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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**

# REPLY COMMENTS OF THE CLEAN ENERGY ORGANIZATIONS

**August 20, 2025**

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## INTRODUCTION

Minnesota Center for Environmental Advocacy ("MCEA") and the Sierra Club (collectively, "Clean Energy Organizations," or "CEOs") appreciate the opportunity to submit these reply comments regarding the Commission's investigation into the use of a fuel life-cycle analysis framework for compliance with the state's Carbon-Free Standard ("CFS") and other issues raised by the Commission for this comment period.[1]

In our initial comments we explained that considering generators burning either biomass or solid waste to be carbon-free, even partially, would violate both the plain language of the CFS law and legislative intent, regardless of the results of any life-cycle analysis.[2] We also set forth the policy reasons why generators burning biomass and solid waste should not be granted carbon-free status, including how doing so would create a new and inappropriate ratepayer subsidy of waste burning; result in a heavy administrative burden, unreliable results, and regulatory uncertainty; and interfere with climate, waste, and air quality progress.[3]

In these reply comments we further explain why commenters' specific life-cycle analysis proposals would violate both the language and intent of the CFS law. Part I addresses how commenters' proposals deviate from the law's definition of "carbon-free." Part II addresses how the commenters' proposals deviate from the law's partial

[1] Minn. Pub. Utils. Comm'n, *In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota's Carbon-Free Standard,* Notice of Comment Period, Docket No. E-999/CI-24-352 (Jan. 22, 2025).
[2] CEOs, Initial Comments, p. 5-19.
[3] CEOs, Initial Comments, p. 19-49.

compliance provision. Part III addresses how partial compliance for carbon capture and storage ("CCS") plants should be determined, and Part IV addresses the need to limit partial compliance for hydrogen co-firing facilities to plants using hydrogen produced in carbon-free ways.

Appendix A to these comments presents our position in the template form requested by the Department of Commerce and Minnesota Pollution Control Agency (collectively, "the Agencies").

## ARGUMENT

### I. Commenters' proposals would greatly weaken and complicate the definition of "carbon-free" by including carbon-emitting technologies assumed to slightly reduce carbon emissions somewhere else

Various commenters in this docket have proposed methods of interpreting the carbon-free definition that ignore the law's fundamental distinction between technologies that emit carbon dioxide and those that do not. It would be a clear error of law for the Commission to adopt any of these interpretations, which would also greatly weaken the CFS and complicate its implementation. Indeed, some of the proposals would weaken and complicate the law even more than we had anticipated in our initial comments.

#### A. The Agencies' recommendations would replace the statutory goal of carbon-free generation with the far weaker goal of incremental carbon reductions

In their initial comments, the Agencies say that they "support technologies and fuels that demonstrate a proven improvement to net carbon emissions across the

state…."[4] The Agencies' approach represents a misreading of the law in two fundamental ways: (1) it inserts the concept of "netting" into the CFS law, which nowhere appears in the statute; and (2) it replaces the law's "carbon-free" standard with a "lower-carbon" standard. The Agencies go on to state, with respect to electricity "generated from a combusted waste fuel source without carbon capture," that "the emissions from the non-electricity generation counterfactual per ton of material should set the cap for CFS eligibility, which means that electricity generation should not increase emissions over a business-as-usual scenario."[5]

This approach would allow a waste-burning facility that can claim just the slightest reduction in emissions below a "business-as-usual" counterfactual to qualify as carbon-free. It means that if a waste-burning facility has even slightly lower emissions than the counterfactual, the facility would be deemed entirely carbon-free, even if it actually emits far more carbon dioxide per MWh than coal plants. This approach is clearly inconsistent with the common usage of the term carbon-free, and it is incompatible with the plain meaning of the statutory definition of carbon-free. It is far more lax than what the law demands, which is a decisive shift toward technology that generates electricity without emitting carbon dioxide at all.

The Agencies also state that biomass, renewable natural gas ("RNG"), solid waste, manure and other emerging feedstocks "have potential to demonstrate beneficial fuel pathway life cycles and should be eligible as fully or partially carbon-free based on where

[4] Agencies, Initial Comments, p. 11.
[5] *Id.*

their individual project lies on this spectrum."[6] This statement further illustrates how incompatible the Agencies' approach to decarbonization is with the law. The CFS does not create or recognize a spectrum of energy technologies with different levels of GHG-emissions, nor does it ask the Commission to do so.

