

STATE OF MARYLAND

**BEFORE THE
PUBLIC SERVICE COMMISSION OF MARYLAND**

IN RE:

**PETITION OF THE OFFICE OF
PEOPLE'S COUNSEL FOR NEAR-
TERM, PRIORITY ACTIONS AND
COMPREHENSIVE, LONG-TERM
PLANNING FOR MARYLAND'S
GAS COMPANIES**

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CASE NO. 9707

DIRECT TESTIMONY OF MICHAEL WALSH

ON BEHALF OF

THE SIERRA CLUB

MAY 4, 2026

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1 **I. INTRODUCTION AND QUALIFICATIONS**

2 **Q. Please state your name, title, and employer.**

3 A. My name is Michael J. Walsh. I am the Managing Partner of Groundwork Data, an
4 independent advisory, research, and technology development firm. My business address
5 is 51 Lockeland Ave, Arlington, Massachusetts 02476.

6 **Q. What is your educational background and professional experience?**

7 A. I hold a Ph.D. in Environmental Engineering from Cornell University and an A.B. in
8 Chemistry from Colby College. My career has focused on the intersection of energy
9 technologies, environmental policy, and utility regulation.

10 I have over 15 years of energy systems modeling and analysis experience, with the
11 previous 10 years of that period focused on translating that capacity for diverse
12 stakeholders and policymakers in both academic and corporate settings. I have overseen
13 or had a leadership role in several state and local climate planning exercises. I have
14 expertise in the domains of bioenergy, life-cycle and techno-economic assessment,
15 building energy systems, and the economics of gas utility decarbonization strategies,
16 including evaluating renewable natural gas (“RNG”) and hydrogen as potential
17 alternatives to fossil gas for building heating applications. My full qualifications are
18 detailed in my curriculum vitae, which is attached as Exhibit MJW-1.

19 **Q. On whose behalf are you testifying in this case?**

20 A. I am testifying on behalf of Sierra Club.

21 **Q. Have you testified previously before this or any other regulatory commission?**

22 A. Yes. While this is my first time testifying before the Maryland Public Service Commission
23 (“PSC” or “Commission”), I have testified before regulatory agencies and participated in

1 regulatory investigations in multiple states. My testimony has addressed the future of gas
2 distribution systems, new customer connection policy, low-carbon fuels, methane leaks,
3 non-pipeline alternatives, integrated energy planning, and the alignment of utility practices
4 with climate policy.

5 In Massachusetts, I have been directly and extensively involved in the Department of
6 Public Utilities (“D.P.U.”)’s investigation into the future of local gas distribution
7 companies (D.P.U. 20-80) and subsequent Climate Compliance Plan Proceedings (D.P.U.
8 25-40 through 25-45). Prior to my participation in these proceedings, I provided
9 testimony on behalf of the Conservation Law Foundation in D.P.U. 22-32, the petition of
10 Liberty Utilities to procure RNG.

11 In Rhode Island, I have testified on behalf of the Conservation Law Foundation in the
12 Rhode Island Energy Company’s separate FY2025 and FY2026 Infrastructure Safety and
13 Reliability Proceedings (Docket 23-49-NG and Docket 24-55-NG), and its 2025 petition
14 for a change in its distribution rates (Docket 25-45-GE). I also represented the
15 Conservation Law Foundation and Sierra Club in the Rhode Island Public Utilities
16 Commission Investigation into the Future of Gas (Docket 22-01-NG) stakeholder
17 process.

18 My work outside New England includes testimony before the Colorado Public Utilities
19 Commission on Xcel Energy’s 2025-2030 Gas Infrastructure Plan (CO P.U.C. 25A-
20 0220G) on behalf of Rewiring America, regarding data needs for evaluating non-pipeline
21 alternatives. I have also recently testified on behalf of the City of Ann Arbor before the
22 Michigan Public Service Commission on DTE Energy’s 2025 filing for an increase in

1 distribution rates (MI P.S.C. U-21973) on a variety of topics related to alignment with
2 city and state climate goals, including low-carbon fuels.

3 **Q. Please provide a description of each of the exhibits you are sponsoring.**

4 A. I am sponsoring the following exhibits:

- 5 • Exhibit MJW-1. Curriculum vitae.
- 6 • Exhibit MJW-2. Map of landfill gas management projects in Maryland.
- 7 • Exhibit MJW-3. National listing of agricultural digestion (top) and landfill gas
8 energy projects by operational years.

9 **Q. What is the purpose of your testimony?**

10 A. The purpose of my testimony is to evaluate the claims made by Maryland’s gas utilities
11 that RNG, hydrogen, or some blend of natural gas and hydrogen can “realistically and
12 affordably” assist in achieving the State’s climate goals, which is Issue 7 in Order No.
13 91791.¹

14 **Q. What are your principal conclusions?**

15 A. I reach the following principal conclusions:

16 **First**, utilizing RNG is neither a realistic nor an affordable decarbonization strategy for
17 Maryland’s gas system. The utilities have conducted only minimal supply analysis and do
18 not offer specific commitments as to how they would procure any alternative fuels.

19 Further, the costs of RNG are prohibitive—full substitution of RNG for natural gas would
20 increase Maryland ratepayers’ gas costs by approximately \$4 billion annually.

21 **Second**, hydrogen blending is not a viable pathway for building decarbonization. No
22 Maryland utility has an operational hydrogen program, and the consensus of 54

¹ Case No. 9707, *In the Matter of the Petition of the Office of People’s Counsel for Near-Term, Priority Actions and Comprehensive, Long-Term Planning for Maryland’s Gas Companies*, Order No. 91791 (Aug. 20, 2025).

1 independent studies, as well as federal research and development policy, clearly
2 demonstrates that hydrogen has no significant role in building heating.

3 **Third**, the Commission should decline to authorize ratepayer-funded procurement of
4 RNG or hydrogen as a climate-compliance mechanism.

5 **Fourth**, the Commission should defer to the Maryland Department of the Environment
6 (“MDE”) to make any determinations on whether any specific fuel pathway qualifies for
7 meeting Maryland’s climate goals.

8 **II. ALTERNATIVE FUELS DEFINED**

9 **Q. What is the scope of this investigatory proceeding?**

10 A. In its *Order Instituting Long-Term Gas Planning Proceedings*, Order No. 91791, the
11 Commission identified twelve distinct issues relating to the implications of climate targets
12 and changes in market conditions on gas distribution company planning.² These issues
13 include planning transparency, stranded costs, alternative fuels, non-pipeline alternatives,
14 and emerging technologies.

15 **Q. What question did the Commission identify regarding alternative fuels?**

16 A. The Commission’s question regarding alternative fuels was as follows: “Are there
17 alternative fuels that could realistically and affordably assist in achieving the State’s
18 climate goals by utilizing the existing gas system?” This question identifies two criteria for
19 evaluation: (1) whether alternative fuels can *realistically* scale to meaningfully deliver
20 emissions reductions; and (2) whether alternative fuels can do so in a way that is
21 economically *affordable* for ratepayers or Maryland as a whole.

² *Id.*

1 **Q. What are alternative fuels?**

2 A. Alternative fuels³ are chemical energy carriers that, when burned, do not directly release
3 fossil carbon into the atmosphere. The term encompasses non-fossil forms of gaseous,
4 liquid,⁴ and solid fuels.⁵ Carbon-containing alternative fuels—analogs to conventional
5 fossil fuels—are produced from biomass or synthesized from captured carbon dioxide
6 (CO₂). Hydrogen—produced via various pathways—is considered to be a potential
7 alternative to conventional fuels in some situations. Figure 1 below shows that many
8 pathways exist for creating alternative fuels alongside conventional fossil fuel pathways.
9 Alternative fuels simply substitute fossil petroleum and fossil natural gas in these
10 pathways. My testimony primarily focuses on the two alternative fuels, RNG and hydrogen
11 blending, that are discussed by the gas companies.

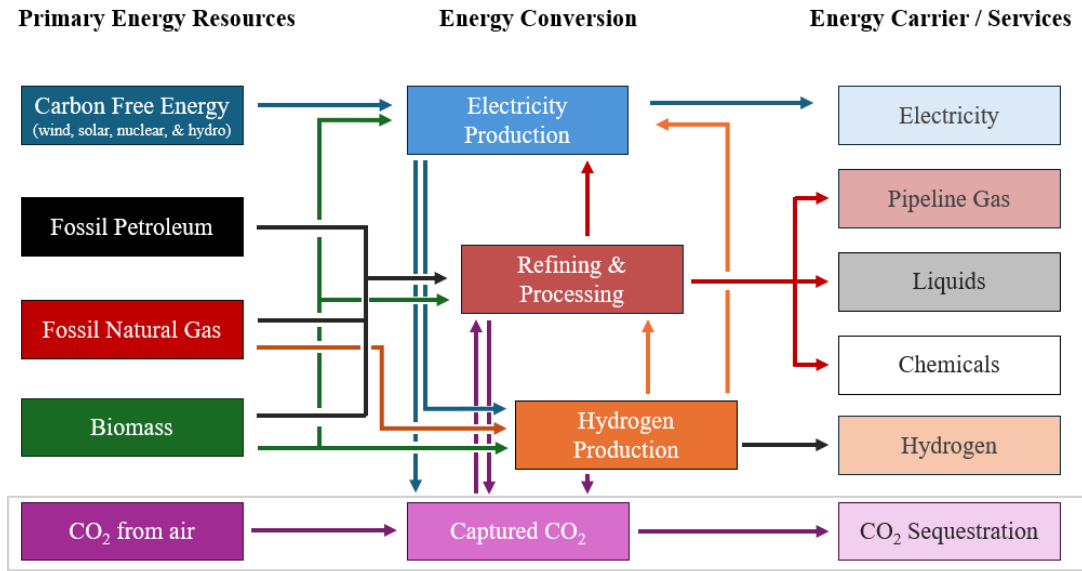
³ Analogous terms for alternative fuels can include “renewable fuels,” “decarbonized fuels,” or “low-carbon fuels.” These terms are generalizing descriptors, and the impact of such fuels relative to fossil fuels depends on several factors. For example, corn-derived ethanol fuels are classified by the Federal Renewable Fuel Standard as a “renewable fuel;” however, comprehensive life-cycle assessments have shown that they are potentially more carbon-intensive than fossil gasoline due to process energy requirements and land use impacts. *See* T. J. Lark et al., *Environmental outcomes of the US Renewable Fuel Standard*, Proceedings Nat’l Acad. Sci. (Feb. 14, 2022), doi.org/10.1073/pnas.2101084119.

⁴ Examples of liquid low-carbon fuels include methanol, dimethyl ether (used as a propane substitute), ethanol, renewable gasoline, biodiesel, renewable diesel, and sustainable aviation fuel. The first three refer to specific chemicals, while the last refer to blends that seek to replace certain classes of liquid fuels.

