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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**

SUPPLEMENTAL COMMENTS OF THE CLEAN ENERGY ORGANIZATIONS

September 17, 2025

TABLE OF CONTENTS

Introduction 1

Argument 1

I. The Department and others misinterpret the CFS statute 1

A. Commenters' recommendations would create an "incremental reductions" standard that falls far short of what the CFS law requires and what state GHG reduction goals demand 2

B. The Department's revised position on avoided emissions is a step in the right direction, but it should also apply to emissions avoided outside the power sector 5

C. The Commission need not choose between two extreme interpretations of the CFS law, neither of which reflect legislative intent 8

D. Legal arguments submitted by St. Paul Co-Generation and District Energy of St. Paul misinterpret the CFS law 11

II. Commenters fail to appreciate the urgent need to reduce carbon emissions 15

III. Minnesota Power's claims regarding the value of Hibbard are not relevant to this docket, and they overlook the plant's harmful health impacts 18

IV. The CEOs agree with the Department that the formula for determining partial compliance for plants using CCS should capture the impact of "parasitic load" but believe this requires using the formula the CEOs have presented, including consideration of indirect emissions 20

V. Partial credit for hydrogen co-firing should consider more than just heat content 21

VI. RNG generation emits CO_2, so it cannot be considered carbon-free, plus it can have other potentially serious environmental impacts 22

Conclusion 24

INTRODUCTION

Minnesota Center for Environmental Advocacy ("MCEA") and the Sierra Club (collectively, "Clean Energy Organizations," or "CEOs") appreciate the opportunity to submit these supplemental comments in the Commission's Life-Cycle Analysis docket.[1]

In these supplemental comments we respond to the reply comments filed by other commenters. In Part I we address misinterpretations of the Carbon Free Standard ("CFS") statute, including the use of a compliance standard that is far weaker than the CFS law requires and that would undermine efforts to achieve Minnesota's greenhouse gas ("GHG") target of net zero by 2050. Part II discusses how other commenters' recommendations fail to appreciate the urgent need to reduce GHGs to address the climate crisis. Part III addresses Minnesota Power's comments regarding Hibbard Energy Center, noting their irrelevance to this docket and the facility's substantial health impacts. Part IV addresses the Department of Commerce's ("Department's") discussion regarding capturing the emissions from the parasitic load caused by carbon capture and storage ("CCS"). Part V addresses Xcel Energy's discussion of hydrogen co-firing, and Part VI addresses Renewable Natural Gas ("RNG").

ARGUMENT

I. The Department and others misinterpret the CFS statute

In this section the CEOs identify various misinterpretations of the CFS statute in the reply comments filed by the Department, Xcel, Minnesota Municipal Power Agency

[1] *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. E999/24-352.

("MMPA"), and in the joint comments filed by St. Paul Co-Generation and District Energy St. Paul.

A. Commenters' recommendations would create an "incremental reductions" standard that falls far short of what the CFS law requires and what state GHG reduction goals demand

In our reply comments, CEOs discuss how the interpretation of the law put forth in the initial joint comments by the Department and the Minnesota Pollution Control Agency ("Agencies") would replace the approach to decarbonization enacted by the legislature with one that is fundamentally different, far weaker and substantially more complex.[2] The interpretation of the CFS statute proposed in the Department's reply comments[3] remains inconsistent with the CFS law's basic regulatory structure as well as its ambitious purpose, which goes far beyond achieving mere incremental reductions as compared to some status-quo baseline.

For example, at the beginning of its reply comments, the Department says this:

> The determination of carbon-free eligibility is highly dependent upon the modeling choices made within a fuel life-cycle analysis (LCA) study, and the basis of comparison to a counterfactual base case (business-as-usual scenario). Due to the complex nature of energy systems, it may not be clear whether a resource *actually lowers emissions compared to a base case*. This ambiguity necessitates a rigorous analysis process to determine emissions that result from different energy generation technologies.[4]

This statement simply does not reflect Minnesota's CFS. Carbon-free eligibility under the CFS does *not* depend on how a technology compares to a business-as-usual

[2] CEOs, Reply Comments, p. 2-5.
[3] In addition to the Department, all the commenters that would consider a generation source carbon-free if it emits less than a counterfactual scenario in a life-cycle analysis would in effect be endorsing an incremental reductions standard that conflicts with the law, as we discuss in Section I.A. of our reply comments.
[4] Department, Reply Comments, p. 1 (emphasis added).

scenario, and this is true whether the counterfactual scenario focuses on business-as-usual forms of generation or business-as-usual waste management. Carbon-free eligibility depends on whether a technology "generates electricity without emitting carbon dioxide."[5] This determination should be based on solid, real-world data about the technology's carbon emissions, rather than being "highly dependent" on modeling assumptions about speculative alternative scenarios. It should not require a "rigorous analysis process," nor did the legislature ever contemplate such a process.[6] The law makes no mention of life-cycle analysis, of baseline or counter-factual scenarios, or of netting, nor was there any discussion of these concepts in the legislative history. Because the law does not define carbon-free in comparison with something else, it does not require anything like the kind of complex analysis the Department and others recommend. Linking carbon-free status to such an analysis, in addition to being inconsistent with the law, would be a wholly unnecessary complication of the law.[7]

