STATE OF MINNESOTA
BEFORE THE PUBLIC UTILITIES COMMISSION

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In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota's Carbon-Free Standard	**Docket No. E-999/CI-24-352**

CURE, Health Professionals for a Healthy Climate, Partnership for Policy Integrity, Minnesota Interfaith Power and Light, and Minnesota Environmental Justice Table Answer to Petition for Reconsideration and Clarification

June 15, 2026

Introduction

Pursuant to Minn. R. 7829.3000, Subp. 4, CURE, Health Professionals for a Healthy Climate, the Partnership for Policy Integrity, Minnesota Interfaith Power and Light, and Minnesota Environmental Justice Table (jointly "Supporting Petitioners") file this answer to the Clean Energy Organizations' Petition for Reconsideration and Clarification[1] in the above-captioned docket.

The Supporting Petitioners support the CEOs petition's overall request for reconsideration and urge the Public Utilities Commission (Commission) to take up this petition in order to correct its interpretation of "carbon free" energy and to reconsider the Fuel Life-Cycle Analysis approach to implementation, which would allow for carbon-emitting generation sources to be designated "carbon free," contrary to both the language and intent of Minnesota law.[2] Public health, environmental protection, and basic logic dictate that the Carbon-Free Standard (CFS) must be implemented as written, and not undercut by a reading that doesn't meet Minnesota's needs for a 100 percent clean energy future.

I. Burning Wood Biomass for Electricity Emits Carbon and Promotes Unsustainable Forest Management Practices

Biomass energy is more expensive than almost every other form of dispatchable energy. The average levelized cost of electricity from biomass in the United States is more than twice that of on-shore wind, natural gas, geothermal, or stand-alone solar.[3] But it's not just a rip-off for ratepayers, it's also a disaster for the climate.

a. Woody biomass burning emits more carbon than coal, especially in the immediate, climate-relevant timeframe

Wood-burning power plants emit around 50 percent more CO_2 out the stack than coal plants per megawatt hour (MWh) and 200-300 percent more than a natural gas plant. It is

[1] Clean Energy Organizations Petition, *In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota's Carbon-Free Standard*, June 3, 2026, eDockets No. 20266-232518-02.
[2] Members of the Minnesota Legislature, Comment, *In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota's Carbon-Free Standard*, Sept. 17, 2025, eDockets No. 20259-223129-01.
[3] U.S. Energy Information Administration, Levelized Costs of New Generation Resources in the Annual Energy Outlook 2022, March 2022, Table 1b, www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf.

only through a sleight of hand that wood burning is painted as "carbon neutral," leading to policy decisions that are harmful to communities and the climate.[4]

Burning wood to produce electricity typically results in net emissions that exceed those from fossil fueled energy for decades and even centuries. The timeframe is critical because it is the reduction of emissions *now*, and the next decade or two, that can mitigate the impacts of greenhouse gas emissions on the livability of our planet, rather than exacerbate them. A comprehensive review of the published scientific literature found that "the vast majority of all published quantitative assessments have concluded that there are net greenhouse gas (GHG) emissions associated with the use of forest-derived woody biomass for electricity production when compared to generating an equivalent amount of energy from fossil sources, even when accounting for subsequent biomass regrowth and avoided fossil emissions."[5]

When woody biomass is burned to generate electricity in utility-scale power plants, the net carbon emissions after 40 years are still higher than if the power had been generated with coal, even taking forest regrowth into consideration. The length of time to achieve "parity" with carbon emissions from natural gas is at least 90 years.[6]

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[4] Mary S. Booth, *Trees, Trash, and Toxics: How Biomass Energy Has Become the New Coal,* Partnership for Policy Integrity, (Apr. 2014), https://www.pfpi.net/wp-content/uploads/2014/04/PFPI-Biomass-is-the-New-Coal-April-2-2014.pdf).

[5] John S. Gunn et al., *Scientific Evidence Does Not Support the Carbon Neutrality of Woody Biomass Energy: A Review of Existing Literature*, SIG-NAL Report 2018-01.

