December 4, 2020

Attn: Samantha Meserve
Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

RE: Massachusetts Alternative Energy Portfolio Standard Review

To Whom It May Concern:

The Coalition for Renewable Natural Gas (RNG Coalition)[1] offers this letter in response to the Massachusetts Department of Energy Resources' (DOER) ongoing review of the Commonwealth's Alternative Energy Portfolio Standard (APS). Our comments below address the role of renewable gaseous resources in achieving carbon neutrality, as well as potential policy options and programmatic elements that could be used to support the sustainable development of renewable natural gas (RNG) and renewable hydrogen (RH2).

About the RNG Coalition and RNG Industry

The RNG Coalition is the trade association for the RNG industry in the United States and Canada. Our diverse membership is comprised of leading companies across the RNG supply chain, including those with utility operations and RNG production facilities in Massachusetts. Together we advocate for the sustainable development, deployment, and utilization of RNG so that present and future generations will have access to domestic, renewable, clean fuel and energy in Massachusetts and throughout North America.

The RNG industry is nascent relative to other renewables industries, but is experiencing extraordinary growth driven by policies designed to promote environmental and economic goals. Most of the RNG projects developed since 2011 have been incentivized by transportation decarbonization programs, including the Unites States Environmental Protection Agency's (U.S. EPA) Renewable Fuel Standard (RFS) program and California, Oregon, and British Columbia's Low Carbon Fuel Standard (LCFS) programs. RNG is increasingly used as a decarbonization tool for natural gas end-use applications in stationary sectors, marked by the emergence of new programs such as Oregon's recently adopted RNG procurement requirement (similar to a renewable portfolio standard).[2]

DOER's review of the APS presents a good opportunity to consider the prospect of incentivizing RNG and RH2 in Massachusetts, which could be accomplished under the existing APS or through the implementation of a separate program. With this in mind, we are encouraged by the discussion of renewable gases within the APS program assessment conducted by Daymark Energy Advisors (Daymark

[1] The RNG Coalition is the trade association for the RNG industry in the United States and Canada. For more information see: http://www.rngcoalition.com/

[2] See Oregon Public Utilities Commission's adoption of RNG procurement rules under Oregon Senate Bill 98 here: https://apps.puc.state.or.us/orders/2020ords/20-227.pdf

Assessment).[3] Given the potential of RNG and RH2 as a decarbonization strategy in both the waste and energy sectors, we urge DOER to develop policies in line with other forward-thinking jurisdictions which provide appropriate incentives for the development and use of these fuels.

The Potential Role of Renewable Gas in Massachusetts

Conventional natural gas is currently Massachusetts' largest single source of energy, accounting for 30.6% of total in-state energy consumption—including 28.8% of commercial sector use, 31.4% of industrial sector use, and for home heating in more than half of households.[4] This represents a significant portion of the Commonwealth's economy, especially when considering the cross-sector progression toward carbon neutrality. Furthermore, studies outlining gas sector decarbonization in other jurisdictions show significant end-use demand for natural gas remaining through 2050, even in high-electrification scenarios.[5] Even in the long-run, electricity-based technologies may not be attractive for all applications—especially where very high temperatures are required—necessitating the continued use of renewable gaseous fuels if deep decarbonization is to be achieved.[6] With this in mind, incenting low-carbon substitutes for the conventional fuels in these end uses is a natural near-term strategy.

RNG deserves particular near-term attention as a sustainable substitute for conventional natural gas that reduces GHG emissions from both the waste and energy sectors and can be introduced to the existing gas system safely and quickly. The primary method of generating RNG today— anaerobic digestion (AD)—is a well-proven, cost-effective technology available at commercial scale. A significant amount of RNG can be produced at a cost that is within the range of historical natural gas prices (~$7-20/MMBtu).[7] This represents a significant opportunity to utilize Massachusetts' extensive existing infrastructure as a part of the Commonwealth's broader decarbonization strategy.

Massachusetts' potential to produce RNG from anaerobic digestion sources (landfills, animal manure, wastewater treatment, and food waste) is on the order of 7.206-11.824 tBtu/year, and the total New England potential is 24.2-42.4 tBtu/y.[8] This regional supply could satisfy 9.4% of Massachusetts' total current natural gas demand—32.5% of residential demand, 35.6% of commercial demand, or 89.3% of

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[3] Daymark Energy Advisors, *Alternative Energy Portfolio Standard Review*, October, 2020
https://www.mass.gov/doc/alternative-energy-portfolio-standard-review/download

[4] EIA estimates Massachusetts' 2018 total energy consumption by type here, 2018 commercial and industrial energy consumption here, 2018 total natural gas use by sector here, and portion of homes reliant on natural gas here. Note that values are approximate due to variations between data sets.