Importantly, carbon-free status does not turn merely on "whether a resource actually lowers emissions compared to a base case," as the Department suggests. This language assumes use of an incremental emissions reduction standard, and such a standard would deliver far fewer carbon reductions than actually replacing today's carbon-emitting generation with technologies that have no emissions. There is a vast

[5] Minn. Stat. § 216B.1691, subd. 1(b).
[6] CEOs also dispute whether life-cycle analyses can be considered rigorous when their accuracy depends on the accuracy of highly subjective judgments and speculative long-term predictions about the counterfactual scenario.
[7] See section IV of our initial comments in this docket for further discussion of the unnecessary administrative burden created by determining carbon-free status based on life-cycle analysis.

difference between a technology assumed to lower net emissions (by some amount, somewhere, someday) and a technology that is actually and demonstrably carbon-free (not emitting carbon dioxide). If all utilities had to do was show that a proposed resource reduced carbon emissions compared to the status quo, Minnesota would fall far short of the deep power grid decarbonization required by the CFS and the deep economy-wide decarbonization required by our state's GHG reduction targets. Indeed, by making long-term investments in carbon-emitting generation—particularly the burning of biomass or solid waste—we would be locking in decades of carbon emissions even higher than those from coal plants on a per megawatt-hour (MWh) basis, directly counter to the law's intent.

In their reply comments, MMPA similarly endorses use of an incremental emissions reduction standard. It supports using a carbon-intensity-based framework to ensure "only resources with verifiable greenhouse gas benefits contribute toward CFS compliance,"[8] and it supports RNG because it allegedly "delivers verifiable net reductions." MMPA's approach, like the Department's, assumes that the CFS's approach is to require GHG benefits or reductions compared to some baseline. While some laws do take this approach, the CFS is not one of them.

We explained in both our initial and reply comments the crucial distinction between the CFS and laws like the Minnesota's Natural Gas Innovation Act ("NGIA")[9]

[8] MMPA, Reply Comments, p. 2.
[9] CEOs, Reply Comments, p. 7 and CEOs, Initial Comments, p. 7-10.

or California's Low Carbon Fuel Standard ("LCFS").[10] The NGIA and LCFS laws explicitly seek to reduce GHG-intensity *as compared to baseline GHG-intensity levels* of conventional natural gas[11] or conventional transportation fuels.[12] These laws differ fundamentally from the CFS because they use comparative standards which seek incremental GHG-intensity reductions compared to current fuels. Such an approach is necessarily analysis-heavy, requiring the calculation of the GHG-intensity of both the currently used fuels and the lower-intensity replacement fuels. This, in turn, requires the use of models and assumptions about counterfactual, business-as-usual scenarios. By contrast, the CFS does not require or even contemplate any such comparisons, and therefore, requires no such analysis.

The CEOs urge the Commission to recognize that the life-cycle analysis process as described by the Department and others would necessarily weaken the CFS by accepting for compliance merely incremental reductions from the status quo. The Commission should reject this approach as incompatible with the language and purpose of the law.

B. The Department's revised position on avoided emissions is a step in the right direction, but it should also apply to emissions avoided outside the power sector

The Department has changed its recommendations in its reply comments with respect to avoided emissions. It says that "the Department found that it erroneously applied avoided emissions to the determination of carbon-free status in Minn. Stat. §

[10] CEOs, Reply Comments, p. 9-10.
[11] An NGIA plan's compliance with the law depends on whether the plan has "lower lifecycle greenhouse gas intensity" than natural gas from conventional sources. Minn. Stat. § 216B.2427, subd. 2(b)(4).
[12] California Air Resources Board, Low Carbon Fuel Standard/About, website available at: https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/about.

216B.subd. 2d(b)(i)."[13] It goes on to acknowledge that "[c]arbon-free status requires zero emissions, and any net emissions of carbon dioxide disqualifies all generation from carbon-free determination."[14] As we understand the Department's position, it would no longer credit the generating facility with any of the emissions the generator presumably avoids at other generating facilities. In our reply comments, the CEOs objected to giving any credit for avoided emissions elsewhere on the grid.[15] If we correctly understand the Department's new position, it is a step in the right direction. However, that step is not large enough, because "avoided emissions" are still baked into the Department's recommended use of a life-cycle analysis, which credits generators with avoided emissions from the waste-management sector. That is, a generator could not claim credit for avoiding emissions from other power plants, but it could still claim credit for avoiding emissions from landfilling, open burning, or other methods of handling a waste feedstock.

