January 16, 2024

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

Re: In the Matter of the Petition by CenterPoint Energy for Approval of its First Natural Gas Innovation Plan

Dear Mr. Seuffert,

The Coalition for Renewable Natural Gas (RNG Coalition) submits the following feedback in response to the Minnesota Public Utilities Commission's (MPUC) request for initial comments on CenterPoint Energy's (CenterPoint or Company) first Natural Gas Innovation Plan (Plan).

RNG Coalition's goal in this proceeding is to support MPUC and other stakeholders' understanding of renewable gas as an energy and waste decarbonization tool, including how elements of CenterPoint's Plan may be viewed in the context of broader climate and environmental strategies. RNG Coalition was an active participant in the development of carbon intensity (CI) and cost-benefit analysis (CBA) proposals approved by the Commission in Docket 21-566, and in the development of CenterPoint's RNG tariff in Docket 20-434. The Company's inaugural Plan is an important opportunity to support the use of RNG as part of Minnesota's decarbonization strategy, in furtherance of the groundwork laid in these proceedings and other stakeholder efforts.[1]

Our comments herewithin provide an overview of renewable gas technologies and their role as a climate strategy, feedback on the RNG portion of the Company's Plan, and responses to some of the questions posed by the Commission in its Notice of Comment Period.[2]

About RNG Coalition and the Role of Renewable Gas

RNG Coalition is the trade association for the renewable gas industry in the United States and Canada. Our diverse membership is comprised of leading companies across the supply chain of renewable gas technologies and end-uses. Together we advocate for the sustainable development, deployment, and utilization of renewable gas, so that present and future

[1] For example, *Decarbonizing Minnesota's Natural Gas End Uses*, prepared by joint MN stakeholders in 2021: https://e21initiative.org/wp-content/uploads/2021/07/Decarbonizing-NG-End-Uses-Stakeholder-Process-Summary.pdf

[2] https://www.edockets.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={B0FA6489-0000-CC19-BAC8-2B2F862DE8C8}&documentTitle=20237-197544-01

generations have access to domestic, renewable, clean fuel and energy in Minnesota and across North America.

Renewable gases are an important near-term decarbonization strategy for all applications which currently utilize fossil-derived fuels and, in the long-term, will be necessary in energy applications which are not well-suited to electrification, and as platform molecules for other fuels and products.

Our organization is primarily focused on renewable gas derived from organic waste feedstocks which can achieve compound benefits through (1) the displacement of anthropogenic carbon dioxide (CO_2) emissions from the combustion of fossil fuels, (2) the critical near-term GHG impact of methane capture and destruction, and (3) additional air and water benefits that result from the improved management of organic waste. Recycling organic material in this manner continues to grow as a key strategy for achieving a circular economy.

Defining Renewable Gas Technologies

The four most common types of renewable gas are as follows:

Biogas – A mixture of methane (CH_4), CO_2, and very small amounts of water vapor and other gases. Biogas is generated when microorganisms break down organic material under anaerobic conditions (in the absence of oxygen). Biogas can be combusted on-site to produce renewable electricity, or processed to produce other renewable gases.

Renewable Natural Gas (RNG) or *Biomethane* – CO_2 and other impurities can be removed from biogas to create RNG, which is fully-fungible with existing gas infrastructure. Other methods of producing RNG include gasification or methanation (the combination of renewable CO_2 and hydrogen).

Hydrogen – The most common renewable inputs for hydrogen include clean electricity (e.g., electrolysis of water), RNG (e.g., steam methane reformation or SMR), and waste biomass (e.g., gasification, pyrolysis). Hydrogen can be used to generate electricity, for thermal processes, and as a platform molecule.

CO_2 – When obtained from biological processes or mechanically removed from the atmosphere, renewable CO_2 is a carbon-neutral platform molecule for fuels and products. The permanent sequestration of biogenic CO_2 yields a carbon negative outcome; one example of this is Direct Air Capture (DAC) paired with Carbon Capture, Utilization and Sequestration (CCUS).

