

Staff Briefing Papers

Meeting Date July 16, 2026

Agenda Item 1**

Company All Electric Utilities

Docket No. E-999/CI-24-352

In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota's Carbon-Free Standard

Issues Should the Commission grant the Petition for Reconsideration submitted by Clean Energy Organizations?

Staff Danielle Winner danielle.winner@state.mn.us 651-539-1084

✓ Relevant Documents

Date

Staff's Corrected Briefing Papers - Clean	January 7, 2026
Commission Order	May 14, 2026
Petition for Reconsideration, Sierra Club and Minnesota Center for Environmental Advocacy (collectively, Clean Energy Organizations or CEOs)	June 3, 2026
Answer to Petition, (Xcel Energy)	June 12, 2026
Answer to Petition, CURE, Health Professionals for a Healthy Climate, the Partnership for Policy Integrity, Minnesota Interfaith Power and Light, and Minnesota Environmental Justice Table (collectively, the Supporting Petitioners or Supporters)	June 16, 2026

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The attached materials are work papers of the Commission Staff. They are intended for use by the Public Utilities Commission and are based upon information already in the record unless noted otherwise.

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EXECUTIVE SUMMARY

The Minnesota Public Utilities Commission (Commission) is tasked with detailing the criteria and standards used to measure an electric utility's efforts and achievements in meeting Minnesota's Carbon-Free Standard (CFS). As part of its investigation into this topic, the Commission opened the current proceeding to explore the possibility of Life-Cycle Analysis (LCA) as a means for compliance. On May 14, 2026, the Commission issued its *Order Adopting Fuel Life-Cycle Analysis Framework for Identifying Carbon-Free Technologies* (May 14th Order).

On June 3, 2026, the Minnesota Center for Environmental Advocacy and Sierra Club (jointly, the Clean Energy Organizations or CEOs) filed a Petition for Reconsideration and Clarification (Petition) concerning the Commission's May 14th Order. CEOs requested the Commission:

1. Reconsider its decision that generating technologies that emit carbon dioxide (CO₂), particularly those that burn solid waste or other waste biomass, can be treated as "carbon-free" under the CFS based on the results of a Fuel LCA; and
2. Clarify whether the formula for determining the carbon-free share of output from facilities using carbon capture and storage/sequestration (CCS) includes indirect emissions.

Two parties filed answers: Northern States Power Company d/b/a Xcel Energy (Xcel Energy) and a coalition comprising CURE, Health Professionals for a Healthy Climate, the Partnership for Policy Integrity, Minnesota Interfaith Power and Light, and Minnesota Environmental Justice Table (collectively, the Supporting Petitioners or simply Supporters).

The Commission must decide whether to grant the Petition in whole, in part, or deny the Petition.

BACKGROUND

I. Statute

Minnesota's Carbon-Free Standard was adopted in 2023. Unlike Minnesota's other energy standards,¹ the CFS statute allows for partial compliance and does not define which technologies are eligible. It requires the Commission to issue the necessary orders that (1) detail the criteria and standards used to measure an electric utility's efforts to meet the standard; and (2) determine whether the utility is achieving these standards. In relevant parts, the statute states:

Subdivision 1. Definitions.

(b) "Carbon-free" means a technology that generates electricity

¹ The Eligible Energy Technology Standard (EETS, formerly known as the Renewable Energy Standard or RES), the Solar Energy Standard (SES), and the Distributed Solar Energy Standard (DSES).

without emitting carbon dioxide.

...

Subd. 2d. Commission order.

- (a) The commission shall issue necessary orders detailing the criteria and standards used to: (1) measure an electric utility's efforts to meet the standards under subdivisions 2a, 2f, and 2g; and (2) determine whether the utility is achieving the standards.
- (b) In the order under paragraph (a), the commission shall include criteria and standards that: (1) protect against undesirable impacts on the reliability of the utility's system and economic impacts on the utility's ratepayers and that consider technical feasibility; and (2) require the commission to allow for partial compliance with subdivision 2g from:
 - (i) electricity generated from facilities that utilize carbon-free technologies for electricity generation, but only for the percentage that is carbon-free;

...

Subd. 2g. Carbon-free standard.

In addition to the requirements under subdivisions 2a and 2f, each electric utility must generate or procure sufficient electricity generated from a carbon-free energy technology to provide the electric utility's retail customers in Minnesota, or the retail customers of a distribution utility to which the electric utility provides wholesale electric service, so that the electric utility generates or procures an amount of electricity from carbon-free energy technologies that is equivalent to at least the following standard percentages of the electric utility's total retail electric sales to retail customers in Minnesota by the end of the year indicated:

- (1) 2030 80 percent for public utilities; 60 percent for other electric utilities
- (2) 2035 90 percent for all electric utilities
- (3) 2040 100 percent for all electric utilities.

II. Commission Procedure

To provide guidance concerning the CFS, the Commission opened Docket No. E-999/CI-23-151, *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 (CFS Docket). Staff divided the proceedings into a series of four rounds; in Round 2 of the CFS Docket, the Commission was tasked with defining “carbon-free.”

Given the lengthy and often conflicting record in Round 2 of the CFS Docket, the Commission determined that further investigation into certain complex fuels was necessary, since from a life-cycle perspective, some fuels could be considered either fully or partially carbon-free under the statute. Commissioners found particularly compelling the following:

- Hydrogen generated from a fossil fuel might still be considered 100 percent carbon-free if a strict point-of-generation framework were applied, which did not appear to align with the statutory intent.
- Certain waste streams might generate more emissions if left to decompose than if they were burned for electricity; this would appear to contradict the fundamental point of the statute to reduce emissions.
- One remedy for non-compliance with the CFS could be acquisition of EETS technologies such as eligible biomass, implying that a utility could rely on EETS technologies to help meet its obligations under the CFS.

As a result, the Commission established² the instant docket, *In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota’s Carbon-Free Standard* (LCA Docket), requesting comment on a number of topics, including:

- Definitions of the sources of and requirements for a life-cycle analysis when interpreting the statutory definition of “carbon-free” for combusted fuel generation resources, including sustainable and waste biomass, renewable natural gas, and solid waste, and whether these resources should be fully or partially eligible generation resources based on a fuel life-cycle analysis; and
- Calculating partial compliance for hydrogen co-firing and for fossil fuel generation with carbon capture and sequestration/storage.

