE, Mandhane P, Brook JR, Subbarao P. Association between gas stove use and childhood asthma in the Canadian CHILD Cohort Study. Can J Public Health. 2023 Aug;114(4):705-708.
Han YY, Rosser F, Forno E, Acosta-Pérez E, Canino G, Celedón JC. Gas stove use and asthma in a longitudinal study of Puerto Rican children and adolescents. J Allergy Clin Immunol Pract. 2023 Aug;11(8):2599-2601.

[6]Buxton MA, Fleischer NL, Ro A, O'Neill MS. Structural racism, air pollution and the association with adverse birth outcomes in the United States: the value of examining intergenerational associations. Front Epidemiol. 2023 Jun 22;3:1190407.
Tessum CW, Apte JS, Goodkind AL, Muller NZ, Mullins KA, Paolella DA, Polasky S, Springer NP, Thakrar SK, Marshall JD, Hill JD. Inequity in consumption of goods and services adds to racial-ethnic disparities in air pollution exposure. Proc Natl Acad Sci U S A. 2019 Mar 26;116(13):6001-6006.

[7] Kashtan Y, Nicholson M, Finnegan CJ, Ouyang Z, Garg A, Lebel ED, Rowland ST, Michanowicz DR, Herrera J, Nadeau KC, Jackson RB. Nitrogen dioxide exposure, health outcomes, and associated demographic disparities due to gas and propane combustion by U.S. stoves. Sci Adv. 2024 May 3;10(18).

[8] Zhao H, Chan WR, Cohn S, Delp WW, Walker IS, Singer BC. Indoor air quality in new and renovated low-income apartments with mechanical ventilation and natural gas cooking in California. Indoor Air. 2021 May;31(3):717-729.

The Commission has several options to incorporate the cost of health impacts into the gas utility resource planning process

As noted above, the consumption of natural gas in Minnesota's buildings is a significant source of nitrogen oxide and volatile organic compound emissions and thus affects health and health equity. Gas utility resource plans, similar to the Conservation Improvement Program's cost-effectiveness analyses, should consider the societal impacts of their associated emissions increases or decreases.

Beyond simply reporting emissions, I suggest two options whereby resource plans could further quantify health impacts for use in future decision-making.

1) Apply established environmental cost factors

The Department of Commerce recently updated the Conservation Improvement Program's (CIP) cost-effectiveness process through a final decision issued in March 2023. In particular, the impacts of criteria air pollutant emissions are to be incorporated into CIP cost-effectiveness determinations using Environmental Damage Factors taken from the Commission's 2018 Order.[9]

The Commission could incorporate a similar application of its environmental cost values to assess the health impacts of future gas resource plans. The environmental cost values provide a succinct and straightforward approach that would not impose significant burdens on natural gas utilities.

2) Utilize existing assessment tools

Alternatively, the Commission could require the use of established tools for calculating changes in health costs resulting from future gas resource plans. The Environmental Benefits Mapping and Analysis Program (BenMAP)[10] is an open-source tool produced and managed by the US Environmental Protection Agency (EPA). It uses health impact functions to assess the changes in health outcomes, as well as costs, of reductions in air pollution. The Co-Benefits Risks Assessment (COBRA) tool,[11] also available from the US EPA, is similarly intended to assess the health benefits and reduced health care costs that result from reductions in air pollution.

Recommendations

As recognized in other proceedings, the consumption of natural gas by Minnesota's buildings results in both greenhouse gas and criteria air pollutants. The incorporation of societal costs produced by criteria pollutant emissions, particularly their impact on Minnesotans' health, are now explicitly incorporated into the cost-effectiveness process for the Conservation Improvement Program. I urge the Commission to similarly incorporate a requirement that gas utility resource plans assess changes in societal costs through their impact on criteria pollutant emissions.

[9] Order updating environmental cost values. Issue date: Jan 3 2018. Docket No. E-999/CI-14-643
[10] For more background, see https://www.epa.gov/benmap
[11] See https://www.epa.gov/cobra for more information

Recommendation 1:

I would specifically recommend that the Commission adopt option 1 (apply established environmental cost factors). The environmental cost factors have undergone assessment by the Commission and can be updated in the future to incorporate newer science on air quality impacts. The burden on utilities will be lower than option 2 and not require any additional tools or training but will nonetheless represent a significant advancement in the gas planning process.

Recommendation 2:

I would further recommend that the Commission require a delineation of the extent to which gas utility resource plans will impact environmental justice communities. This could include, for example, delineating the proportion of a project or a project's emissions that would be located within environmental justice communities in order to assess the degree to which benefits or costs will fall upon them.

I conclude by thanking the Commission for the opportunity to comment on their Investigation into Gas Utility Resource Planning, and their consideration of health and equity in the gas resource planning process.

Sincerely,

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