January 29, 2025

RE: In the Matter of an Investigation into Implementing Changes to the Renewable Energy Standard and the Newly Created Carbon Free Standard under Minn. Stat. § 216B.1691; **Docket No. E-999/CI-23-151** per the October 31, 2024 Notice of Comment Period and Updated Timeline

Dear Executive Secretary Seuffert:

Health Professionals for a Healthy Climate (HPHC), Climate Generation, CURE, Minnesota Environmental Justice Table, Minnesota Interfaith Power and Light, MN350 and Sierra Club North Star Chapter appreciate the opportunity to submit additional comments on Docket 23-151, pertaining to the implementation of Minnesota's 100% Carbon Free Law. In this letter we respond to Topic #5. Are there other issues or concerns related to this matter?

In previous comments we asserted our position that biomass and incineration are not carbon-free technologies. Both biomass and incineration directly emit carbon and therefore cannot be included under the plain language of the 100% Carbon Free Law. All biomass emits carbon when it is burned, including waste to energy facilities, which burn garbage or biomass that generate large amounts of carbon pollution. Any technology that burns biomass should not be considered carbon free, nor should it receive partial compliance credit. We noted that the greenhouse gas emissions from biomass plants are comparable to coal plants and worse if compared to the amount of energy produced for each ton of carbon.[1] We also noted that trash incinerators emit up to 2.5 times as much greenhouse gasses per unit of electricity produced than coal-fired power plants and 3.8 times as much greenhouse gasses as the grid average.[2]

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[1] Partnership for Policy Integrity https://www.pfpi.net/biomass-basics/

[2] Neil Tangri, Waste Incinerators Undermine Clean Energy Goals, PLOS Clim 2(6): e0000100 (June 1, 2023), https://doi.org/10.1371/journal.pclm.0000100 (Researchers found that trash "incinerators emit more

Having established our position that biomass burning should be ineligible for inclusion as a carbon free energy source, we will comment on the need to consider impacts from co-pollutants generated by biomass emissions on human health, especially in environmental justice communities.

Topic #5. Are there other issues or concerns related to this matter? We urge the PUC to consider impacts on human health from co-pollutants generated by biomass emissions. Such co-pollutants should be quantified and tracked along with any renewable energy credits/carbon-free credits that these dirty sources of energy are associated with.

The 100% Carbon Free Law calls for maximizing benefits to *all* Minnesotans, including sharing in the benefits of clean and renewable energy, particularly in environmental justice areas. Allowing burning of biomass as an energy source is counter to this goal. Burning biomass has significant public health and environmental justice consequences, per Harvard T.H. Chan School of Public Health's Jonathan Buonocore,[3] who notes, "Declaring biomass to be carbon neutral with no regard for the health consequences may set us onto a path toward further investing in an energy system with an already-serious health burden, ambiguous climate benefits and environmental justice issues in the supply chain."[4] Across the U.S. and in Minnesota we've significantly reduced our use of coal as an energy source, and have plans to shut down our largest coal units in the coming decade. It would be counterproductive to our climate goals to replace coal with burning biomass, another health harming energy source.

Co-Pollutant Emissions from Biomass Burning

Biomass energy facilities emit nitrous oxide, sulfur dioxide, carbon monoxide, hazardous air pollutants, and volatile organic compounds (VOCs)[5] [6] that can endanger human health, which is contrary to the 100% Carbon Free Law's mandate to ensure all Minnesotans enjoy the benefits of clean energy. Air pollutants from fuel combustion also contribute significantly to $PM_{2.5}$ and ozone, which increases risk for cardiovascular and respiratory disease, stroke, asthma, autism spectrum disorder, and premature mortality.[7] Incinerators specifically harm the communities in which they're located, which are mostly low income and BIPOC communities, by emitting dangerous air pollutants like nitrogen and sulfur

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greenhouse gas emissions per unit of electricity produced (1707 g CO 2 e/kWh) than any other power source (range: 2.4 to 991.1 g CO2 e/kWh)"—more polluting than all fossil fuel generating plants).

[3] Buonocore JJ, Sakimifard p, Michanowicz DR, Allen JG. A decade of the U.S. energy mix transitioning away from coal: historical reconstruction of the reductions in the public health burden of energy. Environmental Research Letters. 2021;16(5).

[4] Buonocore, Jonathan. Biomass is not health neutral, March 27, 2022. The Hill.

[5] Ibid.

[6] Partnership for Policy Integrity https://www.pfpi.net/biomass-basics/

[7] Buonocore, The Hill, 2022.

oxides, lead, particulate matter, dioxins & furans, PFAS, VOCs, and mercury.[8] These pollutants contribute to serious health impacts like cancer, respiratory and heart disease, as well as reproductive and developmental problems.[9]

Air pollution from burning biomass is also linked to asthma exacerbations, hospitalizations for heart attack and respiratory disease, birth defects, neurodegenerative diseases, and premature death.[10] The adverse effects on human health from indoor wood burning in the developing world are well documented. The World Health Organization estimates that exposure to particulate matter (PM) from residential heating using wood burning is responsible for 61,000 excess deaths per year in the European Union.[11] A growing body of evidence also demonstrates health impacts from increased use of biomass for energy in Europe and the U.S.. It's estimated that 40,000 excess deaths per year are attributable to biomass smoke in Europe.[12] Biomass combustion emissions contribute to increased concentration of $PM_{2.5}$ pollution in the local environment. Notably, studies from Denmark and Sweden found that air pollution from wood burning in rural areas was at levels similar to levels in urban areas with high traffic.[13] Authorizing Minnesota's aging coal plants to instead burn biomass will also visit these health harms onto rural Minnesotan communities with clear environmental justice populations, both Indigenous and low-income groups.