Instead of such a spectrum of technologies, the Minnesota CFS creates just two distinct categories of electricity: (1) "carbon-free" electricity, from technology that generates "without emitting carbon dioxide," and, by necessary implication, (2) other electricity, from technology that does emit carbon dioxide. *This fundamental distinction – between carbon-free generation and other generation – lies at the heart of the CFS*. It is appropriately ambitious, given the obvious need for deep decarbonization of the power grid, not just incremental carbon reductions. It is simple, requiring the Commission only to distinguish between the two categories of electricity. And it is clear, using the single criterion of whether or not carbon dioxide is emitted by the generating technology. No complicated calculations are needed to answer the yes-or-no question of whether a technology is carbon-free; the Commission need only determine if the technology generates without emitting carbon dioxide.

In enacting a CFS based upon this definition of carbon-free, the legislature rejected the multitude of less ambitious and more complicated approaches it could have taken. It could have merely sought to promote an incremental shift to lower carbon generation rather than to carbon-free generation, but it did not. It could have enacted a comparative

[6] Agencies, Initial Comments, p. 18.

standard requiring the Commission to determine a facility's carbon emissions relative to other facilities or activities, but it did not. It could have defined carbon-free based on a technology's *net* carbon emissions estimated using life-cycle analysis, but it did not. And it could have treated biogenic carbon dioxide differently than fossil carbon dioxide, but it did not.

Clearly, doing just a little better than business-as-usual is not nearly good enough if we are to achieve the state goal of net-zero GHGs by 2050 under Minn. Stat. § 216H.02, subd. 1. Indeed, by justifying and promoting the ongoing use -- or even new construction -- of facilities with carbon emissions that are just a little better than assumed business-as-usual alternatives, the Commission would be perpetuating carbon emissions close to today's. The ongoing emissions from such facilities would not only be incompatible with achieving the carbon-free electricity goals of the CFS but incompatible with achieving the state's economy-wide GHG reduction goals under Minn. Stat. § 216H.02.

The Agencies are not alone in promoting an approach that would weaken the CFS by treating a carbon-emitting technology as carbon-free if alternative technologies are even more polluting. Indeed, this weakening effect is inherent in the concept of using a life-cycle analysis that includes in its counterfactual the emissions from alternative methods of waste management. It is another reason such a life-cycle analysis framework is incompatible with the CFS statute.

### B. The Agencies and Xcel would further weaken and complicate the law by allowing power generators to claim carbon-free status based on emitting less than other power generators

In its Notice of Comment Period in this docket, the Commission invited comment on the issue of calculating partial compliance by generators burning waste using a life-cycle analysis considering the GHG benefits *relative to alternative waste management methods* (what the CEOs have previously named the "comparative waste management analysis").[7] However, the Agencies and Xcel have taken this comparative approach beyond just comparing waste management alternatives. They would in addition allow waste-burners to claim carbon-free status based on how they compare to other carbon-emitting power generation they could claim to displace.

We quote above the Agencies' statement about the counterfactual setting the "cap" for a waste-burner so that it cannot be deemed carbon-free if it increases emissions above the business-as-usual waste management counterfactual. However, the Agencies then go on to create a substantial exception to this statement. They say that "if higher emissions result from transportation or other waste transformation processes above the counterfactual, waste could generate higher emissions than the counterfactual and would not be CFS-eligible, which is not the intended result of the Agencies. In order to account for marginal emissions additions, displaced electricity should be considered in the LCA…."[8] In other words, even if the carbon emissions from the waste-burning generation

[7] Notice of Comment Period, p. 2; *See* CEOs, *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,* Petition of the Clean Energy Organizations for Clarification and Reconsideration, Docket No. E-999/CI-23-151 (Nov. 27, 2024).
[8] Agencies, Initial Comments, p. 11.

is *higher than the counterfactual*, the Agencies would still let the waste-burning generator claim to be carbon-free by comparing its remaining emissions (above those that have already been disregarded based on the comparative waste management analysis) to the emissions of the generation it can claim to be displacing.