[6] Thomas Walker et al., *Carbon Accounting for Woody Biomass from Massachusetts (USA) Managed Forests: A Framework for Determining the Temporal Impacts of Wood Biomass Energy on Atmospheric Greenhouse Gas Levels*, 32 J. Sustainable Forestry 130-158 (2013), https://doi.org/10.1080/10549811.2011.652019; *see also* Scott Pruitt, U.S. Environmental Protection Agency, Apr. 23, 2018, EPA's Treatment of Biogenic Carbon Dioxide (CO_2) Emissions from Stationary Sources that Use Forest Biomass for Energy Production (available at https://www.epa.gov/sites/default/files/2018-04/documents/biomass_policy_statement_2018_04_23.pdf) (noting that "it is not scientifically valid to assume that all biogenic feedstocks are carbon neutral"); Pete Smith et al., Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, *Climate Change 2014: Mitigation of Climate Change, Agriculture, Forestry and Other Land Use (AFOLU)*879 (2014), https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter11.pdf (explaining that "the neutrality perception is linked to a misunderstanding of the guidelines for GHG inventories").

b. *Life-cycle analyses demonstrate that "waste biomass" is not carbon-neutral in a meaningful timeframe*

Limiting eligible biomass to "waste biomass" does not remedy the timeframe problem inherent in a "carbon-neutral" standard under a life-cycle analysis.[7] Researchers at the Canadian Forest Service found that when natural gas power plants are the counterfactual, all woody biomass fuels will exceed emissions *for more than a century* (with the single exception of harvest residues that would have been burned on site). [8] When compared to coal plants, "waste biomass" harvest residues used as fuel for electricity would not achieve parity with coal plant emissions for 15-40 years, and salvaged trees would take 50 years or longer.[9]

Even in a theoretical case where only true harvest residues are burned, the carbon emissions are still net additive to the atmosphere for decades and thus cannot be construed as "carbon neutral" within climate-relevant timeframes.[10] Minnesota does not have this kind of time to waste, and the carbon-free standard did not allow for this kind of noncompliance in its very clear definitional language.

c. *Future tree growth cannot be relied upon to justify burning trees as "carbon-free"*

Any lifecycle analysis that is reverse engineered in such a way as to make woody biomass electricity appear "carbon neutral" is simply wrong. The premise of woody biomass as a carbon-neutral (or carbon-free) energy source is untenable because any hypothetical offsetting from growing trees is outside of the Commission's purview or oversight.[11] Furthermore, life-cycle analyses of biomass fuel do not include all the carbon impacts

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[7] *See* PFPI Reply Comment, *In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota's Carbon-Free Standard*, Aug. 20, 2025, eDockets No. 20258-222278-01 (discussing the GREET model and tax credits for bioenergy under the Inflation Reduction Act).

[8] Jérôme Laganiere et al., *Range and Uncertainties in Estimating Delays in Greenhouse Gas Mitigation Potential of Forest Bioenergy Sourced from Canadian Forests*, 9 Global Change Biology Bioenergy 358–369 (2017), https://onlinelibrary.wiley.com/doi/epdf/10.1111/gcbb.12327. A web-based version of the calculator is available at https://apps-scf-cfs.rncan.gc.ca/calc/en/bioenergy-calculator.

[9] When the counterfactual is that logging residues are left in the forest and decompose, this exception is rendered meaningless.

[10] *See* Mary S. Booth, *Not Carbon Neutral: Assessing the Net Emissions Impact of Residues Burned for Bioenergy*, Environmental Research Letters, Feb. 21, 2018, https://iopscience.iop.org/article/10.1088/1748-9326/aaac88.

[11] Importantly, it is outside of any Minnesota regulator's authority because the carbon pollution is spread far outside of state borders and impacts private and public lands globally.

associated with bioenergy production, such as soil carbon loss in logged areas and the foregone carbon sequestration from harvesting living trees. When compared with truly carbon-free energy sources such as wind and solar, the "carbon debt" from biomass combustion will never be paid off.

II. Burning Garbage Emits Carbon and is an Environmental Justice Travesty

a. Garbage burning also emits more carbon than coal

Burning trash for energy is also neither clean nor carbon-free, emitting more GHGs per unit of energy than any other energy source. A 2023 peer-reviewed study found that incinerators emit 1.7 times as much GHGs as coal.[12] The Supporting Petitioners and others have documented throughout the relevant dockets the climate and community harms directly resulting from trash burning.[13] Although the Commission warns against absurd results, it is hard to imagine a more absurd result than a supposed "carbon-free" standard that not just allows, but incentivizes, the use of one of the dirtiest and most carbon-intensive forms of energy production, and in so doing draws resources away from truly clean generation such as solar and wind.

b. *Allowing for Garbage Burning Under the CFS Undermines Minnesota's Waste Policy Priorities*

The Supporting Petitioners maintain that the CFS is energy policy, not waste policy, and the Commission should not attempt to conflate the two. The Commission has neither the purview nor the expertise necessary to support its conclusion in the Order that denying trash burning carbon-free energy status would "conflict with the state's Waste

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[12] Neil Tangri, *Waste Incinerators Undermine Clean Energy Goals*, PLOS Climate, June 1, 2023, https://doi.org/10.1371/journal.pclm.0000100. This same study also compares MSWI with the national grid average and discovered even more damning results: incinerators emit 3.8 times as much GHGs, 14 times as much NOx, and 1.3 times as much SO2 as the grid in totality.