Indeed, the Department later discusses a "business-as-usual base case where a feedstock is not used to generate electricity." [16] It goes on to state that "[i]f the emissions from a fuel LCA study of electricity generation with the feedstock are less than or equal to the emissions of the base case, then the marginal addition of the electricity has either negative emissions or no emissions associated with the electricity generation, and should

[13] Department, Reply Comments, p. 11.
[14] *Id.* CEOs would generally agree with this sentence but for the use of the word "net," which has no basis in the law's definition of carbon-free.
[15] CEOs, Reply Comments, p. 6-9.
[16] Department, Reply Comments, p. 14.

qualify as carbon free."[17] The CEOs have explained in our initial and reply comments that this comparative analysis is inconsistent with the language and intent of the law, creates tremendous new complexity, undermines climate and solid waste goals, and harms human health. Here we simply note the inconsistency between disallowing consideration of avoided grid emissions while allowing consideration of avoided waste-management emissions. Moreover, this quote again illustrates the far weaker standard the Department is proposing, under which carbon-free status could be granted based on slightly improving the waste-management status quo—or even just not making the status quo worse—rather than on replacing carbon-emitting generation with carbon-free generation.

Minnesota's CFS law is intended to dramatically reduce the state's power sector carbon emissions, bringing them close to zero. No other sector of the economy is currently subject to such an ambitious carbon-reducing law, but then no other sector has made the carbon-reducing progress that the power sector has, with advances in carbon-free technologies now making it possible to achieve such deep reductions. And it makes sense to require the power grid to decarbonize first, since carbon-free power is key to enabling other sectors to decarbonize through beneficial electrification. However, if the state is to achieve its GHG reduction targets, every other sector of the economy with significant emissions will have to follow its own decarbonization pathway. Other laws related to

[17] *Id.*

those sectors will surely emerge, implemented by regulatory authorities other than the Commission.

It would be an error of law for the Commission to assume the CFS gives it the responsibility or authority to tolerate ongoing or even increased power sector emissions based on the assumption of reduced emissions in other sectors that the CFS does not mention and that the Commission does not regulate. The CFS gives the Commission authority to weaken its implementation of the CFS upon consideration of other sectors' GHGs *in only one limited circumstance*: when the Commission considers an offramp request under the CFS, it may consider the GHG savings in other sectors from beneficial electrification, but even that narrow authority is constrained by specific conditions.[18] The CFS does not give the Commission any broader statutory authority to weigh power sector emissions against emission reductions in other sectors. Such language is conspicuously absent from the statute.

C. The Commission need not choose between two extreme interpretations of the CFS law, neither of which reflect legislative intent

The Department's reply comments indicate that the Commission must either (1) narrow its focus solely to emissions at the point of generation, or (2) widen it broadly enough to include a life-cycle analysis that not only goes beyond considering emissions from the generating technology but includes counterfactuals that consider avoided GHG emissions assumed to occur at other facilities in other sectors of the economy across the

[18] Minn. Stat. § 216B.1691, subd. 2b(a)(10).

coming century, as well as considering the long-term growth of future forests.[19] These represent two extreme interpretations of the law, and both of them are inconsistent with legislative intent.

The Commission is authorized to consider emissions beyond the point of generation because the law defines carbon-free with respect to a "technology" that generates electricity without emitting carbon dioxide, rather than with respect to a "facility" that does so. Thus, the Commission can look at other emissions that can reasonably be considered part of the generating technology. However, if the technology does emit carbon dioxide at the point of generation, the Commission need not look for more emissions upstream or downstream, since that technology is already disqualified from being considered carbon-free.

While in most cases there will be no need to look for emissions beyond the point of generation, in the case of a facility that uses both carbon-free and carbon-emitting technologies and that seeks partial compliance credit under Minn. Stat. § 216B.1691, subd. 2d(b)(2)(i), the Commission must determine what percentage of the generation is carbon-free.[20] This is not a simple yes-or-no question, unlike the definition of carbon-free. The calculation will necessarily require the Commission to take a more in-depth look at the generating technology. The legislative history clearly indicates that this provision is

[19] Department, Reply Comments, p. 10, 13.

[20] The Commission could also look at carbon emissions beyond the point of generation if ever faced with a power plant that burns 100% hydrogen produced using high-carbon methods, since hydrogen production is part of the generating technology. The Commission is unlikely to need to consider such a facility, which would cost more than natural gas generation while delivering no climate benefits. If such a facility is ever proposed by a Minnesota utility, in addition to finding it to be a carbon emitting technology under the CFS, the Commission could reject it as imprudent and contrary to the public interest under its other authorities.

meant to apply to facilities partially using CCS or partially co-firing with hydrogen, and possibly, in the words of the chief Senate author, to other technologies that "maybe we're going to invent and improve on in the future."[21] The chief House author of the bill repeatedly used the example of giving partial credit for "green" hydrogen, and whether the hydrogen is green or not can only be determined by looking beyond the point of generation at the carbon emissions associated with the hydrogen's production.[22]

Based on this history of the partial compliance provision, and the law's overall goal of increasing the state's use of technology that generates electricity without emitting carbon dioxide, it is necessary for the Commission to look beyond the point of generation when calculating the carbon-free share of generation under the partial compliance provision. Looking beyond the point of generation under the partial compliance provision is entirely consistent with the law's definitional focus on an energy technology's carbon emissions.