Xcel also seems to be suggesting that waste-burning generators that have higher emissions than the waste-management counterfactual should get yet another chance to claim carbon-free status, though based on a different approach. Xcel suggests the Commission establish a "carbon intensity" (CI) threshold and that "fuel pathways" with lower CI scores than that new threshold could be considered carbon-free.[9] Xcel says that this approach "is conceptually similar to the NGIA approach."[10] However, as we have discussed, the CFS and the NGIA (the Natural Gas Innovation Act) take conceptually very different approaches to decarbonization.[11] The NGIA sets an explicitly comparative standard, basing compliance on whether a plan has "lower lifecycle greenhouse gas intensity" than natural gas from conventional sources, and the NGIA requires the Commission to use life-cycle analysis to assess life-cycle GHG intensity.[12] Under the CFS, by contrast, the standard is whether the technology generates "without emitting carbon dioxide," which is a non-comparative standard that does not consider life-cycle emissions nor leave room for life-cycle analysis. Xcel's approach -- asking the Commission to choose its own carbon-free threshold based on the relative carbon intensity of different fuel

[9] Xcel, Initial Comments, p. 7-8.
[10] *Id.,* p. 8.
[11] CEOs, Initial Comments, p. 7-10.
[12] Minn. Stat. § 216B.2427, subd. 2(b)(4); Minn. Stat. § 216B.2428, item (1).

pathways -- would mean replacing the statutory "without emitting carbon dioxide" threshold with its own newly-invented threshold. Xcel is effectively asking the Commission to adopt an approach to decarbonizing the power grid very much at odds with the one the legislature enacted.

These proposals -- which go beyond comparing the emissions of alternative waste management methods to comparing the emissions of alternative generation technologies -- would bring the comparative approach to a new and even more corrosive level.[13] Almost any carbon-emitting generator could claim carbon-free status by virtue of displacing generation with yet higher carbon-dioxide emissions. Combined cycle gas plants could claim to be carbon-free by virtue of displacing energy from the higher-emitting gas-fired combustion turbines. Gas-fired combustion turbines could claim to be carbon-free by virtue of displacing energy from higher-emitting coal plants. More efficient coal plants could claim to be carbon-free by virtue of displacing energy from less efficient and thus higher-emitting coal plants. This comparative, better-than-something-worse-on-the-grid-today approach simply bears no resemblance to the straightforward and ambitious carbon-free standard that was actually enacted.

Moreover, the Agencies and Xcel propose looking at the emissions of other generating sources not as an *alternative* to a comparative waste management analysis but

[13] Xcel's focus on the relative carbon intensity of "fuel pathways" suggests to us that it is not just urging the Commission to compare the emissions from various methods of waste disposal but also to compare the emissions of various non-waste fuels. If that is not Xcel's intention, this paragraph does not apply to their comments, though their proposed approach would still represent an error of law.

as a supplement to it, providing waste-burners that emit more than the waste-management counterfactual yet another chance to claim carbon-free status. It is a new rationale for disregarding the emissions that remain even after giving the waste-burning generator credit for avoiding the assumed emissions of waste-management alternatives.

We note that the Agencies would constrain this new rationale for disregarding a facility's $CO_2$ emissions using a complex formula involving the inverse of the CFS percentage obligation.[14] However, despite this nod to the CFS law, the Agencies' approach is still simply incompatible with the statutory language and the law's goal of promoting a shift to technologies that generate electricity without carbon dioxide emissions.

### C. Xcel's efforts to streamline the complex life-cycle analysis process would further weaken the CFS

Xcel's comments recognize the administrative complexity of conducting and reviewing lifecycle analyses. Xcel therefore "recommends that, at a minimum, a state agency (or agencies) be identified as responsible for developing, overseeing and managing the LCA framework and review of LCAs," such as the MPCA.[15]

Xcel then proposes that this complex process be streamlined in certain ways.[16] Once a "fuel pathway" has been defined as carbon-free, Xcel says that fuel pathway should be added to an "Approved CF Fuel Pathway" list. Then future projects that are "sufficiently similar" can be automatically considered carbon-free without having to

[14] Agencies, Initial Comments, p. 11.
[15] Xcel, Initial Comments, p. 4, 10.
[16] *Id.*, p. 5-6.

conduct a facility-specific life-cycle analysis. It points to a similar approach taken by the California Air Resources Board (CARB) for their Low Carbon Fuel Standard (LCFS), which has a website listing the carbon intensity of various transportation fuel resources.[17]

However, Xcel's proposal overlooks the decidedly different approaches to decarbonization taken by California's LCFS and Minnesota's CFS. The goal of California's LCFS program is to gradually reduce the carbon intensity of transportation fuels sold in California.[18] This approach necessarily required the state to calculate the carbon intensity of various fuel options as compared to the baseline carbon intensity of gasoline and diesel, effectively creating a spectrum of somewhat lower-carbon fuel options on which compliance can be based. Minnesota's CFS, by contrast, is not merely seeking to shift the electric grid to technologies with incrementally lower carbon emissions; it is seeking to shift it to technologies without carbon emissions. There is therefore no reason for the Commission to measure the relative carbon intensity of various carbon-emitting technologies.

