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People's Counsel

June 26, 2020

Brinda Westbrook-Sedgwick
Commission Secretary
Public Service Commission
of the District of Columbia
1325 G Street, N.W., Suite 800
Washington, D.C. 20005

**Re: Formal Case No. 1142, In the Matter of the Merger of AltaGas, Ltd. and
Washington Gas Holdings, Inc.**

Dear Ms. Westbrook-Sedgwick:

Enclosed for filing in the above-referenced proceeding, please find the *Office of the People's Counsel for the District of Columbia's Initial Comments on AltaGas Ltd.'s Filing Regarding Merger Terms Nos. 6 and 79.*

If there are any questions regarding this matter, please contact me at 202.727.3071.

Sincerely,

/s/ Timothy Oberleiton

Timothy Oberleiton
Assistant People's Counsel

Enclosure

cc: Parties of record

**BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA**

In the Matter of	§	
	§	
the Merger Application of AltaGas Ltd. and WGL Holdings, Inc.	§	Formal Case No. 1142
	§	

**OFFICE OF THE PEOPLE’S COUNSEL
FOR THE DISTRICT OF COLUMBIA’S INITIAL COMMENTS ON
ALTAGAS LTD.’S FILING REGARDING MERGER TERM NOS. 6 AND 79**

Pursuant to the Public Service Commission of the District of Columbia’s (“PSC” or “Commission” or “PSC”) Order Nos. 20276, 20310, and 20346,¹ the Office of the People’s Counsel for the District of Columbia (“OPC” or “Office”) the statutory representative of District of Columbia utility ratepayers and consumers,² hereby submit its initial comments on AltaGas, Ltd. (“AltaGas” or “Company”) Climate Business Plan for Washington, D.C.³

I. SUMMARY OF COMMENTS AND RECOMMENDATIONS

The requirement that AltaGas submit a Climate Business Plan was borne out of questions and concerns raised during the AltaGas-Washington Gas Light Holdings, Inc. merger proceeding regarding AltaGas’ commitment to climate change and its long-term vision for the District’s only natural gas distribution utility, Washington Gas Light Company

¹ *Formal Case No. 1142, In the Matter of the Merger Application of AltaGas Ltd. and WGL Holdings, Inc.*, (“*Formal Case No. 1142*”), *Formal Case No. 1142*, Order No. 20276, rel. December 19, 2019 (“*Order No. 20276*”); *Formal Case No. 1142*, Order No. 20310, rel. March 18, 2020 (“*Order No. 20310*”); *Formal Case No. 1142*, Order No. 20346 at ¶¶ 8 & 9, rel. May 14, 2020 (“*Order No. 20346*”)(setting June 26, 2020 as the deadline to file initial comments on AltaGas’ Climate Business Plan and August 25, 2020 to file reply comments).

² D.C. Code § 34-804 (Lexis 2020).

³ *Formal Case No. 1142*, AltaGas, Ltd., Natural Gas and its Contribution to a Low Carbon Future Climate Business Plan for Washington, D.C., filed March 16, 2020) (“Climate Business Plan” or “CBP”).

(“WGL” and, collectively with AltaGas, “Companies”). The question of the merged Companies’ climate action policies and plans is critical given that WGL’s business is centered on a carbon-based fuel and the District has adopted aggressive policies to curb greenhouse gas emissions (“GHG”) and combat the deleterious effects of climate change on District residents and business.⁴

OPC appreciates the effort that the Company put into developing its Climate Business Plan. It is the first step in what will certainly be a long conversation of how the Company plans to evolve its business model to support and service the District’s climate goals and reduce reliance on selling natural gas. It also ties into an even more important planning process that the District needs to undertake to decide how best to meet the District’s aggressive energy efficiency, renewable energy, and carbon reduction standards in an efficient, equitable, and affordable manner.

OPC welcomes the opportunity to engage in these conversations, but it is imperative that the conversations be serious and be based on open and transparent exchange of information so that all parties can develop and agree on solutions that properly serve ratepayers and meet the impending challenge of decarbonization in the District. As OPC demonstrates in the instant

⁴ See, e.g. Mayor’s Order 2013-09, Sustainable DC Transformation Order § VUI.C (mandating the Department of the Environment [now the Department of the Energy and Environment, or DOEE] “develop a Comprehensive Energy Plan ... to achieve a District-wide energy consumption reduction of fifty percent (50%) by 2032 from baseline energy consumption in 2012.”); Mayor’s Order 2017-142, Commitment to Adopt, Honor, and Uphold the Paris Agreement § II.A (committing to the “Paris Agreement to reduce greenhouse gas emissions between 26 and 28 percent by 2025 from 2005 levels, and further commit[ting] to reduce carbon emissions 50 percent by 2032 and 80 percent by 2050 below 2006 levels), issued June 5, 2017 (Mayor’s Order 2017-142); Executive Office of the Mayor, *Mayor Bowser Commits to Make Washington, DC Carbon-Neutral and Climate Resilient by 2050*, (announcing the Mayor’s pledge to make Washington, DC carbon-neutral and climate resilient by 2050), released December 4, 2017, <https://mayor.dc.gov/release/mayor-bowser-commits-make-washington-dc-carbon-neutral-and-climate-resilient-2050>, last accessed Oct. 22, 2018.

comments and the attached technical supporting affidavits of Dr. Elizabeth Stanton,⁵ an expert economist who specializes in climate, environmental, and energy issues, and Mr. Rod Walker,⁶ a natural gas engineer with extensive experience in designing, constructing and managing gas infrastructure projects, the Climate Business Plan is technically flawed and does not account for critical concerns of equity and affordability. Among other flaws, the CBP:

- Continues to rely heavily on the sale of natural gas, even though the Merger Term calls for the Company to provide a plan that outlines how it will provide innovative and new services and products instead of relying only on selling natural gas;
- Reviews only a narrow set of potential solutions and rejects others, such as electrification initiatives, without a sufficient basis for doing so; moreover, it relies on business-as-usual approaches to reducing carbon which won't reach the deep cuts needed to meet the District's climate goals;
- Fails to account for technical considerations related to mixing renewable natural gas ("RNG") and hydrogen with fossil natural gas and overestimates the availability of these alternative fuels; and
- Appears to rely almost entirely on rate-based cost recovery to fund the initiatives outlined in the CBP, leaving ratepayers vulnerable to unaffordable and inequitable costs.