[13] *See* Minnesota Environmental Justice Table, CURE Reply Comments, *In the Matter of the Commission Investigation into the Definition of Carbon-Free Pursuant to Minnesota Statute § 216B.1691,* July 24, 2024, eDockets No. 20247-208915-01; Minnesota Environmental Justice Table Reply Comments, eDockets No. 20247-208927-01; Clean Energy Organizations Reply Comments, July 24, 2024, eDockets No. 20247-208912-01; CEO Initial Comments, *In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota's Carbon-Free Standard,* June 5, 2025, eDockets No. 20256-219637-01; CURE Reply Comments, August 20, 2025, eDocket No. 20258-222281-01.

Management Act."[14] This is not a matter of utility regulation that the Commission understands. Exemplifying this lack of authority and expertise is the Commission's explanation that the WMA "favors using waste as fuel rather than sending it to a landfill"[15] while failing to acknowledge that both methods of waste disposal fall at the absolute bottom of Minnesota's Waste Hierarchy, and are subordinate to source reduction, reuse, and recycling of waste.[16] How does promoting the production of waste by designating it a carbon free energy fuel not undermine Minnesota's mandated waste reduction goals as codified in the Waste Hierarchy? How would this designation conflict, for example, with Minnesota's 2024 Packaging Waste and Cost Reduction Act which seeks by 2032 to shrink a major source of the feedstock for incinerators which the Commissions new interpretation of the CFS would now incentivize through 2040 and beyond?[17]

A Fuel Life-Cycle Analysis which treats the generation of waste as an inevitable and static phenomenon without incorporating a growing body of policy and local and state-wide initiatives aimed at reducing or even eliminating the production of waste will be incomplete and skewed toward an artificial "carbon-free" determination for burning garbage for energy. By incentivizing the production of large amounts of waste the Commission increases both waste and pollution, contrary to both the carbon-free standard and all of Minnesota's waste policy favoring reduction.

c. Garbage burning is an environmental justice crisis

Of the seventy-two large incinerators still operating in the U.S., 80 percent are situated in environmental justice (EJ) communities, which have higher proportions of low-income and BIPOC people.[18] The burden of pollution from garbage burning in these communities adds to the existing air pollution burden from traffic and industrial sources that already occur in these cities. In May, Earthjustice and the Environmental Integrity Project sued the U.S. Environmental Protection Agency over its air emissions rules for large municipal solid

[14] Order Adopting Fuel Life-Cycle Analysis Framework for Identifying Carbon-Free Technologies, *In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota's Carbon-Free Standard*, Docket No. E-999/CI-24-352, May 14, 2026, at 9, eDockets No. 20265-231826-01.
[15] *Id.*
[16] For further discussion, see CURE Reply Comments, *In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota's Carbon-Free Standard*, August 20, 2025, eDocket No. 20258-222281-01.
[17] Minn. Stat. §§ 115A.144-115A.1463.
[18] Ana Baptista, *Is Burning Trash a Good Way to Dispose of it? Waste Incineration in Charts*. Science, June 23, 2019, https://www.pbs.org/newshour/science/is-burning-trash-a-good-way-to-dispose-of-it-waste-incineration-in-charts.

waste incinerators, alleging that large incinerators, including those in Minnesota, have been operating under permits that violate the Clean Air Act.[19]

As the Minnesota Environmental Justice Table documented in their July 24, 2025, comment, their "extensive outreach to communities surrounding the Hennepin Energy Recovery Center (HERC), found that HERC has a major negative impact on quality of life: the noise from a constant stream of garbage trucks, and the pollution can get so bad that people feel trapped indoors. More than three-quarters of households we visited in the ZIP code 55411 in 2021 had a household member who suffered from asthma."[20] Regulations underestimate and overlook risks from HERC in several important ways. For one, key pollutants like PFAS are missing from HERC's monitoring. Second, only three pollutants (CO, NOx, and SO2) are measured continuously. The remaining pollutants monitored are measured only once per year, which can hide substantial variation and prolonged spikes that endanger communities. For example, studies show that emissions of dioxins/furans can be several times higher during periods of startup, shutdown, and malfunction, which occur regularly for HERC.[21] Finally, research shows that EJ communities experience more harm from a given amount of air pollution than more affluent communities,[22] further exacerbating the cumulative harms from the many pollution sources that tend to be located in these areas.