⁵ Examples of solid low-carbon fuels include cordwood, pelletized biomass, and biochar (charcoal).

1

Figure 1. Overview of energy production.



2

3 **Q. What is RNG, and how is it incorporated into the gas system?**

4 A. RNG, or methane from biological sources, is mainly produced today by purifying biogas
5 from landfills or anaerobic digesters⁶ that process wastewater sludge, animal waste, and
6 food scraps. Biogas, however, must be upgraded to pipeline-quality methane before
7 injection into gas systems.⁷ Moreover, crop residues, forest scraps, energy crops, and
8 municipal solid waste can be gasified⁸ directly into RNG. While raw biogas from landfills
9 or digestors that is not upgraded to RNG has traditionally been combusted for heat or
10 electricity, all the feedstocks above can serve other purposes, such as power generation,
11 liquid fuels, fertilizers, chemicals, or carbon sequestration.

⁶ Anaerobic digestion is a biological process in which methanogenic bacteria break down organic matter in the absence of oxygen (“an-”: without; “aerobic”: oxygen).

⁷ Raw biogas is approximately 40-50% CO₂, and 40-50% methane, with residual water and trace gases.

⁸ This refers to reacting organic material at high temperatures with varying levels of steam and oxygen without combusting it.

1 **Q. What is hydrogen, and how is it incorporated into the gas system?**

2 A. Hydrogen is a gas that is widely used in the chemical industry; it is also the simplest
3 molecular energy carrier and can be produced through several pathways. Steam reforming,
4 the main method for producing hydrogen, reacts methane from natural gas with steam to
5 produce hydrogen. However, this method is energy-intensive, relies on natural gas, and
6 emits significant quantities of CO₂. Achieving low-carbon hydrogen requires alternatives
7 such as water electrolysis powered by clean electricity. Once produced, hydrogen can be
8 combusted directly to produce heat, used to power a fuel cell to generate electricity for grid
9 and transportation applications, and serve as a chemical feedstock in the production of
10 fertilizer, hydrocarbon fuels, and other chemicals.

11 Hydrogen, however, presents major implementation challenges for existing gas systems
12 due to its unique properties. Hydrogen can cause steel embrittlement, leaks easily from
13 pipelines, and has only a third of the energy per unit volume of natural gas, meaning that
14 supplying equivalent energy to fossil gas requires tripling the flow rate. These factors
15 lead to significant integrity and leakage concerns in natural gas networks and require
16 substantial investment to mitigate, even if hydrogen is blended at low levels. Installing
17 dedicated hydrogen networks would require novel network and consumer equipment.

18 **Q. Do alternative fuels reduce emissions and support net-zero targets?**

19 A. Simplistically, alternative fuels may, depending on the circumstances, contribute to
20 *incremental* emissions reductions by substituting for fossil-based fuels. The role of
21 alternative fuels in meeting *systemic* net-zero targets, however, is much more complex.
22 For one, alternative fuels vary in their life-cycle greenhouse gas (“GHG”) emissions,
23 particularly when their cultivation and production require significant energy from fossil-

1 based resources and generate potent GHGs, such as methane and nitrous oxide (N₂O),
2 during processing or agricultural cultivation. Furthermore, alternative fuels produced from
3 agricultural or forestry products can lead to changes in cultivation practices and land use
4 that significantly increase GHG emissions. Ideally, alternative fuels produced from waste-
5 based feedstocks can be targeted for high-value end uses, such as higher-value energy-
6 dense liquid fuel products (e.g., aviation fuel), distinct energy system services (e.g., load-
7 following biogas generator serving rural electric needs), or decarbonized industrial
8 applications such as ammonia (fertilizer) production. In other words, due to the limited
9 availability and high cost of alternative fuels, policy should direct them to hard-to-electrify
10 sectors and processes and avoid directing them to sectors where feasible options for
11 electrification exist.

12 **Q. Can pipeline alternative fuels achieve the two criteria set out by the Commission in**
13 **Issue 7?**

14 A. No. My testimony will explain in detail why alternatives to pipeline fossil gas cannot
15 realistically scale and are not affordable. In summary, a wide body of literature has
16 established that achieving ambitious climate targets, such as the Maryland Climate
17 Solution Now Act's net-zero by 2045 target, requires substantially reducing the use of
18 combustible fuels in sectors such as heating, through strategies such as efficiency measures
19 and electrification of end uses.

20 Alternative fuels face two constraints. The first is that the feedstocks for biobased
21 alternative fuels are fundamentally limited by the availability of certain resources or by
22 material tradeoffs incurred when scaling some resources, such as energy crops. The second
23 is that alternative fuels are more expensive to produce than fossil fuels, especially synthetic

1 fuels made from captured carbon and hydrogen. The following sections will explore these
2 constraints with regard to RNG and hydrogen, the two alternative fuels proposed by the
3 gas companies in this docket.

4 **Q. Is there anything you would like to add about Certified Gas?**

5 A. Washington Gas Light Company (“WGL”) states that it is procuring some amount of
6 Certified Gas, which Witness Kevin Murphy claims is ostensibly sourced in a more
7 sustainable manner than fossil gas. I agree with UGI Utilities, Inc. (“UGI”) Witness Jessica
8 Rogers’ statement that Certified Gas is not an alternative fuel, as “[c]ertified gas is in all
9 material molecular and transportation respects identical to traditional geologic gas.”⁹ While
10 such a mechanism seeks to reduce upstream emissions, the industry is trending toward
11 implementing these practices more broadly anyway. Additionally, Certified Gas only
12 reduces upstream out-of-state emissions and has no impact on the end-use emissions that
13 are subject to Maryland’s GHG emissions reduction targets.

14 **III. THE STATE OF ALTERNATIVE FUELS IN MARYLAND**

15 **A. Alternative Fuel Activity in Maryland**

16 **Q. What is the current state of RNG activity in Maryland?**

17 A. Actual RNG production and consumption in Maryland is minimal. Despite the utilities’
18 broad advocacy for RNG as a decarbonization strategy, the state has only two operational
19 RNG facilities that inject into a gas utility distribution system.

20 **Q. Please describe the operational RNG facilities in Maryland.**

21 A. The BioEnergy DevCo (now BTS Bioenergy) facility at the Maryland Food Center in
22 Jessup, Howard County, became operational in 2022. It processes approximately 110,000

⁹ Direct Testimony of Jessica Rogers, UGI at 34 (Feb. 9, 2026) [hereinafter “Rogers Direct”].

1 tons of food waste per year through anaerobic digestion and produces pipeline-quality
2 RNG.¹⁰ Baltimore Gas & Electric Company (“BGE”) purchases the physical gas from this
3 facility at 90% of the City Gate Index for the month.¹¹ Critically, BGE does not pay for the
4 environmental attributes—it purchases only the commodity gas. This means the one RNG
5 injection point on BGE’s system provides no tangible environmental benefit to BGE’s
6 customers; the environmental value is sold to meet transportation alternative fuel
7 production standards. These transportation-attribute markets heavily subsidize RNG
8 production, but this discounted commodity-fuel arrangement may not be as beneficial as it
9 seems. These two issues will be discussed in detail later.

10 A planned BioEnergy DevCo facility at Principio Business Park in Cecil County, which
11 would have processed 70,000 to 100,000 tons per year of mixed food and agricultural
12 waste, is listed as canceled in the Argonne National Laboratory database.¹²

13 The Washington Suburban Sanitary Commission (“WSSC”) Water Piscataway Bioenergy
14 Project in Prince George’s County opened in October 2024 at a cost of approximately
15 \$271 million.¹³ This facility produces approximately 312,000 million British thermal
16 units (“MMBtu”) per year of RNG. However, the RNG is earmarked for Montgomery
17 County Ride On buses—that is, for transportation fuel, not building heat. The financial
18 model is instructive: the facility generates approximately \$700,000 per year in RNG
19 commodity revenue, compared to approximately \$3.2 million per year in Renewable Fuel

¹⁰ Argonne National Laboratory, Renewable Natural Gas Database (2023), www.anl.gov/esia/reference/renewable-natural-gas-database; *see also* Direct Testimony of Brian M.W. Scheerer, BGE at 30 (Feb. 9, 2026) [hereinafter “Scheerer Direct”].

¹¹ BGE Resp. to Sierra Club Data Request 1-34.

¹² Argonne National Laboratory, *supra* note 10.

¹³ WSSC Water, *Piscataway WRRF Bioenergy Project, Grand Opening* (Oct. 2024), www.wsscwater.com/bioenergy.

1 Credits.¹⁴ The facility is interconnected with the Washington Gas system.^{15,16} The
2 economics of this production facility depend almost entirely on transportation fuel credit
3 markets, not on the value of displacing fossil gas in buildings.

4 Additionally, Chesapeake Utilities of Maryland, Inc. (“Chesapeake”) acquired the Planet
5 Found Energy Development (“PFED”) facility in Somerset County in 2022 for \$9.4
6 million; this facility was researching new strategies for the anaerobic digestion of poultry
7 litter.¹⁷ While Chesapeake Utilities claims that the biogas produced from this process
8 “can” be used to generate RNG and hydrogen, it has not provided a concrete pathway for
9 commercial deployment or monetization of its purchase, acknowledging that “while the
10 PFED facility does not sit within the CUC’s regulated utilities, in future rate filings the
11 Company may request recovery of some costs that support the ability to produce
12 renewable energy from Maryland-based sources.”¹⁸

13 No Maryland landfill RNG projects are operational. The U.S. Environmental Protection
14 Agency (“EPA”) Landfill Methane Outreach Program (“LMOP”) and AgSTAR
15 databases list no RNG projects in the state.¹⁹ The Brown Station Landfill in Prince
16 George’s County issued a request for proposals (“RFP”) in 2024 for beneficial use of
17 landfill gas, but the project remains in the procurement stage.²⁰ From 1987 to 2021, this

¹⁴ *Id.*

¹⁵ WGL Resp. to Sierra Club Data Request 1-47.

¹⁶ WSSC Water, WSSC Water and Montgomery County Partner to Turn Poop to Power (June 21, 2023), www.wsscwater.com/news/2023/june/wssc-water-and-montgomery-county-partner-turn-poop-power.

¹⁷ Direct Testimony of Shane Breakie, Chesapeake at 7 (Feb. 9, 2026) [hereinafter “Breakie Direct”]; Chesapeake Utilities Corporation, Chesapeake Utilities Corporation Announces Acquisition of Planet Found (Nov. 7, 2022), www.chpk.com/chesapeake-utilities-corporation-announces-acquisition-of-planet-found/.

¹⁸ Breakie Direct at 8.

¹⁹ EPA, Landfill Methane Outreach Program Database (LMOP), www.epa.gov/lmop/lmop-landfill-and-project-database; EPA, AgSTAR Livestock Anaerobic Digester Database (accessed 2026).