⁵ Dr. Stanton's Affidavit is attached herein as OPC Attachment A (Stanton Aff.).

⁶ Mr. Walker's Affidavit is attached herein as OPC Attachment B (Walker Aff.).

While the Merger Term requires AltaGas to hold biannual meetings “to report on and discuss its progress on the business plan,”⁷ OPC submits that this is the wrong plan for the District and therefore the biannual meetings will not be sufficient to meet the long-term planning needs of the District. Moreover, OPC is extremely concerned with AltaGas’ apparent strategy to rely primarily on ratepayer funding to evolve its business model. The District’s ratepayers and consumers are not an ATM. District residents and businesses are subject to a multitude of economic pressures, including the skyrocketing costs of funding the maintenance and replacement of gas, electric, and water infrastructure, and expenses related to addressing the impacts of climate change, including extreme weather events. Consumers cannot reasonably be expected to fund every aspect of the climate transition.

In order to advance the ball, OPC respectfully requests that the Commission follow the lead of other forward-looking jurisdictions and open a new comprehensive investigation into heating sector transformation in the District and the impact of the District’s environmental policies on Washington Gas’ ratepayers and regulated business activities. Similar to the investigations that have commenced in New York, California, and Massachusetts, the PSC’s investigation should be aimed at developing a stakeholder supported roadmap of the industry and regulatory changes that will be needed to support the achievement of the District’s climate goals. Such a roadmap should balance immediate safety and reliability needs with these long-term goals and should protect both the short- and long-term interests of consumers and ratepayers. Moreover, the Commission should require that the findings and directives of the comprehensive investigation be integrated into all of WGL’s initiatives to ensure that every

⁷ *Formal Case No. 1142, Settlement Agreement*, p. 34.

program for which WGL seeks ratepayer funding is consistent with the Company's long-term plan for climate change.⁸ It is vital that as gas companies and regulators are addressing climate change policies, the traditional safety concerns be viewed in context with the future planned uses (or decommissioning) of the system.

II. BACKGROUND

On April 24, 2017, AltaGas, Ltd. filed an application with the Commission for authorization to acquire WGL Holdings, Inc. and WGL, the District's sole natural gas distribution utility.⁹ At the time the Company filed its application, the District had already adopted a goal of reducing GHG emissions by 50 percent below 2006 levels by 2032 and by 80 percent by 2050.¹⁰ During the investigation of AltaGas' Merger Application, District of Columbia Mayor Muriel Bowser committed to an even more aggressive GHG reduction goal by pledging to develop a pathway to deliver GHG emissions neutrality by 2050.¹¹

Because WGL business is reliant on natural gas, a GHG emitting fuel, the potential impact of the District's environmental and climate goals on WGL and AltaGas, and the need for advance planning to address such concerns, was at the forefront of the Commission and the parties' minds throughout the merger proceeding. During the evidentiary hearing, for

⁸ See, e.g. *Formal Case No. 1142*, Order No. 20342 P 11, rel. May 14, 2020 ((stating that "the Commission may consider whether the AltaGas Climate Business Plan aligns with the District of Columbia's clean energy goals and targets in another proceeding").

⁹ *Formal Case No. 1142*, Application of AltaGas Ltd., WGL Holdings, Inc., and Washington Gas Light Company ("Joint Application"), filed April 24, 2017.

¹⁰ Mayor's Order 2017-142, Commitment to Adopt, Honor, and Uphold the Paris Agreement § II.A.

¹¹ Executive Office of the Mayor, *Mayor Bowser Commits to Make Washington, DC Carbon-Neutral and Climate Resilient by 2050*, (announcing the Mayor's pledge to make Washington, DC carbon-neutral and climate resilient by 2050), released December 4, 2017, <https://mayor.dc.gov/release/mayor-bowser-commits-make-washington-dc-carbon-neutral-and-climate-resilient-2050>, last accessed Oct. 22, 2018.

example, former Commission Chairman Betty Ann Kane directly questioned AltaGas' then-CEO, David Harris, about how WGL would continue to operate in the face of significant revenue loss from drastic reductions in gas consumption as the District's environmental policies are implemented.¹²

On May 8, 2018, AltaGas and WGL Holdings, Inc. filed a Unanimous Agreement of Stipulation and Full Settlement ("Settlement Agreement")¹³ to resolve the merger proceeding. To address the above concerns, the parties included Term No. 79 in the Settlement Agreement, requiring that AltaGas file by January 1, 2020:¹⁴

. . . a long-term business plan on how it can evolve its business model to support and serve the District's 2050 climate goals (e.g., providing innovative and new services and products instead of relying only on selling natural gas).

The term further requires that AltaGas hold bi-annual public meetings after the CBP is filed "to report on and discuss its progress on the business plan."¹⁵

The parties also agreed on Term No. 6, requiring AltaGas to undergo a study to assess the development of renewable (bio) gas facilities.¹⁶ Term No. 6 reads, in relevant part, that:

AltaGas will provide \$450,000 to fund a study to assess the development of renewable (bio) gas facilities in the Greater Washington, D.C. metropolitan area. The study will assess the potential environmental benefits of repurposing locally sourced waste streams into pipeline quality renewable gas, compressed natural gas and/or liquefied natural gas that can be used for carbon

¹² *Formal Case No. 1142*, Tr. at 442:12 to 443:3.