Moreover, no two facilities burning solid waste or biomass would have the same emissions relative to the emissions under a counterfactual. Not only would the carbon emissions of the waste-burning facility itself vary, based on its fuel and efficiency, but the assumed emissions of the counterfactual would also vary, based on the waste

[17] *Id.*

[18] 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. The California LCFS is similar to the Minnesota NGIA in that both laws seek incremental reductions relative to a life-cycle GHG-intensity baseline, therefore requiring calculation of life-cycle GHG intensities for the baselines and all alternatives. However, as we discuss above, the CFS takes an approach to decarbonization fundamentally distinct from that taken by the NGIA.

management alternatives available in that specific location and point in time. The Agencies have stated that "it is apparent that each fuel source and individual energy generation project will require a unique analysis to determine the specific percentage of partial credit that should be applied."[19] This acknowledgement illustrates why the Commission could not reasonably establish pre-approved fuel pathways, as Xcel proposes, even if such an approach were compatible with Minnesota law, which it is not.

Conducting life-cycle analyses of waste-burning plants would be undeniably complex and burdensome. However, rather than try to streamline this burdensome process in ways that weaken the CFS even further, the Commission should simply recognize that life-cycle analysis has no legal role in determining carbon-free status under the CFS.

### D. Failing to review a carbon-free designation for decades, as the Agencies and Xcel request, ignores and undermines state climate goals

The Agencies and Xcel ask that an LCA-based carbon-free determination for a new generating facility not be reviewed for decades. The Department says that "if a new capital project is proposed, the lifecycle emissions should not be re-evaluated until the asset is fully depreciated, otherwise ratepayers could be stuck with a stranded asset."[20] Xcel goes even further, saying that "[o]nce a resource qualifies as CF [carbon-free] or partially CF, that designation should remain in place for the duration of the lifetime of

[19] Agencies, Initial Comments, p. 11.
[20] Agencies, Initial Comments, p. 10.

the asset, unless and until significant modifications are made to the fuel type or generation resource."[21]

However, changes to the fuel type or generation source are not the only relevant changes. If a waste-burning facility were to be deemed carbon-free based on a life-cycle analysis concluding it would have lower carbon-emissions than a counterfactual, then any significant changes relative to the assumptions in the counterfactual could completely invalidate the conclusion. For example, a life-cycle analysis concluding that a facility that burns waste biomass has lower emissions than open-burning of that waste would be immediately undermined if open-burning were banned or if the state or a community invested more in lower-carbon alternatives like composting or wood vaulting.[22] Failing to re-evaluate the carbon-free status of the wood-burning generator for decades would be locking in its substantial carbon emissions long after the original justification disappeared. Locking in these emissions runs counter to the ongoing progress necessary to achieve the state's climate goals.[23]

The Agencies and Xcel are correct in stating that re-evaluating the life-cycle analysis on which a carbon-free determination has been based would be disruptive to a facility built on the strength of such a determination and could lead to a stranded asset.

[21] Xcel, Initial Comments, p. 10-11.
[22] Saima Sidik, "Burying wood in 'vaults' could help fight global warming," *Science*, Sep. 26, 2024, available at: https://www.science.org/content/article/burying-wood-vaults-could-help-fight-global-warming
[23] Moreover, if a community has failed to develop lower-carbon alternatives for managing wood waste, it could be because the pressure to do so was blunted by a Commission finding that, despite its undeniable carbon emissions, a wood-burning generator is carbon-free. We discuss more in our initial comments how an LCA-based carbon-free determination can interfere with the development of policies and technologies needed to meet our climate goals. CEOs, Initial Comments, p. 32-33.

However, that is no reason to allow carbon-emitting generation to continue claiming carbon-free status for decades. Rather, the prospect of such disruption is further evidence that it is not in the public interest to allow carbon-emitting facilities to claim carbon-free status based on how they compare to alternative GHG-emitting practices currently allowed. Those other practices will almost certainly change as Minnesota implements its Climate Action Framework, as the climate crisis advances, and as statutory deadlines for GHG reductions approach. The assumed emissions of the counterfactual represent far too weak a foundation to support a carbon-free determination of any duration, and certainly not one intended to last for decades.