Importantly, renewable gases can be used either as a fuel directly, or as platform molecules for other fuels and products. For example, RNG, hydrogen, and biogenic CO_2 can be used as inputs to create Sustainable Aviation Fuel (SAF). In order to achieve full decarbonization, Minnesota must consider the use of renewable gas both directly as energy resources and a feedstock for other fuels and products which are currently fossil-derived.

Supply Potential and Carbon Intensity

RNG presents the most significant near-term decarbonization opportunity of any renewable gas, based on both the well-proven technology readiness level of various methods of making RNG today—such as Anerobic Digestion (AD)—and the flexibility provided by RNG's fungibility with all conventional gas applications.

Based on a 2019 study conducted by ICF which outlines the supply potential for RNG in the United States,[3] we estimate that RNG from AD feedstocks will be able to supply at least 1,425.3 tBtu/year by 2040.[4] Based on U.S. natural gas consumption in 2021, this would cover approximately 30.6% of residential demand, 43.7% of commercial demand, or 17.4% of industrial demand nationally.[5]

Extensive capital stock exists in Minnesota that is designed to transport and consume gaseous fuels, and which possesses a significant remaining useful life. Conventional natural gas is currently Minnesota's largest source of energy, accounting for 30% of total energy consumption in the state—including 29% of commercial sector use, 25% of industrial sector use, and 31% of residential use.[6] ICF's high- to technical-case estimate of Minnesota's potential to produce RNG from anaerobic digestion sources (landfills, animal manure, wastewater treatment, and food waste) is on the order of 22.9-41.6 tBtu/year. This supply potential could satisfy 32% of the aforementioned residential demand, 41% of commercial demand, or 27% of industrial demand.

In the mid- to long-term, hydrogen produced from renewable feedstocks such as clean electricity and waste biomass, as well as the biogenic CO_2 which is produced as a byproduct of these processes or captured via DAC, should also be viewed as an essential part of Minnesota's renewable gas mix. When derived from such waste feedstocks, all commercially available methods of producing renewable gas have excellent lifecycle greenhouse gas performance, exemplified by lifecycle carbon intensity (CI) modeling employed by Washington, Oregon, and California's[7] clean fuel programs.

Moreover, some renewable gas projects capture and destroy a greater amount of GHGs (as measured on a tons of carbon dioxide equivalency basis) than are emitted during the fuel's

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[3] ICF, *Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment.* https://gasfoundation.org/wp-content/uploads/2019/12/AGF-2019-RNG-Study-Full-Report-FINAL-12-18-19.pdf

[4] Based conservatively on the "High" production scenario, using landfill gas, animal manure, wastewater, and food waste feedstocks.

[5] https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm

[6] EIA estimates Minnesota's 2021 total energy consumption by type here, 2021 commercial and industrial energy consumption here, and 2021 total natural gas use by sector here. Note that values are approximate due to variations between data sets.

[7] For example, see the lifecycle analyses conducted by California's Air Resources Board: https://ww3.arb.ca.gov/fuels/lcfs/fuelpathways/pathwaytable.htm

production and use, making it one of the few fuels available commercially today that can achieve a carbon-negative impact (i.e., better than carbon-neutral). Carbon-negative emissions technologies, and in particular those which operate based on the sequestration of biogenic carbon (e.g, bioenergy with geologic carbon capture and sequestration, biochar with soil carbon sequestration), present an opportunity to accelerate GHG reductions in the energy sector and/or provide useful, non-fossil CO_2 as an additional platform molecule. Employing such technologies will ultimately allow our economy to not only reach, but potentially move beyond carbon neutrality to a point where atmospheric carbon levels can be drawn down to stabilize Earth's climate, if needed. To this end, our industry is working toward the implementation of carbon capture and sequestration at RNG production facilities, and to create carbon-negative renewable hydrogen or bioliquids as outlined in work conducted by Lawrence Livermore National Laboratory for California.[8,9]

Improving and Circularizing Organic Waste Management

Complementary to their role as a method of zero-fossil-carbon energy supply, waste-derived renewable gases are unique in their near-term ability to reduce methane—a short-lived climate pollutant that, when assessed over a 20-year timeframe, is up to 80 times as potent as a greenhouse gas as carbon dioxide[10]—and to serve as a catalyst for improving organic waste management practices.