²⁰ WGL Resp. to Sierra Club Data Request 1-47; *see also* Maryland Environmental Service, Landfill Gas Beneficial Use Brown Station Road Sanitary Landfill (RFP) (2024).

1 landfill produced heat and electricity, making it one of the earliest landfill gas energy
2 recovery projects in the country.²¹

3 Currently, for reference, the LMOP database lists seven landfills in Maryland that collect
4 landfill gas for direct combustion to generate electricity and heat rather than RNG
5 (Exhibit MJW-2), while the EPA AgSTAR database lists two animal waste anaerobic
6 digestion projects that produce electricity or heat rather than RNG.

7 **Q. What is the significance of this limited activity?**

8 A. The utilities claim that RNG for heat is “viable” and “scalable.”²² However, this review of
9 RNG activity in Maryland is instructive on the challenges that RNG faces. The entire state
10 has one small food waste RNG facility injecting into a utility system, one canceled project,
11 one major wastewater facility whose economics depend on transportation fuel credits rather
12 than building heat, and one landfill that is still in the RFP stage—and even if implemented
13 as an RNG project, this would represent a shift away from this landfill’s other energy uses.

14 **B. Gas Customers Currently Do Not Benefit from Local RNG Production**

15 **Q. BGE Witness Brian Scheerer testified that BGE purchases RNG at 90% of the City
16 Gate Index for the month. Does this arrangement benefit BGE’s ratepayers?**

17 A. No. The 90% figure is misleading without context on how it was established and how it
18 actually operates. The 90% price is not a negotiated market rate for gas supply. It is the
19 Buyer of Last Resort, or “BOLR,” price established in Section 4.2 of BGE’s Schedule RNG
20 tariff (Supplement No. 479 to P.S.C. Md. G-9), approved by the Commission under Mail

²¹ EPA LMOP, *supra* note 19.

²² Direct Testimony of Erich Evans, Columbia at 4 (Feb. 9, 2026) [hereinafter “Evans Direct”] (describing RNG as “a viable, scalable, and increasingly affordable alternative fuel”).

1 Log No. 235636 (TG-458) on August 18, 2021.²³ Under that provision, the RNG producer
2 must find its own end users for the gas. BGE steps in to purchase the gas at 90% of the
3 City Gate Index *only* as a backstop when the producer cannot place the gas with third-party
4 buyers before the start of the month.

5 **Q. Why is this distinction important?**

6 A. It is important for two reasons. First, Commission Staff noted in its review of TG-458 that
7 BGE performed no analysis to develop the 90% BOLR price, noting that it may overvalue
8 the RNG produced.²⁴ Staff stated in that docket that “[i]t is Staff’s understanding that no
9 analysis was performed to develop this number.”²⁵ Staff explicitly warned that “there is a
10 risk that ratepayers may pay more than necessary under this approach, as there are other
11 factors that impact BGE’s gas costs.”²⁶ Second, the BOLR provision was designed to be a
12 *last resort*—an occasional backstop, not the primary purchase mechanism. BGE describes
13 the 90% price as the standard terms of trade, stating that “BGE will purchase the physical
14 RNG at 90% of the City Gate Index for the month,” without any reference to the BOLR or
15 the expectation that the producer find third-party buyers.²⁷ This suggests the BOLR
16 provision has become the de facto purchase channel.

²³ Md. Pub. Serv. Comm’n, Comments of the Telecommunications, Gas and Water Division and the Engineering Division (TG-458) at 10, Mail Log No. 235636 (Aug. 18, 2021).

²⁴ The City Gate Index reflects the blended average cost of the utility’s full gas supply portfolio, including both lower-cost baseload contracts and higher-cost peaking resources such as spot market purchases and storage withdrawals. RNG from an anaerobic digester produces at a roughly constant rate year-round and cannot ramp to meet peak demand, making it functionally equivalent to baseload supply—typically the lowest-cost tranche in the portfolio. Benchmarking the BOLR price to 90% of the City Gate Index therefore implicitly credits RNG with system-average value, including a peaking premium that RNG does not provide. The 10% discount may not constitute an actual or sufficient savings relative to the baseload gas supply the RNG displaces.

²⁵ Mail Log No. 235636 at 10, *supra* note 23.

²⁶ *Id.*

²⁷ BGE Resp. to Sierra Club Data Request 1-34.

1 **Q. Did Commission Staff take any steps to monitor the risk to ratepayers?**

2 A. Yes. In Consolidated Recommendation (4) of TG-458, Staff required BGE to report, in its
3 future purchased gas cost proceedings in Case No. 9500, “the number of suppliers using
4 this provision by month, the terms injected by supplier by month, and the associated cost
5 per month . . . to track the cost to BGE’s ratepayers to determine if RNG customers are
6 using these provisions as last resort options or are engaging in price arbitrage, and
7 recommend adjustments if necessary.”²⁸ The Commission should examine whether BGE
8 has complied with this reporting requirement and whether the data indicate that the BOLR
9 provision is being used as intended.

10 **Q. How does the consideration of environmental attributes affect this analysis?**

11 A. It highlights that BGE customers may be subsidizing RNG producers, while not receiving
12 the ostensible environmental benefit of that product. As BGE acknowledged in its response
13 to SCDR01-34, “BGE does not purchase any renewable attributes of RNG, and these
14 purchases are for the physical gas only.”²⁹ This means BGE ratepayers pay for the physical
15 gas molecule—at a price set by a BOLR mechanism with no supporting analysis—while
16 the RNG producer retains all of the renewable environmental attributes, including
17 Renewable Identification Numbers (“RINs”) under the federal Renewable Fuel Standard,
18 which have historically been worth far more than the physical gas commodity itself. Under
19 this arrangement, BGE’s ratepayers are effectively subsidizing a producer whose primary
20 revenue stream comes from federal and state fuel credits in the transportation sector. The
21 producer has a guaranteed floor price for the physical gas—the BOLR—regardless of

²⁸ *Id.* at 27 (Consolidated Recommendation (4)).

²⁹ BGE Resp. to Sierra Club Data Request 1-34.

1 whether the molecule provides any environmental benefit to BGE’s customers, who simply
2 receive ordinary methane with no renewable attributes.

3 **IV. RNG IS NOT A REALISTIC OR AFFORDABLE DECARBONIZATION**
4 **STRATEGY**

5 **A. Overview**

6 **Q. Is utilizing RNG a realistic and affordable decarbonization strategy for Maryland’s**
7 **gas system?**

8 A. No. My analysis of the record leads me to conclude that RNG fails both criteria established
9 by the Commission’s Phase II, Issue 7 directive. There are four reasons for this conclusion.

10 First, the utilities’ central premise—that RNG is “carbon-negative”—rests on an
11 erroneous and unrealistic application of life-cycle analysis, borrowed from California
12 transportation fuel policy. I address this first because the utilities’ cost comparisons also
13 rely on this same flawed emissions crediting; evaluating their affordability claims
14 requires first examining the emissions assumptions those claims depend on.

15 Second, even when set against fossil gas on a like-for-like basis, the cost of RNG is
16 prohibitive. In discovery, the gas companies admit that delivered RNG costs four to
17 seventeen times higher than fossil gas. Section IV.C focuses on the economics of RNG
18 procurement. Section VI then discusses the implications for ratepayers.

19 Third, RNG is not available at the scale the utilities imply it is. No Maryland gas utility
20 has conducted a rigorous RNG supply analysis, and the industry studies that the utilities
21 rely on involve feedstocks and assumptions that do not withstand scrutiny.

22 Fourth, the national growth in RNG production is driven by federal and state
23 transportation fuel credit programs, not by building heat economics. The RNG market

1 exists to monetize those credits; its growth pattern does not support the claim that RNG is
2 poised to become a viable building heating pathway.

3 Taken together, these four considerations show that RNG cannot realistically or
4 affordably help Maryland achieve its climate goals.

5 **B. “Carbon-Negative” Claims Are Incorrect and Misleading**

6 **Q. Do the utilities claim that RNG is “carbon-negative”?**

7 A. Yes. BGE Witness Scheerer claims that “fuels from some RNG feedstocks can achieve
8 negative carbon footprints.”³⁰ Columbia Gas of Maryland, Inc. (“Columbia”) Witness
9 Erich Evans states that “RNG and clean hydrogen are both fuels that have low to negative
10 carbon emissions.”³¹

11 **Q. Is the characterization of RNG as “carbon-negative” accurate?**

12 A. No. The characterization of RNG as “carbon-negative” is incorrect and misleading,
13 reflecting an erroneous understanding of life-cycle analysis. It rests on the assumption that
14 the use of RNG entails managing a methane-producing feedstock, manure, which is *a priori*
15 assumed to have otherwise been producing methane. The assumption is specific to the
16 feedstock under consideration. For example, landfill gas does not earn such a credit because
17 regulations require its destruction. Methane emissions from agricultural manure wastes are
18 not as explicitly regulated. In this case, regulatory schemes have provided incentives for
19 pathways that avoid methane emissions. This *avoidance* is not a removal of a GHG from
20 the atmosphere, which is what the term “carbon-negative” intends to refer to. Life-cycle
21 analysis tracks this avoidance, while a given policy can turn that avoidance into distinct

³⁰ Scheerer Direct at 29.

³¹ Evans Direct at 3.

1 credit for that policy objective. The above attributional framework, which compares
2 landfill gas and agricultural wastes, shows how policy differently interprets the identical
3 measurements made in life-cycle analysis. The appropriateness of this attributional
4 framework has been the subject of much debate in policies that use it, given that RNG is
5 one of many manure management practices and that methane-producing practices are not
6 necessarily the default, as such policies assume.

7 **Q. Why is the gas companies' claim prevalent in the industry?**

8 A. The claim has its formal origins in the California Low Carbon Fuel Standard (“LCFS”), a
9 transportation sector policy that creates a market for low-carbon transportation pathways
10 to earn credits based on how much they reduce carbon emissions. The amount of credit a
11 pathway receives is determined by assessing its life-cycle carbon intensity—an aggregation
12 of changes in emissions that can be attributed to the selection of a pathway over another.
13 For example, while an electric vehicle (“EV”) eliminates tailpipe emissions, it does induce
14 a much smaller amount of emissions on the grid due to its need for additional electricity.
15 An EV pathway is scored by the difference between the conventional use of fossil fuels
16 and the life-cycle emissions associated with EV use. Often, policy and practitioners need
17 to make simplifying assumptions based on data availability for determining a carbon-
18 intensity score, such as: *Should the grid emissions reflect the annual grid average, or some*
19 *estimate of when vehicle charging occurs, possibly at a time when the grid's carbon*
20 *intensity differs from the annual average?*

21 In updates made in 2018, the LCFS allowed crediting for avoided methane emissions from
22 anaerobic digesters producing biogas from manure, effectively using transportation sector

1 policy to influence agricultural sector emissions.³² The credit was intended to be a blanket
2 mechanism to incentivize dairy farmers to adopt anaerobic digestion. It also required
3 making some simplifications and—given severe limitations in information about dairy
4 farmers’ actual practices—specious assumptions.

