July 10, 2024

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

Dear Executive Secretary Seuffert:

As organizations that support the urgent need to take action on climate change, many of whom have worked hard over many years to pass the 100% Carbon Free Law, we are committed to assuring that Minnesota's future energy is truly carbon free. Our pathway to carbon-free electricity should be grounded in the dual goals of achieving real emissions reductions while also assuring that already overburdened communities don't bear undue costs.

We view with grave concern the influx of comments in this proceeding from fossil fuel and other carbon-polluting industry lawyers, utility lobbyists, and their allies vying for a version of carbon-free energy that includes an "all of the above" approach, leaving the door open to a host of speculative and community-harming technologies. Technologies held up as "carbon free" by these commenters include burning wood for utility-scale electricity, carbon capture on coal or other fossil fuel facilities, dirty "blue" hydrogen, and even garbage incineration. This would be a so-called "carbon free" future that runs counter to the vision of *truly* clean, healthy, renewable electricity that Minnesotans want and were promised in the passage of this law. It will make Minnesotans sick, and allow for unabated carbon pollution in violation of the clear language of the law.

With the health and wellbeing of our communities in mind, we urge the Public Utilities Commission to consider the following guiding principles when evaluating how we as a state and a society implement the concept of "carbon-free" electricity. We also offer comments responding to the specific questions presented in Docket 23-151.

I. GUIDING PRINCIPLES

1. **No sacrifice communities.** Our current fossil fuel-based energy system has been built on the backs of so-called Sacrifice Communities–low-wealth and working-class Black, Brown, multi-racial, white communities, Tribes, and Indigenous Peoples whose health, wealth, and lives have been sacrificed to advance the profits of corporations and polluting industries. We cannot allow the urgency of the climate crisis to be weaponized in order to replicate and entrench the existing harms of our current energy system. <u>As we transition to zero-carbon technologies, we cannot create new injustices and vulnerabilities, or miss the opportunity to</u>

address existing drivers of injustice and begin to repair the past harms of our energy system.[1]

2. **Energy Democracy.** The way in which we produce and distribute energy and electricity to fuel our economy has never been a purely technological question. Our current energy system is structured, sited, and governed to serve the interests and the bottom lines of powerful incumbent utilities and industries. But the burdens and opportunities stemming from widespread decarbonization must be distributed justly and equitably. The next energy system must focus on people and community-based solutions that are rooted in principles of social, economic, and environmental justice and not in maintaining an extractive economic system.[2] Energy Democracy means distributed energy resources, owned and operated by the communities where they are sited, supporting the electric system for the betterment of all users.

3. **Proven carbon-free energy solutions.** Proven renewable and carbon-free energy sources include wind, solar, geothermal, and energy storage. Technologies like biomass and trash incineration cannot qualify as carbon-free because they generate carbon and dump harmful pollutants on neighboring communities. Hydrogen produced by any method other than *additional* renewable energy is not carbon free (and even so-called "green hydrogen" can be prohibitively inefficient in the context of electricity generation).[3] Carbon capture utilization and storage (CCUS) is demonstrably ineffective at reducing emissions not the least because it sucks up so much electricity that it increases energy usage and criteria pollutants in the best case scenarios, and is used to justify the maintenance and expansion of carbon-emitting facilities and infrastructure.[4] The Intergovernmental Panel on Climate Change (IPCC) affirms that wind and solar energy and natural carbon sequestration reduce more greenhouse gasses at lower cost than other strategies, including CCUS. They also reap more health and ecosystem benefits than energy sources that continue to rely on fossil fuels or fossil fuel infrastructure.[5]

Minnesota's electricity future will be determined by the decisions we make today. We must take the path that invests in proven renewable strategies such as wind, solar, geothermal, and

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[1] *See* Climate Justice Alliance, *Just Transition Principles,* https://climatejusticealliance.org/wp-content/uploads/2019/11/CJA_JustTransition_highres.pdf.

[2] *See* Energy Democracy Project, *Reimagining Energy for our Communities* https://drive.google.com/file/d/1bhGdL__uNJmCGR8vugSjvt2PyvGBrNS4/view.

[3] Clean Energy Group, *Blue and Green Hydrogen Production: Potential Harms & Global Warming Impacts*, https://www.cleanegroup.org/wp-content/uploads/Blue-and-Green-Hydrogen-Production-Harms.pdf.

[4] Desmog, *Carbon Capture Will Extend Oil Production by 84 Years, Industry Study Finds*, https://www.desmog.com/2024/06/10/carbon-capture-will-extend-oil-production-by-84-years-industry-study-finds/.

[5] IPCC, Sixth Assessment Report, Synthesis Report, 2022. Summary for Policymakers & Mitigation of Climate Change; https://www.ipcc.ch/report/ar6/wg3/.

energy storage, and avoid the path that continues to allow burning things for electricity and the insidious perpetuation of fossil fuels.

In support of the above principles, we request that the PUC hold a public hearing on docket 23-151, to hear from the many Minnesotans who care deeply about this issue and who are not industry insiders with years of lobbying experience before the Commissioners.

II. TECHNOLOGIES AND ELECTRICITY RESOURCES THAT DO AND DO NOT MEET THE DEFINITION OF CARBON FREE

1. Wind, solar, geothermal, and energy storage are carbon free. The legislature defined "carbon free" in Minnesota statute as a technology that emits no carbon dioxide. Solar, wind, geothermal, and energy storage meet the definition of carbon free and also fulfill the principle of "proven technologies." Wind and solar are not only renewable and carbon free, but are the most cost-effective energy sources available in Minnesota. Minnesota's electricity emissions were down 54% since 2005 due to the transition from coal and natural gas to wind and solar.[6] Energy storage, both at the distributed and utility-scale levels, provides a bridge to our future renewable energy grid and is essential to maintaining affordability, reliability, and resiliency. While geothermal provides only 0.4% of energy in the US today, there are opportunities for Minnesota to grow this carbon-free and renewable energy resource, especially with new federal and state financial incentives.