[5] For example, see pg. 35 of the California Energy Commission report entitled *The Challenge of Retail Gas in California's Low Carbon Future,* which finds that natural gas in California's residential, commercial, and industrial sectors is still ~1,000 tBtu in 2050 in the high-building-electrification case:
https://ww2.energy.ca.gov/2019publications/CEC-500-2019-055/CEC-500-2019-055-F.pdf

[6] Bataille et al., *A Review of Technology and Policy Deep Decarbonization Pathway Options for Making Energy-Intensive Industry Production Consistent with the Paris Agreement*
https://www.sciencedirect.com/science/article/abs/pii/S0959652618307686

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

[8] Id.

industrial demand[9] and pipeline-connected RNG projects could be shifted between these demand categories over time if needed. Furthermore, the addition of RNG from New England's wood waste could increase the total resource potential by 3.6-7.3 tBtu/y.[10] Massachusetts can deploy a significant amount of RNG as a complement to electrification and renewable liquid fuels to decarbonize heating demand and transport.[11] Supporting the growth of proven technologies like RNG as part of the Commonwealth's climate change mitigation strategy will help to position Massachusetts as a leader in decarbonization.

The development of portfolio standard incentives for renewable gases should also be considered with respect to RH2. Although still a relatively nascent industry, RH2 at scale could ultimately contribute greatly to renewable thermal applications with zero carbon emissions at combustion. Feedstocks used to produce RNG today can be shifted toward RH2 in the long run—a carbon-negative process when paired with carbon capture and sequestration.[12] Furthermore, increased availability of electrolytic hydrogen could provide significant resource potential for zero-carbon renewable gas for thermal applications.

Environmental and Economic Benefits of RNG Development and Use

The vast majority of RNG available commercially today is created by capturing and processing raw biogas generated at sites with aggregated organic matter—such as landfills, wastewater treatment plants, and agricultural operations—and then upgrading this gas to meet pipeline quality standards. In the absence of the RNG project this biogas is often flared, or worse, is uncollected and escapes fugitively into the atmosphere as a short-lived climate pollutant (methane) that, according to the Intergovernmental Panel on Climate Change, is 84 times as potent a greenhouse gas (GHG) as carbon dioxide.[13]

In addition to the potential for GHG reduction through feedstock processing and fossil fuel displacement, implementation of RNG projects can address other environmental issues which may occur with the aggregation of organic waste. For example, improved manure management practices in agricultural operations can result in water quality benefits. There are also substantial economic benefits realized with increased development, deployment and utilization of RNG—including millions of dollars in

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[9] EIA estimates Massachusetts' 2018 total energy consumption by type here and 2018 total natural gas use by sector here.

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

[11] M.J. Bradley & Associates, *The Role of Renewable Biofuels in a Low Carbon Economy*, February 2020 https://www.mjbradley.com/reports/role-renewable-biofuels-low-carbon-economy

[12] Lawrence Livermore National Laboratory (LLNL), *Getting to Neutral: Options for Negative Carbon Emissions in California*, Baker et al., January, 2020 https://www-gs.llnl.gov/content/assets/docs/energy/Getting_to_Neutral.pdf

[13] Intergovernmental Panel on Climate Change Fifth Assessment Report estimate of the Global Warming Potential of methane over a 20-year time horizon. See: Myhre et al., *2013: Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf

capital investment per project and creation of thousands of clean energy sector jobs.[14] In all cases, RNG production and utilization helps to create a circular economy, increasing the sustainability of organic waste processing systems.

Creating Portfolio Standard Incentives for Renewable Gas

DOER's APS review process has created a clear opportunity to evaluate the role of renewable gases as a decarbonization strategy in Massachusetts, and to consider how best to develop incentive programs for these fuels. A portfolio standard such as the APS has the ability to serve as an effective incentive for RNG and RH2. However, we believe that the best outcome would be achieved by implementing a dedicated renewable gas portfolio standard. Such a program should place the renewable gas procurement obligation on local distribution companies (LDC), with increasing targets based on a percentage of yearly gas throughput. As part of the APS review, DOER might consider how a dedicated renewable gas portfolio standard would interact with existing programs, including the APS.

DOER could also incentivize the use of renewable gases through modification of the existing APS program. To do so, eligibility for credit generation should be extended to include RH2, as well as allowing the qualification of contractually purchased RNG and RH2 when transported through a common carrier pipeline. Additionally, expanding the program's obligation to include gas LDCs would establish appropriate alignment with RNG and RH2 use and create additional credit demand.