5 In determining this credit, the California Air Resources Board (“CARB”) prescribed the
6 use of certain assumptions embedded in the U.S. Department of Energy’s Greenhouse
7 Gases, Regulated Emissions, and Energy Use in Technologies (“GREET”) model,
8 produced by Argonne National Laboratory. These assumptions assigned a substantial
9 avoided-emissions value based on the best available measurements at the time for the
10 difference between anaerobic digestion to produce RNG and what was assumed to be the
11 default practice of “lagooning”—a common, but not universal, manure management
12 practice that is methane-intensive. The outputs of the GREET calculation were used to set
13 the carbon-intensity scores of RNG and biogas-electricity pathways,³³ the avoided methane
14 portion of which, using CARB’s methodology, is four- to five-fold the typical carbon
15 intensity of fossil methane, leading to a substantial negative carbon-intensity score based
16 on that assumption. Pointing only to the scores for CARB’s RNG pathways, the gas
17 industry has used the LCFS RNG carbon-intensity scores to claim that RNG is carbon-
18 negative.

³² Ca. Air Res. Bd., Low Carbon Fuel Standard Regulation, Cal. Code Regs. Tit. 17, §§ 95480–95503 (2018 re-adoption, effective Jan. 1, 2019).

³³ Both pathways are transportation pathways with the RNG attributes being directed to compressed natural gas (CNG) vehicles, and the biogas-electricity pathway powering EVs.

1 **Q. Does this credit apply to all sources of RNG?**

2 A. No. This approach applies only to RNG sources involving manure management. It would
3 not apply to landfill gas, wastewater, or RNG derived from the gasification of solid biomass
4 and municipal solid waste, which are the dominant sources of RNG in supply studies
5 produced by WGL³⁴ and the American Gas Foundation (“AGF”).³⁵

6 **Q. Has CARB made updates to the policy?**

7 A. Yes. Since the adoption of this method, CARB has faced significant criticism due to the
8 large-but-dubious scale of avoided methane credits and how it subsequently distorts the
9 aims of the LCFS and climate policy and its credit markets.^{36,37} For example, at 2020 LCFS
10 prices, the avoided methane subsidy was worth up to \$80/MMBtu, more than 20 times the
11 supply price of fossil gas, representing an unparalleled subsidy scale for any technology.³⁸
12 In November 2024, CARB announced it would phase out avoided methane crediting under
13 the LCFS.³⁹

³⁴ Case No. 9449, *In the Matter of the Merger of AltaGas Ltd., And WGL Holdings, Inc.*, ICF Resources, L.L.C., WGL Study on the Use of Biofuels (Renewable Natural Gas) in the Greater Washington, D.C. Metropolitan Area (Mar. 2020) [hereinafter “WGL RNG Study”].

³⁵ ICF, Renewable Natural Gas Supply Assessment (July 2025), gasfoundation.org/wp-content/uploads/2025/07/AGF-RNG-Study_FINAL-09022025.pdf [hereinafter “AGF RNG Study”].

³⁶ Danny Cullenward, *California’s Low Carbon Fuel Standard*, Kleinman Center for Energy Policy (Oct. 2024), kleinmanenergy.upenn.edu/wp-content/uploads/2024/10/KC-Paper-16-Californias-Low-Carbon-Fuel-Standard.pdf.

³⁷ Jim Duffy, Comments to the California Air Resources Board (Feb. 2024), midwestadvocates.org/wp-content/uploads/Jim-Duffy-CARB-Letter-Feb-2024.pdf.

³⁸ This was calculated as: 2020 LCFS credit price of approximately \$200 per metric ton CO₂e, multiplied by the avoided-emissions delta between certified dairy biomethane pathways (which has a carbon intensity of approximately ~300 gCO₂e/MJ) and the LCFS petroleum-fuel comparator (~95 gCO₂e/MJ), or approximately 395 gCO₂e/MJ. Converted to a fuel-energy basis (1 MMBtu = 1,055 MJ), this yields approximately 0.42 tCO₂e/MMBtu, which at \$200/tCO₂e equals approximately \$83/MMBtu. See Ca. Air Res. Bd., *LCFS Data Dashboard*, ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard (last visited May 1, 2026) (showing 2020 monthly weighted-average credit prices and certified pathway carbon-intensity scores).

³⁹ *Id.*

1 **Q. Has the GREET model been updated to more accurately reflect the avoided emissions**
2 **credit?**

3 A. In November 2025, the U.S. Department of Energy recognized how avoided emissions
4 calculations have been misconstrued and, as a result, updated GREET to reflect more
5 realistic patterns of manure management and gave users of GREET the ability to consider
6 alternative counterfactuals.⁴⁰ The effective result is a significant reduction in the estimated
7 avoided methane emissions that could be attributed to a given fuel.

8 GREET has value as a decision-support tool; however, its application requires expert
9 judgment, awareness of counterfactual assumptions, and an understanding of life-cycle
10 impact allocation methods. The Companies, in their advocacy for RNG, do not demonstrate
11 the level of understanding necessary to critically evaluate the emissions impacts associated
12 with RNG.

13 **Q. Are the purported avoided emissions benefits exclusive to RNG?**

14 A. No. Avoiding methane emissions can be achieved through various energy and non-energy
15 pathways. Several manure management practices (e.g., composting, spreading, and solid
16 storage) have much lower methane emissions than the methane-intensive lagooning that
17 serves as the basis for the calculation of the CARB credit. Further, manure, like other
18 organic wastes considered for RNG, can be used to produce a variety of higher-value
19 energy outputs, including liquid fuels and electricity. Biogas electricity generation can be

⁴⁰ Michael Wang, et al., *Summary of Expansions and Updates in R&D GREET*, U.S. Department of Energy (Nov. 2025), doi.org/10.2172/3010156; Branden E. Leonhardt, et al., *Updates to Anaerobic Digestion Pathways for Animal Manure in R&D GREET 2025*, Argonne National Laboratory (2025), www.anl.gov/argonne-scientific-publications/pub/201499; A Generic Counterfactual Greenhouse Gas Emission Factor for Life-Cycle Assessment of Manure-Derived Biogas and Renewable Natural Gas, U.S. Department of Energy (Jan. 2025), www.energy.gov/sites/default/files/2025-01/generic-counterfactual-greenhouse-gas-emission-factor-for-life-cycle-assessment-of-manure-derived-biogas-and-renewable-natural-gas_010225.pdf.

1 designed to be load-following and provide a generation source on rural grids, achieving
2 both time and locational value for the electricity system.

3 **Q. How should regulators consider renewable fuels given these challenges?**

4 A. Generally, regulators should look for opportunities for co-benefits in emissions reductions
5 across sectors, but be cautious of potential unintended consequences, such as those
6 experienced by CARB. If the Commission were to authorize ratepayer-funded RNG
7 procurement, it would need to establish a robust regulatory framework for verifying the
8 environmental claims associated with each RNG supply contract. Such verification
9 requires life-cycle analysis (“LCA”)—a technically complex, assumption-dependent
10 methodology that demands specialized expertise to conduct and to audit. As demonstrated
11 by the LCFS experience, even well-resourced state agencies with dedicated LCA staff have
12 struggled with implementation. The GREET model itself offers users a number of
13 adjustable parameters, each of which materially affects whether a given RNG pathway
14 appears carbon-negative, carbon-neutral, or merely lower-carbon than fossil gas. Small
15 changes in these assumptions can greatly swing a pathway’s assessed carbon intensity, yet
16 may not affect reality.

17 The Commission does not have LCA expertise on staff, nor is there any indication that the
18 utilities possess it. Even if they did, the uncritical claims offered by the utilities in this
19 proceeding demonstrate that they would very likely use LCA in a manner that aligns with
20 their interest. Evaluating these claims on a contract-by-contract basis would divert
21 Commission Staff resources away from core utility oversight. This is a reason why the
22 determination of whether RNG qualifies as a climate compliance mechanism should rest

1 with MDE, which has the statutory mandate and technical capacity to evaluate life-cycle
2 emissions claims in the context of the state’s broader climate strategy.

3 **C. RNG Costs Are Prohibitive**

4 **Q. What do the utilities claim about the costs of RNG?**

5 A. Columbia Witness Evans references the American Gas Association (“AGA”)’s “Building
6 for Efficiency” study to claim that “if the natural gas system converts to a 100% RNG
7 blend, GHG emissions reductions can be achieved at a cost of \$196 per metric ton of carbon
8 dioxide equivalent ... while an all-electric home would reduce GHG emissions at a cost of
9 \$735 per metric ton.”⁴¹

10 **Q. Is this cost comparison accurate?**

11 A. No. The AGA study contains two notable errors, one apparently unintentional, while the
12 other relates to the avoided emissions assumption.

13 First, the AGA study underestimates the cost of RNG because the study compares the
14 residential cost of gas (*supply plus distribution*) in relation to the supply cost of RNG to
15 calculate the RNG premium (*supply only*). The report should have been consistent in using
16 either (1) only the supply cost or (2) the supply plus distribution cost for both forms of gas.
17 Because the distribution cost should be identical for both forms of gas, either calculation
18 should result in the same premium.

19 Second, and more consequential, the AGA study selectively applies avoided-methane
20 crediting to the RNG pathway while omitting it from the electric-pathway comparison. If
21 the gas industry is going to rest its strategy on LCA accounting for methane mitigation, it

⁴¹ Evans Direct at 6.

1 needs to apply it consistently across the LCA. The avoided methane credit is not inherent
2 to RNG—it is a function of an assumed counterfactual *feedstock management practice*
3 (i.e., diverting manure from open lagoons to anaerobic digestion), not the *end use* of the
4 biogas produced. Biogas from the same manure digester can be used to generate electricity
5 rather than upgraded to pipeline-quality RNG. Under any consistent application of the
6 avoided methane credit, the biogas-to-electricity-to-heat-pump pathway would receive the
7 same upstream credit as RNG, while delivering heat at substantially greater end-use
8 efficiency. The AGA study ignores this entirely, comparing a credited RNG pathway
9 against an uncredited electric pathway—an apples-to-oranges comparison that inflates
10 RNG’s apparent advantage by several hundred dollars per ton of CO₂e.

11 **Q. What does the record show about actual RNG costs?**

12 A. UGI Witness Rogers provides the most transparent cost data in this proceeding. Rogers
13 testifies:

14 RNG supply produced from a landfill is currently priced anywhere from
15 \$9.00/Dth [dekatherms] to \$51/Dth, with many facilities averaging around
16 \$20/Dth. Whereas RNG produced from animal manure can range up to
17 \$170/Dth ... In 2025, traditional natural gas prices ranged from \$2.91/Dth
18 to \$3.79/Dth. Even with a very conservative assumption of \$4/Dth for
19 traditional gas and \$20/Dth for RNG supply, the cost of RNG is still 400%
20 higher.”⁴²

⁴² Rogers Direct at 38–39.

