

STATE OF MINNESOTA
BEFORE THE PUBLIC UTILITIES COMMISSION

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| Katie Sieben | Chair |
| Valerie Means | Commissioner |
| Hwikwon Ham | Commissioner |
| Joseph Sullivan | Commissioner |
| John Tuma | Commissioner |

**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

CURE Answer to Petition for Clarification and Reconsideration

December 9, 2024

Introduction

Pursuant to Minn. R. 7829.3000, Subp. 4, CURE files this answer to the Clean Energy Organizations' Petition for Clarification and Reconsideration¹ in the above-captioned docket.

CURE supports the CEOs petition's overall request for clarification and urges the Public Utilities Commission to take up this petition rather than leaving a vague record that could be interpreted as supporting positions that violate the clear letter of the law. By clarifying that burning biomass and waste is not "carbon free" under the clear statutory definition the Commission will save considerable administrative resources, and will save parties' and other expert agencies' time and efforts in trying to prove or disprove issues that are clearly illegal interpretations of the Commission's authority. The statute does not define "carbon free" as "carbon neutral" based on a lifecycle analysis that could allow anything to meet the definition using timelines and accounting methods that are subject to considerable gaming and uncertainty. In granting the petition and clarifying its position the Commission can reaffirm its understanding of the statutory language, and by doing so focus the parties' future efforts on issues that are germane to the task assigned by the legislature.

CURE however, does have additional reasons for supporting the request for clarification and reconsideration that go beyond what was stated in the petition, and wishes to state its slightly different position regarding the use of hydrogen and carbon capture and sequestration (CCS) applied to energy generation connected to the Minnesota electrical grid. While this document focuses on these additional and divergent points for the sake of brevity, CURE supports the overall request and many of the arguments the CEOs made but will not repeat them here.

Analysis

- 1. Minnesota's biomass plants are far more polluting than even the CEOs petition states, the Commission should assess the repeated violations of pollution standards and harm to environmental justice communities to fully assess their foreseeable impact under the law**

CEOs are correct when they explain that the plain meaning of the applicable statute is that electric generation that does not emit carbon is "carbon free" and that polluting combustion sources of electricity, such as burning trash or biomass, is not

¹ Clean Energy Organizations Petition for Clarification and Reconsideration, Nov. 27, 2024, eDockets No. [202411-212510-02](#).

carbon free. They also correctly state that burning waste and biomass emits far more carbon than fossil fuels when measured on a unit-of-energy basis.

Moreover, Minnesota's direct experience with large biomass plants that provide relatively small amounts of electricity suggests that these plants are extremely harmful to the health of communities where they are located. When these plants violate their lax air pollution limits—as they demonstrably do—they do so to the harm of low-income and vulnerable communities. Specifically, biomass plants *that are part of the electrical grid* appear to be incentivized to continue pumping out harmful air pollution, while biomass facilities that are used for purposes other than electricity generation are more able to change their operations to limit pollution.

A. Hibbing plant violations

One of Minnesota's existing biomass plants is located in Hibbing, Minnesota, and is run by the Hibbing Public Utilities Commission. This plant was previously a coal plant and as is not uncommon with many so-called biomass facilities, still appears to burn some coal.² Because this facility is connected to the grid it remains available to be called up by MISO, and when it runs it appears to often be in violation of the air quality standards that have been put in its operating permits.

EPA data on the Hibbing plant notes that it has had “high priority violations” of its air quality permit for twelve of the last twelve quarters, i.e. all quarters for the past three years.³ According to EPA's ECHO database, the violations are for carbon monoxide, particulate matter, and visible emissions violations.⁴ A recent Administrative Penalty Order issued by MPCA to the Hibbing Public Utilities Commission and obtained under the Data Practices Act (DPA) also notes that the plant was in violation of particulate matter limits for its wood-fired boilers and coal ash silo emissions, as well as ammonia

² In its EPA ECHO page the facility is designed as a “Fossil Fuel Electric Power Generation” facility, among other things, in its NAICS codes. See EPA, Enforcement and Compliance History Online, Detailed Facility Report – Hibbing Public Utilities Commission, at “Facility NAICS Codes” Table, <https://echo.epa.gov/detailed-facility-report?fid=110001442332>.