Indeed, organic waste is a serious and growing issue, and climate and other environmental impacts from these wastes require an immediate and ongoing solution. Globally, municipal solid waste is expected to grow 69% from 2.01 billion metric tons (BT) in 2018 to 3.4 BT in 2050 (around 50% of which is organic waste).[11] Moreover, these trends are underpinned by an expected 25% population increase of 2 billion people between now and 2050.[12] Capturing waste biogas for use as renewable energy is a proven technology for addressing GHG emissions and other challenges in the waste sector.

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[8] LLNL, *Getting to Neutral: Options for Negative Carbon Emissions in California*, Baker et al., January, 2020, Lawrence Livermore National Laboratory (LLNL). https://gs.llnl.gov/sites/gs/files/2021-08/getting_to_neutral.pdf

[9] Sequestration of the biogenic carbon contained in waste feedstocks from RNG and biomass-derived renewable hydrogen can be a carbon-negative process that removes carbon from the atmosphere. This benefit is separate from the methane destruction potential of RNG, which can lead to additional carbon-negative outcomes on a lifecycle basis relative to existing environmental control baselines.

[10] The Global Warming Potential for non-fossil methane is 27 on a 100-year basis and 80 on a 20-year basis according to the most recent IPCC assessment. See Table 7.15 directly from Chapter 7.6 of the Sixth Assessment Report (Working Group 1: The Physical Science Basis). https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter07.pdf

[11] https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html

[12] https://www.un.org/development/desa/en/news/population/world-population-prospects-2019.html

Society's waste streams create significant methane that must be dealt with quickly. Using this methane from organic wastes productively as a resource, rather than flaring it, provides greater impetus toward implementing and improving methane capture and organic waste management systems. The need to target methane emissions immediately as part of any GHG reduction strategy is substantiated by leading organizations focused on climate change mitigation. For example, the 2021 IPCC Working Group I report recommends that "strong, rapid, and sustained reductions in CH_4 emissions" should be a first priority for policymakers.[13]

Importantly, producing renewable gas from organic waste is also a primary method of recycling organic material. Unlike composting, these technologies transform waste back into usable energy and/or platform molecules (CH_4 and CO_2) which are a requirement for full decarbonization in some energy and industrial sectors, and wherever electrification proves infeasible. Waste-derived bioenergy is the only type of renewable energy which serves as a method of recycling and can therefore reduce GHG emissions and other environmental impacts outside of the energy sector.

Feedback on Renewable Gas Portions of Plan

Our comments herewithin primarily respond to Pilots A, B, C, and D from CenterPoint's proposed Plan:[14]

Pilots A & B – Organic Waste Diversion

RNG Coalition notes that the Company expects to revise its portfolio to remove Pilot A and allocate these costs to additional funding for RNG purchases.[15] With this in mind, we support the concept of Pilots A and B as a strong example of how AD can serve as a dual climate strategy in both the energy and organic waste sectors.