## II. Commenters would expand the partial compliance provision far beyond what the law allows and the legislature intended

Many commenters would have the Commission apply the partial compliance provision at Minn. Stat. § 216B.1691, subd. 2d(b)(2) to forms of generation that do not even partially use technologies that can generate without emitting carbon dioxide. Moreover, some would grant facilities *full* compliance credit under this partial compliance provision. There is no support in the statute for these interpretations, which run counter to the law's fundamental distinction between technologies that generate "without emitting carbon dioxide" and other generating technologies.

The partial compliance provision should not be interpreted as a rejection of the carbon-free definition at the heart of the CFS. Rather, it was a late amendment added to

incentivize emerging carbon-free technologies even during the years when facilities can only partially employ them.[24]

### A. Commenters would wrongly grant partial compliance credit to biomass and solid waste generators, even though these facilities do not utilize any technology that can reasonably be considered carbon-free

Commenters urging the Commission to grant partial compliance credit to facilities burning biomass, solid waste, or RNG are misinterpreting the language and intent of the partial compliance provision. That provision requires the Commission to grant partial credit to facilities that "utilize carbon-free technologies for electricity generation, but only for the percentage that is carbon-free."[25] The double use of the term "carbon-free" in this provision directly imports into this subdivision the law's fundamental distinction between technologies that generate without emitting carbon dioxide and other generating technologies. The first question the Commission must ask when considering whether to apply this provision is whether the facility partially utilizes *any* technology that can meet the law's definition of carbon-free.

The legislative history shows that the bill's authors intended the partial compliance provision to incentivize emerging new carbon-free technologies, specifically discussing green hydrogen co-firing and carbon capture and storage.[26] It is widely expected that for the next several years power plants could only partially employ these technologies. Without the partial-credit provision, plants partially using these

[24] Comments by Majority Leader Jamie Long, House Climate and Energy Finance and Policy Committee, Jan. 18, 2023, at minutes 1:43:51 – 1:44:15, *available at* https://www.house.mn.gov/hjvid/93/896125.
[25] Minn. Stat. § 216B.1691, subd. 2d(b)(2)(i).
[26] *See* CEOs, Initial Comments, p. 15-19.

technologies would have gotten no compliance credit for using these emission-reducing technologies. (This would have put the state on a conflicting path with the Environmental Protection Agency, which later in 2023 proposed the rule offering hydrogen co-firing and partial use of CCS as pathways for power plants to comply with GHG limits.[27]) The CFS bill's authors amended their bill to correct this by allowing the use of these technologies to get partial compliance credit. They hoped to incentivize the development of the technologies which could someday, at least arguably, lead to generating facilities without carbon dioxide emissions.

No generator burning solid waste, biomass, or RNG can claim to be even partially utilizing any technology that generates electricity without emitting carbon-dioxide.[28] At best, they can only claim that the carbon dioxide they undeniably emit should not count, even though the law includes no language authorizing the Commission to disregard these carbon emissions. It would thus violate the language of the law and the legislative intent to apply the partial compliance provision to such facilities.

### B. Commenters would grant full compliance to technologies under the partial compliance provision

The way that many commenters, including the Agencies, would apply the partial compliance provision would result in facilities getting *full* compliance credit rather than partial credit. Under the Agencies' approach, for example, a solid-waste burning

[27] U.S. Environmental Protection Agency, *New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units, etc.*, Proposed Rule, 88 Fed. Reg. 33240 (May 23, 2023).
[28] Unless the facilities also employ CCS or hydrogen co-firing, but then only the generation attributable to these technologies could be considered carbon-free.

generator would get full compliance credit if it has lower lifetime GHG emissions than the assumed emissions if the same waste were landfilled.[29] Of course, the law only requires the Commission to "allow for *partial* compliance with subdivision 2g"[30] for specified facilities, and limits it to "the percentage that is carbon-free." Granting full compliance credit for all of a plant's output is not allowed by the law and clearly not what the legislature intended for this provision.

## III. The Commission should not ignore the indirect carbon emissions associated with CCS

Minnkota proposes that the Commission ignore all indirect emissions associated with CCS, including those attributable to powering the CCS process, and claims that paying attention to those upstream emissions would be discriminatory. The CEOs disagree with both these assertions, for reasons explained below.