CEOs' recommended interpretation is also far simpler and requires less speculation than the sort of life-cycle analyses recommended by other commenters. It does not require the Commission to: (1) look beyond the carbon emissions of the generating technology itself; (2) guess at avoided GHG emissions at other facilities, in other sectors, in future decades; (3) guess at the carbon dioxide absorbed by future forests and decide who should get credit for it;[23] (4) speculate about the impact of policy,

[21] CEOs, Initial Comments, p. 15-19.
[22] *Id.*, p. 50-51.
[23] CEOs, Initial Comments, p. 38-40.

technological, and economic changes on counterfactual scenarios as the climate crisis intensifies; (5) interpret the partial credit provision so broadly that it largely obliterates the law's bedrock distinction between technologies that do not emit carbon dioxide and those that do;[24] or (6) replace the law's strong "without emitting carbon dioxide" standard with a much weaker "incremental reductions" standard. And it does not require ignoring the legislative history showing that legislators purposely excluded generation from solid waste and biomass from the definition of carbon-free.[25]

The Commission need not choose between either an overly narrow interpretation of the law that always ignores indirect emissions or an extremely broad interpretation that takes the Commission far afield from the scope of the CFS. It can take a reasonable middle ground such as we have outlined and which is entirely consistent with the language and intent of the law.

D. Legal arguments submitted by St. Paul Co-Generation and District Energy of St. Paul misinterpret the CFS law

Surprisingly few commenters have offered any rebuttal to the extensive legal arguments and discussion of legislative history submitted by the CEOs in this docket and in Phase II of the CFS docket. The joint comments submitted by St. Paul Co-Generation and District Energy of St. Paul ("Joint Comments") do offer some legal arguments, to which we respond here.

[24] CEOs, Initial Comments, p. 13-16.
[25] CEOs, Initial Comments, p. 11-13.

The Joint Comments state that the definition of carbon-free does not contain any timeframe for determining emissions.[26] Thus, the Joint Comments assert that the Commission can and should consider whether a technology "does not emit carbon dioxide based on emissions over its life cycle." However, this argument assumes that the law applies to *net* emissions over time (and considering alternative fates) rather than to whether the technology is one that "generates electricity without emitting carbon dioxide." As we have discussed,[27] the definition of carbon-free in no way grants the Commission authority to disregard the undeniable emissions from a generating technology or to net them against avoided emissions elsewhere, under any timeframe. Thus, the lack of a specified timeframe has no relevance to the definition of carbon-free.

The Joint Comments also argue that using a life-cycle approach is consistent with the flexibility and Commission discretion built into the statute, citing various considerations mentioned in the law.[28] It is true that the Commission is authorized, and indeed required, to consider a long list of factors when implementing the CFS, ranging from cost and reliability concerns to worker and air quality impacts.[29] Conspicuously

[26] St. Paul Co-Generation and District Energy of St. Paul, Reply Comments, p. 2.
[27] CEOs, Initial Comments, Section I.A.
[28] St. Paul Co-Generation and District Energy of St. Paul, Reply Comments, p. 2.
[29] Under subdivision 9 of the law, for example, the Commission must try to maximize benefits related to creating high-quality jobs; recognizing worker rights to organize; ensuring workers have the tools to adapt to the energy transition; ensuring all Minnesotans share in the benefits of the clean energy economy; ensuring statewide air emissions are reduced, particularly in environmental justice areas; and providing affordable electric services, particularly to low-income consumers. It must also balance factors like ownership of energy production (locally, by independent power producers, and by utilities), costs to meet the renewable and carbon-free standards, and electric service reliability. Under subdivision 2b, if a utility seeks an offramp, the Commission must consider customer costs and the competitive pressure customers face; the environmental costs of granting the offramp; reliability of service; technical advances or concerns; delays in site acquisition or permitting; equipment delays; transmission constraints; other statutory obligations; impacts on environmental justice areas; and the GHG savings from beneficial electrification.

absent from this long list is any mention of the impact of implementing the CFS on the disposal of wood waste or on waste management more generally. And even if impacts on waste management were listed among the factors the Commission must consider, this would not give the Commission the flexibility to ignore the plain language of the carbon-free definition, which precludes treating the burning of waste wood (or any carbon-emitting waste) as carbon-free.

The Joint Comments also state that interpreting the definition of carbon-free in a manner than excludes biomass means "there would be no practical reason for electric utilities to generate or purchase energy compliant with the EETS [Eligible Energy Technology Standard], thus rendering the EETS superfluous."[30] But of course the EETS is a distinct and enforceable requirement under the law. The practical reason that utilities will have for complying with the EETS is that the law requires them to. The Joint Comments stress the value of having "overlap" between the EETS and CFS. While there is indeed a great degree of overlap—with about 98 percent of the state's current generation from EETS qualifying under the CFS[31] and much of its carbon-free generation qualifying under the EETS (with the exception of nuclear)—there is no reason to believe all EETS should be considered carbon-free. As we have noted before,[32] utilities can

And under subdivision 2d the Commission must consider system reliability, economic impacts on ratepayers, and technical feasibility.