³ See EPA, Enforcement and Compliance History Online, Detailed Facility Report – Hibbing Public Utilities Commission, <https://echo.epa.gov/detailed-facility-report?fid=110001442332>.

⁴ *Id.* at Table “Three-Year Compliance History by Quarter.”

emissions.⁵ The emissions of coal ash particulate matter were 700% above the permit limit and the ammonia emissions were 166% over the permit limit.⁶

MPCA's Environmental Justice map notes that the area directly to the north of this facility is an environmental justice area because 58% of the population is low-income.⁷ Two other nearby census tracts are also above the threshold for low-income residents.⁸

B. Virginia plant violations

Similar to its nearby Iron Range city, Virginia Minnesota has a biomass plant at the center of town that was once primarily a coal-burning facility.⁹ Like the Hibbing plant, this aging coal facility has received many notices of violations and schedules of compliance from regulators. EPA's ECHO page for this facility notes twelve quarters of "High Priority Violations" of air standards in the past twelve quarters.¹⁰ Records obtained from MPCA regarding these violations demonstrate that the Virginia biomass plant was in violation of particulate limits for two years before receiving a fine and corrective action, and the facility emitted mercury above permit limits for more than two months before the unit was shut down for the season.¹¹

Virginia, Minnesota, has several low-income census tracts identified by MPCA as environmental justice areas, with similar demographics as noted above for Hibbing.¹² The mercury and particulate matter violations that MPCA and the facility are responding to have direct impacts on communities with limited resources available to protect themselves from pollution and other stressors.

⁵ See MPCA, Administrative Penalty Order, Aug. 13, 2023, at 1-2. This document is attached to this answer as Attachment A.

⁶ *Id.* at 1-2.

⁷ MPCA, Understanding Environmental justice in Minnesota, GIS Map, https://experience.arcgis.com/experience/bff19459422443do816b632beoc25228/page/Page/?views=EJ-areas#data_s=id%3AdataSource_11-190fo70e1af-layer-3-3%3A298.

⁸ *Id.*

⁹ Virginia Public Utilities, Steam, <https://www.vpuc.com/products/steam/>.

¹⁰ Enforcement and Compliance History Online, Detailed Facility Report – Virginia Department of Public Utilities, <https://echo.epa.gov/detailed-facility-report?fid=110001442341>.

¹¹ MPCA, Case Development Forms, on file with author.

¹² MPCA, Understanding Environmental justice in Minnesota, GIS Map, https://experience.arcgis.com/experience/bff19459422443do816b632beoc25228/page/Page/?views=EJ-areas#data_s=id%3AdataSource_11-190fo70e1af-layer-3-3%3A298.

What makes these two facilities different is that the Virginia plant, while also in disrepair and violation of air quality standards, has considerable down time when steam is not needed, as well as the ability to shift its operations to less-polluting units. Because this facility no longer produces electricity for the grid it idles in summer months, leading to less pollution emissions at that time. Additionally, in response to MPCA citations, the facility's staff have repeatedly agreed to shut down the most-polluting units¹³ in favor of newer units that produce sufficient heat for its needs. Because this facility is not grid-tied it appears to be able to address ongoing issues by scaling back its operations in rational stages.

C. Boswell's future as a biomass plant

Similar to both the Hibbing and Virginia examples, it appears that Minnesota Power is interested in taking its aging coal plant in Cohasset, Minnesota, and converting it to burn some amount of biomass when it ceases coal operations in the 2030s.¹⁴ However, unlike Hibbing and Virginia's old coal facilities, the Boswell coal unit Minnesota Power would like to replace is a very large generation source, comprising 585 megawatts. Replacing it with biomass would require a much larger and more constant supply of biomass to burn, causing much more air pollution in the surrounding communities.

As CEOs' petition notes, other commenters in the docket hope that the Commission will green light the burning of all sorts of biomass, including the very vaguely stated "used wood products."¹⁵ This term for post-consumer or post-processing wood likely means railroad ties, treated wood containing arsenic or copper, and products containing toxic amounts of metals and other chemicals. Burning "used wood products" would likely expose the people of Cohasset, Grand Rapids, and Leech Lake's reservation to large amounts of toxic chemicals in addition to the carbon footprint of burning such wastes. Considering that all other "biomass" plants in the state, including Hibbard as discussed by the CEOs in their petition, emit a disproportionate amount of toxic pollution and carbon dioxide, it is reasonable to assume that Boswell will as well if it is converted to biomass instead of ceasing electric generation from combustion.

