June 17, 2025

ELECTRIC NATURAL GAS COALITION

Philip L. Barlett II, Chair
Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

Re: Request for Comments on Inquiry Regarding the Future of Natural Gas – Docket 2025-00145

Dear Chair Bartlett and Commissioners,

On behalf of eNG Coalition, I am writing to provide comments in response to the Maine Public Utilities Commission's (MPUC) Initial Request for Comment[1] pursuant to the recent Inquiry Regarding the Future of Natural Gas (Docket 2025-00145).[2]

eNG Coalition is a global platform dedicated to raising awareness of electric natural gas (e-NG), promoting its tradability, fostering policy support, and driving harmonization of applicable regulations and standards. eNG Coalition's members include energy producers and end-users with substantial industrial expertise and investment capacity across energy technologies. We believe that e-NG, as part of the broad set of solutions required to fully decarbonize the economy, can play a critical role in reducing greenhouse gas (GHG) emissions, supporting energy security as a domestically-produced clean fuel that utilizes existing gas infrastructure, and creating employment opportunities and economic growth.

To this end, we appreciate MPUC's inquiry regarding how Maine's use of natural gas will evolve over time with a particular focus on Maine's GHG reduction goals. Our comments herewithin (1) provide background information regarding e-NG and (2) respond to select questions posed by the Notice of Inquiry.

Background: e-NG (Electric Natural Gas)

e-NG, also known as e-methane, is a synthetic form of natural gas produced using electricity, carbon dioxide (CO_2), and water. First, through a process called electrolysis,

[1] https://mpuc-cms.maine.gov/CQM.Public.WebUI/Common/ViewDoc.aspx?DocRefId={C034CB96-0000-C118-A267-6CEA36B2F70A}&DocExt=pdf&DocName={C034CB96-0000-C118-A267-6CEA36B2F70A}.pdf
[2] https://mpuc-cms.maine.gov/CQM.Public.WebUI/Common/CaseMaster.aspx?CaseNumber=2025-00145

electricity is used to produce hydrogen by splitting the water molecule.[3] This hydrogen is then combined with CO_2 in a chemical reaction known as the Sabatier process to produce methane (CH_4), which can be stored, transported, and used in existing natural gas infrastructure. The resulting e-NG has the same chemical properties as geologic natural gas, making it compatible with current energy systems and applications.

Importantly, CO_2 captured from industrial processes serves as a crucial feedstock for e-NG; this process transforms CO_2 which is typically considered a waste product into a valuable commodity. This CO_2 can be obtained from various industrial operations that combust fuels, as well as from biogenic CO_2 emissions generated by biofuel production facilities, among other sources.

The Role of e-NG in Maine

e-NG has the potential to serve multiple roles across Maine's economy wherever geologic natural gas is used today, including sectors where clean molecules are expected to play a long-term role. The following are key aspects of how e-NG development and use can support Maine's economic and environmental goals:

Reducing Greenhouse Gas (GHG) Emissions

e-NG plays a key role in reducing greenhouse gas emissions by (1) serving as a clean replacement for geologic natural gas and (2) recycling waste carbon into usable fuel and feedstock. When produced using clean electricity energy, e-NG ranges from low-carbon to carbon-negative on a lifecycle basis, as the CO_2 used in its creation can be captured from the atmosphere or industrial sources, preventing it from being released into the environment. e-NG Coalition supports the use of lifecycle carbon accounting as a means to assess GHG emissions impact in a standardized way.

Utilizing Existing Infrastructure

A key advantage of e-NG is its compatibility with existing natural gas infrastructure. e-NG can be injected into natural gas pipelines and used in existing power plants, industrial facilities, households, and feedstock applications without requiring significant changes to the infrastructure. This makes it a scalable replacement for geologic natural gas, allows Maine to begin to use its gas infrastructure for transporting more clean fuels, and increases in-state energy supply and diversification.

Facilitating Energy Storage and Grid Flexibility

[3] While hydrogen production from electrolysis is the most common production pathway, e-NG Coalition supports the use of all clean hydrogen production pathways as a feedstock for creating e-NG.

e-NG can serve as an energy storage solution which improves the flexibility and reliability of Maine's gas system by converting excess clean electricity, such as that from wind or solar, into storable methane. This stored energy can be kept in existing infrastructure like pipelines or underground storage, making it scalable and dispatchable in applications which currently utilize geologic natural gas.