2. Woody biomass and garbage 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, which states only "a technology that generates electricity without emitting carbon dioxide" is "carbon free." This straightforward definition should not be distorted with carve-outs or exceptions for specific industries that undeniably emit carbon.

All biomass emits carbon when it is burned. 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.[7] Biomass proponents argue that biomass is carbon "neutral" because the amount of CO2 emitted by burning woody biomass is similar to the amount of CO2 originally captured by the trees. However, even if these claims of carbon neutrality held up (they do not[8]) "carbon neutral" simply does not equal "carbon-free" and therefore fails to meet the standard of the law. Biomass plants also emit nitrous oxide, sulfur dioxide, carbon monoxide, fine

[6] MPCA bit.ly/4bysqsP.
[7] Partnership for Policy Integrity, Biomass Energy Basics, https://www.pfpi.net/biomass-basics/.
[8] John D Sterman, Lori Siegel, Juliette N Rooney-Varga, *Does replacing coal with wood lower CO2 emissions? Dynamic lifecycle analysis of wood bioenergy*, Environmental Research Letters 13 (January 18, 2018)

particulates, hazardous air pollutants and VOCs[9] that can endanger human health, going against the 100% Carbon Free Law's mandate to ensure all Minnesotans enjoy the benefits of clean energy. Waste product from the paper industry is known to be contaminated with PFAS, and burning it as waste from the forestry industry will increase PFAS air pollution blanketing the landscape.[10]

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.[11] This should plainly disqualify it from being considered carbon free. The 100% Carbon Free Law states that the PUC should maximize benefits to *all* Minnesotans, including sharing in the benefits of clean and renewable energy, particularly in environmental justice areas. Incinerators specifically harm the communities in which they're located by emitting dangerous air pollutants like nitrogen and sulfur oxides, lead, particulate matter, PFAS,[12] and mercury. This exacerbates environmental injustice and is incompatible with the plain language of the 100% Carbon Free Law.

3. Hydrogen. It is essential to look at the upstream emissions of hydrogen production in determining whether a hydrogen-based energy source can be considered carbon free or qualify for any partial credit.[13] Only green hydrogen, which is produced using renewable energy to power electrolysis, should be considered carbon free, and only if that energy is *additional* rather than diverting existing renewable energy from the grid that would have been used for direct electrical demand.[14] Other forms of hydrogen production have the potential to generate *more* emissions than burning fossil fuels due to the energy intensity of hydrogen production.

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[9] Ibid.

[10] *It's raining PFAS: Even in Antarctica and on the Tibetan Plateau, rainwater is unsafe to drink*, Phys.org, Aug. 2, 2022, https://phys.org/news/2022-08-pfas-antarctica-tibetan-plateau-rainwater.html; Jeffery Kluger, *Now We Need to Worry About Harmful 'Forever Chemicals' in Our Toilet Paper Too*, TIME, Mar. 2, 2023, https://time.com/6259819/pfas-found-in-toilet-paper/.

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

[12] EPA's current guidance indicates that while some PFAS are relatively safe to put in a landfill, i.e. Teflon products, but incinerators must operate at temperatures hugely higher than Minnesota's trash incinerators to have any chance of destroying or mineralizing PFAS rather than just spreading them around as air pollution. EPA, Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances—Version 2, at 2, 12 (2024), https://www.epa.gov/system/files/documents/2024-04/2024-interim-guidance-on-pfas-destruction-and-disposal.pdf.

[13] Rocky Mountain Institute, *Hydrogen Reality Check: All "Clean Hydrogen" Is Not Equally Clean,* https://rmi.org/all-clean-hydrogen-is-not-equally-clean/.

[14] The Commission ideally should designate green hydrogen as an energy storage source and discourage its use in all but essential energy applications because of the scarcity of green hydrogen and its need for other heavy industrial uses.

4. Carbon Capture, Utilization & Storage (CCUS). CCUS technologies aim to capture some portion of CO_2 at a power plant or industrial site and transport the CO_2 via pipeline to another site for storage or use. Today, the majority of captured CO_2 is used in a process of extracting oil in a process called enhanced oil recovery (EOR).[15] Current experience with CCUS in the U.S. demonstrates that it is expensive, energy and water intensive, and underperforms in terms of actual CO_2 sequestration. Construction and operation of the capture equipment, pipelines, and storage or EOR facilities create air and water pollution and land disturbance. CCUS diverts necessary funds from effective climate and pollution solutions and squanders precious water and energy resources. CO_2 pipelines themselves present unique human health risks. CO_2 is an asphyxiant and toxicant, so communities along pipeline routes are at risk for life-threatening exposures that can incapacitate people and emergency response systems in the case of a pipeline leak or rupture. In addition, pipelines are usually sited in BIPOC and rural communities and on or near Indigenous treaty lands. Lastly, CCUS systems are highly energy intensive, putting additional burdens on the grid in the name of questionable carbon reduction. No CCUS system on any power plant has demonstrated or even proposed a 100% carbon capture rate and thus does not meet requirements for compliance of the 100% Carbon Free Law.

We appreciate the opportunity to comment on this critical issue and look forward to participating in future public hearings on this topic.

[15] EPA, Supply, Underground Injection, and Geologic Sequestration of Carbon Dioxide, https://www.epa.gov/ghgreporting/supply-underground-injection-and-geologic-sequestration-carbon-dioxide.