III. LCA Docket Content

In [Briefing Papers](#) submitted before the Commission’s January 15, 2026 agenda meeting,³ Staff characterized the positions between parties as broadly falling into one of three frameworks:

- Point-of-Generation framework: This framework aligns with the most restrictive interpretation of the CFS, holding that any technology emitting carbon dioxide at the point of generation is ineligible, regardless of LCA results.
- EETS framework: This framework asserts that Eligible Energy Technologies, as defined by

² *In the Matter of an Investigation into Implementing Changes to the Renewable Energy Standard and the Newly Created Carbon-free Standard under Minn. Stat. § 216B.1691*, Docket No. E-999/CI-23-151, ORDER INITIATING NEW DOCKET AND CLARIFYING “ENVIRONMENTAL JUSTICE AREA” (November 7, 2024) (hereinafter November 7th Order).

³ Staff’s Corrected Briefing Papers - Clean, p. 11 (January 7, 2026) (hereinafter Staff’s Corrected Briefing Papers).

Minn. Stat. § 216B.1691, subd. 1(c), automatically qualify as carbon-free, bypassing the need for a life-cycle analysis.

- LCA framework: This framework requires LCA for biogenic fuels that emit carbon dioxide at the point of combustion, namely biomass, solid waste, and renewable natural gas.

In the LCA Docket, the Clean Energy Organizations provided extensive comments opposing the use of life-cycle analysis, arguing the following:

- Under a plain language reading, biomass and solid waste cannot be considered “carbon-free” under the statutory definition because they do not generate electricity “without emitting carbon dioxide.”⁴
- Biomass and solid waste cannot be considered partially carbon-free under the statutory definition because they do not “utilize carbon-free technologies for electricity generation.”⁵
- Unlike the Natural Gas Innovation Act (NGIA) statute, the CFS statute does not provide for the use of comparative analysis, carbon neutrality analysis, or life-cycle analysis.⁶
- The CFS does not treat biogenic CO₂ differently than anthropogenic CO₂;⁷ permitting any type of CO₂ emissions would violate the definition of “carbon-free.”⁸
- Biomass and solid waste facilities do not qualify for partial credit under the law unless they “utilize carbon-free technologies” such as CCS or green hydrogen co-firing.⁹
- The legislative record indicates that legislators intentionally excluded biomass and solid waste plants from CFS eligibility.¹⁰
- Even without a Life-Cycle Analysis framework, non-carbon-free facilities can still operate, even past 2040.¹¹
- The use of counterfactuals¹² in an LCA is problematic, since 1) they would be subject to

⁴ Minnesota Center for Environmental Advocacy and Sierra Club, collectively “Clean Energy Organizations” Comments, p. 26 (June 5, 2025) (hereinafter CEOs Initial Comments).

⁵ CEOs Initial Comments, p. 2.

⁶ CEOs Initial Comments, pp. 1-2. On pp. 9-10, CEOs noted one exception wherein the CFS permits comparative analysis, which is at Minn. Stat. § 216B.1691 [sic], subd. 2b, the “so-called off-ramp provisions.”

⁷ In Briefing Papers, Staff provided the following descriptions of “biogenic” and anthropogenic”: “The combustion of biogenic carbon (such woody biomass) and anthropogenic carbon (such as coal or other fossil fuels) demonstrates the difference in these time scales: while the former may have cycled through the atmosphere relatively recently, the latter will have been stored out of the atmosphere for thousands to millions of years.” See Staff’s Corrected Briefing Papers, p. 7.

⁸ CEOs Initial Comments, p. 14.

⁹ Clean Energy Organizations Reply Comments, p. 14 (August 20, 2025) (hereinafter CEOs Reply Comments).

¹⁰ CEOs Initial Comments, pp. 11-13.

¹¹ Specifically, CEOs argued that in 2040, when the statute requires the equivalent of 100 percent “of the electric utility’s total retail electric sales to retail customers in Minnesota” be from carbon-free technologies, utilities may not need to shutter ineligible resources because of 1) the line losses differential and 2) the existence of regional markets. For further discussion, see Staff’s Corrected Briefing Papers, pp. 14-15, referencing CEOs Initial Comments, pp. 20-22.

¹² In Briefing Papers, Staff defined “counterfactual” thusly: “The counterfactual is the process most likely to happen, absent the process being studied. For most commenters in this docket, the counterfactual involves the

change based on a state or community's regulations,¹³ and 2) facilities are unlikely to close operations if not granted carbon-free status, so the waste management counterfactual would not be landfilling, but simply be continued operation of the facility.¹⁴

- From a policy perspective, allowing biomass and solid waste to be considered either fully or partially carbon-free under an LCA would not be in the public interest because it would: create a new incentive for waste burning;¹⁵ undermine the state's climate¹⁶ and waste management goals;¹⁷ perpetuate or increase harm to human health, particularly in environmental justice areas;¹⁸ and have many administrative problems.¹⁹

Staff originally characterized the Clean Energy Organizations as supportive of a Point-of-Generation framework. However, CEOs provided the following correction, which Staff incorporated into its Corrected Briefing Papers:

We wish to correct the implication that CEOs believe the Commission cannot look beyond the point-of-generation under the law.¹ On the contrary, we believe limiting the Commission's focus to the point-of-generation is unduly restrictive, whereas expanding its focus to counterfactuals is far too broad. We support an interpretation of the law that falls between these two extremes and which reflects both the statutory language and the legislative intent.

The statutory definition of "carbon-free" does not refer to the point-of-generation, or even to a facility that generates electricity. Rather, it refers to a technology that generates electricity. This language allows the Commission to look beyond the point-of-generation to consider upstream and downstream emissions that can reasonably be considered part of the technology that generates electricity (such as emissions clearly attributable to producing hydrogen or powering carbon capture).²⁰

alternative fate of the waste in question. For example: if the fuel is wood waste from diseased trees, what would happen to that wood waste if it were not used in electricity generation? CURE introduces a different perspective on the counterfactual, stating that, since the CFS is not a waste management policy but an energy policy, the appropriate counterfactual for consideration is the alternative energy source or fuel, not the alternative fate of the waste if not used as fuel." See Staff's Corrected Briefing Papers, p. 9.