1 Rogers further quantifies the customer impact: “the average residential UGI customer in
2 Maryland would see their monthly utility bill increase by roughly \$144, or more than
3 130%, if the utility was required to procure only RNG supply.”⁴³

4 **Q. What would full RNG substitution cost Maryland ratepayers?**

5 A. Maryland’s annual statewide utility (residential, commercial, and industrial) gas
6 consumption in 2024 was approximately 160 trillion British thermal units (Tbtu).⁴⁴ At an
7 approximate RNG premium of \$25 per Dth over fossil gas—which is a reasonably
8 optimistic value for RNG at scale, based on Witness Rogers’ estimates above—full RNG
9 substitution would cost Maryland ratepayers approximately \$4 billion annually. For a
10 typical house that requires 80 Dth of gas per year, an exclusively RNG-based gas system
11 would result in an additional \$30,000 cost for the consumer over a 15-year period.

12 The contrast between this RNG premium versus building improvements is notable, as the
13 latter measures result in tangible benefits for ratepayers. For example, energy efficiency
14 improves thermal comfort, and heat pumps can provide cooling and dehumidification in
15 addition to heating. RNG provides the customer with nothing beyond a larger bill. While
16 sources of RNG do exist in Maryland, complete substitution at scale would require out-of-
17 state production, a significant constraint discussed in the next section. Heating
18 electrification and building-efficiency investments, by contrast, go into local buildings and
19 use local labor to produce local heat energy. In contrast, RNG throws money out of state,
20 without tangibly improving ratepayers’ quality of life.

⁴³ *Id.* at 39.

⁴⁴ U.S. EIA, Natural Gas Consumption by End Use (2024), www.eia.gov/dnav/ng/ng_cons_sum_dcu_SMD_a.htm.

1 **D. The Utilities Have Not Demonstrated That RNG Is Available at a Meaningful Scale**

2 **Q. Have the Maryland gas utilities conducted supply analyses to support their RNG**
3 **claims?**

4 A. No. Discovery responses and direct testimony reveal that none of the five utilities has
5 conducted a serious RNG supply analysis for Maryland.

6 **BGE** “has not conducted a detailed analysis to determine the portion of its overall supply
7 needs that could potentially be met with RNG.”⁴⁵ BGE Witness Scheerer “has not
8 evaluated potential RNG quantities, projects, or procurement. BGE has not made any
9 outreach, and no assurances were given from any facility.”⁴⁶

10 **Chesapeake** has been “in early-stage conversations with various entities working with the
11 State of Maryland to address issues such as the State’s landfill needs but no commitments
12 have been made at this time.”⁴⁷ Chesapeake cannot quantify available RNG volumes,
13 stating: “We are not aware of the associated volumes being quantified by the State at this
14 time.”⁴⁸

15 **WGL** testimony only references a study it commissioned back in 2020,⁴⁹ which “estimated
16 RNG potential under various scenarios, with locally available RNG estimated to be capable
17 of displacing up to 33% of natural gas consumption.”⁵⁰

18 **UGI** “has not examined potential RNG supplies exclusively to serve its Maryland
19 customers.”⁵¹

⁴⁵ BGE Resp. to Sierra Club Data Request 1-35.

⁴⁶ BGE Resp. to Sierra Club Data Request 1-36.

⁴⁷ Chesapeake Resp. to Sierra Club Data Request 1-21.

⁴⁸ Chesapeake Resp. to Sierra Club Data Request 1-20.

⁴⁹ WGL RNG Study.

⁵⁰ WGL Resp. to Sierra Club Data Request 1-46.

⁵¹ UGI Resp. to Sierra Club Data Request 1-13.

1 **Columbia** Witness Evans cites the AGF study,⁵² claiming “that the technical resource
2 RNG production potential in Maryland will be 77.2 TBtu/year in 2050, which is more than
3 12 times Columbia’s current annual throughput of 6.3 TBtu.”⁵³ However, Columbia’s
4 claim is further undermined by its own discovery responses. When asked directly whether
5 it has analyzed potential RNG suppliers, Columbia acknowledged that it has not.⁵⁴
6 Columbia objected to disclosing whether it has had conversations with potential suppliers
7 or received any commitments, characterizing such questions as “outside the scope of this
8 matter” and “commercially sensitive.”⁵⁵

9 **Q. Do the WGL and AGF Supply Studies Stand up to Scrutiny?**

10 A. No. Both studies are produced with a similar methodology and datasets by ICF, a
11 consultancy. Examination of these studies highlights several points that warrant skepticism
12 toward these numbers. First, the claim that local—i.e., Greater Washington, D.C.
13 metropolitan area—RNG could displace 33% of WGL’s throughput (55.5 of 165 TBtu per
14 year)⁵⁶ would require over half of that RNG to be sourced from the thermal gasification of
15 “non-biogenic” municipal solid waste,⁵⁷ severely limiting GHG emissions reductions
16 compared to fossil gas—and perhaps generating even more life-cycle emissions than fossil
17 gas because non-biogenic solid waste is a particularly polluting resource.

18 Columbia’s reference to 77.2 TBtu per year of RNG technical potential in Maryland casts
19 a broader geographic and feasibility net, including not only municipal solid waste but also

⁵² AGF RNG Study.

⁵³ Evans Direct at 5.

⁵⁴ Columbia Gas Resp. to Sierra Club Data Request 1-30.

⁵⁵ *Id.*

⁵⁶ WGL RNG Study at 20–21.

⁵⁷ Much of the energetic content of municipal solid waste comes from plastics. The inefficient combustion of these leads to potentially higher emissions intensities.

1 energy crops, which together are responsible for over half of the available technical
2 potential supply.⁵⁸ However, the use of energy crops raises complex trade-offs in
3 agriculture.

4 Ultimately, both studies ignore competing uses: the AGF study cautions that it “does not
5 estimate resource availability—in a competitive market, resource availability is a function
6 of factors, including but not limited to demand, feedstock costs, technological
7 development, and the policies in place;”⁵⁹ while the WGL study notes: “Competition for
8 feedstocks will constrain RNG production potential.”⁶⁰ Such competition could include
9 using these feedstocks for electricity generation, or for higher-value liquid fuels.

10 **Q. How important is such competition when considering the supply of RNG?**

11 A. It is crucial, but is neglected by the utilities in this docket. Pipeline-quality methane
12 production from biomass is considered an inferior use of biomass because it is a costly
13 process that yields a substitute for a cheap commodity. While the production of liquid fuels
14 or electricity from the same feedstocks is also done through costly processes, such
15 pathways are more competitive than RNG because they produce higher-value commodity
16 products. Given that sustainable bioenergy resources for alternative fuels are
17 fundamentally limited, policy should avoid favoring suboptimal pathways such as RNG,
18 so as not to constrain availability of these fuels in sectors where they will have a greater
19 impact.

⁵⁸ AGF RNG Study at 97.

⁵⁹ *Id.* at 11.

⁶⁰ WGL RNG Study at 117.

1 **Q. Does the record include any candid assessment of RNG’s scale limitations?**

2 A. Yes. UGI Witness Rogers provides the most forthcoming assessment: “The biggest
3 limiting factors of widespread RNG use are the size and availability of applicable facilities,
4 the cost to interconnect those facilities to distribution systems, and the cost of the
5 commodity when it is paired with the environmental attributes.”⁶¹ Rogers notes that “[e]ven
6 at maximum production, the RNG produced” from Keystone Landfill, which Rogers
7 describes as the largest operational RNG facility in the world, “would cover less than 1%
8 of UGI’s peak day supply requirements.”⁶²

9 Various supply curves in the WGL Supply Study further demonstrate that costs increase
10 with scale. The “low-hanging fruit” feedstocks are consumed first; growth requires
11 tapping progressively more expensive resources.

12 **E. RNG Growth Nationally Is Driven by Federal and State Fuel Credits, Not Building**
13 **Heat Economics**

14 **Q. Is the growth of RNG production nationally driven by building decarbonization?**

15 A. No. As shown in Exhibit MJW-3, a timeline of U.S. biogas and RNG projects compiled
16 from EPA AgSTAR and LMOP databases through 2024, biogas and landfill gas facilities
17 have historically produced electricity or heat for decades. RNG production—shown in red
18 on the figure—appears almost exclusively after approximately 2015, coinciding with (1) a
19 favorable federal ruling that allowed RNG from landfill gas, wastewater biogas,
20 agricultural digestion biogas, and other organic waste biogas to be eligible for the Federal
21 Renewable Fuel Standard (“RFS”) credits known as D3 Renewable Identification Numbers

⁶¹ Rogers Direct at 38.

⁶² *Id.*

1 (“D3 RINs”)⁶³; and (2) the California LCFS’s adoption of an “avoided methane credit.”⁶⁴
2 A market shift from electric uses of landfill gas and biogas was subsequently driven by a
3 combination of (1) these credits being “stackable” with each other, meaning that a producer
4 could gain revenue from both programs; (2) the landfill gas and biogas to electricity
5 pathways being ineligible for the D3 RIN; and (3) the LCFS allowing RNG to be produced
6 on any location that is connected to the North American pipeline gas system, while LCFS
7 electricity pathways needed a direct interconnection to the California grid. As
8 demonstrated by the WSSC project, the value of such credits is many times the value of
9 the gas produced. The growth of RNG is a story about highly distortive transportation fuel
10 credit markets, not about building decarbonization.⁶⁵

11 **V. HYDROGEN IS NOT A VIABLE PATHWAY FOR BUILDING** 12 **DECARBONIZATION**

13 **Q. Have the Maryland gas utilities demonstrated the viability of hydrogen blending?**

14 A. No. Discovery responses reveal that no utility has conducted the basic analysis necessary
15 to support hydrogen blending in its system.

16 **BGE’s hydrogen pilot is not operational and uses grey hydrogen.** BGE states in
17 discovery, “[t]he infrastructure for the pilot has not been fully commissioned at this
18 time.”⁶⁶ It adds that the pilot “is restricted to behind-the-meter at a Company facility and
19 does not include injecting hydrogen onto the gas system.”⁶⁷ Moreover, BGE is procuring

⁶³ Regulation of Fuels and Fuel Additives: RFS Pathways II, and Technical Amendments to the RFS Standards and E15 Misfueling Mitigation Requirements, 79 Fed. Reg. 42128 (July 18, 2014).

⁶⁴ Ca. Air Res. Bd., Low Carbon Fuel Standard Regulation, *supra* note 32.

⁶⁵ U.S. Biogas & RNG Project Timelines, EPA AgSTAR and LMOP Databases (through 2024) (attached as Ex. MJW-3).