¹³ *Formal Case No. 1142*, Consent Motion to Reopen the Record in Formal Case No. 1142 to Allow for Consideration of Unanimous Full Settlement Agreement and Stipulation, and to Waive Hearing on Proposed Settlement, filed May 8, 2018 ("Settlement Agreement").

¹⁴ *Id.* at 33-34.

¹⁵ *Id.* at 34.

¹⁶ *Id.* at 4-5.

neutral vehicle fueling and onsite energy production. The study will evaluate the economic viability, identify operating challenges and solutions, and offer recommendations relating to regulatory and market approaches that can facilitate the utilization of renewable sources to support the achievement of local, state, and regional climate and energy plans. This study will be a single study funded by AltaGas with respect to all of the Washington Gas service territories and will be commenced within one year after Merger Close.

On June 29, 2018, the Commission authorized AltaGas' acquisition of WGL subject to terms and conditions that included Term No.79 and No. 6, thereby providing AltaGas with nearly a year and a half to formulate and file its long-term business plan and renewable gas study.¹⁷

On December 18, 2018 the D.C. Council passed, and on January 18, 2019, Mayor Bowser signed into law, the CleanEnergy DC Omnibus Amendment Act of 2018 ("CleanEnergy Act").¹⁸ Among other things, the CleanEnergy Act, increases the District's Renewable Portfolio Standard to 100% by 2032, establishes a 10% solar energy standard by 2041, and directs the District of Columbia Department of Energy and Environment ("DOEE") to establish strong Building Energy Performance Standards that are aimed at achieving the District's climate commitments. The CleanEnergy Act further modified the PSC's and OPC's statutory mandates to require "consider[ation of] the public safety, the economy of the District, the conservation of natural resources, and the preservation of environmental quality, including effects on global

¹⁷ *Formal Case No. 1142*, Order No. 19396 ¶ 39, Appendix A ¶¶ 6, 79, rel. June 29, 2018 ("Order No. 19396").

¹⁸ D.C. Code § 34-808.02 as amended by the CleanEnergy DC Omnibus Amendment Act of 2018, DC Act 22-583 (Jan. 18, 2019)(enrolled original, signed), <http://lims.dccouncil.us/Download/40667/B22-0904-SignedAct.pdf>.

climate change and the District’s public climate commitments” in their respective regulatory decision-making and advocacy efforts.¹⁹

On March 16, 2020, subject to the extension granted by the Commission in Order No. 20276, AltaGas Ltd. filed its Climate Business Plan.²⁰ AltaGas’ CBP is built around what the Company has termed a “fuel neutral decarbonization approach” and consists of certain initiatives in the areas of: (1) natural gas end use, (2) natural gas transmission and distribution, and (3) sourcing and supply of certified natural gas, RNG, and alternative fuels such as hydrogen. The CBP is further based on two technical analyses that were prepared by ICF International: the Term No. 6 Renewable Natural Gas Study (included as Appendix D)(“RNG Report”) and a technical study entitled “Opportunities for Evolving the Natural Gas Distribution Business to Support the District of Columbia’s Climate Goals” (included as Appendix E) (“ICF Technical Study”). The ICF Technical Study examines four different case scenarios: Case 1 is a Business as Usual Case which assumes approximately a 73% reduction in GHG relative to 2006 by 2032 and 75% reduction by 2050 based on an assumption of 100% Renewable Portfolio Standard;²¹ Case 2 is a partial decarbonization approach; Case 3 is a policy-driven electrification approach; and Case 4 is a Fuel neutral decarbonization case.

III. DISCUSSION

In order to fulfill the District’s robust climate goals, changes must be made both in the sources of energy supply and the ways in which energy is used in the District. Because the

¹⁹ *Id.* § 103.

²⁰ *Formal Case No. 1142*, AltaGas Ltd.’s Climate Business Plan.

²¹ The Business as Usual case also assumes that demand growth at the wholesale level is met largely through increased natural gas and renewable generation. ICF Technical Study Report, p. 94.

District's policies call for deep carbon reductions, these changes will likely have an impact on WGL's business model which is currently solely dependent on the delivery of natural gas. To protect its business and ensure that the transition is equitable and affordable for consumers, WGL must proactively plan for the coming transition and work collaboratively with the District government and District stakeholders in doing so. The Climate Business Plan is the first time that AltaGas or WGL have publicly set forth the Companies' thoughts on how they can assist with meeting the GHG reductions called for by the District's clean energy policies.

Though AltaGas and WGL have had almost two (2) years to develop a targeted plan for how to evolve their business to support the District's climate and environmental goals, the Climate Business Plan unfortunately does not meet the mark. All three of AltaGas' targeted areas, i.e. natural gas end use, natural gas transmission and distribution, and sourcing and supply, continue to rely heavily on the sale and use of natural gas (both fossil-derived and alternative natural gasses) rather than contemplating changes to provide innovative and new services and products.

Moreover, as both Dr. Stanton and Mr. Walker explain, the options that are explored in the Climate Business Plan are narrowly-focused on business as usual approaches to carbon reductions and do not account for other forward-looking ideas that could address the District's climate goals in a more efficient and innovative manner.²² Because AltaGas shared only a limited set of workpapers, none of which are in native file format,²³ OPC and its expert

²² Stanton Aff. ¶ 8; Walker Aff. ¶¶ 6 & 7.

²³ See WGL and AltaGas, Supplemental Technical Information, <https://washingtongasdcclimatebusinessplan.com/supplemental-technical-information/>, last accessed June 25, 2020. Other parties sought the workpapers underlying the Climate Business Plan and ICF Technical Study through discovery (e.g. DCG Data Request No. 30, filed March 26, 2020), but when OPC followed up with the request it was directed to the materials posted on the WGL website.

consultants were unable to comprehensively review the assumptions, data, and methodologies that were used to develop the Climate Business Plan.²⁴ Nevertheless, OPC raises in its comments herein several issues with the Climate Business Plan that bear further exploration by the Commission. OPC also offers recommendations for steps the Commission should take to ensure that the utility is engaging in proactive and forward-looking planning to support the District’s environmental goals.