Under any portfolio standard, including the APS, DOER should seek to ensure consistency in the language used to describe various renewable energy technologies. For example, the Daymark Assessment asserts that, "customers could utilize biofuels until they have the capital to convert to a renewable thermal technology". This language seems to imply that biofuels produced from renewable resources such as RNG are not renewable technologies, which is definitionally incorrect. A detailed assessment of the GHG of these various renewable technologies can be accomplished through a lifecycle analysis of the GHG emissions and reductions resulting from energy production and consumption in each energy pathway. Similarly, the full lifecycle impacts of RNG, including reduction of emissions from both waste and energy sectors, should be taken into consideration in all future modeling—especially that which is used to determine its effectiveness in reducing GHG emissions under a given program.

Lifecycle GHG Accounting and Attribute Tracking Ensure Sustainable RNG Development and Use

Greenhouse gas accounting using lifecycle accounting (LCA)—sometimes called carbon intensity (CI) when expressed on an emissions per unit energy basis—is a key tool to ensure the development of sustainable biofuels. Full LCA has already been successfully included in multiple demand-side policies for transportation. For example, the California Low Carbon Fuel Standard and Oregon Clean Fuels Standard are largely[15] responsible for the current incentive structure governing project development and subsequent RNG utilization in North America. Oregon also recently finalized an RNG procurement

[14] ICF, *Economic Impacts of Deploying Low NOx Trucks fueled by Renewable Natural Gas*, 2017 https://static1.squarespace.com/static/53a09c47e4b050b5ad5bf4f5/t/59077544ebbd1ad192d13ff6/1493660998766/ICF_RNG+Jobs+Study_FINAL+with+infographic.pdf

[15] As layered atop the Federal Renewable Fuels Standard.

requirement for gas utilities—the first of its kind—which will utilize LCA accounting.[16] Under these programs, projects with the lowest CI scores receive the greatest incentive.[17]

Project-specific CI scores under the aforementioned policies are calculated via LCA accounting, which factors in GHG emissions and reductions from every step of the fuel production and utilization process.[18] Each project-specific LCA is modelled using a version[19] of the GREET model[20] created by Argonne National Lab, which is widely accepted among regulatory agencies and the scientific community. Given the comprehensive and established nature of these tools, RNG Coalition strongly supports using LCA accounting and the GREET model in assessing renewable energy technologies. Should Massachusetts opt to incentivize RNG under any renewable portfolio standard policy, we recommend they build upon this framework.[21]

Registries supporting tradeable credit systems and LCA for thermal energy are emerging, such as the Midwest Renewable Energy Tracking System (M-RETS). The use of such registries and harmonization with other jurisdictions undertaking similar policies could also be helpful to promote RNG projects in a portfolio standard setting.[22] Such systems increase market confidence about the environmental benefits claimed by low-carbon fuels. Oregon's new RNG procurement regulation will require the use of M-RETS in RNG procurement and compliance.

Conclusion

The RNG Coalition appreciates the opportunity to participate and provide comment on DOER's APS review process. The development of a portfolio standard incentive that includes the use of RNG and RH2 would provide significant opportunity for decarbonization of Massachusetts' waste and energy sectors, and the use of LCA would position Massachusetts as a leader in low-carbon fuel use for thermal energy.

Our members look forward to continuing the expansion of methane-capture through sustainable RNG production and utilization in Massachusetts. We thank DOER for their leadership in continued development of the APS as such dialogue benefits the environment and the economy, energy consumers, and policymakers interested in decarbonization across North America.

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[16] See Oregon Public Utilities Commission's adoption of RNG procurement rules under Oregon Senate Bill 98 here: https://apps.puc.state.or.us/orders/2020ords/20-227.pdf

[17] Voluntary programs for RNG—and the tools built to support such markets—are considering adopting the same general CI approach. See: https://www.green-e.org/renewable-fuels and https://www.mrets.org/m-rets-renewable-thermal-tracking-system/

[18] CI inputs include but are not limited to feedstock production, fuel production (upgrading and processing), fuel transport, and fuel combustion.

[19] The CA GREET (used by California LCFS) and OR GREET (used by Oregon CFS) are versions of Argonne National Lab's GREET model which have been modified to include parameters specific to each jurisdiction.

[20] More information about Argonne National Lab's GREET model can be found here.

[21] While existing state-level low carbon fuel standard policies target the vehicle sector, this LCA framework can easily be adapted to other end uses (e.g., stationary thermal applications).

[22] https://www.mrets.org/m-rets-renewable-thermal-tracking-system/

Sincerely,

/s/

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