[30] St. Paul Co-Generation and District Energy of St. Paul, Reply Comments, p. 3.

[31] Minn. Dept. of Commerce, Energy Policy and Conservation Quadrennial Report (2024), p. 104, Figure 5-1. This figure shows that 2 percent of generation comes from biomass, which the CEOs understand to include municipal solid waste given its inclusion under the category of biomass at Minn. Stat. § 216B.1691, subd. 1(c)(5).

[32] CEOs, Initial Comments, p. 20-22.

continue to generate or procure a certain amount of carbon-emitting power even after 2040, given that the 100% standard is pegged to sales and not generation and given the flexibility the CFS provides to buy renewable energy credits ("RECs") or even seek an off-ramp.

The Joint Comments state that having overlap between CFS- and EETS-eligible sources would be consistent with how other states have implemented their renewable and carbon-free energy requirements, citing only Colorado.[33] However, the Colorado legislature made the decision to explicitly include renewable energy resources, including biomass, in its definition of "clean energy resource."[34] The Minnesota legislature could have similarly included EETS in its definition of carbon-free, but it chose not to.

The Joint Comments also assert that if their biomass-burning co-generation plant is not deemed carbon-free it will lead to its closure.[35] However, the ongoing requirement to meet the EETS will mean ongoing demand for the valuable RECs that biomass facilities create today. Not allowing biomass to be considered carbon-free would only prevent the facility from accessing the new income stream that could otherwise come from generating carbon-free credits, but that is entirely appropriate given that biomass facilities cannot "generate electricity without emitting carbon dioxide."

As for the larger financial troubles confronting the Joint Commenters' co-generation facility, there is nothing in the CFS law suggesting the Commission is

[33] St. Paul Co-Generation and District Energy of St. Paul, Reply Comments, p. 2.
[34] Colo. Rev. Stat. § 40-2-125.5(2)(b).
[35] St. Paul Co-Generation and District Energy of St. Paul, Reply Comments, p. 4.

responsible for solving them, and certainly not by granting all biomass plants carbon-free status. Indeed, the exclusion of carbon-emitting technologies from the carbon-free definition leaves the Commission no legal room to do so. And as we discussed earlier,[36] Xcel has been paying above-market rates for energy from this biomass facility, meaning its ratepayers have been inappropriately subsidizing its waste wood disposal services for years. The legislature sought to reduce this subsidy by statutorily requiring District Energy to attempt to obtain other funding that would enable the cogeneration facility to keep providing tree disposal services after the expiration of its power purchase agreement with Xcel.[37] The Commission subsequently noted that the facility could obtain funding by imposing tipping fees on those who deliver wood waste to it and that the Minnesota Pollution Control Agency is in the process of hosting stakeholder discussions regarding those tipping fees.[38] That is the appropriate setting for putting the facility on a more economically sustainable footing, rather than through misinterpreting the CFS law.

II. Commenters fail to appreciate the urgent need to reduce carbon emissions

Reply comments by the Department and Xcel fail to reflect the urgent need to reduce carbon emissions, both to meet Minnesota GHG reduction goals and to help confront the escalating climate crisis.

The Department states that the life-cycle analysis study period should be "[a]t least 100 years to account for new biogenic growth and emission tails of decaying debris" for

[36] CEOs, Initial Comments, p. 23-24.
[37] Minn. Stat. § 216B.2424, subd. 5c(d).
[38] Minn. Pub. Utils. Comm'n, *In the Matter of Xcel Energy's Petition for approval of a Power Purchase Agreement between Northern States power and St. Paul Cogeneration, LLC,* Order Approving Electrification Proposal and Extension of Power Purchase Agreement, Docket No. E-002/M-21-590, p. 4 (Nov. 4, 2024).

waste biomass.[39] This recommendation suggests a misguided belief that there is an equivalency between carbon emitted today and carbon emissions avoided (or carbon absorbed) sometime over the next century, and it is obviously inconsistent with Minnesota's goal to achieve net-zero emission by 2050. It also overlooks the fact that Earth's system contains multiple tipping points that, once reached, will accelerate the climate crisis and cause tremendous damage, such as the thawing of the permafrost or the unstoppable melting of the Greenland ice sheet.[40] Reducing our emissions now is vital to avoid crossing those tipping points. The prospect that emissions might be reduced or that carbon might be re-absorbed several decades from now in no way compensates for the risk posed by carbon emissions today.