Buonocore's study on impacts of biomass burning in the U.S. found significant air pollution health impacts in 24 states from biomass and wood. The study concluded "… that burning wood and biomass in buildings and in industry had a combined public health burden of at least 18,000 deaths, higher than that of coal-fired power plants."[14] The study also broke out excess deaths from various types of biomass energy, concluding for 2017 in the US:

- Residential burning of firewood was responsible for 9,800-16,000 excess deaths
- Biomass in industrial boilers was responsible for 8,000-15,000 excess deaths
- Use of biomass burning in commercial buildings contributed to 640-1200 excess deaths

Environmental Justice Considerations

The use of biomass combustion, including garbage, as an energy source exacerbates environmental injustice and is incompatible with the plain language of the Carbon Free law. Of the 72 large incinerators still operating in the U.S., 80% are situated in

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[8] GAIA, 2019. Waste Incineration: Pollution and Health Impacts.

[9] Ana Baptista, The Conversation. Is burning trash a good way to dispose of it? Waste incineration in charts. Science. June 23, 2019.

[10] Buonocore et al, 2021.

[11] Sigsgaard T, Forsberg B, Annesi-Maesano I, Blomberg A, et al. Health impacts of anthropogenic biomass burning in the developed world. Eur Respir J. 2015;46:1577-1588.

[12] Ibid.

[13] Ibid.

[14] Buonocore et al, 2021.

environmental justice communities, which have higher proportions of low income and BIPOC people.[15] Six of the seven municipal incinerators in Minnesota are located in environmental justice (EJ) areas, as defined by Minnesota's cumulative impacts law (MN statute 116.065). They include the Hennepin Energy Recovery Center (HERC) in Minneapolis, Olmsted Waste-to-Energy Facility in Rochester, and facilities in Red Wing, Mankato, and other areas. The burden of pollution from garbage burning in these communities adds to the existing air pollution burden from traffic and industrial sources in these cities. The Minnesota Department of Health (MDH) reports that communities in the Twin Cities Metro are exposed to high levels of air pollution, contributing to 1,600 deaths, 10% of all deaths metro-wide in 2015.[16] Zip codes in specific EJ areas in Minneapolis – Phillips, Northside, Elliot Park - have the highest exposure to air pollution in the state contributing to rates of pediatric asthma emergency department visits at 4-5 times the rate for the whole state.[17] MDH also reports that urban communities in Greater Minnesota also have higher exposure to air pollution, with potential health impacts from fine particles and ozone in Rochester and other cities.[18]

To the extent that the Commission allows renewable energy credits/carbon-free credits from other jurisdictions to be used in utility compliance with this law, it will be subsidizing the co-pollutant health harms described above in other states and jurisdictions. For each credit retired elsewhere, there is likely a low-income impacted community that will be harmed by this pollution, and a Minnesota community will have also been harmed from co-pollutants from the fossil-fuel generation that the credit is being used to offset.

In addition to incinerators, EJ communities are also impacted by the siting of woody biomass production facilities in their communities. Biomass facilities include both processing plants that turn trees into a uniform fuel, as well as the plants where the biomass is burned to make energy. In the southeastern U.S. these facilities are 50% more likely to be sited in EJ communities. These facilities expose surrounding communities to heavy duty truck emissions, on site wood burning for energy, and water pollution. The NAACP found that African Americans living near biomass power plants are exposed to smog, asbestos, sulfur dioxide, and other toxins which put their health at risk.[19] There are four biomass facilities in Minnesota, including St. Paul District Heating, Laurentian Energy Authority in Virginia and Hibbing, and M.L. Hibbard Renewable Energy Center in Duluth MN. Situated in an urban area, Hibbard burns wood paper pulp for energy, emitting CO_2,

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[15] Ana Baptista, 2019.

[16] Minnesota Department of Health. Health Impacts of air pollution. Life and Breath: Metro (updated 2022).

[17] Asthma rates in Minneapolis EJ Communities (2015-2019) & (2016-2020)- annual asthma hospitalization & emergency department (ED) visits for ages 0-17, age adjusted per 10,000 people https://data.web.health.state.mn.us/asthma_staticmaps

[18] Minnesota Department of Health. Health Impacts of air pollution. Life and Breath: Greater Minnesota (published 2022)

[19] Koestar S, Davis S. Siting of Wood Pellet Production Facilities in Environmental Justice Communities in the Southeastern United States. Environmental Justice. 2018;11(2):64-70.

NOx, SO_2, PM, and VOCs. Minnesota Power's 2021 Integrated Resource Plan's projected emissions for Hibbard could cause an estimated 6.4 to 38.9 mortalities and a total of $70 to $437 million in health care impacts, depending on projections of future emissions. Emissions for Hibbard affect downwind communities, disproportionately affecting Native people.[20]

In conclusion, we ask that you consider the serious health impacts resulting from allowing burning biomass from any source, including wood and forestry residues, agricultural or industrial residues or municipal solid waste. Burning biomass for energy is incompatible with Minnesota's carbon free future and with our obligation to protect and improve the health of all communities, especially environmental justice communities. To the extent that the PUC allows any of these dirty energy sources going forward, including partial implementation between now and 2040, the tracking process and utility planning should effectively quantify and analyze the deaths and morbidity these facilities cause in overburdened communities in Minnesota and other jurisdictions. This is consistent with the PUC's quantification and inclusion of externalities in planning dockets, and expanding the externality values and their use would be consistent with the 100 percent law's focus on protecting environmental justice communities from undue harm.

Respectfully,

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[20] PSE Healthy Energy on Behalf of Fresh Energy, Minnesota Center for Environmental Advocacy, and the Sierra Club. Incorporating Health and Equity Metrics into the Minnesota Power 2021 Integrated Resource Plan. April 2022.