⁶⁶ BGE Resp. to Sierra Club Data Request 1-40.

⁶⁷ *Id.*

1 “grey” hydrogen, which is generated via steam methane reforming.⁶⁸ While it has no
2 tailpipe emissions, grey hydrogen has a higher carbon intensity than fossil gas due to
3 emissions from its production.⁶⁹ Further, BGE “has not had any conversations with
4 entities that might supply hydrogen to its system beyond the scope of its pilot program”
5 and has received no assurances from any supplier.⁷⁰ BGE “has not fully contemplated the
6 level of hydrogen the Company may use as a blend,” the required system upgrades,
7 energy density impacts, or appliance compatibility.⁷¹ Furthermore, BGE admits that even
8 a 20% hydrogen blend would require replacing all cast iron distribution piping in BGE’s
9 system—a massive capital requirement that BGE has not quantified.⁷²

10 **WGL** “has not studied the current cost of green hydrogen”⁷³ and “has not determined
11 specific potential blending ratios of hydrogen.”⁷⁴ WGL received only preliminary
12 inquiries from one company and has not received assurances from any hydrogen
13 suppliers.⁷⁵

14 **Chesapeake** “has not determined what blending ratio it will consider” and “has not done
15 an analysis” of blending costs.⁷⁶ Chesapeake points to the Mid-Atlantic Clean Hydrogen
16 Hub (“MACH₂”) as its sole hydrogen initiative, but it is “a multiyear initiative that is in
17 its early stages” with “no assurances or commitments.”⁷⁷

⁶⁸ *Id.*

⁶⁹ U.S. Dep’t of Energy, U.S. National Clean Hydrogen Strategy and Roadmap at 37–38 (June 5, 2023), www.hydrogen.energy.gov/library/roadmaps-vision/clean-hydrogen-strategy-roadmap.

⁷⁰ BGE Resp. to Sierra Club Data Requests 1-43 and 1-44.

⁷¹ BGE Resp. to Sierra Club Data Requests 1-46, 01-47, and 1-48.

⁷² BGE Resp. to Sierra Club Data Request 1-46.

⁷³ WGL Resp. to Sierra Club Data Request 1-57.

⁷⁴ WGL Resp. to Sierra Club Data Request 1-50.

⁷⁵ WGL Resp. to Sierra Club Data Requests 1-50 and 1-52.

⁷⁶ Chesapeake Resp. to Sierra Club Data Request 1-24.

⁷⁷ Chesapeake Resp. to Sierra Club Data Request 1-26.

1 **Columbia** has had exploratory conversations with hydrogen producers, but has allegedly
2 not sought any commitments because it “does not have regulatory authority to purchase
3 hydrogen for system supply.”⁷⁸ Columbia has received “various prices” for hydrogen
4 ranging from \$0.25 per kilogram to \$15 per kilogram, but acknowledges that “[n]one
5 were actual quotes.”⁷⁹ When asked whether hydrogen is commercially available at the
6 volumes needed for a blended system, Columbia stated that is “[u]nknown at this time,”
7 elaborating that “the Company has made no effort to look at availability of supply for
8 clean hydrogen.”⁸⁰ Columbia claims that no modifications to its distribution system
9 would be required for hydrogen blending,⁸¹ a position that is difficult to reconcile with
10 BGE’s acknowledgment that a 20% blend would require replacing all cast iron piping
11 and with UGI Witness Rogers’ testimony that appliance modifications would be
12 necessary at hydrogen concentrations above 5%.⁸² Columbia has conducted no emissions
13 analysis at different hydrogen blending levels⁸³ and has not evaluated the health or indoor
14 air quality impacts of hydrogen combustion.⁸⁴

15 **UGI** Witness Rogers notably recommends against Commission encouragement of
16 hydrogen blending at this time, stating that continued evaluation is sufficient.⁸⁵

17 **Q. What does the scientific literature say about using hydrogen for building heating?**

18 **A.** A 2024 meta-review of 54 independent studies on hydrogen heating for buildings found
19 scientific consensus on multiple important points. All 54 studies found that hydrogen had

⁷⁸ Columbia Resp. to Sierra Club Data Request 1-35.

⁷⁹ Columbia Resp. to Sierra Club Data Request 1-33.

⁸⁰ Columbia Resp. to Sierra Club Data Request 1-34.

⁸¹ Columbia Resp. to Sierra Club Data Request 1-37.

⁸² Rogers Direct at 44.

⁸³ Columbia Resp. to Sierra Club Data Request 1-44.

⁸⁴ Columbia Resp. to Sierra Club Data Request 1-42.

⁸⁵ Rogers Direct at 45.

1 no significant role for building space or water heating. All 54 studies found hydrogen to be
2 more costly than electric heat pumps or district heating.⁸⁶

3 **Q. What is the U.S. Department of Energy’s position?**

4 A. The U.S. Department of Energy’s 2023 National Clean Hydrogen Strategy and Roadmap
5 prioritizes strategic, high-impact applications of clean hydrogen—such as in industrial
6 processes, heavy-duty transportation, and energy storage—but notes that for blending with
7 existing natural gas networks, “costs must decline considerably to be economically
8 viable.”⁸⁷ Building heat is classified as low priority for hydrogen usage.⁸⁸

9 **Q. Have any detailed economic studies evaluated hydrogen’s financial viability?**

10 A. A Pacific Northwest National Laboratory techno-economic study of hydrogen and
11 synthetic RNG power-to-gas systems for a municipal gas and electric utility analyzed 82
12 design cases. Only six showed a positive return on investment, and those required
13 unrealistic assumptions: zero-cost input energy or high hydrogen market prices that, while
14 sufficient to make the process economic, would likely be unaffordable for customers in
15 heating markets. All hydrogen-blending scenarios failed the financial viability test.⁸⁹

16 **Q. Are there safety concerns with hydrogen blending?**

17 A. Yes. UGI Witness Rogers acknowledges that “[c]ompared to traditional natural gas,
18 hydrogen has a greater flammability range and lower autoignition temperature ...
19 Hydrogen molecules are also smaller in size than methane molecules, and therefore more

⁸⁶ Jan Rosenow, *A Meta-Review of 54 Studies on Hydrogen Heating*, Cell Reports Sustainability, Vol. 1, Issue 1 (Jan. 26, 2024), <https://www.sciencedirect.com/science/article/pii/S2949790623000101>.

⁸⁷ U.S. Dep’t of Energy, U.S. National Clean Hydrogen Strategy and Roadmap at 75, *supra* note 69.

⁸⁸ *Id.* at 8 (“High priority sectors are those with few decarbonization alternatives (e.g., decarbonization through direct electrification or the use of biofuels)”).

⁸⁹ Pacific Northwest National Laboratory, Power-to-Gas System Valuation: Final Report, PNNL-ACT-10095 (June 22, 2020), [osti.gov/servlets/purl/1657345](https://www.osti.gov/servlets/purl/1657345).

1 likely to leak ... hydrogen embrittlement can seriously degrade the pipe.”⁹⁰ Such safety
2 issues raise several challenges, particularly with older distribution systems. While
3 conceptually possible, incorporating hydrogen into gas distribution systems at a
4 meaningful scale would require substantial investment—including behind-the-meter—to
5 address safety concerns. This investment, plus the added costs of hydrogen production,
6 would be passed on to ratepayers and could significantly increase their gas bills.

7 VI. RATEPAYER IMPACT AND COST RECOVERY

8 Q. What would RNG procurement cost Maryland ratepayers?

9 A. RNG substitution of Maryland’s approximately 160 TBtu of annual gas consumption, at
10 the approximate \$25/Dth RNG premium discussed in Section IV.C above, would cost
11 ratepayers approximately \$4 billion per year.

12 Q. How would these costs interact with other gas system pressures?

13 A. Incorporation of RNG and hydrogen into the gas supply would quickly raise customer rates
14 and encourage defections from the gas system. Rising infrastructure costs from programs
15 such as Strategic Infrastructure Development and Enhancement (“STRIDE”) and ongoing
16 pipe replacement, combined with declining throughput from efficiency gains and
17 electrification, already create upward rate pressure. Adding RNG premiums would
18 compound this affordability crisis and accelerate customer defections—the very outcome
19 the utilities’ “preserve the gas system” strategy is meant to prevent.

⁹⁰ Rogers Direct at 43–44.

1 **Q. What cost recovery mechanisms do the utilities propose?**

2 A. All five utilities seek Commission authorization for ratepayer-funded RNG and hydrogen
3 programs. Columbia Witness Evans proposes that the Commission:

4 Establish low-carbon fuel standards for gas utilities, similar to renewable
5 portfolio standards in the electric sector, to incentivize RNG adoption and
6 hydrogen blending. This standard would allow utilities to own, and put
7 into rate base, RNG, hydrogen, and other sustainable fuels and provide
8 these fuels at a lower cost to customers.⁹¹

9 Chesapeake asks the Commission to “[a]uthorize cost recovery for RNG and hydrogen
10 blending projects and for certified low-carbon gas procurement.”⁹² WGL Witness Melissa
11 Bartos urges that “policymakers should adopt regulations that allow gas utilities to recover
12 reasonable costs associated with implementing GHG emissions reduction actions.”⁹³

13 **Q. Why should the Commission reject these proposals?**

14 A. The utilities are seeking Commission approval of a pathway that favors the utilities over
15 other entities and other uses for alternative fuels. As large companies with diffuse ratepayer
16 funding, the utilities would have significant advantages in procuring limited RNG supplies,
17 potentially crowding out superior applications such as electricity or sustainable aviation
18 fuel. The New York State Energy Plan’s foundational white paper on *Considerations for*
19 *Low-Carbon Alternative Fuel Use* confirms this concern, finding that “injecting RNG into
20 the gas distribution system does not directly advance the State’s long-term goals, whereas

⁹¹ Evans Direct at 9.

⁹² Breakie Direct at 10.

⁹³ Direct Testimony of Melissa F. Bartos at 46, WGL (Feb. 9, 2026).

1 using it to produce [sustainable aviation fuel] or renewable diesel does.”⁹⁴ Moreover, once
2 ratepayers fund RNG infrastructure, institutional pressure to continue the program
3 regardless of results creates path dependency—locking Maryland into an inferior and
4 expensive procurement pathway.

5 **Q. Should the Commission consider alternative uses for in-state biogas feedstocks?**

6 A. Yes. For in-state sources of RNG feedstock—such as landfills, wastewater treatment, and
7 agricultural waste—the Commission should explicitly consider the potential benefits of
8 using those feedstocks for alternative uses to inclusion in the gas system. The only reason
9 alternative uses may have fallen out of favor is the lucrative subsidies associated with the
10 RFS and LCFS subsidies. The Commission should require utilities to demonstrate why
11 RNG’s usage in the gas system is superior to alternative uses before authorizing any
12 procurement.