### A. Minnkota's proposed formula to measure partial compliance by facilities with CCS overestimates the generation that can reasonably be considered carbon-free

Minnkota proposes a formula that would considerably overestimate how much of the generation from a power plant with CCS could reasonably be considered carbon-free. This overestimation appears in two related ways: (1) by relying on the percentage of carbon emissions captured rather than the percentage reduction in $CO_2$ per MWh; and (2) by ignoring carbon emissions attributable to the CCS process if those emissions occur offsite ("indirect emissions"). The Commission should reject Minnkota's formula in favor

[29] Agencies, Initial Comments, p. 17-18.
[30] Minn. Stat. § 216B.1691, subd. 2d((b)(2) (emphasis added).

of one that looks at the percentage carbon reduction per MWh and that considers reasonably attributable indirect carbon emissions.

Minnkota's formula would multiply a plant's total MWh of generation by its carbon capture percentage (tons of carbon captured divided by tons of carbon generated), and consider all the resulting generation carbon-free.[31] However, this formula fails to capture the emissions increase attributable to the CCS process itself. The Department of Energy estimates that retrofitting a coal plant with 90-95% capture would reduce the coal plant's efficiency by about 25%.[32] If the power to drive the CCS equipment came from the coal plant itself, the plant would either have to reduce its output by about a quarter or increase its coal use and thus its carbon generation by about a quarter. Using a formula that looks at the reduction in the plant's $CO_2$/MWh attributable to the CCS, as the CEOs have proposed, would capture either the reduced output or the increased carbon generated by the use of CCS, provided the CCS is driven by steam and electricity produced by the coal plant subject to capture.

However, the power to drive the CCS equipment may come from offsite, causing indirect emissions that should not be overlooked. Indeed, Minnkota's own Project Tundra, which proposes to capture CO2 from the Milton R. Young plant coal plant in North Dakota, illustrates this possibility. The Revised Draft Environmental Assessment assumes the project would purchase the electricity needed to power the CCS process from

[31] Minnkota, Initial Comments, p 2.
[32] U.S. Department of Energy, *Eliminating the Derate of Carbon Capture Retrofits – Revision 2,* National Energy Technology Laboratory (Mar. 31, 2023), at 6, *available at* https://www.osti.gov/servlets/purl/1968037/.

"the Minnkota electricity system (i.e., grid) that includes multiple generation sources."[33] Minnkota is asking the Commission to ignore the significant increased carbon emissions that would occur at the power plants driving the CCS equipment and to only focus on the reduced carbon emissions at the Young plant itself. This is an unreasonable request.

Minnkota's formula would also have the Commission ignore carbon emissions occurring downstream of the CCS process, including those attributable to a leak or to the use of the captured carbon to pursue enhanced oil recovery. The Commission should reject Minnkota's proposed formula in favor of a formula that considers the percentage reduction in carbon emissions per MWh, considering reasonably attributable carbon emissions upstream and downstream of the capture plant, as CEOs have set forth in our initial comments.[34] And given that enhanced oil recovery can potentially increase carbon emissions as much or more than the amount of carbon captured by CCS, no carbon-free credit should be given for facilities where the captured carbon is used for this purpose.[35]

### B. It is not discriminatory to consider the indirect emissions associated with CCS under the partial compliance provision

Minnkota argues that it would be discriminatory to look at upstream emissions for fossil fuel generation with CCS unless the Commission also uses life-cycle analysis to look for the upstream carbon emissions of all eligible energy technologies.[36] The CEOs disagree.

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[33] U.S. Department of Energy, Revised Draft Environmental Assessment for North Dakota, CarbonSAFE: Project Tundra, DOE/EA-2197D (April 13, 2024), Appendix K, at K-28, *available at:* https://www.energy.gov/nepa/articles/doeea-2197-revised-draft-environmental-assessment-april-2024.
[34] CEOs Initial Comments, p. 55-59.
[35] See CEOs' discussion of enhanced oil recovery at CEOs, Initial Comments, p. 58.
[36] Minnkota Initial Comments, p. 3.