A. *AltaGas’ CBP provides a limited view of how the Companies can help further the climate and environmental goals of the District.*

As noted above, the CBP is based on a “fuel decarbonization approach” that AltaGas claims will preserve customer choice and maintain the use of natural gas, but in fact provides a limited menu of options for reducing carbon emissions. The majority of the options it does offer are aimed at serving the utility’s business as usual operations rather than the interests of ratepayers or the District’s environmental goals. As Dr. Stanton explains more fully in her affidavit, the Climate Business Plan is focused largely on repurposing WGL’s existing infrastructure through the injection of “renewable” natural gas and “green” hydrogen and customer-side changes, including conversion to “gas heat pumps” and energy efficiency measures.²⁵ It does not adequately address other pathways to achieve emission reductions, such as the role of electrification, energy efficiency, or accelerated pipeline replacement activities.²⁶

²⁴ See, Stanton Aff., ¶¶ 8, 35, & 39; Walker Aff., ¶¶ 7 & 16.

²⁵ Stanton Aff., ¶¶ 16, 26, & 44; see also Walker Aff., ¶ 6 (“The Climate Business Plan’s proposed reduction in future emissions relies heavily on end user efficiency/behavioral improvements (50.7%) and Renewable Natural Gas (RNG) (29.5%) for future emissions reductions.”)

²⁶ Stanton Aff., ¶ 8.

1. *The CBP does not adequately address electrification policies.*

Indeed, though the ICF Technical Study reviewed a policy-based electrification scenario, it dismissed the viability of this scenario on the basis of cost. As Dr. Stanton explains:

AltaGas has not made available any of the assumptions, data, or methods that would make it possible for stakeholders and third-party experts to review and evaluate these claims. AltaGas' claim that its preferred scenario is more affordable should be robust enough to withstand outside review—a minimum standard in any public process.²⁷

Dr. Stanton further explains that AltaGas' claims that gas is “over 99 percent reliable and affordable, costing \$879 less per year than a comparable home using electricity for heating, hot water, cooking and clothes drying” is stated in the Climate Business Plan, but is not supported in the Company's own independent analysis or in ICF's analysis. Instead, AltaGas is relying on the American Gas Association (“AGA”) 2020 “Playbook” which “covers the opportunities and challenges that face the gas industry in an effort to promote a path forward for gas as ‘the best energy choice.’”²⁸ But like AltaGas, the AGA Playbook also does not provide an explanation or verification of these findings.²⁹

Dr. Stanton finds AltaGas' choice to reject heating electrification and instead embrace less established technologies both “surprising” and “out of step” with the District's plans for reducing emissions from the heating sector.³⁰ Indeed, the *Clean Energy DC: Climate and Energy Action Plan* (“DC Action Plan”) which DOEE developed as a roadmap for how the District plans to achieve its clean energy goals, specifically calls for electrification to displace fossil fuel

²⁷ *Id.*, ¶ 19.

²⁸ *Id.* at ¶¶ 31-34.

²⁹ *Id.* at ¶ 34.

³⁰ *Id.* at ¶ 20.

combustion.³¹ As Dr. Stanton explains, the DC Action Plan recommends a two-step process in order of priority: first, any end uses currently using natural gas that can be electrified should be; and second, the District should investigate the use of biologically derived fuels to supply any remaining end uses.³²

Contrary to the Climate Business Plan, the DC Action Plan makes no mention of hydrogen injection, or gas heat pumps. Instead it highlights electric-based systems for heating and cooling, including neighborhood-scale energy systems. DOEE has also funded research on ground source heat pumps³³ and included electric heat pumps among strategies for improved energy efficiency. The DOEE also includes electric heat pumps among the characteristics of high-performance buildings and recommends that the District update building codes to make heat pumps more feasible, promote conversion to electric heat pumps for deep retrofits, and support related training and certification for HVAC technicians.³⁴

Furthermore, gas heat pumps do not appear to be viable technology choice for low-cost heating and cooling. Dr. Stanton explains that:³⁵

A gas heat pump is a type of air-source heat pump that runs on gas rather than electricity. However, gas heat pumps are

³¹ *Id.* at ¶¶ 14-15 (referencing *The District of Columbia Climate and Energy Action Plan*, DOEE, at p. 5, August 2018, available at: https://doee.dc.gov/sites/default/files/dc/sites/ddoe/page_content/attachments/Clean%20Energy%20DC%20-%20Full%20Report%200.pdf)(stating that: “The share of end-use energy coming directly from electricity or fuels produced from electricity must increase from less than 20% in 2010 to over 50% in 2050, displacing fossil fuel combustion.”)

³² *Id.* at ¶ 17.

³³ DOEE, *Notice of Funding Availability - A Characterization Study of Direct Geothermal Resource Potential for Ground Source Heat Pump Technologies*, October 20, 2017, available at: <https://doee.dc.gov/release/notice-funding-availability-characterization-study-direct-geothermal-resource-potential>

³⁴ *Id.*, pp. 62, 67-68, 80, 116.

³⁵ Stanton, ¶ 44.

more expensive and less readily available than their electric counterparts. As of 2017, the cost to produce a gas heat pump ranged from \$14,000 to \$24,000, due in large part to the unique requirements for gas heat pump engines. Due to their very small share of the U.S. heating/cooling market, customers are not broadly aware of gas heat pumps and the sales of and services for gas heat pumps are very limited. The use of gas heat pumps for cooling is especially challenging, and the reliable use of this equipment requires that its engine be run consistently over long periods of time.