¹³ See, e.g., Administrative Penalty Order, 08/16/2022, available at <https://webapp.pca.state.mn.us/wimn/site/2504/documents> (click on "TEMPO_Final Enforcement, 08/16/2022, administrative order, 369.8 KB") (stating "The regulated Party shall permanently retire Boiler #7 (EQUI 2 / EU 001) no later than January 1, 2025.").

¹⁴ At that point Boswell will have reached its 80th birthday, having first been permitted in 1956.

¹⁵ CEO petition at 32, n.60 (citing American Forest and Paper Association comments).

Similar to both Hibbing and Virginia, Boswell is not far from low-income census tracts that MPCA has identified as environmental justice communities, and EPA also has noted concerns about environmental justice impacts near the existing plant.¹⁶ Additionally, Boswell is on the doorstep of the Leech Lake Band of Ojibwe's reserved lands, by definition an environmental justice community.¹⁷ Greatly increasing air pollution in close proximity to these populations will have a disproportionate impact on low-income and Indigenous communities, who already bear a disproportionate amount of harm from the existing coal facility and its air and water pollution.¹⁸ Rather than creating a situation where pollution will only increase for these communities due to coal conversion to biomass, the Commission should follow the statutory directive and assure that these communities can benefit from clean and renewable energy sources that meet their needs, without harming their health.

2. CCS applied to energy generation has not met design expectations, and the Commission would need to assess the frequent breakdowns of such plants' capture technology in addition to indirect and enhanced oil recovery (EOR) emissions to judge any partial compliance

CURE does not believe that CCS is an appropriate carbon-free technology for electricity generation under Minnesota law. As covered by CURE and other commenters in this docket, plants that burn coal, natural gas, oil, trash, or biomass emit carbon dioxide to generate electricity, and CCS technology appended to such a plant does not generate any electricity (rather, it consumes a large portion of available electricity) so it

¹⁶ Cohasset, Minnesota is a short distance on Highway 2 from census tracts with 49 percent and 39 percent of the population below the 200% federal poverty level, and proximate to the Leech Lake reservation, another designated Environmental Justice area, which also contains a low-income census tract along Highway 2. MPCA, Understanding Environmental justice in Minnesota, GIS Map, https://experience.arcgis.com/experience/bff19459422443d0816b632be0c25228/page/Page/?views=EJ-areas#data_s=id%3AdataSource_11-190fo70e1af-layer-3-3%3A298. Similarly, EPA has flagged environmental justice concerns in this community due to the disproportionate wastewater discharge harms. EPA, Enforcement and Compliance History Online, Detailed Facility Report - Boswell Energy Center (noting the census block is in the 95th percentile for wastewater discharge harms in the state of Minnesota), <https://echo.epa.gov/detailed-facility-report?fid=110041028492> (last visited Nov. 1, 2024).

¹⁷ *Id.*

¹⁸ For additional information on Boswell's ongoing water pollution harms to the community and downstream waters see CURE/ Sierra Club comment on Draft NPDES Permit to MPCA, Nov. 4, 2024, https://scs-public.s3-us-gov-west-1.amazonaws.com/env_production/oid333/did200071/pid_209608/assets/merged/9lo5iho_xrr_document.pdf?v=31917.

cannot be a “technology that generates electricity without emitting carbon dioxide.” The language of the statute is clear, and CCS should not be included as a partial compliance technology even if there is legislative history that runs counter to the clear statutory language—in this respect we disagree with CEOs’ petition, which turns to legislative history to determine whether CCS is an appropriate partial compliance technology.

To the extent that the commission does continue to consider CCS within this or related dockets, it is important to recognize that it will be a long-term capacity drain for the Commission to keep its information on any particular facility with CCS up to date and accurate. While a CCS system added to an old coal plant may be *designed* to capture a set percentage of the plant’s emissions, available evidence demonstrates that these facilities fall far short of the design capacity and often operate with the CCS technology turned off for long periods of time, resulting in significantly less carbon capture than planned.