¹³ CEOs Reply Comments, p. 12.

¹⁴ CEOs Initial Comments, p. 28.

¹⁵ CEOs Initial Comments, p. 2 and p. 19.

¹⁶ CEOs Initial Comments, p. 4 and p. 41.

¹⁷ CEOs Initial Comments, p. 44.

¹⁸ CEOs Initial Comments, p. 46.

¹⁹ See Staff's Corrected Briefing Papers, pp. 19-20 for more discussion.

²⁰ Clean Energy Organizations' Letter entitled "CEOs' new decision options," p. 1 (January 5, 2026) (hereinafter CEOs' Corrections and New Decision Options).

¹ However, the CEOs do agree with the position described in the briefing papers on p. 14, stating that if there are carbon dioxide emissions at the point-of-generation, the technology is ineligible for carbon-free status. Under these circumstances the Commission has no need to look further to see if there are additional carbon dioxide emissions beyond the point-of-generation attributable to the technology that generates electricity.

IV. Commission's May 14th Order

The Commission met on January 15, 2026 and issued its *Order Adopting Fuel Life-Cycle Analysis Framework for Identifying Carbon-Free Technologies* on May 14, 2026. The May 14th Order did the following:

- Established that compliance with the carbon-free standard can be demonstrated without a life-cycle analysis when electricity is derived from solar, wind, hydropower, nuclear, geothermal, and hydrogen produced from any of those resources.
- Established that for other technologies, a fuel life-cycle analysis must be conducted to determine whether the net emissions resulting from a technology or fuel used to produce electricity, throughout the fuel's production and combustion cycle, is lower than the emissions that would result from the process most likely to occur in the absence of its use for electricity generation (the counterfactual scenario).
- Established that facilities using carbon capture and storage/sequestration and dual-fuel technologies (for example, hydrogen co-firing) may qualify as partially carbon-free;
- Authorized a docket to develop an accounting methodology for energy storage to comply with the CFS.
- Outlined a number of procedures for Fuel LCA implementation, including fuel- and technology-specific directives.

The Commission's reasoning for adopting the Fuel LCA framework included the following:

- Larger context of Minnesota laws:

While the Carbon-Free Standard is a new statute, it does not stand alone; it is part of a larger set of policies designed to track and reduce greenhouse gas emissions. [...] ...[T]he purpose of this proceeding is not to determine how someone might interpret the statute in the abstract or in isolation; it is to determine how the Commission should integrate the standard into the larger context of state law and Commission responsibilities.²¹

- Statutory definition does not specify a time frame for when emissions should be

²¹ Commission's ORDER ADOPTING FUEL LIFE-CYCLE ANALYSIS FRAMEWORK FOR IDENTIFYING CARBON-FREE TECHNOLOGIES, p. 11 (May 14, 2026) (hereinafter May 14th Order).

counted:

While the statutory definition of “carbon-free” focuses on the relationship between electricity generation and emissions, the definition does not specify how to determine when emissions are sufficiently proximate to generation as to be considered in the analysis.²²

- The statute does not require the use of a particular framework [i.e., Point-of-Generation, EETS, LCA] and there was ambiguity in the guidance the Commission received from legislators:

The Commission finds that the definition of “carbon-free” does not mandate any of these approaches, and even legislators who voted for the law have reached different conclusions on this question.²³

- A Point-of-Generation framework could shift emissions to other sectors:

To read the definition to focus solely on emissions emitted at the moment of electricity generation would lead to absurd results. It might lead utilities subject to the Carbon-Free Standard to invest in a mix of electric generation resources that result in increased greenhouse gas emissions throughout our economy.²⁴

- A Point-of-Generation framework could conflict with Commission’s statutory responsibilities concerning reliability and cost:

...[G]iven that the statute directs the Commission to maintain system reliability and manage costs to ratepayers,[footnote: Minn. Stat. § 216B.1691, subd. 2d(b)1] the Commission will decline to construe the definition in a manner that would compel the premature retirement of sources of electricity that are currently operating, dispatchable, and potentially carbon-free.²⁵

- A Fuel Life-Cycle Analysis is consistent with the overarching goal of the CFS to reduce emissions:

While the language is ambiguous, it is clear that it should be read in a manner consistent with the overarching goals of the Carbon-Free Standard. Whether a generation resource qualifies as carbon-

²² May 14th Order, p. 12.

²³ May 14th Order, p. 12.

²⁴ May 14th Order, p. 12.

²⁵ May 14th Order, p. 12.

free should be determined by whether the net emissions resulting from a technology or fuel used to produce electricity, evaluated over the fuel's production and combustion cycle, is lower than the emissions that would result from the process most likely to occur in the absence of its use for electricity generation. This is the Fuel Life-Cycle Analysis.²⁶

- An LCA Framework would not negate the Commission's responsibilities to curb other forms of pollution in resource planning:

Even if this [Fuel LCA] process would result in less greenhouse gases emitted, opponents argue that a Fuel Life-Cycle Analysis may not give sufficient weight to other types of pollution that may result. The Commission again notes that it faces legal obligations—arising from the Renewable Energy Objectives and elsewhere—to weigh a variety of factors when evaluating a utility's resource plan or Certificate of Need application. In particular, the Commission has directed utilities to evaluate their preferred resource plans and alternative scenarios while giving specific financial weight to a variety of environmental and regulatory costs.[footnote omitted] In short, a utility's need to consider environmental costs long predated the Carbon-Free Standard.²⁷

RECONSIDERATION AND CLARIFICATION PETITION AND ANSWERS

On June 3, 2026, CEOs filed its *Petition for Reconsideration and Clarification* (Petition) concerning the Commission's May 14th Order. On June 12, 2026, a Response to the Petition (Xcel Energy Answer) was filed by Xcel Energy. On June 16, 2026, an Answer to the Petition (Supporters Answer) was filed by the Supporting Petitioners.