Xcel, meanwhile, asks the Commission to decide that new assets granted carbon-free status based on a life-cycle analysis will not have that status re-evaluated until they are fully depreciated, and even then only if there are significant operational changes, arguing this is needed to provide regulatory certainty.[41] We have addressed in our reply comments why such a delayed re-evaluation would require the Commission to ignore the inevitable changes in the counterfactual in the intervening decades.[42] We simply note here that there can be no regulatory certainty related to any long-term investments in

[39] Department, Reply Comments, p. 13.
[40] Raymond Zhong and Mira Rojanasakul, "How Close Are the Planet's Tipping Points?" *New York Times,* Aug. 11, 2024, *available at* https://www.nytimes.com/interactive/2024/08/11/climate/earth-warming-climate-tipping-points.html.
[41] Xcel, Reply Comments, p. 3.
[42] CEOs, Reply Comments, p. 11-13.

assets that emit carbon dioxide while society struggles to reach net zero. Such assets will inevitably and appropriately be under the shadow of stricter impending regulation.

Both the Department's and Xcel's comments presume a more leisurely pace of decarbonization than we can afford. Minnesota's GHG reduction targets for 2030 and 2050 were chosen to reflect the then-current science indicating the scale of emission cuts needed to avoid severe global climate disruption. Since those targets were strengthened in 2023, the climate crisis has advanced significantly. Both 2023 and 2024 shattered global temperature records.[43] The past ten years represent what the World Meteorological Organization ("WMO") has called "an extraordinary streak of record-breaking temperatures."[44] In fact, the WMO found that 2024 exceeded pre-industrial temperatures by about 1.55° C, meaning it exceeded the warming limit nations aimed to achieve under the Paris Agreement. While the Paris goal is based on longer term temperatures than a single year, crossing the 1.5° threshold in 2024 is a clear warning sign that the world needs to be much more aggressive about reducing emissions than it has been.

Life-cycle analyses that net out a technology's emissions against reduced emissions under a counterfactual scenario would violate the law even if the emissions assumed to be avoided elsewhere were contemporaneous with the generating technology's emissions. Offsetting today's emissions against emissions projected for

[43] Roxana Bardan, "Temperatures Rising: NASA Confirms 2024 Warmest Year on Record," NASA news release, Jan 10, 2025, *available at* https://www.nasa.gov/news-release/temperatures-rising-nasa-confirms-2024-warmest-year-on-record/.
[44] World Meteorological Organization, "WMO Confirms 2024 as warmest year on record at about 1.55° C above pre-industrial level," news release, Jan. 10, 2025, *available at* https://wmo.int/news/media-centre/wmo-confirms-2024-warmest-year-record-about-155degc-above-pre-industrial-level.

some time in the distant future is even more speculative and dangerous. In a world that could soon cross any of multiple climate tipping points, we need emission reductions today, not in future decades.

III. Minnesota Power's claims regarding the value of Hibbard are not relevant to this docket, and they overlook the plant's harmful health impacts

Minnesota Power's reply comments assert that biomass could help meet the state's 2040 carbon goals and stress its reliability and cost advantages.[45] In particular, Minnesota Power discusses the value of its 50 MW Hibbard power plant in Duluth. However, the relative value of Hibbard for reliability, cost, and CFS compliance is something that can only be shown in the context of a resource planning docket, with the aid of capacity expansion modeling that can compare the full suite of resources Minnesota Power has to choose from. Moreover, even if Minnesota Power established the cost and reliability value of Hibbard, that does not make it carbon-free under the CFS. In short, Minnesota Power's Hibbard claims are both unsubstantiated in this docket and irrelevant to the legal question of whether biomass, which emits high quantities of carbon per MWh when used to fuel generation, can be considered carbon-free under the CFS.

Of course, if the Commission concludes that Hibbard cannot be considered carbon-free, that would not necessarily require the plant's closure, even by 2040. It simply means Hibbard's generation must be shifted to the carbon-emitting side of the utility's ledger. If, as a result, Minnesota Power could not meet its CFS compliance obligation for

[45] Minnesota Power, Reply Comments, p. 1-2.

a certain year, it could compensate by purchasing renewable energy credits or it could even apply for an offramp.

To the extent the Hibbard plant is relevant to this docket, it supports a Commission decision not to treat biomass as carbon-free. The plant has extremely high and documented health impacts. A 2022 analysis modeling the health impacts of Hibbard found the plant likely contributed to 6.4 premature deaths and $70 million in health impacts in 2021 alone, comparable to the far larger Boswell coal plant.[46] As we discussed in our initial comments, this may be because biomass facilities nationwide have been subject to lax environmental regulation.[47] Moreover, the 2022 analysis found that Hibbard's emissions had a disproportionate impact on the Native American community,[48] and the plant is located in Duluth, which is an environmental justice area.[49] Under subdivision 9 of the CFS law, the Commission must take all reasonable actions within its authority to implement the law in a manner that maximizes benefits that include "ensuring that statewide air emissions are reduced, particularly in environmental justice areas."[50] The fact that air pollution emissions from burning biomass can have serious health impacts, as illustrated by Hibbard itself, is an additional reason biomass should not qualify as carbon-free.