The best example of this failure to meet benchmarks is the one coal plant with CCS operating in the U.S. today. The Petra Nova CCS facility, attached to the W.A. Parish generating station in Fort Bend County, Texas, began carbon capture operations in 2017, operated through early 2020 when the CCS was shut off, and only restarted carbon capture again in the second half of 2023.¹⁹ Analysis from 2022, during its long hiatus, demonstrated that even when the facility was “working” between 2017 and 2022 it was not meeting the capture rate it claimed to be aiming for: “Emissions data for Parish Unit 8 reported to the EPA suggests the actual CO₂ capture rate was substantially lower than 90%, perhaps as low as 65% to 70%.”²⁰

Relevant to CEO’s request to include indirect emissions in any CCS calculation for partial compliance, Petra Nova is powered by an ancillary gas-burning plant that has no CCS for its own emissions: “Adding those emissions lowers the overall on-site capture rate to perhaps as low as 55% to 58%.”²¹ During the years that Petra Nova was mothballed of course it was achieving 0% capture while W.A. Parish continued to operate and emit carbon dioxide. But even when it was meant to be operational it was not always operating:

¹⁹ Sonal Patel, *Petra Nova, Pioneering Power Plant Carbon Capture Unit, Is Up and Running Again*, says *JX Nippon*, Power Mag, Sept. 13, 2023, <https://www.powermag.com/petra-nova-pioneering-power-plant-carbon-capture-unit-is-up-and-running-again-says-jx-nippon/>

²⁰ Suzanne Mattei and David Schlissel, *The ill-fated Petra Nova CCS project: NRG Energy throws in the towel*, Institute for Energy Economics and Financial Analysis, Oct. 5, 2022, <https://ieefa.org/resources/ill-fated-petra-nova-ccs-project-nrg-energy-throws-towel>.

²¹ *Id.*

Petra Nova also was expected to be in operation some 85% of the time but failed to meet its target because so many technical problems and so much downtime were experienced—not just in the CCS facility and in Parish Unit 8, but also in the CO₂ pipeline and the oilfield where the captured CO₂ was injected. Similar problems can be expected to affect any carbon capture project, especially at an aging coal plant.²²

This example helps to demonstrate that in order to include CCS in its partial compliance technologies, the Commission will have to vigilantly monitor the facility for actual operations rather than assuming that it continues to run as described in idealized planning or design documents.

Also germane to the CEO's argument that indirect emissions should cover any captured carbon used for EOR, it is relevant that all of Petra Nova's captured carbon has been used to extract oil that would otherwise not have been accessible. Similarly, if built, Project Tundra would be linked to the Summit Carbon Solutions' pipeline network and could potentially provide captured carbon for EOR in North Dakota.²³

In order to authorize any CCS as a partial compliance technology the Commission will have to continuously monitor the efficacy of capture as well as the ultimate use of each ton of captured carbon dioxide. At minimum, this will mean that the plant's emissions and CCS plant will have to report carbon emitted and captured on an hourly basis, and all tons will have to be tracked to their ultimate injection well. This will require the Commission to have staff who are versant in this technology and able to gather information from out of state on the use of CCS waste in other jurisdictions. Ongoing monitoring and oversight will be necessary to assure the Commission that a plant designed for "90% carbon capture" continues to operate at that level and only sends its captured carbon to the injection wells that were approved by the Commission, and also that the wells don't experience leakage that invalidates the premise of long-term storage in geologic formations.²⁴

²² *Id.*

²³ See CURE, Sierra Club, and Dakota Resource Council Comment to Department of Energy regarding the Revised Draft Environmental Assessment for Project Tundra, May 13, 2024, at 13–15, <https://drive.google.com/file/d/1IADSmT2MJC302MSuryuukrQHPbh5cTY3/view>.

²⁴ Juanpablo Ramirez-Franco, *The nation's first commercial carbon sequestration plant is in Illinois. It leaks.*, WBEZ, Oct. 21, 2024, <https://www.nprillinois.org/illinois/2024-10-21/the-nations-first-commercial-carbon-sequestration-plant-is-in-illinois-it-leaks>.