V. CEOs' Petition

CEOs request that the Commission reconsider its decision that generating technologies that emit carbon dioxide, particularly those that burn solid waste or other waste biomass, can be treated as "carbon-free" under the CFS based on the results of a Fuel LCA. **(Decision Option 1)** CEOs attached their Initial, Reply, and Supplemental Comments to their Petition, as well as their Petition for Reconsideration for the Commission's November 7, 2024 *Order Initiating New Docket and Clarifying "Environmental Justice Area"* in the CFS Docket (November 7th Order).

Broadly, CEOs argue that:

- A. The Commission's interpretation of "carbon-free" violates the plain language of the law

²⁶ May 14th Order, p. 12.

²⁷ May 14th Order, pp. 12-13.

- and legislative intent;
- B. The legal reasoning provided in the May 14th Order fails to justify the use of the Fuel LCA framework; and
- C. The Commission's Fuel LCA framework undermines the progress needed to achieve Minnesota's climate and waste goals by weakening the carbon-free standard and subsidizing waste-burning.

CEOs also request that the Commission provide clarification on the formula used to determine the carbon-free share of output from facilities using carbon capture and storage/sequestration. CEOs note that:

- D. The Commission's Order is unclear whether indirect emissions associated with CCS are included in the formula.

CEOs state that if the formula does not include indirect emissions, they also request reconsideration of that issue.

A. Plain Language and Legislative Intent

1. Plain Language

CEOs argue that the statutory definition of carbon-free excludes generating technologies that emit carbon dioxide, specifically noting that the statute does not refer to "net" carbon emissions or "net" climate impact.²⁸

Further, CEOs argue that carbon-free status under the law is not defined as relative to, or in comparison with, other facilities or technologies that emit carbon dioxide.²⁹ By contrast, the NGIA statute specifically authorizes the Commission to assess utility innovation plans on a comparative basis, and uses the term "lifecycle" twenty times.³⁰

Finally, the CEOs state that the Commission's interpretation of carbon-free does not maximize net benefits to all Minnesotans, which is required by subdivision 9 of the statute. CEOs argue that facilities that burn solid waste and waste biomass are damaging to human health and are often located in environmental justice areas.³¹

The statutory definition of environmental justice area and the language of subdivision 9 are as follows:

(e) "Environmental justice area" means an area in Minnesota that,

²⁸ Clean Energy Organizations Petition for Reconsideration and Clarification, p. 3 (June 3, 2026) (hereinafter Petition).

Petition, p. 3.

²⁹ Petition, p. 3.

³⁰ Petition, pp. 3-4.

³¹ Petition, p. 4.

based on the most recent data published by the United States Census Bureau, meets one or more of the following criteria:

- (1) 40 percent or more of the area's total population is nonwhite;
- (2) 35 percent or more of households in the area have an income that is at or below 200 percent of the federal poverty level;
- (3) 40 percent or more of the area's residents over the age of five have limited English proficiency; or
- (4) the area is located within Indian country, as defined in United State Code, title 18, section 1151.

...

Subd. 9. Local benefits.

(a) The commission shall take all reasonable actions within the commission's statutory authority to ensure this section is implemented in a manner that maximizes net benefits to all Minnesota citizens. Reasonable actions the commission must take and benefits that must be maximized include but are not limited to:

- (1) the creation of high-quality jobs in Minnesota paying wages that support families;
- (2) recognition of the rights of workers to organize and unionize;
- (3) ensuring that workers have the necessary tools, opportunities, and economic assistance to adapt successfully during the energy transition, particularly in environmental justice areas;
- (4) ensuring that all Minnesotans share (i) the benefits of clean and renewable energy, and (ii) the opportunity to participate fully in the clean energy economy;
- (5) ensuring that statewide air emissions are reduced, particularly in environmental justice areas; and
- (6) the provision of affordable electric service to Minnesotans, particularly to low-income consumers.

(b) The commission must also implement this section in a manner that balances factors such as local ownership of or participation in energy production, development and ownership of eligible energy technology facilities by independent power producers, Minnesota utility ownership of eligible energy technology facilities, the costs of energy generation to satisfy the renewable and carbon-free standards, and the reliability of electric service to Minnesotans.

- (c) When making investments to meet the requirements under this section, utilities are encouraged to locate new energy generating facilities in Minnesota communities where fossil-fuel-generating plants have been retired or are scheduled for retirement.

2. Legislative Intent

CEOs argue that legislators intended to exclude technologies burning solid waste and other waste biomass from the definition of carbon-free.³² CEOs offer the following evidence:

- Opponents of the CFS bill argued that since solid waste incinerators were not eligible for carbon-free status, the CFS would lead to more landfilling and increased methane emissions.
 - In Committee, the chief House author disputed the premise that the law would lead to more landfilling, noting statutory preference for recycling, compost, and waste diversion. The chief House author did not dispute the assertion that incinerators were excluded from the definition of carbon-free, or suggest the Commission could use a Fuel LCA to define incinerators as carbon-free.³³
 - On the House floor, a legislator responded that the CFS should be amended to exclude municipalities because a municipal generator in his district that burned waste wood from a factory would not qualify as carbon-free.³⁴ No one disputed this concern or suggested that the Commission would find these facilities to be carbon-free.
- While the Commission’s Order cites a letter that Senator Frentz filed in the LCA Docket stating his intent that burning waste biomass was to be considered carbon-free, 43 other legislators submitted comments stating the opposite. Senator Frentz’s interpretation of the law did not concern LCA, thus, no legislators who submitted comments supported a life-cycle analysis interpretation.³⁵

B. Commission’s Legal Reasoning

1. Two Extremes

CEOs argue that the Commission’s Order indicated that the Commission had to choose between “looking solely at emissions at the moment of generation” and “considering emissions of a

³² Petition, p. 4.

³³ Petition, pp. 4-5.

³⁴ Petition, p. 5.