AltaGas' rejection of electrification is also out of step with actions that are being taken in other jurisdictions. As Dr. Stanton explains, across the United States, there has been a widespread adoption of heating and water heating electrification technologies, such as air-source heat pumps and solar-powered hot water heaters.³⁶ In fact, every state in the country except Georgia has some kind of electric-based renewable thermal program or policy.³⁷ And many states are providing incentives to their residents to adopt renewable energy or electrify their home energy systems by offering equipment rebates, tax credits and other tax incentives, loans and grants.³⁸ Dr. Stanton submits that “[u]ltimately, electrifying home heating equipment is a widespread, trusted strategy to lower emissions and heating costs.”³⁹ The Commission should explore further why AltaGas rejected an electrification strategy out of hand.

2. *The CBP does not adequately address the role of energy efficiency in reducing carbon emissions.*

While the Climate Business Plan relies heavily on customer-side energy efficiency measures, there are at least two problems with the CBP's methodology for doing so.

³⁶ Id. at ¶¶ 21-22.

³⁷ Id.

³⁸ Id. at ¶ 22 (citing numerous examples of jurisdictional incentives).

³⁹ Id. ¶ 24.

First, as Dr. Stanton explains, the energy efficiency savings included in AltaGas’ CBP preferred plan do not appear to be additional to that already required in the District. The District’s gas energy efficiency programs are presently administered by the DC Sustainable Energy Utility (“DCSEU”). While the CleanEnergy Act directed the Commission to form a working group to develop metrics for electric and gas company energy efficiency and demand response (“EEDR”) programs, with the goal of establishing utility-led EEDR programs that are not duplicative of those now offered by the DCSEU, this work is not yet complete.⁴⁰

Nevertheless, prior to the CleanEnergy Act, DOEE established performance benchmarks for the DCSEU for the five-year period between FY2017-FY2021. In FY2017, DCSEU exceeded the Year 1 maximum target of 0.5 percent, achieving 0.6 percent savings. In FY2018, DCSEU exceeded the cumulative Year 2 maximum target of 1.0 percent, achieving 1.2 percent savings. For FY2021, DCSEU’s cumulative gas energy efficiency target is 2.5 to 3 percent.^{41,42} (For reference, continuing DCSEU’s minimum pace of 0.5 percent annual incremental gas savings would add up to *8 percent in 2032 and 17 percent in 2050*—before accounting for gradual

⁴⁰ See Stanton Aff., ¶ 24 (referencing *Formal Case No. 1160, In the Matter of the Development of Metrics for Electric Company and Gas Company Energy Efficiency and Demand Response Programs Pursuant to Section 201(b) of the Clean Energy DC Omnibus Amendment Act of 2018*, (“*Formal Case 1160*”), Energy Efficiency And Demand Response (“EEDR”) Metrics Working Group Report, January 30, 2020 (“EEDR January 30, 2020 Report”).

⁴¹ Office of the Deputy Mayor for Planning and Economic Development. *Contract DOEE-2016-C-0002*. Awarded to Vermont Energy Investment Corporation, April 5, 2017, available at: http://app.ocp.dc.gov/Award_attachments/CW51134_VermontEnergyInvestmentCorporationContractNoDOEE-2016-C-0002executedApril52017.pdf

⁴² *Performance Benchmark Assessment of FY2018 DC Sustainable Energy Utility Programs*. NMR Group et. al., submitted to the District of Columbia Department of Energy and Environment, June 25, 2019, available at: <https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/DCSEU%20FY2018%20Performance%20Benchmarks%20Report%20-%20FINAL%20DRAFT.pdf>

retirement of measures over time.)⁴³ Dr. Stanton further explains that AltaGas' CBP, on the other hand, "calls for cumulative energy efficiency savings of 4 percent by 2032 and 14 percent by 2050, even though it includes measures not currently offered by DCSEU: behavioral programs and gas heat pumps. These savings goals have a baseline of 2006 (compared to 2014 for DCSEU's goals).⁴⁴ Dr. Stanton further note that in its DC Action Plan and Sustainable DC 2.0 Plan, the District has set out to achieve a long-term energy savings target of a 50 percent reduction in District-wide energy use by 2032 from a 2012 baseline.⁴⁵ Even after adjusting for different baseline years, this savings target is more than 12 times greater than the 2032 savings recommended in AltaGas' CBP.⁴⁶

The second issue with the Climate Business Plans reliance on energy efficiency is explored in Mr. Walker's affidavit. As Mr. Walker explains:

Efficiency improvements are a cornerstone of the CBP – comprising just over half of the proposed future emissions reductions. While new building standards, behavioral modifications, CHP, etc. can all make a big impact on the total amount of energy used, the amount suggested in the CBP is unlikely. In the ICF Technical Report, the claim is made that building construction improvements and an aggressive adoption rate of new meters by 2050 will reduce energy consumption. The ICF report also relies on behavioral programs to reduce residential energy use by 0.85%/customer.⁴⁷ While these types of activities will undoubtedly reduce demand for NG, the assumption that that reduction can be sustained through 2050 is unsupportable.

⁴³ Stanton Aff., ¶ 25.

⁴⁴ Stanton Aff., ¶ 26.

⁴⁵ *Formal Case No. 1160*, EEDR January 30, 2020 Report, ¶ 16.

⁴⁶ Stanton Aff., ¶ 27.

⁴⁷ *Formal Case No. 1142*, Climate Business Plan, Appendix D, "Opportunities for Evolving the Natural Gas Distribution Business to Support the District of Columbia's Climate Goals" ("ICF Technical Report"), filed March 16, 2020.

Long-term programs like this typically have diminishing returns in efficiency improvements as time goes on. In addition, current gas appliances and end-user equipment is already fairly efficient to begin with.⁴⁸

Accordingly, the Commission should reevaluate the Climate Business Plan’s energy efficiency assumptions and conclusions with respect to both feasibility and accountability.