The Commission should reconsider its interpretation of the statute and avoid a reading that both complicates clear language, and burdens the Commission with a large regulatory oversight burden that goes beyond its customary responsibilities.

3. Hydrogen likely should be assessed in its own separate docket, not addressed within a docket regarding unrelated dirty generation such as biomass and waste incineration

CURE agrees with the CEOs that to the extent that hydrogen is ever used in the utility system it should be so-called “green hydrogen.” However, CURE is also seriously concerned that the Commission is combining the issue of how to assess hydrogen and its environmental impacts with many unrelated issues that will tend to distract from this important discussion.

The issue of how to treat hydrogen co-firing under the carbon-free standard is a vast and complex issue, which was generally not fully addressed by commenters in previous rounds of comments in this docket. Ultimately, it is not necessary for the Commission to address the issues related to hydrogen use in electricity generation in the same docket as other issues such as biomass and waste incineration. Due to the high amount of uncertainty about what kinds of hydrogen may be used and under what conditions, CURE suggests that issues of hydrogen co-firing be separated into its own docket.

Separating hydrogen matters to another docket will better assure the issues are fully considered without the same deadline imposed in Docket No. E-999/CI-24-352. At this point no utility has suggested that they have a hydrogen co-firing proposal that will be presented in an upcoming Integrated Resource Plan or Certificate of Need proceeding, and scientific knowledge about how this technology might work in Minnesota is a moving target to say the least.

This absence of critical assessment of hydrogen is not unique to this proceeding, it’s an endemic issue in the discussion of hydrogen use by policymakers today. A recent report on both CCS and hydrogen found that “there has been an absence of consideration of environmental justice in programs and policies that promote CCS and hydrogen deployment in the power sector.”²⁵ This report finds that there are issues to consider around hydrogen production, transportation/storage, and use that have serious

²⁵ New Jersey Environmental Justice Alliance et al., Environmental Justice Concerns with Carbon Capture and Hydrogen Co-Firing in the Power Sector, 2024, <https://njeja.org/wp-content/uploads/2024/07/CCS-EJ-White-Paper.pdf>. This report is attached to this answer as Attachment B.

implications for environmental justice²⁶—issues that were not fully addressed in this docket and may also be pushed to the side in Docket 24-352. For example, the report found that far from producing innocuous water vapor when burned, co-fired hydrogen produces far more health-harming pollution than burning natural gas alone:

For use in the power sector, hydrogen-blended natural gas would be combusted as a supposedly lower-carbon fuel. However, this application poses a threat to public health, as the combustion of hydrogen or hydrogen-blended natural gas, in the presence of air and at high temperatures, leads to NOx emissions, and by extension the formation of ozone and PM (Lewis 2021). Notably, hydrogen co-firing can yield more NOx emissions than burning natural gas alone (McNamara 2020). A study by Celtek and Pinarbaşı (Celtek and Pinarbaşı 2018) found that hydrogen co-firing can produce up to six times more NOx emissions than combusting methane on its own.²⁷

No commenters covered this issue in depth in prior comments. Further, the Commission's sole bulleted point in its order regarding hydrogen appears limited to the amount of carbon generated with or without hydrogen co-firing—it seems entirely likely that commenters will not address the important environmental justice and public health issues surrounding hydrogen if limited to only the carbon implications.

The Commission should grant the CEOs petition and consider separating the many issues surrounding hydrogen's carbon impact and environmental justice implications in a separate docket. Addressing the topic of hydrogen, its carbon emissions and greenhouse gas effects, and its potential environmental justice impacts, is a worthy issue for comment and should not be buried under the other nine subjects the Commission has identified for Docket 24-352.

Conclusion

In conclusion, CURE respectfully requests that the Commission reconsider and clarify its order in this docket, consistent with the CEOs petition to that effect. CURE also would like the Commission to consider that biomass plants in Minnesota disproportionately pollute their environmental justice communities with illegal air pollution more often than not, and that the only examples of CCS on coal plants functioning in the United States similarly are cautionary tales showing promises broken and targets unmet. Finally, the issue of hydrogen co-firing is too important of an

²⁶ *See id.* at 12–13.

²⁷ *Id.* at 29.

environmental justice issue to resolve without further record development, and a separate docket on hydrogen may be the most appropriate way to resolve this.

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