³⁵ Petition, p. 5.

technology or fuel over its production and combustion cycle and then comparing those emissions to whatever was most likely to occur if the fuel had not been used for electricity.”³⁶ CEOs state that these are two extreme interpretations, and that neither finds support in the statutory language or reflects legislative intent.³⁷

CEOs offer the following:

The carbon-free definition does not use the term “point-of-generation,” nor does it use the term “facility” or “generator.” Rather it refers to a technology that generates electricity. If the technology emits carbon dioxide at the point-of-generation, then the Commission need not look further; the technology is disqualified from carbon-free status. But it need not stop there. If there are no emissions at the point-of-generation, the Commission can and should look upstream and downstream of the generator to determine if the technology, which includes more than just the generator, could reasonably be seen as carbon-free.³⁸

CEOs offer two examples:

- If a 100% hydrogen plant has zero emissions at the point-of-generation, the Commission should look upstream to the hydrogen *production* emissions to determine whether the technology (i.e., using that hydrogen to generate electricity) is carbon-free; and
- If a plant employs 100% carbon capture, and thus has no emissions at the point-of-generation, the Commission should look downstream to consider the fate of the captured carbon dioxide to determine if the technology (i.e., generating electricity while using that carbon capture) is carbon-free.

CEOs state that the legislative history supports the Commission looking beyond the point-of-generation because 1) legislators intended to differentiate between green hydrogen and other types, and 2) legislators intended to consider whether captured carbon dioxide is truly sequestered. The former would require the Commission to look upstream, the latter downstream.³⁹

CEOs argue that employing a Fuel Life-Cycle Analysis with a counterfactual is meaningfully different from simply looking at upstream and downstream emissions. They say a Fuel LCA “takes the Commission far beyond the technology that generates electricity” because it requires the Commission to speculate about the likely waste management counterfactual, then to speculate about that counterfactual’s likely long-term emissions.⁴⁰ CEOs contend that such a leap is not necessary to achieve the goal of considering upstream and downstream emissions

³⁶ Petition, p. 6.

³⁷ Petition, p. 6.

³⁸ Petition, p. 6.

³⁹ Petition, pp. 7-8.

⁴⁰ Petition, pp. 7-8.

attributable to a technology.⁴¹

2. Reliability and Affordability

CEOs argue that the Commission can protect reliability and affordability without adopting a Fuel LCA framework. They argue that the record does not demonstrate that either reliability or affordability would be impacted if the Commission didn't adopt a Fuel LCA framework, and that "[c]oncluding in 2026 that utilities will need to rely on generators burning solid waste or waste biomass in the 2030s or 2040s or beyond for reliability or cost reasons is certainly not supported by the record."⁴² CEOs state that these types of reliability and cost determinations must be made on a utility-specific basis, ideally in a resource plan.⁴³

CEOs also argue that the CFS provides other forms of flexibility for utilities that might be facing cost or reliability problems, such as applying for a modification or delay of the standard ("off-ramp") or buying offsetting Renewable Energy Credits or Energy Attribute Credits.⁴⁴

3. Statutory Authority

CEOs argue that the Commission has no authority to "weaken the definition of carbon-free based on claims that doing so might avoid emissions in another sector of the economy."⁴⁵ CEOs also note that the Commission is not well-positioned to make the types of waste sector emission reduction determinations needed in a counterfactual analysis, especially because waste sector policy is evolving.⁴⁶ This could be especially problematic, given that the Commission has determined that for new capital investments, the carbon-free status could remain un-reexamined for decades until the asset is fully depreciated.⁴⁷

CEOs note one part of the CFS statute that authorizes the Commission to consider emissions impacts outside the electric sector, but that is the "beneficial electrification" provision under the "off-ramps" subdivision 2b(10), which provides:

Subd. 2b. Modification or delay of standard.

(a) The commission shall modify or delay the implementation of a standard obligation under subdivision 2a, 2f, or 2g, in whole or in part, if the commission determines that modifying or delaying the standard obligation is in the public interest. The commission, when

⁴¹ Petition, pp. 7-8.

⁴² Petition, p. 8. Staff clarifies that the Commission did not conclude this.

⁴³ Petition, p. 8.

⁴⁴ Petition, p. 8. Staff notes that it is unclear how buying credits would help a utility solve reliability problems; CEOs were unclear on this point but may have only been arguing for the potential affordability benefits of credits.

⁴⁵ Petition, p. 9.

⁴⁶ Petition, p. 9.

⁴⁷ Petition, p. 9.

evaluating a request to modify or delay implementation of a standard, must consider:

...

(10) additional electric load from beneficial electrification and the greenhouse gas emissions savings associated with those loads as compared to serving the load with nonelectric energy sources.

For the purposes of this paragraph, "beneficial electrification" means the substitution of electricity for a fossil fuel, provided that the substitution meets at least one of the following conditions without adversely affecting either of the other two, as determined by the commission:

(i) saves a consumer money over the long run compared with continued use of the fossil fuel;

(ii) enables an electric utility to better manage the electric utility's electric grid network; or

(iii) reduces negative environmental impacts of fuel use, including but not limited to statewide greenhouse gas emissions.

CEOs note that no part of the statute asks the Commission to compare emissions from solid waste or other waste biomass electricity generation with emissions from other ways of managing that waste.⁴⁸

C. Effects on State Goals

CEOs argue that the use of the Fuel LCA framework is unreasonable because it undermines both Minnesota's statutory climate goals and waste goals, as well as the state's economy-wide statutory goal of achieving net zero greenhouse gas emissions by 2050, all of which require rapid, sustained, transformative progress towards cleaner technologies and practices.⁴⁹ CEOs note that state law establishes a goal that metro counties will recycle or compost 75 percent of total solid waste by 2030, and Hennepin County has adopted a goal to divert 90 percent or more of its solid waste from landfills or incinerators.⁵⁰

CEOs express concern that the Commission's approach is tied to counterfactuals based on "commercially available" waste management technologies. This would exclude emerging waste management technologies, even if those were to become commercially available during the lifetime of a generator that has achieved carbon-free status via Fuel LCA.⁵¹

⁴⁸ Petition, p. 10.

⁴⁹ Petition, p. 10.

⁵⁰ Petition, pp. 10-11.

⁵¹ Petition, p. 11.