While the Commissioners have tried to verbally assure the Supporting Petitioners and other concerned parties that the HERC would be exempted from being deemed carbon-free by virtue of its exclusion as an Eligible Energy Technology under the commonly-named Renewable Energy Standard, neither the statute nor the Commission's written Order are explicit on this matter, leaving considerable room for concern that future political administrations or Commissions could come to a different conclusion.

Moreover, this unclear "HERC exception" ignores community concerns about the other five of seven incinerators in Minnesota which are also located in EJ areas, as defined by Minnesota's cumulative impacts law,[23] including the Olmsted Waste-to-Energy Facility in Rochester, and Xcel's RDF facilities in Red Wing and Mankato. The CFS requires the Commission to consider the local "benefits of clean and renewable energy" and to "ensur(e)

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[19] EarthJustice, *Zeldin's EPA Is Letting Trash Incinerators Poison Children. Now It's Being Sued*, May 11, 2026, https://earthjustice.org/press/2026/zeldins-epa-is-letting-trash-incinerators-poison-children-now-its-being-sued.

[20] Minnesota Environmental Justice Table Reply Comments, *supra* note 13.

[21] Chun-Jou Guo et al., *Emissions of PCDD/Fs and PCBs during the cold start-up of municipal solid waste Incinerators*, 14 Aerosol & Air Quality Res. 1593–1604 (2014), https://aaqr.org/articles/aaqr-14-06-oa-0118.pdf.

[22] Rachel Morello-Frosch et al. *Understanding the Cumulative Impacts of Inequalities in Environmental Health: Implications for Policy*, 30 Health Aff. 879–87 (2011), https://pubmed.ncbi.nlm.nih.gov/21555471/.

[23] Minn. Stat. § 116.065.

that statewide air emissions are reduced, particularly in environmental justice areas."[24] This mandate is inclusive of communities throughout the state, *not only the Twin Cities*, and the Commission must take more seriously the health impacts of burning garbage and other biomass on all communities as further discussed below.

III. The Commission Must Consider Health Impacts and Effects of Co-Pollutants on Host Communities

a. *Health impacts of co-pollutants*

Biomass energy facilities emit nitrous oxide, sulfur dioxide, carbon monoxide, hazardous air pollutants, and volatile organic compounds (VOCs)[25] that can endanger human health, which is contrary to the CFS'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.[26]

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 oxides, lead, particulate matter, dioxins & furans, PFAS, VOCs, and mercury.[27] These pollutants contribute to serious health impacts like cancer, respiratory, and heart disease, as well as reproductive and developmental problems.[28]

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.[29] Authorizing Minnesota's aging coal plants to instead burn biomass will also visit these health harms onto rural Minnesotan communities with clear EJ populations, both Indigenous and low-income groups.

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[24] Minn. Stat. § 216B.1691, subd. 9(a) (4-5).
[25] Partnership for Policy Integrity, *Biomass Energy Basics*, https://www.pfpi.net/biomass-basics/ (last visited June 15, 2026).
[26] Jonathan Buonocore & Parichehr Salimifard, *Biomass is Not Health Neutral*, The Hill, Mar. 27, 2022, https://thehill.com/opinion/energy-environment/599950-biomass-is-not-health-neutral/.
[27] GAIA, *Waste Incineration: Pollution and Health Impacts*, https://www.no-burn.org/wp-content/uploads/Pollution-Health_final-Nov-14-2019.pdf (2019).
[28] Ana Baptista, *supra* note 16.
[29] Jonathan J. Buonocore et al., *A Decade of the US Energy Mix Transitioning Away from Coal: Historical Reconstruction of the Reductions in the Public Health Burden of Energy*, Envtl. Res. Letters, May 5, 2021, https://iopscience.iop.org/article/10.1088/1748-9326/abe74c.

b. A Minnesota Carbon Free Standard that Includes Dirty Energy Generation Outsources Pollution Impacts and Environmental Harms

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 biomass and trash burner credit retired from elsewhere, there is likely a low-income impacted community that will be harmed by this pollution, and another community in Minnesota (or even farther afield) that will have also been harmed from co-pollutants from the fossil-fuel generation that the credit is being used to offset. We have already seen this occur in 2022[30] and 2025[31] when Minnesota utilities reported using credits from controversial garbage burning facilities sited in EJ communities in Florida[32] to meet their obligations under the Renewable Energy Standard. This phenomenon of offsetting emissions in Minnesota by paying polluters sited in other vulnerable communities seems likely to increase the closer we get to 2040.