13 **VII. THE COMMISSION’S ROLE AND THE LIMITS OF ALTERNATIVE FUELS AS**
14 **REGULATORY STRATEGY**

15 **Q. What is the appropriate role for the Commission in evaluating alternative fuels?**

16 A. The Commission regulates gas utilities to ensure safe, reliable, and economic public utility
17 service. In the context of questions about the Future of Gas, the Commission must ensure
18 that utility investments and operational decisions enable aggressive reductions in gas fuel
19 use and respond appropriately to declines in fuel use driven by broader climate policy and
20 market forces. The Commission can and should ensure that these decisions are compliant
21 with climate-aligned pathways—specifically, pathways that reduce gas consumption and

⁹⁴ New York State Energy Planning Board, Considerations for Low-Carbon Alternative Fuel Use at 84 (Dec. 16, 2025), <https://energyplan.ny.gov/-/media/Project/EnergyPlan/files/2025-Energy-Plan/Low-Carbon-Alternative-Fuels.pdf>.

1 accommodate increased electrification. But it is not the Commission’s role to act as an
2 arbiter of the carbon intensity of a specific fuel pathway.

3 **Q. Why should the Commission decline to authorize RNG procurement as a climate**
4 **compliance measure?**

5 A. Renewable environmental attributes are distinct from the physical gas commodity. They
6 are commonly unbundled and traded on markets. They are substitutable across compliance
7 pathways. Whether an RNG attribute “counts” toward Maryland’s climate goals is a
8 determination for the state’s emissions regulator—MDE—not the PSC. The utilities are
9 effectively asking the Commission to make an emissions compliance determination by
10 authorizing ratepayer-funded RNG procurement. This undercuts MDE’s broader authority
11 to regulate climate strategies while accounting for cross-sector considerations.

12 **Q. Are there additional reasons the Commission should not take on this role?**

13 A. It is inappropriate for the Commission to stipulate a specific mechanism—gas utility RNG
14 procurement—that favors one use of limited bioenergy resources over others. By
15 authorizing utility-scale RNG procurement with ratepayer cost recovery, the Commission
16 would be picking winners in a market that should be shaped by economy-wide emissions
17 policy, not utility regulation. The Commission’s focus should be on regulating utilities to
18 ensure safe, reliable, and affordable energy delivery amid technological change driven by
19 broader climate action and emerging technologies. In other words, MDE is the better-
20 situated party to regulate utilities’ use of alternative fuels in their gas distribution systems.

1 **VIII. CONCLUSIONS & RECOMMENDATIONS**

2 **Q. Please summarize your conclusions.**

3 A. The record in this proceeding demonstrates that neither RNG nor hydrogen can realistically
4 or affordably assist in achieving Maryland’s climate goals through the existing gas system.
5 RNG production in Maryland is negligible. The companies’ positions on alternative fuels
6 were lukewarm, with several witnesses acknowledging substantial challenges related to
7 cost, scalability, and, in the case of hydrogen, physical limitations. While some of the
8 companies argue for cost recovery and continued consideration of alternative fuels, they
9 have not built a substantial record for the Commission to justify ongoing consideration of
10 alternative fuels.

11 **Q. What do you recommend to the Commission?**

12 A. Based on the evidence presented in this testimony, I recommend the following:

13 1. The Commission should find that RNG cannot “realistically and affordably” assist
14 in achieving State climate goals by utilizing the existing gas system.

15 2. The Commission should find that neither hydrogen, nor a blend of hydrogen and
16 natural gas, can “realistically and affordably” assist in achieving State climate goals by
17 utilizing the existing gas system.

18 **Q. Does this conclude your testimony?**

19 A. Yes. I reserve the right to amend or supplement this testimony based on the receipt of
20 additional information.

Exhibit MJW-1: Curriculum vitae

Michael J. Walsh, Ph.D.

Managing Partner, Groundwork Data

Arlington, MA | mjw@groundworkdata.org

SUMMARY

Dr. Michael J. Walsh is an experienced energy and sustainability expert with a strong background in research, technical analysis, stakeholder engagement, and project leadership. As Managing Partner of Groundwork Data, he supports the transition to cleaner energy systems through research, stakeholder engagement, and expert testimony.

PROFESSIONAL EXPERIENCE

Groundwork Data Inc., Arlington, MA, Managing Partner and Founder, 2021 – Present.

Established a consultancy focused on supporting the transition to cleaner and more resilient energy systems. Performs research, technical analysis, and stakeholder engagement to contribute to expert testimony, reports, and outreach about the future of gas, electrification, decarbonization, and alternative fuels.

The Cadmus Group., Boston, MA, Senior Associate, 2019 – 2020.

Served as a technical decarbonization specialist within a state and local policy practice group, overseeing project coordination, expert-level analysis, and quantitative research. Responsibilities encompassed a diverse range of initiatives, such as the development of comprehensive climate action plans, the evaluation of efficiency programs, and the preparation of natural carbon inventories.

Boston University Institute for Sustainable Energy, Boston, MA. Senior Research Scientist, 2017 – 2019.

Lead researcher and project manager for an academic research institute. Primarily oversaw the development of a multi-report city decarbonization study.

Bentley University Center for Integration of Science and Industry, Waltham, MA. Research Fellow (2013-2017).

Participated in a multi-university, federally-funded research consortium investigating advanced biofuel and food product pathways. Conducted techno-economic, lifecycle, and integrated energy assessments of novel technologies. Supported the center's research into understanding the drivers of technological change.

EDUCATION

Ph.D. in Environmental Engineering, Cornell University, Ithaca, New York (2013)

B.A. in Chemistry (Honors), Colby College, Waterville, Maine (2005)

SELECTED PROJECTS

The Future of Gas: Regulatory Interventions. Dr. Walsh is a nationally recognized authority in developing regulatory strategies for the evolving gas sector. Through research conducted in New York, Illinois, and Massachusetts, he has identified three challenges facing utility gas service: rising infrastructure costs, climate initiatives, and increased competition from alternative gas technologies. Dr. Walsh has contributed his expertise to proceedings addressing the future of gas in Massachusetts, Rhode Island, Colorado, and Illinois, serving multiple public interest organizations and governmental entities.

Integrated Energy Planning. Recognizing the increasing challenges associated with the gas system, Dr. Walsh developed the “Local Energy Asset Planning Framework” in 2022, accompanied by a white paper that describes how various datasets can be used to inform and design strategies for targeted electrification, non-pipeline alternatives, and integrated energy planning. Subsequently, he authored a series of technical studies that described progressive improvements and applications of the framework, demonstrating the cost-effectiveness of avoiding pipeline replacement and strategies for sourcing such opportunities. The LEAP framework has been used to support testimony. It is under continued development under Dr. Walsh’s oversight. Additionally, he has supported the Commonwealth of Massachusetts in three working groups focused on non-pipeline alternatives, integrated energy planning, and the future role of the Everett Marine Terminal Liquefied Natural Gas Facility in supporting utility gas and electric sector needs.

Massachusetts 2050 Decarbonization Roadmap. Dr. Walsh led a comprehensive multi-sector technical research and stakeholder engagement initiative for the Massachusetts Executive Office of Energy and Environmental Affairs. In this capacity, he coordinated a team of 40 professionals across 10 organizations, focusing on greenhouse gas mitigation strategies and their effects across transportation, buildings, electric, non-energy, and land use sectors. This project has played a critical role in shaping Massachusetts’ climate policy.

Boston’s Climate Planning: Carbon Free Boston (2019) and the Boston Climate Progress Report (2022). Dr. Walsh has been instrumental in advancing Boston’s climate planning initiatives, including his leadership on the Carbon Free Boston Study (conducted for the Boston Green Ribbon Commission in 2019) and the Boston Climate Progress Report (prepared for the Boston Foundation in 2022). As part of the Carbon Free Boston Study, Dr. Walsh represented the Boston University Institute for Sustainable Energy, where he coordinated a multidisciplinary team of researchers and consultants to perform a comprehensive, pioneering analysis of municipal decarbonization strategies. For the Boston Climate Progress Report, he partnered with the Dukakis Center at Northeastern University to thoroughly evaluate both mitigation and adaptation efforts, highlighting critical transformation areas and identifying four major initiatives required for accelerated progress. Additionally, Dr. Walsh has provided pro bono climate action advice to organizations such as the New England Aquarium, Livable Streets Alliance, the Boston Foundation, and Boston University.

Bioenergy and Advanced Waste Energy Recovery Technologies - Dr. Walsh possesses significant expertise in engineering and policy related to bioenergy and waste management systems. His doctoral research involved developing bioreactors designed to scale up algae production for bioenergy applications. Subsequently, his postdoctoral work concentrated on advancing technologies within the bioenergy sector, including analysis of commercialization strategies, technoeconomic assessments, and lifecycle evaluation of various bioenergy pathways. Dr. Walsh has collaborated with the Pacific Northwest National Laboratory to develop bioenergy pathways for integrated energy planning software and conducted an extensive stakeholder engagement initiative focused on emerging waste management strategies in the Metro Boston Region. In the private sector, his experience includes conducting life cycle analyses for consumer-grade composting devices and reviewing sustainability plans for major waste management organizations.

EXPERT TESTIMONY AND PARTICIPATION IN REGULATORY PROCEEDINGS

Rhode Island Public Utilities Commission (25-45-NG): Provided direct testimony regarding The Narragansett Electric Co. d/b/a Rhode Island Energy - Application for Approval of a Change in Electric and Gas Base Distribution Rates. On behalf of the Conservation Law Foundation, April 2025.

Michigan Public Service Commission (U-21973): Provided direct testimony regarding DTE Gas Company's 2025 application to increase its rates. On behalf of the City of Ann Arbor. March 2025.

Colorado Public Utilities Commission (25A-0220G): Provided direct testimony regarding Xcel Energy's 2025-2030 Gas Infrastructure Plan. On behalf of Rewiring America. November 2025.

Massachusetts Department of Public Utilities (25-41 through 25-44/45): Provided direct and surrebuttal testimony regarding the Massachusetts Local Distribution Companies' 2025 Climate Compliance Plans. On behalf of Rewiring America. September 2025.

Rhode Island Public Utilities Commission (25-55-NG): Provided direct testimony regarding The Narragansett Electric Co. d/b/a Rhode Island Energy - FY 2026 Gas Infrastructure, Safety and Reliability (ISR) Plan. On behalf of the Conservation Law Foundation, February 2025.

Rhode Island Public Utilities Commission (23-49-NG): Provided direct testimony regarding The Narragansett Electric Co. d/b/a Rhode Island Energy - FY 2026 Gas Infrastructure, Safety and Reliability (ISR) Plan. On behalf of the Conservation Law Foundation, February 2024.