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[46] PSE Healthy Energy, "Incorporating Health and Equity Metrics into the Minnesota Power 2021 Integrated Resource Plan," (April 2022) p. 19, 28, *available at:* https://fresh-energy.org/wp-content/uploads/2022/04/Minnesota-Power-IRP-Equity-Analysis-Final-4.28.22.pdf.
[47] CEOs, Initial Comments, p. 48.
[48] PSE Report, supra note 46, p. 28.
[49] Minnesota Pollution Contral Agency, "Understanding Environmental Justice in Minnesota; Environmental Justice Areas," map, *available at* https://experience.arcgis.com/experience/bff19459422443d0816b632be0c25228/page/Page/?views=EJ-areas.
[50] Minn. Stat. § 216B.1691, subd. 9(a)(5).

IV. The CEOs agree with the Department that the formula for determining partial compliance for plants using CCS should capture the impact of "parasitic load" but believe this requires using the formula the CEOs have presented, including consideration of indirect emissions

The Department's reply comments include a formula for determining the "carbon-free" percentage of the output of a plant partially employing CCS, stating:

> This system normalizes for parasitic load from the CCS and ensures that the carbon-free percentage of natural gas with partial CCS reflects energy output and not simply the carbon capture percentage at the time of electricity generation, which would underestimate emissions per MWh due to increased fuel burn to provide the same MWh as an unabated power plant.[51]

We agree with the Department that it is important to capture the parasitic load from the CCS equipment and to avoid underestimating the emissions per MWh due to the increased fuel burn. However, we do not believe the Department's formula would actually capture the added emissions associated with this parasitic load. The Department uses the fiction that there are two fuels being co-fired, one being standard natural gas subject to no capture and the other being a natural gas fully subject to capture. It then uses the "percent capture rate" as "a proxy" for estimating the total MMBtus from each fuel source, however, using capture rate is not an adequate proxy. As we understand the Department's proposed formula, the percentage of carbon captured would flow through to become the rate of generation presumed to be carbon-free. As we have discussed, though, the percentage of carbon captured will always be higher than the percentage of carbon dioxide reduced by the addition of the CCS process.[52]

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[51] Department, Reply Comments, p. 12.

[52] CEOs, Initial Comments, p. 55-56 (citing analysis by the Environmental Protection Agency explaining how the capture rate will be higher than the actual reduction in carbon dioxide on a per MWh-net basis).

The Commission, in its Notice of Comment Period for this docket, was correct to focus on the "carbon dioxide emissions per megawatt-hour (MWh) reduced by the CCS."[53] However, when estimating the CO_2/MWh of the plant with CCS and a comparable plant without CCS, we urge the Commission to also consider emissions from offsite power sources used to drive the CCS process, since some CCS proposals (including Project Tundra, the CCS project furthest along in this region) would power the CCS equipment from offsite plants that are not subject to carbon capture. The Commission's formula should factor in all significant indirect carbon emissions reasonably attributable to the CCS process as well as direct emissions, consistent with considering the indirect emissions associated with generating the hydrogen used in co-firing plants. We refer the Commission to our initial comments for more detail on how to estimate the carbon-free generation from a plant employing CCS.[54]

V. Partial credit for hydrogen co-firing should consider more than just heat content

In its reply comments, Xcel says that when calculating the carbon-free percentage of electricity from a plant co-firing hydrogen with gas, the carbon-free percentage can easily be calculated by looking at the heat input from each fuel, which would be closely tracked by the power plant.[55] Xcel says there is therefore no need to calculate the reduction in CO_2/MWh caused by co-firing with hydrogen.

The CEOs are concerned, however, that focusing solely on heat content would overlook any potential losses in the efficiency at the power plant caused by co-firing with

[53] Notice of Comment Period, p. 1-2 (Jan. 22, 2025).
[54] CEOs, Initial Comments, p. 55-59.
[55] Xcel, Reply Comments, p. 4-5.

hydrogen. If there are such efficiency losses, they should be reflected in the calculation of the percentage of carbon-free generation from the plant. We therefore recommend that the Commission base the carbon-free percentage calculation on "the direct and indirect emissions of the generation resource per MWh with hydrogen cofiring, compared to the carbon dioxide per MWh that would be emitted if the generator burned only natural gas," as stated in the Commission's Notice of Comment Period. This information should be readily available since any utility retrofitting a gas plant to co-fire with hydrogen, or building a new plant with such capability, will surely have already determined the efficiency impact.[56]

VI. RNG generation emits CO_2, so it cannot be considered carbon-free, plus it can have other potentially serious environmental impacts

MMPA asks the Commission in its reply comments to treat RNG-burning generators as carbon-free.[57] However, like plants burning biomass or solid waste, RNG-burning generators cannot "generate electricity without emitting carbon dioxide," and therefore cannot qualify as carbon-free as a matter of law.

