June 5, 2025

VIA E-FILING

Will Seuffert
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

Re: In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota's Carbon-Free Standard under Minn. Stat. Sec. 216B.1691, Docket No. E-999/CI-24-352

Dear Mr. Seuffert:

Enclosed for filing are the Comments and Certificate of Service of the Minnesota Municipal Power Agency ("MMPA") in the above docket.

Please contact me if you have any questions regarding this filing.

Respectfully submitted,

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cc: Service List

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Dear Mr. Seuffert:

Pursuant to the Minnesota Public Utilities Commission's ("Commission") January 22, 2025, Notice of Comment Period, the Minnesota Municipal Power Agency ("MMPA") respectfully submits its Comments relating to the establishment of criteria and standards necessary for utilities to calculate partial compliance with the Carbon Free Standard ("CFS") under Minn. Stat. Sec. 216B.1691.

MMPA appreciates the opportunity to offer input to the Commission on the CFS partial compliance issue.

The State of Minnesota has established a goal to reduce statewide greenhouse gas emissions ("GHGs") across all sectors producing GHGs. The CFS defines "carbon free" as "technology that generates electricity without emitting carbon dioxide." MMPA believes that the concept of "carbon free" should include electricity produced from Renewable Natural Gas ("RNG").

A Carbon Intensity Comparison Should Determine a Technology's CFS Credit Eligibility. MMPA urges the Commission to define "carbon-free" in a manner that considers the full GHG impact of electricity generation. An evaluation of a technology's potential for CFS credit eligibility should consider how a fuel is made, moved, and used, and the corresponding GHG implications of each stage of the process. This approach,

known as a life-cycle assessment ("LCA"), compares technologies based on their carbon intensity ("CI").

CI represents the total GHGs associated with producing, distributing, and consuming a fuel, as is frequently measured in grams of CO2-equivalent per megajoule ("gCO2e/MJ"). As discussed in greater detail below, LCA models can quantify CI across all stages of a fuel's production and use.

Evaluating a technology's relative carbon-free status based on its comparative CI addresses a key problem that the Commission faces: A literal application of "carbon free" at the point of electricity generation under the CFS would lead to inconsistent and potentially unintended results. For example, hydrogen combustion may not emit carbon dioxide at the point of use and therefore may qualify for full credit under the CFS, but could be produced using carbon-intensive processes. Conversely, RNG, when combusted, emits carbon dioxide but offers net emissions benefits due to avoided methane emissions, which are 28 times more potent than carbon dioxide.

MMPA has previously noted that electricity generated using RNG from Anaerobic Digester ("AD") and Landfill Gas ("LFG") sources can be considered "carbon negative" when assessed against the GHG impacts of alternative waste management practices.[1] Specifically, capturing methane from landfills or manure management systems and combusting it to produce electricity converts methane—a gas with a global warming potential 28 times higher than carbon dioxide—into carbon dioxide and water, thereby reducing net atmospheric emissions. This comparative emissions benefit is consistent with the intent and purpose of the CFS. This carbon-negative effect results in a net environmental benefit that exceeds the outcome of simply avoiding carbon dioxide emissions at the point of generation.

The Minnesota Legislature established the CFS with the goal of harnessing the benefits of clean energy. According to the bill summary prepared by Senate Counsel,

[1] *In the Matter of an Investigation into Implementing Changes to the Renewable Energy Standard and the Newly Created Carbon Free Standard under Minn. Stat. Sec. 216B.1691,* Docket No. E999/CI-23-151, Comments of the Minnesota Municipal Power Agency (June 27, 2024) and Reply Comments of Minnesota Municipal Power Agency (July 24, 2024).

the law directs the Commission to implement the standard in a way that "maximizes" several benefits, including the reduction of statewide air emissions—particularly in environmental justice areas—and the creation of high-quality clean energy jobs.[2] RNG, when evaluated via an LCA based on comparative CI, aligns with these objectives by delivering measurable GHG reductions, enabling deployment of local clean energy infrastructure, and providing opportunities for investment in underserved communities.

The GREET Model is the Most Widely Used Life-Cycle Analysis Tool for Identifying Carbon Intensity. MMPA supports the use of the Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation ("GREET") model for CI analysis. GREET is an open-access model developed by Argonne National Laboratory and supported by the U.S. Department of Energy. The GREET model provides comprehensive life-cycle inventories and is widely used by federal and state agencies, including the U.S. Environmental Protection Agency ("EPA") and the California Air Resources Board, to evaluate GHG impacts.

Although originally developed for the transportation sector, the GREET model is a sector-agnostic tool that evaluates emissions across all stages of a fuel's lifecycle, including extraction, processing, transportation, and combustion. These lifecycle stages are shared by transportation and electricity sectors alike, with only the final use (*e.g.*, engine versus turbine) differing. This makes the GREET model easily adaptable to determine the CI of fuels used in electricity generation.

The GREET model includes comprehensive data for key fuels used in the power sector—such as natural gas, coal, hydrogen, and biomass—and is capable of accounting for critical emissions sources like methane leakage, coal mining, and land-use changes. It also includes electricity-specific modules that simulate technologies such as natural gas combined-cycle, integrated gasification combined-cycle, subcritical pulverized coal, and other plant configurations.[3] These modules allow for region-specific

[2] https://assets.senate.mn/summ/bill/2023/0/SF4/Bill%20Summary%20-%20SF%204%20(1st%20Engrossment).pdf

[3] The *Well to Plug GHG Emissions for Electric Power Generation – Washington Electricity Mix* report prepared by Life Cycle Associates, LLC for the Washington Department of Ecology in 2022 provides a good example for how such factors can be treated as default parameters in the GREET model. The report

customization, including plant efficiency, emission factors, and electricity grid mixes, making GREET well-suited to evaluating electricity across fuel sources.