Massachusetts Department of Public Utilities (20-80): Provided a technical comment on the practice of offering Line Extension Allowances by Massachusetts Gas Local Distribution Companies. On behalf of Sierra Club, Conservation Law Foundation, and CLF, August, 2024.

Rhode Island Public Utilities Commission (22-01-NG): Provided comments and meeting participation in the "Future of Gas" Investigation. On behalf of Conservation Law Foundation and Sierra Club, 2023-2024.

Massachusetts Department of Public Utilities (22-32): Provided testimony on the petition of Liberty Utilities for Approval of an Agreement to Purchase Renewable Natural Gas from Fall River RNG LLC. On behalf of Conservation Law Foundation, June 2022

Massachusetts Department of Public Utilities (20-80): Provided a technical comment on the Local Distribution Companies Independent Consultant Report's pathways analysis. May 2021.

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Economic and Health Impacts Report: A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study (December 2020) Cadmus Group for the Massachusetts Executive Office of Energy and Environmental <https://www.mass.gov/doc/economics-and-health-impacts-report/download>

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- Joan Fitzgerald, Michael **Walsh**, The Boston Climate Progress Report. The Boston Foundation and Boston Green Ribbon Commission, November 2022. <https://www.tbf.org/news-and-insights/reports/2022/november/2022-climate-report-card-20221103>
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- Castigliero, J.R., Pollack, A., Cleveland, C.J., **Walsh**, M.J. (2021). Evaluating emissions reductions from zero waste strategies under dynamic conditions: A case study from Boston. *Waste Management*, 126, 170-179. <https://doi.org/10.1016/j.wasman.2021.02.026>
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- Vadas, T.M., Fahey, T.J., Sherman, R.E., Demers, J.D., Grossman, J.M., Maul, J.E., Melvin, A.M., O'Neill, B., Raciti, S.M., Rochon, E.T., Sugar, D.J., Tonitto, C., Turner, C.B., **Walsh**, M.J., Xue, K. (2007). Approaches for analyzing local

carbon mitigation strategies: Tompkins County, New York, USA. *International Journal of Greenhouse Gas Control*, 1(3), 360-373. [https://doi.org/10.1016/S1750-5836\(07\)00041-2](https://doi.org/10.1016/S1750-5836(07)00041-2)

SELECTED MEDIA APPEARANCES

Dr. Walsh is a frequent source of media expertise on energy, climate, and environmental matters

Television & Broadcast Media

WCVB Boston (Channel 5) (November 6, 2022). "Report: Boston falling short when it comes to fighting climate change." Live interview. <https://www.wcvb.com/article/boston-climate-progress-report-michael-walsh-interview/41879378>

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Expert Commentary in Major Media

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Gas Outlook (March 21, 2023). Are hydrogen blending and RNG climate solutions? <https://gasoutlook.com/analysis/are-hydrogen-blending-rng-really-climate-solutions/>

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SELECTED TALKS

Panelist, "Future of Gas 101: A Panel Discussion with Experts," Climate Xchange, October 28, 2025.

Presenter, "Perspectives for Decarbonizing the Peak Focus Area Working Group from the MA 2050 Roadmap and other relevant research & analysis," Massachusetts Office of Energy Transformation Expert Presentation Series: Renewable Fuels, June 17, 2025. <https://www.youtube.com/watch?v=ioKrDyJU8yk>

Presenter, "Neighborhood Electrification," MassCEC Thoughtful Climate Live Interview Series (Interview with Galen Nelson), April 18, 2025. <https://www.youtube.com/watch?v=GjA-NI6xo00>

Invited Speaker, "The Boston Foundation's 2024 Climate Progress Report Convening," The Boston Foundation, October 16, 2024.

Invited Speaker, "The Future of Gas and Gas Policy," NESCAUM Building Electrification Task Force Meeting, October 1, 2024.

Presenter, "Pipeline Extension Allowances and the Transition Beyond Gas in Massachusetts," webinar hosted by Conservation Law Foundation, Sierra Club, and Environmental Defense Foundation, October 9, 2024.

<https://www.youtube.com/watch?v=MYu-N2Si7Dw>

Presenter, "Clearing the Air Gas," webinar hosted by Institute for Market Transformation for C40, August 27, 2024.

Presenter, "The Future of Gas and Tactical Thermal Transitions," Multitown Gas Leaks Initiative, May 2, 2024.

Presenter, "New Construction and Report Presentation," webinar hosted by Zero Carbon Massachusetts, March 14, 2024.

Presenter, "The Future of Gas in NY: Perspectives on RNG," New York State Department of Public Service Avoided Cost of Gas Working Group, September 3, 2023.

Presenter, "The Future of Gas in New York State," webinar hosted by Building Decarbonization Coalition, May 25, 2023.

Panelist, "NECEC Emerging Trends Series: Decarbonizing Building Heating," New England Clean Energy Council, January 23, 2023. <https://www.youtube.com/watch?v=PAPYUt5ZbAo&t=4828s>

Presenter, "Boston Climate Progress Report 2022," The Boston Foundation, November 3, 2022.

<https://www.tbf.org/news-and-insights/videos/2022/november/boston-climate-progress-report-forum-20221103>

Keynote Presenter and Panelist, "Massachusetts' 2050 Roadmap: Transformations Needed to Achieve Net Zero," Environmental Business Council of New England, November 18, 2021.

Presenter and Panelist, "Designing a Carbon Free Boston," Boston Society for Architecture/American Institute of Architects, May 9, 2019. <https://www.youtube.com/watch?v=frdnNvuNHyo>

Presenter and Panelist, "Carbon Free Boston: Findings & Next Steps," A Better City, February 12, 2019.

Presenter, "Accounting for CO2 in Algae Cultivation," Algae Cultivation for Carbon Capture and Utilization Workshop, May 23, 2017.

Presenter, "Food and Energy from Marine Algae: Enabling deep transformation in agriculture & bioenergy," 9th Annual Integrated Assessment Modeling Consortium Meeting, Beijing, China, December 2016.

Presenter, "Financial and Integrated Assessment of Algae for Food and Energy," MIT Joint Program on the Science and Policy of Global Change Economic Projection and Policy Analysis Seminar, Cambridge, MA, November 2016.

Presenter and Panelist, "Creating Climate, Energy and Food Security Using Algae from the Sea," Bentley University Innovators Business Series, April 22, 2015. <https://www.youtube.com/watch?v=NM2wTHtoaRs>

Presenter, "Turning Research into Practice: Cornell University Climate Action Plan," United Nations Climate Change Conference COP 16 Side Event on Sustainable Agriculture and Terrestrial Carbon, Cancun, Mexico, November 2010.

AWARDS AND HONORS

Bishop Brady High School Distinguished Alumni Award (2024)

Boston Business Journal 40 under 40 (2022)

Bentley University Innovation in Teaching Award (2016)

New England Aquarium Young Professionals Advisory Committee (2014)

American Institute of Biological Sciences Emerging Public Policy Leadership Award Honorable Mention (2011)

Cornell University Board of Trustees, Student-Elected Member (2008-2010)

Cornell University Distinguished Student Volunteer Award (2007)

Colby College Coach's Award, Cross Country (2003)

TEACHING EXPERIENCE

Arlington Community Education

Course Instructor: Decarbonizing Massachusetts, Fall 2025

Bentley University, Waltham, MA

Adjunct Assistant Professor: Global Climate Change (NASE 337), Spring & Fall 2015

Adjunct Assistant Professor: Science of Sustainability (NASE 364), Spring 2014

Cornell University, Ithaca, NY

Teaching Assistant: Sustainable Development (BEE 3299), 2009-2012

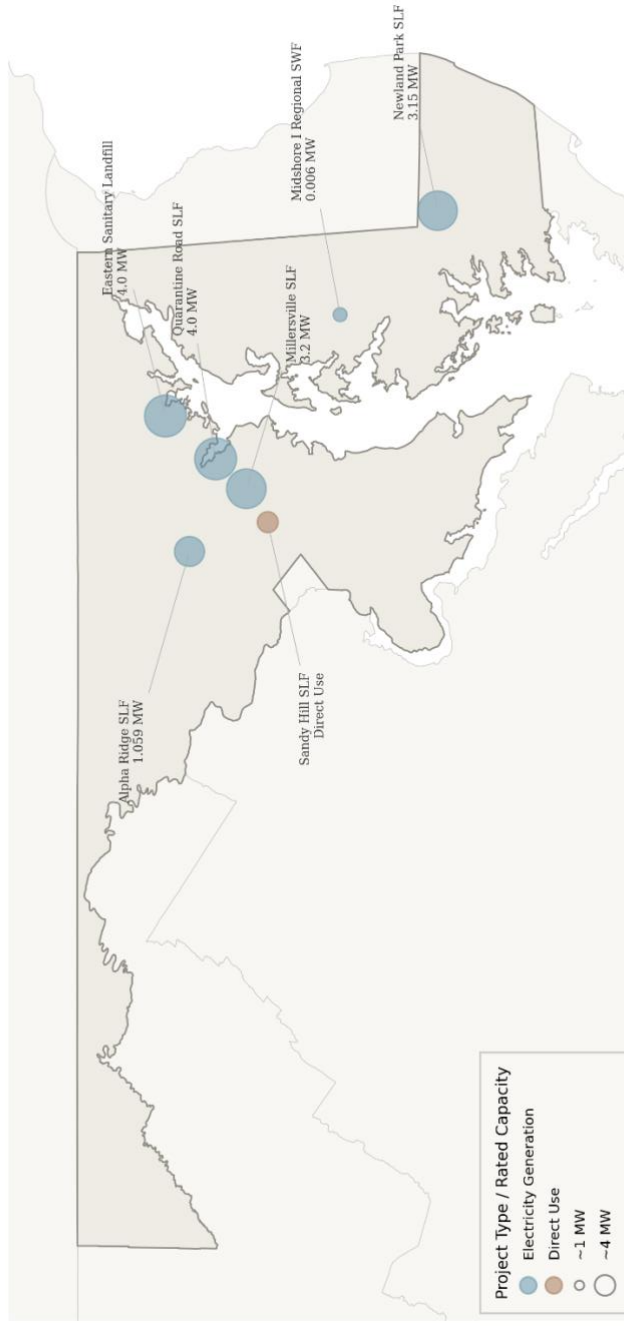
Teaching Assistant: Engineering for a Sustainable Society (BEE 2510), 2007-2011

Graduate Resident Fellow: Hans Bethe House residential college, 2007-2008

Exhibit MJW-2: Map of landfill gas
management projects in Maryland by type and
rated capacity

Source: EPA LMOP Database

Operational Landfill Gas-to-Energy Projects in Maryland



Source: U.S. EPA Landfill Methane Outreach Program (LMOP) Database

Exhibit MJW-3: National listing of agricultural
digestion (top) and landfill gas energy projects
by operational years

Source: EPA AgStar and LMOP Databases