No energy source today would meet the definition of carbon-free if all calculable upstream emissions (even those related to manufacturing and transporting the generating equipment) were included. Reading the law to exclude all energy sources would render compliance impossible, violating the statutory presumption that the legislature "does not intend a result that is absurd, impossible of execution, or unreasonable."[37] The legislative history clearly shows that legislators considered wind, solar, nuclear, and hydro power to be carbon-free.[38] Under state law, "the object of all interpretation and construction of laws is to ascertain and effectuate the intention of the legislature."[39]

However, this does not mean the legislature intended the Commission to ignore all indirect emissions under all provisions of the law. The partial compliance provision requires the Commission to determine what percentage of certain plants' generation is carbon-free. This necessarily requires that the Commission undertake a deeper analysis of the carbon-free generating technology being partially utilized at the facility, differentiating its output from the carbon-emitting technology also in use at the facility. The history shows the legislature did not intend that this deeper analysis be limited solely to the generating facility. The chief House author, when describing the new partial compliance provision, specified that it would allow partial compliance credit for a facility

[37] Minn. Stat. § 645.17.
[38] *See, e.g.*, discussion of wind and solar and statement that zero carbon sources already provide over half of Minnesota's electricity, by Majority Leader Jamie Long, House Climate and Energy Finance and Policy Committee, Jan. 18, 2023, at minutes 8:20-9:00, reference to 7:41 – 12:13, *available at* https://www.house.mn.gov/hjvid/93/896125.
[39] Minn. Stat. § 645.16.

that partially burned green hydrogen.[40] The only way to know if hydrogen is green is to look upstream at the carbon dioxide emissions associated with the hydrogen's production. And when a House floor amendment would have made CCS promotion a policy of the state, the chief House author opposed it on the grounds that it did not distinguish between permanently sequestered carbon and carbon used "for enhanced oil recovery, which would actually increase carbon emissions."[41] Thus, the legislative history shows that legislators intended the Commission to consider at least certain indirect emissions when conducting the calculations necessary to apply the partial compliance provision.

Counting the significant indirect emissions clearly attributable to the use of CCS (or of hydrogen co-firing) is far less complex, burdensome, and speculative than conducting a life-cycle analysis.[42] Estimating these indirect emissions would likely be part of any engineering analysis of these technologies already, given that they are being advanced precisely for the purpose of reducing climate impacts. Moreover, considering such emissions differs from a life-cycle analysis because it is addressing the definitional question of whether a technology generates electricity "without emitting carbon dioxide," rather than speculating about counterfactuals and creating rationales for disregarding a technology's known carbon emissions.

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[40] Comments by House Majority Leader Jamie Long, House Climate and Energy Finance and Policy Committee, Jan. 18, 2023, at minutes 1:43:51 – 1:44:15, *available at* https://www.house.mn.gov/hjvid/93/896125.
[41] Comments by Majority Leader Jamie Long, House Floor Session, Jan. 26, 2023, at minutes 2:40:29 -2:40:39, *available at*: https://www.house.mn.gov/hjvid/93/896169.
[42] See CEOs, Initial Comments, p. 51.

It is not discriminatory nor unreasonable for the Commission to consider indirect emissions when applying the partial compliance provision, even though the Commission does not generally need to look beyond the point of generation, because the deeper analysis required by the partial compliance provision makes that provision unique. However, it would be discriminatory to ignore the carbon emissions associated with powering the CCS equipment when offsite power is used (causing indirect carbon emissions). This would discriminate against CCS plants that obtain the power to drive their CCS process from the same power plant where the capture takes place (causing direct carbon emissions and potentially capturing most of them). It would also be discriminatory to ignore indirect carbon emissions associated with CCS while factoring in the indirect carbon emissions associated with hydrogen co-firing.

## IV. The Agencies would grant partial credit for co-firing with hydrogen even when the hydrogen was not produced in a carbon-free way, contrary to the law

The Agencies' initial comments include a discussion of the various methods of producing hydrogen and the carbon dioxide emissions attributable to these methods.[43] The CEOs agree with the Agencies that it is critical to look upstream at indirect carbon emissions when applying the partial compliance provision.

However, we disagree with the Agencies to the extent they would grant partial credit for co-firing with hydrogen even if the hydrogen was produced in carbon-emitting ways. As discussed, the first question the Commission should ask when deciding if the partial compliance provision applies is whether the facility is partially utilizing any

[43] Agencies, Initial Comments, p. 14-18.

technology that meets the statutory definition of carbon-free. If the hydrogen being co-fired has been produced in carbon-emitting ways, the answer to this threshold question is no and the provision does not apply.

The Agencies would apparently allow some carbon-free credit unless co-firing with the hydrogen would *increase* emissions compared to just burning natural gas. They say that hydrogen "should therefore receive no CFS credit if primary input emissions exceed the potential emissions offset of the hydrogen."[44] This means that, under the Agencies proposal, the hydrogen co-firing *would* get at least some CFS credit as long as it did *not* increase emissions.