3. *The CBP does not adequately address the role of accelerated pipeline replacement activities.*

The Climate Business Plan also relies on carbon reductions from pipeline replacement activities. However, the pipeline repairs and replacement included in AltaGas’ preferred plan do not appear to be additional to those already required and planned under PROJECTpipes 1 or proposed by WGL under PROJECTpipes 2. Essentially, this part of the CBP appears to be no different than the current PROJECTpipes plan. Although the District’s Climate Goals call for 100% carbon neutrality by 2050, AltaGas’ CBP calls for a continuation of the 40 year timeline for PROJECTpipes work—and proposes no changes, additions, or accelerations to that program.⁴⁹ If the accelerated pipeline replacement program is not planned correctly, it could lead to a host of issues, including the possibility of stranded assets, or as explored further below, the inability to mix alternative fuels and deliver those fuels through the existing distribution system.

4. *Technical issues with The CBP does not adequately address concerns about affordability and equity.*

While AltaGas’ CBP relies on many new investments in programs and infrastructure, it does not present a detailed plan to pay for these investments. Rather, as Dr. Stanton explains, the CBP refers repeatedly to “socializing costs” and ensuring “cost recovery” concerning end-use,

⁴⁸ Walker Aff., ¶ 23.

⁴⁹ Stanton Aff., ¶ 28.

transmission, and sourcing and supply.⁵⁰ Under the section entitled, general policy considerations, the CBP states that “Washington Gas will seek consideration for [] over-arching regulatory mechanisms” that include “developing a cost recovery mechanism that would socialize the costs and benefits of gas use to all energy users.”⁵¹ A similar claim is then repeated under the policy considerations for each of AltaGas’ three buckets of initiatives. Specifically:

- under the policies for End Use, the CBP states that the:

Policies to facilitate measures specifically related to energy efficiency promotion and programs as well as accelerating the deployment of high-efficiency equipment and appliances include: . . . Ensuring cost recovery and enabling utilities to earn a return on investment (ROI) for investments in next-generation end-use technology; Allowing for cost recovery associated with the promotion of ready-now lower GHG emissions appliances, contractors’ education, demonstration pilots, and similar items; . . . Utilizing accelerated recovery mechanisms to support infrastructure investment in service areas of high CHP/demand potential;. . . Applying tiered performance incentives (e.g. ROI adders) to support the implementation of behavioral energy efficiency programs.);^[52]

- under the policies for transmission and distribution, the CBP states that: “other policies that policymakers and the DC PSC can pursue to facilitate GHG emissions reduction during the transmission and delivery of natural gas, include[e]:. . . Cost recovery for investments in new detection equipment and personnel and/or pilot project participation; [and] [b]uilt-in incentives for performance that reward timely deployment and results.”);⁵³

⁵⁰ Stanton Aff., ¶ 13.

⁵¹ *Formal No. Case 1162*, Climate Business Plan, p. 28.

⁵² *Id.*

⁵³ *Id.*

- and under the policies for Sourcing and Supply, the CBP states that:

The development of RNG production sources for national, regional and local supply scenarios in the greater Washington, D.C. metropolitan region are all contingent upon Washington Gas being able to gain approval of some kind of legislative and/or regulatory structure that will include a timely cost recovery mechanism for Washington Gas. [And that] “this policy structure should address the following. . . Allocate incremental cost of low carbon gas supply to all customers in the District; [] Rate base and approve return for investments in interconnection facilities and equipment to facilitate access to low carbon gas supplies needed to meet gas quality specifications and standards (odorization, metering, gas chronometers, emergency shut off valves, etc.); [and] Rate base of investment in larger facilities such as pipelines and low carbon gas production, supply facilities and recovery of pipeline capacity costs that would support and facilitate the development and access to RNG and other low carbon supply”.⁵⁴

If the CBP were to be implemented as written it could translate into substantial costs for ratepayers.⁵⁵ Moreover, while AltaGas never explains its plan to “socialize” costs, this term implies a spreading of costs across members in a society. As Dr. Stanton explains, “this kind of vague suggestion of cost planning is not sufficient to adhere with the District’s MEDSIS principles of social equity and affordability. To achieve MEDSIS standards, all DC energy plans and programs must transparently analyze and discuss the distribution of costs and benefits across specific actors including utility investors, ratepayers, and taxpayers.”⁵⁶

⁵⁴ *Id.*, p. 29.

⁵⁵ Stanton Aff., ¶ 13.

⁵⁶ *Id.*

Furthermore, because WGL’s regulated arm is limited to distribution-only activities,⁵⁷ the Commission needs to pay particular attention to any of the Company’s claims that ratepayers should fund its business evolution initiatives.

B. The CBP and underlying studies have technical deficiencies.

As mentioned earlier, without the underlying workpapers, OPC and its consultants were only able to conduct a high-level review of the CBP. Nevertheless, Dr. Stanton and Mr. Walker both explain that AltaGas’ CBP includes several assumptions that appear to be erroneous.

1. *The CBP’s assumptions about RNG emission characteristics, availability, and scope of integration are faulty and at odds with other studies, including other ICF studies.*

RNG is a term that is defined by the AGA and AltaGas’ Climate Business Plan as gas that: “is derived from biomass or other renewable resources and is a pipeline-quality gas that is fully interchangeable with conventional natural gas.”⁵⁸ Dr. Stanton and Mr. Walker examined the CBP and Renewable Natural Gas Study and found both the analysis to be lacking in several respects. As a threshold matter, AltaGas and ICF assume incorrectly that all RNG is zero emitting.⁵⁹ But leading research organizations do not support this claim. Dr. Stanton explains that:

A 2017 study by M.J. Bradley & Associates found that when compared to natural gas, the net lifecycle emissions of RNG provide a 40 percent emission reduction. The National

⁵⁷ See, e.g. CleanEnergy Act ¶ 201 (g)(7) clarifying that the Act should not be “construed to permit the . . . gas company to own an energy generation asset, or to otherwise alter the provisions prohibiting such ownership in the Retail Electric Competition and Consumer Protection Act of 1999, effective May 9, 2000 (D.C. Law 13-107, D.C. Official Code § 34-1501 et seq.).

⁵⁸ Walker Aff. at ¶ 30.