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 percent 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.[33]

Expert analysis provided in Minnesota Power's 2021 Integrated Resource Plan docket showed that 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

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[30] Great River Energy, *Renewable Energy Certificate Retirement Report for Renewable Energy Standards and Green Pricing Programs*, May 31, 2023, eDockets No. 20235-196233-03.

[31] Connexus, *Renewable Energy Certificate Retirement Report for Renewable Energy Standards and Green Pricing Programs*, June 1, 2026, eDockets No. 20266-232360-02.

[32] Fox 13 Tampa Bay, *Environmental Groups Call for Change at Pinellas County's Decades-Old Waste-to-Energy Plant*, Oct. 21, 2025, https://www.fox13news.com/news/environmental-groups-call-change-pinellas-countys-decades-old-waste-to-energy-plant.

[33] Stefan Koester & Sam Davis, *Siting of Wood Pellet Production Facilities in Environmental Justice Communities in the Southeastern United States*, 11 Envtl. Just. 64-70 (2018).

projections of future emissions. Emissions for Hibbard affect downwind communities, disproportionately affecting Native people.[34]

IV. Clean Energy Technologies Are Ready for Adoption, and False Solution Carbon-Emitting Technologies Must be Retired by 2040

As the Commission's order recognizes, solar, wind, hydropower, and energy storage are proven technologies that can provide reliable and affordable energy in Minnesota going forward. While batteries and other forms of energy storage do not "generate electricity" themselves, they will facilitate the renewable technologies that do meet the carbon standard becoming the dominant and universal electricity sources for the state in a matter of years. The Commission can either help to bring this better future about or stand in the way of progress and the law, in enacting an interpretation that doesn't serve Minnesotans' economic, health, or environmental needs. Energy and societal resilience will be best served by onshoring energy production to Minnesota renewable resources, and halting our reliance on burning fuels from other places, harming both our resources and finances with technologies that don't keep energy dollars in our communities.

Minnesota only loses economic opportunity, social strength, and our part in the innovation economy by falling back on the electric generation technologies of the past. Coal, gas, oil, and trash are not fuels that a modern society burns if they want to advance new industries and retain an engaged workforce. Burning wood for electricity is so inefficient and ineffective that it wasn't even done in the industrial revolution—going back to the pre-industrial fuel to attempt to bring our energy system back to a nonexistent past is both anti-science and economically ruinous. Minnesota's forests support sustainable industries and multiple shared uses, while clearcutting to create a biomass industry leaves nothing behind for those existing residents and workers.

Conclusion

The Supporting Petitioners continue to believe that the Commission should follow the plain meaning of the carbon-free definition in Minnesota statute. The Commission's Order in this proceeding is contrary to law, chemistry, and physics, and will only harm Minnesotans who deserve better under this law. The Commission should take this opportunity to reconsider, and reject the "fuel lifecycle analysis" structure that is contrary to the plain language of Minnesota law.

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[34] PSE Healthy Energy, *Incorporating Health and Equity Metrics into the Minnesota Power 2021 Integrated Resource Plan*, Apr. 2022, https://www.mncenter.org/sites/default/files/permalinks/2022-04-28%20Minnesota%20Power%20IRP%20Equity%20Analysis.pdf.

/s/ Hudson Kingston
Hudson B. Kingston
CURE
Legal Director
hudson@curemn.org

/s/ Leslie Myint
Leslie Myint
Minnesota Environmental Justice Table
Research & Policy Director
Associate Professor of Statistics & Data Science, Macalester College
leslie@mnejtable.org

/s/ Kathryn R. Eiseman
Kathryn R. Eiseman
Partnership for Policy Integrity
Program Manager
keiseman@pfpi.net

/s/ Kathleen Schuler
Kathleen Schuler
Health Professionals for a Heathy Climate
Policy Director
Kathleen@hpforhc.org

/s/ Sara Wolff
Sara Wolff
Minnesota Interfaith Power & Light
Strategic Policy Director
sara@mnipl.org