Source-separated organic waste and yard waste—the two feedstocks considered for the AD facilities described—present an important opportunity to prevent methane leakage that would occur when these materials are disposed of at a landfill, as well as a means to recycle the waste back into usable molecules. Importantly, the new Wasted Food Scale developed by the United States Environmental Protection Agency (U.S. EPA) ranks anaerobic digestion in the 4th highest use category after source reduction and repurposing edible food to humans and animals.[16]

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[13] https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf, pg. 27

[14] https://www.edockets.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={90EE0389-0000-CE1C-AA01-7EC7812FB55E}&documentTitle=20236-196995-01

[15] https://www.edockets.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={F03BD18C-0000-CE3A-9087-E8F72E7E907F}&documentTitle=20241-201812-02

[16] https://www.epa.gov/sustainable-management-food/wasted-food-scale

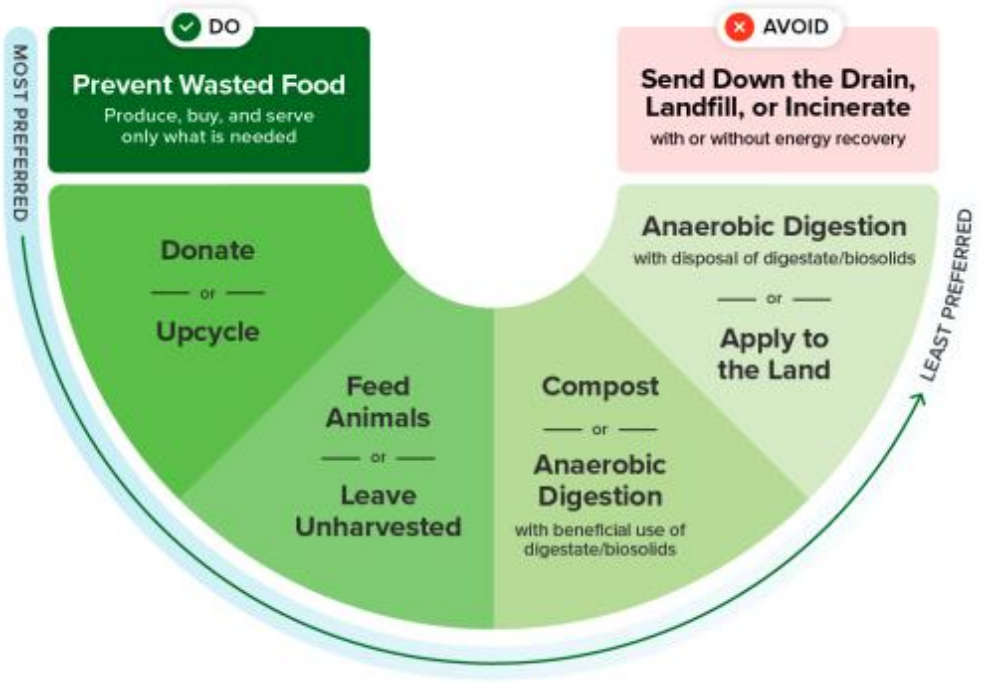

Figure 1. U.S. EPA Food Recovery Hierarchy

Leading jurisdictions such as California and Denmark provide good examples of where RNG serves as an important component of the waste management strategy. In Denmark, organic waste diversion to AD is in large part responsible for the country achieving a 5-6% landfill rate.[17] Similarly, California has in place a renewable gas procurement mandate for the state's utilities which prioritizes RNG from diverted food waste.[18]

The Company plans to interconnect the facility to its system directly, purchase the environmental attributes associated with RNG, and track and retire those attributes on behalf of its customers using the M-RETS system. This represents a best-in-class procurement model for locally produced renewable gas.

Pilot C – RNG Procurement

CenterPoint's RNG procurement strategy as outlined in Pilot C will be an important step toward decarbonizing Minnesota's gas system, and is the single highest impact action considered, with an estimated decarbonization potential of 359,884 MT CO2e. Importantly, the Company plans to minimize $/CO2e reduced while giving preference to local sources, and to track and retire purchased environmental attributes on behalf of its customers using the M-RETS system. This procurement method—where RNG is injected into an interconnected pipeline system and purchased via the transfer of environmental attributes—is the standard among policies designed to promote the use of renewable gas at the state, provincial, and federal levels in the United States, Canada, and Europe:

[17] https://dakofa.com/element/landfilling-in-denmark/
[18] https://perma.cc/DVS2-DT3F

- Renewable Gas Standard and Clean Heat Standard policies in California, Oregon, Colorado, Minnesota, New Hampshire, British Columbia, and Quebec;
- Low-Carbon Fuel Standard programs in California, Washington, British Columbia, and Canada on the federal level, as well as EPA's Renewable Fuel Standard;
- Voluntary renewable energy procurement frameworks from World Resources Institute, Green-e, Climate Disclosure Project, The Climate Registry, RE100, and Airport Carbon Accreditation.