⁵⁹ Stanton Aff. at ¶¶ 39 & 54, (citing the ICF RNG Report that states: “RNG represents a valuable renewable energy source with a low or net negative carbon intensity depending on the feedstock. The GHG emission accounting methodology has a significant impact on how carbon intensities for RNG are estimated, with a lifecycle approach reflecting the full emission reduction potential, such as including credit for avoided methane emissions.””)

Renewable Energy Laboratory notes that for biogas to qualify under the U.S. Environmental Protection Agency's Renewable Fuel Standard (RFS), it must meet a 60 percent emission-reduction threshold.

Dr. Stanton further explains that:

The emissions impacts of RNG depend entirely on the specifics of its production and distribution as well as the emissions of the fuel it is displacing. Most U.S. biogas that qualifies under the RFS is produced from landfill waste, food waste, animal waste and wastewater. Researchers from the European Commission have found that the feedstock for biogas (i.e. landfill waste, food waste, etc.) and the method used to store it (open or closed system) have a big impact on emission reductions—finding emissions reductions as small as 3 percent and as large as 330 percent with different combinations of feedstock and storage. The emissions of RNG also depend on its transport—leaks are costly from an emissions-reduction standpoint: Because biogas consists mostly of the methane it captures from waste streams, it is a much more potent greenhouse gas than carbon dioxide.⁶⁰

As such, the claim that all RNG entails zero greenhouse gas emissions is not in line with the best available research, it depends on a leak-free transmission and distribution system, and it can only be true for RNG from a subset of source materials.⁶¹

Furthermore, while AltaGas' assumed RNG demand for the District seems to be well within regional supply limits, the District would only be able to access that total volume if it was assumed to be the only purchaser of the RNG in the local region. Supplying 13 to 41 percent of total gas demand from RNG would be much more challenging if the rest of WGL or all of Metro DC was purchasing at this same level.⁶² As Dr. Stanton explains: AltaGas' contention that there

⁶⁰ Stanton Aff., ¶ 57.

⁶¹ Stanton Aff., ¶ 59.

⁶² Stanton Aff., ¶ 39.

is, or will be, sufficient RNG source material to supply the District's gas energy needs is unrealistic and at odds with prior ICF studies.⁶³ As noted in Dr. Stanton's Affidavit:

AltaGas' CBP includes replacement of 3 million MMBtu in 2032 (supplying 13 percent of District demand) rising to 7 million MMBtu in 2050 (supply 41 percent of District demand). Three to 7 million MMBtu is half or less than the ICF's conservative RNG supply potential for the DC Metro area (14 million MMBtu).

However, any assumption that DC would find RNG to be an affordable heating fuel choice that meets climate and reliability goals but that other jurisdictions would not find these same advantages in RNG would be very problematic. If RNG is a good choice for the District, it must also be a good choice for at least some of its neighbors. Virginia, for example, enacted a Clean Economy Act in 2020 that establishes net zero greenhouse gas emissions target for 2045.

Customer demand from WGL's entire service territory in the Greater DC area was 180 million MMBtu in 2018 (the District's demand is about 17 percent of this total). Supplying the same share of demand from RNG (13 to 41 percent) for WGL's Greater DC customers would require 23 to 74 million MMBtu.

Moreover, as Dr. Walker explains, RNG availability will depend on the amount of funding available for the various RNG sources.⁶⁴ Costs will reflect the differences in the level of specialized infrastructure and equipment that is needed to produce RNG at commercial quality standards and volumes. To produce RNG from dairies and municipal solid waste sites, greenfield anaerobic digestion facilities must be constructed from scratch.⁶⁵

⁶³ *Id.*, ¶¶ 45-50.

⁶⁴ Walker Aff. at ¶ 62.

⁶⁵ *Id.*

And even the least expensive RNG is expected to cost twice or more the price of natural gas. The higher the demand, the greater the cost, with ICF predicting that the most expensive RNG will sell for at least 10 times the price of natural gas.⁶⁶ As such, the expected costs of RNG do not compare favorably to that of natural gas. Funding and cost aside, the volumes of RNG that are proposed in the CBP and RNG Report are significant, and as Mr. Walker explains, there is no precedent for that level of production at the purity standards needed for safe delivery and use.⁶⁷

To date, very few U.S. gas utilities have successfully incorporated RNG into their gas distribution systems. Dr. Stanton's affidavit provides some examples of utilities that have introduced RNG into their systems, but the numbers of utilities that have done so are limited.⁶⁸ Moreover, as Dr. Walker explains, apart from the California utilities, most peer utilities/jurisdictions that have developed climate plans are planning for a 4-6% RNG by volume implementation rate.⁶⁹ This range is much less than WGL's Plan which assumes 40% of the system volume is comprised of RNG (assuming a 30% reduction in demand by 2050 or 28.7% at current volumes).⁷⁰

⁶⁶ Stanton Aff. at ¶ 53.

⁶⁷ Walker Aff. at ¶ 63; *see also* Walker at ¶ 36 (explaining that "RNG mixed into the existing gas system should adhere to industry standards for Btu content, quality and purity.").

⁶⁸ Stanton Aff. ¶ 40 (discussing Summit Natural Gas of Maine, DTE Energy of Michigan, SoCalGas of California, and Dominion Energy).

⁶⁹ Walker Aff. ¶ 65 (discussing Southwest Gas Corp (AZ) plans on utilizing RNG for 3% of their volume by 2035, SoCalGas (CA) aims for 20% RNG by 2030, Summit Utilities (ME) is developing their own RNG production facilities and is implementing RNG, and Liberty Utilities (NH) is proposing a 5 year plan to replace 6% of its' volume with RNG and so on).