Encouraging Innovation and Investment

The development of e-NG encourages innovation by fostering advancements across several key areas in energy production, storage, and infrastructure. This includes through the advancement of e-fuels production technologies, improving hydrogen production efficiency, and enhancing carbon capture and utilization (CCU) methods. It also fosters the adaptation of existing natural gas infrastructure to handle clean fuels, creating new technical and business opportunities. Additionally, e-NG encourages collaboration across the clean energy, hydrogen, and natural gas sectors.

Response to Initial Request for Comment

Assessing GHG Emissions for e-NG and Clean Fuels

A key aspect of analyzing e-NG from a GHG emissions standpoint relies on the origin of its CO_2 feedstock. When biogenic CO2 is used as a feedstock, the resulting CO2 emissions when e-NG is combusted are treated as carbon-neutral from a GHG accounting standpoint. This treatment is standard for most biofuels and is consistent with carbon accounting frameworks put forth by the Intergovernmental Panel on Climate Change (IPCC),[4] World Resources Institute Greenhouse Gas Protocol,[5] U.S. Environmental

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[4] IPCC's methodology states that, "In the Energy sector, CO2, methane (CH4) and nitrous oxide (N2O) emissions from combustion of biomass or biomass-based products for energy are estimated, but the CO2 emissions are recorded as an information item that is not included in the sectoral total emissions for the Energy sector, as they are already included in AFOLU": https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/2_Volume2/19R_V2_2_Ch02_Stationary_Combustion.pdf

[5] See draft PDF pg. 80, where biogenic CO_2 emissions are "separately reported" to reflect carbon neutrality: https://ghgprotocol.org/sites/default/files/2022-12/Land-Sector-and-Removals-Guidance-Pilot-Testing-and-Review-Draft-Part-1.pdf

Protection Agency,[6] the U.S. Department of Energy's (DOE) GREET model,[7] and the International Energy Agency.[8]

e-NG can also be produced by combining renewable hydrogen with recycled CO_2, often captured from industrial or electricity generation processes. Under the EU's Renewable Fuels of Non-Biological Origin (RFNBO) framework, these recycled carbon fuels are eligible to count toward renewable energy targets if the CO_2 source complies with strict criteria. Currently, CO_2 captured from industrial point sources covered by the EU Emissions Trading Scheme (ETS) is considered eligible until 2035, enabling circular carbon use and avoiding additional fossil extraction. The EU's GHG accounting for RFNBOs is based on full life-cycle emissions using established methodologies under the RED Directive and certified by voluntary schemes like ISCC.

Generally speaking, e-NG Coalition supports the use of lifecycle carbon accounting (LCA) frameworks, like DOE's GREET model, to assess the impact of all energy resources. The use of LCA to determine the impact of clean fuels is critically important because it (1) eliminates environmental concerns by creating full transparency for each fuel pathway and (2) provides a way to prioritize the most impactful clean fuels. For example, any methane leakage that occurs throughout the production and transport of e-NG will be included in the LCA model and its climate impact transparently displayed. <u>MPUC should utilize the latest version of DOE's GREET model as a means of LCA for all energy resources considered by this analysis.</u>

Furthermore, MPUC should recognize that considering energy impact through the lens of scope emissions may not be the appropriate metric for this exercise. Indeed, the emissions of scopes 1-3 which occur in-state for any gas sector entity are relevant for consideration, but would be captured in the use of LCA frameworks that assess energy use. The GHG Protocol, which is response for creating the concept of scope emissions, is currently undergoing an update regarding changes in carbon accounting for all energy resources that will not be completed until 2028[9]—creating a possible area of misalignment between

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[6] EPA's GHG Reporting Rule requires reporting of CO_2 emissions, "excluding biogenic CO_2": https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98

[7] See PDF pg. 44 of the GREET User Manual, which notes that "For all bio-based feedstocks, the biogenic CO2 emitted during conversion and fuel combustion is assumed to be fully offset by the CO2 sequestered in the biomass feedstock during its growth": https://www.energy.gov/sites/default/files/2025-01/45zcf-greet_user-manual.pdf

[8] See International Energy Agency primer regarding the carbon neutrality of biogenic CO_2: https://www.ieabioenergy.com/iea-publications/faq/woodybiomass/biogenic-co2/

[9] https://ghgprotocol.org/ghg-protocol-corporate-suite-standards-and-guidance-update-process

MPUC's process and the specific of scope accounting globally. MPUC should conduct a comparison of LCA results rather than a breakdown of LCA into scopes.