CEOs express particular concern with the Commission's approach to new capital projects, which would not have their carbon-free status re-evaluated until the end of their projected service life or until they are fully depreciated, whichever comes first.⁵² The Commission's Ordering Paragraphs 7 and 8 state:

7. For fully depreciated assets, lifecycle emissions will be evaluated no more often than every five years.

8. For new capital projects, lifecycle emissions will be reevaluated no sooner than after the capital project is either fully depreciated or was expected to be paid off as determined at the time of Carbon-Free Standard eligibility, whichever is earlier, unless the facility was subject to a Fuel Life-Cycle Analysis and the fuel mix deviates by more than ten percent.

CEOs argue that new capital projects, or an old generator that has received new investment, could avoid re-evaluation past the 2050 net-zero goal and past the time emerging waste management and carbon-free energy technologies have become commercially available. CEOs contend that "[t]he result is locking in a carbon-emitting technology for decades to avoid emissions from a counterfactual, even though the emissions from that counterfactual could soon be eliminated."⁵³

Finally, CEOs note that granting carbon-free status to solid waste and other waste biomass facilities effectively incentivizes and subsidizes them because it allows them to generate and sell carbon-free attributes, which provides an additional income stream associated with these facilities.⁵⁴

D. Request for Clarification: CCS Formula

CEOs request that the Commission clarify whether the formula for determining the carbon-free share of output from facilities using CCS includes indirect emissions. The Commission's Ordering Paragraphs 14 and 15 state, in relevant part:

14. A utility may qualify for partial compliance with the Carbon-Free Standard by relying on generating technologies that use carbon capture & storage. Partial credit will be based on the net emissions of electricity generation with carbon capture & storage as compared to the net emissions of electricity generation without carbon capture & storage, on a kg CO₂e / MWh basis.

⁵² Petition, p. 11.

⁵³ Petition, p. 12.

⁵⁴ Petition, p. 11.

15. A utility proposing to use carbon capture & storage for partial compliance with the Carbon-Free Standard must file a detailed analysis of the carbon capture & storage project, including—

B. the regulatory and contractual obligations that will ensure that the carbon tied to carbon credits or accounting used to meet Minnesota standards will in fact be sequestered and not repurposed for activities that would release carbon, such as advanced oil recovery,

...

E. annual estimated indirect greenhouse gas emissions associated with the carbon capture & storage facility, measured in CO₂e,

...

CEOs note that although the Order references “net” emissions and requires reporting on “indirect” emissions, it neither defines indirect emissions nor explicitly states that “net” is inclusive of indirect emissions.⁵⁵ CEOs note that in the record, they previously discussed indirect emissions in this context as the following:

...[E]missions related to the carbon capture and storage technology that do not occur at the point-of-generation, such as emissions from offsite sources producing the steam or electricity needed to power the carbon capture process, or emissions related to transmission, injection, and storage of the capture carbon.⁵⁶

CEOs state that they interpret “net” to be inclusive of such indirect emissions, in particular because this would be aligned with the Commission’s preference to look beyond point-of-generation. CEOs note, however, that uncertainty around this question could be avoided if the Commission would clarify “that indirect emissions are included in the comparative net emissions formula it has adopted to determine the carbon-free share of generation from a facility using carbon capture.”⁵⁷

If the Commission did not intend to include indirect emissions in the CCS formula, CEOs request reconsideration of this issue.

VI. Xcel Energy Answer

Xcel Energy filed an Answer recommending denial of CEOs’ Petition. **(Decision Option 2)** Xcel Energy did not comment on the Request for Clarification, and so it is unclear to Staff if Xcel

⁵⁵ Petition, p. 12 and p. 13.

⁵⁶ Petition, p. 13, referencing CEOs Initial Comments, pp. 55-58.

⁵⁷ Petition, p. 13.

Energy includes this part of the Petition in its denial recommendation.

Xcel Energy noted that the Commission typically reviews petitions for reconsideration to determine whether they 1) raise new issues, (2) point to new and relevant evidence, (3) expose errors or ambiguities in the underlying order, or (4) otherwise persuade the Commission that it should rethink its previous Order.⁵⁸

Xcel Energy stated the Petition does not present new information and fails to otherwise satisfy these criteria, as the Commission's Order reviews and rejects the Point-of-Generation argument put forth by the CEOs in the record.⁵⁹

Xcel Energy further states the Commission has acted within its authority to allow for partial compliance from certain facilities.⁶⁰ Xcel Energy did not comment on the Commission's authority concerning full compliance.

VII. Supporters Answer

The Supporting Petitioners recommend approval of the Petition but did not provide comment on CEOs' Request for Clarification.⁶¹ Supporters provide arguments concerning woody biomass, solid waste, and health impacts.

A. Woody Biomass

Supporters argue that burning woody biomass emits more carbon than coal in the immediate, climate-relevant timeframe, and that Minnesota does not have time to waste.⁶²

Additionally, Supporters note that life-cycle analyses do not include all carbon impacts associated with bioenergy production, such as soil carbon loss in logged areas and "the foregone carbon sequestration from harvesting living trees."⁶³

Finally, Supporters argue that future tree regrowth cannot be relied upon for a carbon-free

⁵⁸ Xcel Energy's Response to Petition for Reconsideration, p. 1 (June 12, 2026) (hereinafter "Xcel Energy Answer").

⁵⁹ Xcel Energy Answer, p. 1.

⁶⁰ Xcel Energy Answer, p. 2.

⁶¹ CURE, Health Professionals for a Healthy Climate, the Partnership for Policy Integrity, Minnesota Interfaith Power and Light, and Minnesota Environmental Justice Table, collectively "Supporting Petitioners" or "Supporters" Answer to Petition for Reconsideration, p. 2 (June 15, 2026) (hereinafter "Supporters Answer").

⁶² Specifically, Supporters state that at the stack, wood-burning power plants emit around 50 percent more CO₂/MWh than coal plants and 200-300 percent more CO₂/MWh than natural gas plants. Supporters also state that, even considering forest regrowth, the length of time to achieve "parity" with carbon emissions is more than 40 years for a coal plant and at least 90 years for a natural gas plant. Supporters further argue that even when only using waste biomass, the length of time to achieve parity with coal plant emissions is 15-40 years when using harvest residues and 50 years or more when using salvaged trees; by contrast, the length of time to achieve parity with a natural gas plant is over a century. Supporters Answer, pp. 2-4.