Moreover, as the Institute for Agriculture and Trade Policy ("IATP") and Health Professionals for a Healthy Climate ("HPHC") have pointed out in their initial comments in this docket, there can be substantial environmental downsides to RNG facilities. Manure-based RNG facilities often leak methane, and the digestate (the remaining manure after the methane has been captured) has higher concentrations of ammonia,

[56] *See* CEOs' discussion of how to calculate the carbon-free generation from plants co-firing hydrogen in our initial comments, p. 52-54.
[57] MMPA, Reply Comments, p. 3.

which can lead to higher emissions of nitrous oxide when applied as fertilizer.[58] These facilities are vulnerable to extreme weather events, including spills and leaks.[59]

Because RNG produced from manure is only economical at the largest operations, granting carbon-free status to generation burning RNG from manure would further the spread of concentrated animal feeding operations ("CAFOs"). EPA's AgSTAR program states that manure digesters require 10,000 hogs to be economically viable.[60] CAFOs are the source of a host of negative environmental impacts, including harmful air emissions that cause health impacts like asthma, respiratory problems, eye irritation, nausea, and an increased risk of community-acquired pneumonia, as well as water pollution and nutrient runoff that contributes to algal blooms. [61] The environmental impact of CAFOs is even greater if we consider the environmental impact of fertilizing the crops fed to the animals.[62] Moreover, CAFOs have serious social impacts. They have contributed to a severe decline in the number of farms in Minnesota and nationally, with major consequences for rural communities.[63]

These negative impacts represent additional reasons why the Commission should not choose to promote the expansion of RNG-fueled generation by granting it carbon-free status under the CFS. Certainly, if the legislature had intended the CFS to promote the further spread of controversial and highly polluting CAFOs, the statute would have

[58] IATP, Initial Comments, p. 1-2.
[59] IATP, Initial Comments, p. 2-3.
[60] HPHC, Initial Comments, p. 3.
[61] HPHC, Initial Comments, p. 2, 5-6.
[62] HPHC, Initial Comments, p. IATP, Initial Comments, p. 2.
[63] HPHC, Initial Comments, p. 3, 7; IATP, Initial Comments, p. 3.

explicitly said so and the legislative history would reflect a vigorous debate on the subject.

CONCLUSION

For the reasons set forth above and in our initial and reply comments, the CEOs respectfully request that the Commission make the following findings, repeated here for ease of reference.

1. Electricity generation fueled by burning solid waste, biomass, or other fuels that emit CO_2 when burned are not eligible for treatment as carbon-free under the CFS as a matter of law because they do not generate electricity "without emitting carbon dioxide," as required under the definition of carbon-free at Minn. Stat. § 216B.1691, subd. 1(b).

2. The partial compliance provision at Minn. Stat. § 216B.1691, subd. 2d(b)(2)(i) applies to facilities that partially employ a technology that, if fully employed at the facility, could potentially generate electricity without emitting CO_2, such as facilities using hydrogen co-firing or CCS. The provision does not apply to facilities that burn solid waste, biomass, or other fuels that emit CO_2 unless they also partially employ a technology described in the previous sentence, and then only the percentage of generation attributable to that technology would be considered carbon-free.

3. [ALTERNATIVE TO FINDINGS 1 AND 2] The Commission declines to consider requests to grant full or partial carbon-free status to electricity generation fueled by solid waste, biomass, or other fuels that emit CO_2 when burned, finding that such grants would be contrary to the public interest. Granting such requests based on life-cycle analysis would be contrary to the public interest because:

   (A) granting such requests would increase power sector CO_2 emissions by incentivizing more burning of solid waste and biomass, which runs counter to the goals of the CFS law and legislative intent;

   (B) such analyses would be administratively burdensome, demand a high degree of speculation regarding multiple factors, and yield unreliable results;

(C) the need to update the analyses as circumstances change would create ongoing regulatory uncertainty disruptive to energy planning and waste-management planning;

(D) granting carbon-free status to such facilities could undermine efforts to reach state climate and waste-management goals; and

(E) granting carbon-free status to such facilities could undermine efforts to reduce health-harming air pollutants, particularly in environmental justice areas, contrary to the goal of Minn. Stat. § 216B.1691, subd. 9.

4. When determining what percentage of generation from a facility employing hydrogen co-firing or CCS should be considered carbon-free under section 216B.1691, subd. 2d(b)(2)(i), the Commission will base it on the total percentage reduction in overall CO_2 emissions per MWh of generation resulting from use of the technology. Hydrogen co-firing will only qualify for partial compliance credit if the hydrogen production process can reasonably be considered carbon-free. Overall CO_2 emissions will reflect reductions in the CO_2 emissions at the point of generation ("direct emissions") as well as any significant CO_2 emissions increases reasonably attributable to the hydrogen co-firing or CCS technologies that occur upstream or downstream of the point of generation ("indirect emissions"). The total percentage reduction in overall CO_2/MWh is the total percentage of the facility's generation that will be considered carbon free.

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/s/ Barbara Freese

Barbara Freese
Staff Attorney
Minnesota Center for Environmental Advocacy
1919 University Ave W, Suite 515
St. Paul, MN, 55104
bfreese@mncenter.org
Attorney for Clean Energy Organizations