The GREET model provides a robust, transparent, and credible method for calculating the CI of renewable natural gas and other fuels used in electricity production. As the Commission considers an LCA framework for the CFS, GREET offers a ready-made and scientifically sound platform for determining fuel-specific CI values in electric generation.

Also, the Commission is already familiar with the GREET model. For example, in May 2021, as part of its application to introduce an RNG interconnection tariff in Docket No. G-008/M-20-424, CenterPoint Energy filed a carbon accounting framework based on GREET ("CenterPoint GREET-based CI Model" or "CI Model").[4] This CI Model, prepared by EcoEngineers, identified a baseline CI value for fossil natural gas used in thermal applications as 71.73 gCO_2e/MJ. By comparison, the CI Model established CI values for RNG projects ranging from 33.74 gCO_2e/MJ to as low as -279.09 gCO_2e/MJ. These results confirm that RNG pathways consistently outperform fossil natural gas.

The CI Model is a valuable reference point for demonstrating the GHG benefits of RNG. MMPA notes that GREET model inputs—such as electricity grid mix and fuel production energy sources—continue to change as the energy sector decarbonizes. With these updates, the CI of RNG and other fuels continues to improve over time. The Commission should adopt a GREET-based LCA framework that includes a mechanism for periodically updating inputs to ensure that CI values remain accurate and policy-relevant into the future. The Commission should require utilities or third-party verifiers to use the most recent GREET version and to document key assumptions, data sources, and regional variations in compliance filings. Doing so ensures consistency across technologies while keeping the framework responsive to technological and market developments.

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is available at https://www.lifecycleassociates.com/wp-content/uploads/2023/09/LCA_-_WA-GREET-Pathways_Electric-Power-v7.1.pdf.

[4] *In the Matter of a Petition by CenterPoint Energy to Introduce a Carbon Accounting Framework for Renewable Natural Gas and a Threshold Carbon Intensity for Interconnection Producers,* Docket No. G-008/M-21-324, Petition (May 7, 2021).

RNG with a Negative Carbon Intensity Should Receive Full CFS Credit. Sources of RNG with a documented negative CI—as determined through GREET modeling—should qualify for full credit eligibility under the CFS. Negative CI RNG displaces methane emissions that would otherwise be released into the atmosphere, yielding net GHG reductions that exceed the environmental benefit of zero carbon dioxide emissions at the point of combustion. For example, the CenterPoint GREET-based CI Model found that RNG projects using animal manure achieved a CI as low as -279.09 gCO_2e/MJ. Recognizing net carbon negative technologies is consistent with legislative policy goals and the public interest.

RNG with Carbon Intensity Below Fossil Fuel Natural Gas Should Receive Partial CFS Credit. Sources of RNG that do not achieve a negative CI, but that have a CI lower than that of fossil natural gas, still deliver meaningful GHG reductions and should receive partial credit under the CFS. For example, the CenterPoint GREET-based CI Model found that both landfill gas (LFG) and wastewater treatment plant (WWTP) RNG projects achieved CI values below the baseline CI of fossil natural gas.

It is important to note that CI scores like those determined by the CenterPoint GREET-based CI Model are facility-specific and depend on numerous input assumptions, including feedstock type, energy inputs, and applicable regulatory requirements. Ensuring that assumptions accurately reflect reality on a project-to-project basis will be critical to achieving a fair comparison across diverse fuel pathways and properly valuing GHG benefits.

If an Entity Has a Portfolio with Different Carbon Intensities, the Carbon Intensity of the Portfolio Should Determine the CFS Credit. MMPA urges the Commission to recognize that fuel portfolios used to generate electricity often include a mix of renewable fuels with varying CI scores. In such cases, compliance with the CFS should consider the aggregate CI score of the fuels used to produce electricity. This approach aligns with Minn. Stat. § 216B.1691, subd. 2d(b)(i), which provides for partial compliance credit based on a percentage of carbon-free energy.

First, when a utility uses multiple renewable fuel sources to power a single facility—or across multiple facilities—the average CI of the fuel portfolio should

determine CFS credit eligibility. As a simple example, if half of the fuel used has a CI of -10 gCO_2e/MJ and the other half of the fuel has a CI of 10 gCO_2e/MJ, the resulting average CI is 0 gCO_2e/MJ. In this case, the emissions outcome is carbon-neutral and the overall electricity portfolio should be treated as fully carbon-free for CFS compliance purposes. Second, when renewable and fossil fuels are both used at the same plant, the percentage of electricity attributable to the renewable portion, based on its CI, should receive proportional credit. If 40 percent of the fuel input is renewable and verifiably low-carbon, then 40 percent of the electricity produced should be recognized as carbon-free. This framework rewards GHG reductions, supports flexible fuel strategies, and encourages utilities to optimize low-carbon fuel blends without being constrained to a single source.

In conclusion, MMPA asks that the Commission adopt and utilize the GREET model as an LCA framework capable of providing a comparison of CI across electricity generation sources. Such adoption is essential for the effective implementation of the CFS. Providing credit eligibility for electricity generated from RNG – on a full or partial basis – fully supports the legislative purpose of reducing GHGs in the state of Minnesota. The approach outlined above incentivizes market development leading to real emissions reductions, leverages an established modeling tool – GREET – and ensures fairness and transparency in the treatment of all clean energy technologies.

Dated: June 5, 2025

Respectfully submitted,

/s/ Kaci W. Poor

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CERTIFICATE OF SERVICE

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

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The undersigned states that on June 5, 2025, a copy of the Comments of the Minnesota Municipal Power Agency in the above matter were served upon all persons on the Commission-approved mailing list.

/s/ Kaci W. Poor

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