We submit that this threshold for cutting off compliance credit is unlawful and far too high. Once again, the Agencies are misinterpreting the term carbon-free by expanding it to include technology that can merely claim somewhat lower carbon emissions compared to current technologies, as we discuss in section I.A above. This is a profound misreading of the carbon-free definition and the goal of the CFS. The goal of the law is not just to replace today's carbon-emitting generation with somewhat lower-carbon generation. It is to dramatically reduce emissions from the electric sector by shifting our energy mix to generation resources that generate electricity "without emitting carbon dioxide."

The Commission should only grant credit for co-firing with hydrogen if that hydrogen was generated in carbon-free ways. Granting carbon-free credit for co-firing

[44] Agencies, Initial Comments, p. 17.

with hydrogen produced in carbon-emitting ways fails to recognize the fundamental statutory distinction between carbon-free generating technologies and all others.

## CONCLUSION

For the reasons set forth above and in our initial comments, the CEOs respectfully request that the Commission make the following findings, repeated here for ease of reference. We have added one sentence (redlined) to item 4, to address the issues discussed in section IV above.

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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# CEOs Reply Comments, Appendix A

CEOs have made a good-faith effort to comply with the Agencies' request to present our positions using the following template. If any language in Appendix A conflicts with our written comments, the written comments represent our position.

| Technology/ Feedstock | Definition | Eligible for CFS compliance? (Y/N/Other) | Method of GHG Quantification (Specify Model or Generic) | LCA Study Period (Yrs) | Baseline | Partial EACs Awarded?[1] | 0 EAC Cutoff |
|---|---|---|---|---|---|---|---|
| CCS | Fossil fuel generation with CCS | Partially, based on % reduction in CO2/MWh considering indirect emissions [except no credit allowed if carbon dioxide is used for enhanced oil recovery] | Determine significant, reasonably attributable CO2 emissions based on engineering study of specific project (no model needed) | N/A | Compared to plant without CCS | See footnote 1 | See footnote 1 |
| Primary Biomass | Biomass cultivated and harvested for fuel use | No | N/A | N/A | N/A | N/A | N/A |
| Waste Biomass | Other biomass | No | N/A | N/A | N/A | N/A | N/A |
| Waste to Energy | Energy derived from solid waste | No | N/A | N/A | N/A | N/A | N/A |
| Geothermal | Electricity derived from heat below earth's surface | Yes | N/A | N/A | N/A | N/A | N/A |
| Green or Pink Hydrogen Production | Hydrogen from wind, solar, hydropower, geothermal, or nuclear energy | Yes, including partial credit when co-firing, based on % reduction in CO2/MWh | N/A | N/A | Compared to plant without hydrogen co-firing | See footnote 1 | See footnote 1 |
| White Hydrogen Production | Geologically mined hydrogen | No position | | | | | |
| All Other Hydrogen Production | Agencies' definition | No | N/A | N/A | N/A | N/A | N/A |

[1] We are uncertain what this heading is asking for, however we believe the law requires granting partial compliance credit for this technology (for the percentage that can reasonably be deemed carbon-free). We support the use of carbon-free certificates to track the percentage of generation deemed carbon-free under the partial compliance provision.

| Technology/ Feedstock | Definition | Eligible for CFS compliance? (Y/N/Other) | Method of GHG Quantification (Specify Model or Generic) | LCA Study Period (Yrs) | Baseline | Partial EACs Awarded? | 0 EAC Cutoff |
|---|---|---|---|---|---|---|---|
| Hydrogen-Only Generation with Green, Pink or White Hydrogen | Agencies' definition | Yes, except we take no position on white hydrogen | N/A | N/A | N/A | N/A | N/A |
| Hydrogen-Only Generation With Partially Emitting Hydrogen | Agencies' definition | No | N/A | N/A | N/A | N/A | N/A |
| Co-Firing with Fully Carbon-free Resource | Mixed combustion with at least 2 fuels, one of which is fully carbon-free | Yes, partially, based on % reduction in CO2/MWh considering indirect emissions. However, carbon-free hydrogen is the only carbon-free fuel we know of. Biomass, MSW, and RNG are not carbon-free and would not qualify for partial credit. | N/A | N/A | Compared to plant without hydrogen co-firing | See footnote 1 | See footnote 1 |
| Co-Firing with Partially Carbon-Free Resource | Mixed combustion with at least 2 fuels, at least one of which is partially carbon-free | No. Partial compliance provision only applies where at least one technology generates without emitting CO2. | N/A | N/A | N/A | N/A | N/A |