Here it is important to consider that both RNG and renewable hydrogen are in a nascent stage compared to their production potential and compared the projected long-term need for gaseous clean fuels. The International Energy Agency's *Net Zero by 2050 A Roadmap for the Global Energy Sector* predicts that the supply of low-emissions gases, such as hydrogen, synthetic methane, biogas and biomethane must rise globally from 2 exajoules (EJ) in 2020 to 17 EJ in 2030 and 50 EJ in 2050.[19] The California Air Resources Board's *2022 Scoping Plan for Achieving Carbon Neutrality* predicts that low carbon hydrogen use must scale by 1,700x by 2045.[20]

Robust and efficient accounting systems are necessary to facilitate rapid growth in renewable gas supplies. Renewable gases produced and used within an integrated gas system[21] will rely on matching low carbon supply to the end-users who pay an environmental premium for the development of these fuels in recognition of their GHG benefits. If entities are not able to claim ownership of pipeline-injected renewable gases from the integrated system, there will not be enough incentive to drive development of renewable gas to the point where it reaches a meaningful share of the gas pipeline system, as envisioned by GHG reduction policies in Minnesota and other leading jurisdictions. Simply put, book-and-claim accounting–as envisioned by the Company in Pilot C—is the most proven method to allow fair ownership claims of the environmental benefits associated with renewable gas.

Pilot D – Electrolytic Hydrogen Blending

RNG Coalition supports the Company's proposal to produce electrolytic hydrogen for blending into its system as an important step in both scaling the hydrogen resource and evaluating its feasibility in gas system applications. The expanded use of RNG and hydrogen will be essential as part of Minnesota's strategy for reaching full decarbonization in any scenario,[22] however, the preferred method of hydrogen transport is not yet known. Utilizing existing gas infrastructure for hydrogen transport could provide cost and emissions savings compared constructing new dedicated hydrogen infrastructure. Comparatively, Minnesota may also consider a switch from

[19] https://www.iea.org/reports/net-zero-by-2050

[20] https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

[21] A connected gas pipeline system that was initially designed to move conventional (fossil) gas and continues to do so in large quantities, at least in the near term.

[22] For example, the e21 natural gas decarbonization study predicts significant demand to be met by renewable gases in 2050, even in a high-electrification scenario.

the current methane transport system to a multi-gas system over time, with dedicated pipelines for biomethane, hydrogen, raw biogas, and CO_2. Pilot D presents an opportunity to explore the near-term use of hydrogen to this end, with the use of M-RETS serving as an important component toward standardizing renewable gas tracking across molecule types.

Conclusion

RNG Coalition appreciates the opportunity to provide feedback on the Company's inaugural Natural Gas Innovation Plan. The NGIA is recognized as a leading policy designed to incent the full suite of technologies required to decarbonize the natural gas sector. We believe that Pilots A-D are important gas decarbonization measures which should be included in an approved Plan. By continuing to pioneer fair and well-designed markets for RNG across North America, Minnesota will create a pathway for our emerging clean energy industry to achieve critically needed methane emission reductions and other environmental benefits at a scale commensurate with the scale of the climate crisis.

Sincerely,

/s/

Sam Lehr
Manager of Sustainability & Markets Policy
Coalition for Renewable Natural Gas
1017 L Street #513
Sacramento, CA 95814
(302) 757-0866
sam.lehr@rngcoalition.com