⁶³ Supporters Answer, pp. 4-5.

designation because tree regrowth is outside of the Commission’s purview or oversight.⁶⁴

B. Solid Waste

Supporters state that burning “trash for energy” emits more greenhouse gasses per unit of energy than any other energy source.⁶⁵

Supporters further argue that the CFS is energy policy, not waste policy. As such, the Commission does not have the authority or expertise to determine that the closure of solid waste generators might conflict with the state’s Waste Management Act, which favors using waste as fuel rather than sending it to a landfill.⁶⁶ Supporters argue that both methods of waste disposal fall at the bottom of Minnesota’s Waste Hierarchy, and thus incentivizing one undermines the more favorable options of reduction, reuse, and recycling of waste.⁶⁷

Finally, Supporters expressed concern that neither the statute nor the Commission’s written Order explicitly precludes the Hennepin Energy Recovery Center (HERC) from gaining carbon-free status under a Fuel LCA.⁶⁸ Supporters argue that even if HERC is unable to gain carbon-free status, five of the other seven incinerators are also located in environmental justice areas.⁶⁹

1. Staff Note

Staff clarifies that the disallowance of HERC from carbon-free status via Fuel LCA is addressed in the Commission’s Ordering Paragraph 13.

The following is the language from the Commission’s May 14th Order:⁷⁰

13. Energy from waste-derived Eligible Energy Technologies included in Minn. Stat. § 216B.1691, subd. 1(c)(5) will qualify as carbon-free only if a facility-specific Fuel Life-Cycle Analysis shows that the technologies release emissions that are less than or equal to the emissions that would result from the relevant counterfactual scenario. The counterfactual must incorporate all reasonable, commercially available waste and emissions mitigation

⁶⁴ Supporters Answer, p. 4.

⁶⁵ Supporters cite to a 2023 peer-reviewed study that found that incinerators emit “1.7 times as much GHGs as coal.” Supporters Answer, p. 5.

⁶⁶ Supporters Answer, p. 5, referencing May 14th Order, p. 9.

⁶⁷ Supporters Answer, p. 5.

⁶⁸ Supporters Answer, p. 7.

⁶⁹ Staff notes that Supporters defined environmental justice area by Minn. Stat. § 116.065 and not Minn. Stat. § 216B.1691. Staff compared the statutes and noted that they are materially the same.

⁷⁰ May 14th Order, Ordering Paragraph 13.

practices.⁷¹

The following is the statutory EETS language:⁷²

Subdivision 1. Definitions.

...

(c) Unless otherwise specified in law, "eligible energy technology" means an energy technology that generates electricity from the following renewable energy sources:

...

(5) biomass, which includes, without limitation, landfill gas; an anaerobic digester system; the predominantly organic components of wastewater effluent, sludge, or related by-products from publicly owned treatment works, but not including incineration of wastewater sludge to produce electricity; and, except as provided in subdivision 1a, an energy recovery facility used to capture the heat value of mixed municipal solid waste or refuse-derived fuel from mixed municipal solid waste as a primary fuel.

...

Subd. 1a. Exception; energy recovery facility.

An energy recovery facility used to capture the heat value of mixed municipal solid waste or refuse-derived fuel from mixed municipal solid waste as a primary fuel is not an eligible energy technology, as defined in subdivision 1, if the energy recovery facility is located in a county with a population density that exceeds 1,500 persons per square mile but is less than 2,500 persons per square mile as of February 8, 2023.

HERC is an energy recovery facility located in a county with a population density that exceeds 1,500 persons per square mile but is less than 2,500 persons per square mile as of February 8, 2023. Therefore, HERC does not qualify as an EETS, and is thus not eligible to pursue carbon-free status via Fuel LCA under the Commission's Ordering Paragraph 13.

C. Health Impacts

Supporters argue that allowing biomass and solid waste facilities to be eligible for carbon-free status via Fuel LCA can endanger human health, and this is contrary to the statutory requirements that 1) all Minnesotans enjoy the benefits of clean energy, and 2) the Commission

⁷¹ May 14th Order, Ordering Paragraph 13.

⁷² Minn. Stat. § 216B.1691, [subd. 1\(c\)\(5\)](#) and [subd. 1a](#).

ensure that statewide air emissions are reduced, particularly in environmental justice areas.⁷³

Supporters cite to a specific analysis provided in Minnesota Power’s 2021 Integrated Resource Plan which showed that “projected emissions for Hibbard could cause an estimated 6.4 to 38.9 mortalities and a total of \$70 to \$437 million in health care impacts, depending on projections of future emissions.”⁷⁴ Supporters noted that emissions for Hibbard affect downwind communities, disproportionately affecting Native people.⁷⁵

Supporters also noted that woody biomass *production* facilities are also often sited in environmental justice communities and are accompanied by emissions, pollution, and health impacts.⁷⁶

Finally, Supporters expressed concerns about the potential repeat of a prior instance in which Minnesota utilities reported using credits from garbage-burning facilities sited in environmental justice communities in Florida to meet their obligations under the RES/EETS.⁷⁷

STAFF ANALYSIS

VIII. Standard of Review

Per Minn. Stat. § 216B.27, subd. 3., the Commission “may reverse, change, modify, or suspend” its original decision if it determines that “the original decision, order, or determination is in any respect unlawful or unreasonable.” Per Minnesota Rules 7829.3000, subparts 1-2, a party or a person may file a petition for reconsideration within 20 days of the date the order. Generally, the Commission will review petitions for reconsideration to determine whether the petition (i) raises new issues, (ii) points to new and relevant evidence, (iii) exposes errors or ambiguities in the underlying order, or (iv) otherwise persuades the Commission that it should rethink its decision.⁷⁸

Staff has reviewed the Petition under this standard, and does not believe that reconsideration is appropriate. Staff agrees with Xcel Energy that by-and-large, CEOs did not raise new arguments: the content of the Petition was largely the same as the content provided by CEOs in their Initial, Reply, and Supplemental Comments. However, Staff note the following, which appears to raise a slightly new issue:

- CEOs previously argued that upstream and downstream emissions should be counted for hydrogen and CCS under the *partial* compliance provision; they did not argue that

⁷³ Supporters Answer, p. 5 and p. 8.