Use of Renewable Gas Compared to Traditionally Sourced Natural Gas

There is a growing global consensus that clean fuels, including various sources of renewable gas, will be necessary to achieve full decarbonization, and that existing fuel distribution systems will play a key role in enabling that strategy. For example, the International Energy Agency's *Net Zero by 2050*[10] roadmap envisions a biomethane pipeline blend rate of 80%, with around 50% going to industry and 20% going to the building sector.[11] The roadmap also envisions hydrogen-derived fuels (e.g., including technologies like e-NG) as comprising 30% of the low-carbon hydrogen use in 2050.[12]

Here it is also critical to highlight how the jurisdictions leading on decarbonization view the role of renewable gas. For example, the EU views renewable gases as an essential part of their decarbonization strategy, with a target of 35 bcm biomethane by 2030,[13] and with current biogas and biomethane production equal to 7% natural gas use EU-wide.[14] Similarly, Denmark currently has approximately 40% blend rate,[15] which ties into their world-leading waste management policy that has resulted in a 1% landfill rate.[16] Denmark's Green Gas Strategy envisions achieving 100% renewable gas throughput over time in tandem with high levels of electrification.[17] Japan has specific e-NG targets of 1% in 2030 and 90% in 2050.[18]

A key theme in these strategies is the ability to use renewable gases (methane, hydrogen, and CO_2) both directly in the energy sector and as feedstocks for other fuels and chemicals. For example, producing decarbonized maritime fuels and sustainable aviation fuel at scale will require significant amounts of bio- and e-fuels, some of which will receive

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[10] *Net Zero by 2050 – A Roadmap for the Global Energy Sector*, International Energy Agency: https://iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroby2050-ARoadmapfortheGlobalEnergySector_CORR.pdf

[11] Id., PDF pg. 78

[12] Id., PDF pg. 76

[13] https://energy.ec.europa.eu/topics/renewable-energy/bioenergy/biomethane_en

[14] https://www.europeanbiogas.eu/eba-roadmap-2040-biogases-value-chain-calls-for-binding-target-to-unlock-circular-and-affordable-energy-for-europe/#:~:text=Currently%20providing%2022%20bcm%20of,tons%20of%20homegrown%20organic%20fertiliser

[15] https://en.energinet.dk/gas/biomethane/

[16] See PDF pg. 34: https://www.eea.europa.eu/publications/many-eu-member-states/denmark

[17] See PDF pg. 9-10: https://ens.dk/media/1715/download

[18] https://www.nature.com/articles/d42473-025-00056-3#:~:text=Japan%20has%20also%20set%20targets,with%20e%2Dmethane%20by%202050.&text=Kanadevia%20has%20been%20at%20the,starting%20in%201974%2C%20says%20Kimura.

their feedstock (e.g., methane as a platform molecule for methanol) through gas infrastructure.

Developing a modern strategy for the future of gas in Maine must consider the many interactions, spanning both climate and non-climate environmental benefits to energy security, which can be realized through the implementation of renewable gas technologies in tandem with other strategies. This includes the GHG reduction, circular economy, and energy security benefits possible through the use of e-NG. Maine's gas pipeline network has the ability to transform over time from a system that currently transports fossil natural gas to a system which provides clean molecules, to be used as both fuel and feedstocks, across various sectors of the economy.

As it pertains to the future of gas in Maine, realizing this future will involve the creation of policies which provide gas utilities with the ability to purchase clean fuels and distribute them to their customers. Furthermore, the use of technology neutral, market-based policies that utilize LCA are the most transparent and equitable way to broadly incentivize gas sector and thermal sector decarbonization. The proposed Clean Heat Standard in Vermont is a good example of one such policy.[19]

Conclusion

In conclusion, e-NG Coalition strongly supports the objectives of MPUC in its contemplation of the future of gas. This process has the potential to set the stage for accelerating development of new energy resources and decarbonization technologies in Maine. We look forward to collaborating with the MPUC and other stakeholders to ensure that this inquiry achieves its stated goals.

Thank you for your consideration of these comments. We are happy to provide further information or engage in discussions upon request.

Sincerely,

/s/

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19