⁷⁴ Supporters Answer, pp. 9-10.

⁷⁵ Supporters Answer, p. 10.

⁷⁶ Supporters Answer, p. 9.

⁷⁷ Supporters Answer, p. 9.

⁷⁸ See, for example, *In the Matter of the Application of Northern States Power Company for Authority to Increase Rates for Electric Service in the State of Minnesota*, Docket No. E-002/GR-13-868, ORDER DENYING PETITIONS FOR RECONSIDERATION at 1 (July 13, 2015).

this framework should also be applied in instances where the facility could be considered *fully* carbon-free at the point-of-generation, such as 100% hydrogen and 100% CCS, as they have in the Petition.

Staff agree with CEOs that the treatment of indirect emissions in CCS may be unclear in the Order.

IX. Discussion

A. Identifying Appropriate Forum to Address Claims

The Commission must make a determination on the Petition and address the claim of commenters that it lacks the legal authority to evaluate whether a technology qualifies as carbon-free based on a Fuel Life-Cycle Analysis.

In addition to this legal challenge, commenters raise policy issues. For example, CEOs question whether the Commission's conclusions regarding CCS will require a utility to consider emissions that are upstream and downstream of the point of generation. Likewise, the bulk of the Supporters' argument makes factual claims challenging whether any technology fueled by solid waste or woody biomass could pass a rigorous Fuel Life-Cycle Analysis.

The Commission may choose to address these policy-related concerns now, in the abstract. Or the Commission may defer consideration of these matters until a utility files a proposal designed to comply with the Carbon-Free Standard. Ordering Paragraphs 3(E), 16, and 19 provide for the Commission to respond to proposals by giving public notice and soliciting comments. The Commission may prefer to address commenters' concerns in the context of a concrete proposal, where adverse parties can develop a factual record about the kinds of information the Commission should consider.

B. CEO's Carbon-Free Framework

As noted previously, Staff's December 19, 2026 Briefing Papers originally characterized CEOs as 1) supporting a Point-of-Generation framework for determining whether or not a technology was *fully* carbon-free, and 2) supporting the inclusion of upstream and downstream emissions when calculating the *partial* carbon-free percentage for hydrogen and CCS.

CEOs disagreed with this characterization in a letter submitted January 5, 2026, noting that it supported looking at upstream and downstream emissions *not just* when calculating partial compliance percentages, *but also* when evaluating whether a technology is fully carbon-free. Staff incorporated the CEOs' correction in its January 7th, 2026 Corrected Briefing Papers. CEOs elaborated on this position in the current Petition, specifically noting how upstream and downstream emissions should be considered in cases of 100% hydrogen and 100% carbon capture.

Staff's current understanding of the CEOs' position is that, when determining whether technology is carbon-free, CEOs support including upstream and downstream emissions in an analysis, but that any emissions at the point-of-generation would be automatically disqualifying of carbon-free status.

One way of conceptualizing this is that CEOs advocate for two different frameworks to be applied: a Point-of-Generation framework for technologies that emit "at the stack," and an "Upstream/Downstream" framework for technologies that don't emit at the stack, including cases of 100% hydrogen or 100% carbon captured.

Alternatively, this might be thought of as a two-step framework:

- Step 1: Determine if carbon is emitted at the point-of-generation. If yes, the technology is not carbon-free. If no, including in the case of 100% hydrogen or 100% carbon captured, proceed to Step 2.
- Step 2: Determine if carbon is emitted upstream or downstream of the generating technology. If no, the technology is carbon-free.

It is unclear to Staff what occurs if yes in Step 2. CEOs consistently have supported CCS and hydrogen as eligible for partial carbon-free status, provided their upstream and downstream emissions are included in the percentage calculation; but this framework appears to suggest that the Commission must find that technologies that emit any amount of carbon upstream or downstream of the point of generation are not carbon-free at all.

It is also unclear to Staff how far upstream and downstream CEOs recommend drawing the system boundary, or whether CEOs support including upstream and downstream offsetting or negative emissions (net benefits) in an analysis.

If the Commission would like to further explore this framework, Staff recommends soliciting additional comments.

C. CCS Formula

Staff has reviewed the Commission's Order and agrees with CEOs that Ordering Paragraph 14 would benefit from clarification. Staff's understanding, like CEOs, is that the Commission intended "net" to be inclusive of indirect emissions.

To remedy this, the Commission may wish to simply verbally clarify. Alternatively, it may wish to expand on Decision Option 14. In **Decision Option 3**, Staff provides the following potential language, which includes a definition based upon CEOs' noted language:

14. A utility may qualify for partial compliance with the Carbon-Free Standard by relying on generating technologies that use

carbon capture & storage. Partial credit will be based on the net emissions of electricity generation with carbon capture & storage as compared to the net emissions of electricity generation without carbon capture & storage, on a kg CO₂e / MWh basis.

A. Net emissions shall be inclusive of indirect emissions occurring upstream or downstream of the point-of-generation, which include, but are not limited to, emissions from offsite sources producing the steam or electricity needed to power the carbon capture process, and emissions related to transmission, injection, and storage of the captured carbon.

Alternatively, the Commission may choose **Decision Option 2**, to deny the Petition in its entirety.

DECISION OPTIONS

1. Reconsider the May 14, 2026 Order, and take the following actions:
 - A. Delegate to the Executive Secretary authority to begin proceedings to further evaluate the Clean Energy Organizations' proposed Carbon-Free Standard framework.
[CEOs, Supporters]
2. Deny the Petition in its entirety.
[Xcel Energy]
3. Clarify Ordering Paragraph 14 of the May 14, 2026 Order to read:

A utility may qualify for partial compliance with the Carbon-Free Standard by relying on generating technologies that use carbon capture & storage. Partial credit will be based on the net emissions of electricity generation with carbon capture & storage as compared to the net emissions of electricity generation without carbon capture & storage, on a kg CO₂e / MWh basis.

A. Net emissions shall be inclusive of indirect emissions occurring upstream or downstream of the point-of-generation, which include, but are not limited to, emissions from offsite sources producing the steam or electricity needed to power the carbon capture process, and emissions related to transmission, injection, and storage of the capture carbon.

[CEOs]