⁷⁰ *Id.*

2. *The CBP and ICF Analysis do not address technical limitations of hydrogen.*

“Hydrogen” in the CBP, refers to the use of hydrogen gas as a combustion fuel. Hydrogen has been produced for combustion by using electricity to split water into its constituent gasses for decades through a process called electrolysis. This hydrogen then goes on to be used in hydrogen fuel cells or mixed with natural gas for combustion in combustion engines and home appliances. This mixture is often referred to as Hydrogen Compressed Natural Gas (“HCNG”).⁷¹

The Climate Business Plan proposes to blend hydrogen into the existing natural gas transmission system so theoretically new hydrogen pipelines would not be needed. However, this approach would have to be vetted for risk and safety and new regulations may be needed for these existing pipelines which are now carrying a new product with different risk and safety factors from conventional natural gas.⁷²

Mr. Walker explains that “the most important driver for safety and reliability on a natural gas distribution system has and continues to be maintaining strong infrastructure that safely holds the natural gas. This is the reason many utilities are replacing the aging leak prone infrastructure (cast iron, ductile iron, unprotected steel) with modern materials (plastic and coated/protected carbon steel) as replacement reduces the associated risk and emissions from leaking natural gas.”⁷³ Based on his experience, Mr. Walker states that most utilities in the US have either already

⁷¹ Walker Aff., ¶ 31 (internal citations omitted).

⁷² *Id.*

⁷³ *Id.*, ¶ 39.

replaced their aging leak prone mains and services or are accelerating their replacement to 20 years or better.⁷⁴

In order to blend hydrogen into the distribution system in a way that mitigates an increased risk of issues, Mr. Walker cautions that hydrogen should only be used in areas of the system that are composed of infrastructure capable of receiving the gas blend without significant leaks. Specifically, areas of WGL's system currently slated for replacement should be avoided or replaced prior to the introduction of hydrogen.

In his affidavit, Mr. Walker explains at length why this is so. In particular, Mr. Walker clarifies that:⁷⁵

[t]here are many risk factors that hydrogen shares with natural gas such as susceptibility to leaks in old main, need for leak prevention and detection systems, etc. However, Hydrogen also differs from natural gas in that it has a larger set of conditions in which ignition is possible. Also, having a molecular weight of almost 1/16th that of natural gas, Hydrogen is more susceptible to leaking at mechanical joints and in older, leak prone pipe.

Mr. Walker suggests that before hydrogen is introduced as an alternative to natural gas, it is important that the Commission and the Companies “vet and understand all of the risks and parameters associated with the mixing and use of hydrogen in a natural gas distribution system (mains and services) and in end user appliances and systems.” He suggests that the Commission and the Companies should look to systems that are 10-15 years ahead in hydrogen implementation for direction.⁷⁶ Mr. Walker explains that most gas companies are planning to test the introduction

⁷⁴ *Id.*

⁷⁵ *Id.*, ¶ 44.

⁷⁶ Walker Aff., ¶ 42; *see also* Stanton Aff., ¶ 43, “explaining that her research into the injection of hydrogen into U.S. gas distribution systems did not identify any utilities currently engaging in this practice.”

of hydrogen in a “pilot” area of their system with new modern materials in a small section of the system that can be easily isolated for safety and reliability during a test period. He also discusses a case study that was done from 2008-2011 in the Netherlands in which up to 20% hydrogen was mixed with natural gas to feed an isolated area with testing being conducted on piping, fittings, meters and appliances.⁷⁷ Studying these programs and implementing a similar pilot program would be ideal for WGL to learn the nuances and impact of blended gas.⁷⁸

Mr. Walker further describes an assessment that the National Renewable Energy Laboratory conducted at the request of the Department of Energy, to determine the relative risk of various percentages of hydrogen-natural gas blends, using data gathered by GTI. That assessment suggested that:

higher concentrations of hydrogen in distribution pipeline, (up to 50%) present a minor increase in overall risk (in both probability and severity of impact). However, in services, the risk is much higher at those concentrations due to the potential for confined spaces and trapped gas. The blending threshold at which the increased risk transitions from minor to moderate is at approximately 20% hydrogen.⁷⁹ Higher concentrations of Hydrogen would require further technical studies before implementation.⁸⁰ These risks are related to using existing infrastructure for the distribution of hydrogen in a mixture. Potential future hydrogen-only infrastructure would be designed differently and would carry different levels of risk.⁸¹ The physical impact of hydrogen on PE/PVC distribution infrastructure is very minimal at

⁷⁷ See e.g. International Gas Union Research Conference – 2008-2011 Pilot Project on Hydrogen Injection in Natural Gas on Island of Ameland in The Netherlands, Kiwa Gas Technology 2011, available at http://members.igu.org/old/IGU%20Events/igrc/igrc2011/igrc-2011-proceedings-and-presentations/poster%20paper-session%201/P1-34_Mathijs%20Kippers.pdf

⁷⁸ Walker Aff., ¶ 43.

⁷⁹ National Renewable Energy Lab, Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues, p. 14, March 2013, available at <https://www.nrel.gov/docs/fy13osti/51995.pdf>

⁸⁰ Walker Aff., ¶ 45.

⁸¹ Walker Aff., ¶ 46.

standard operating conditions. There is no meaningful interaction between the gas and plastic.⁸² The use of hydrogen in steel pipe can present some embrittlement concerns.⁸³ These concerns are mostly present at injection sites where the concentration of hydrogen is much higher and there is more potential for higher pressure. These concerns can be mitigated by instituting blending processes that prevent higher than normal pressures and higher hydrogen concentrations.⁸⁴ . . .The impact of hydrogen blended gas on transmission infrastructure is similarly focused on injections sites. Prior to integrating hydrogen into the transmission infrastructure, there need to be processes in place to mitigate integrity issues. These process should mostly be focused on avoiding high concentrations and high pressures.⁸⁵

Mr. Walker advises that “[t]he best way to mitigate potential issues with hydrogen blends in the distribution system is to ensure that a system does not contain old, brittle distribution main and services.”⁸⁶ Specifically, Mr. Walker advises that a targeted acceleration of the replacement of high-risk, vintage infrastructure would greatly enhance the safety of the implementation of a blended-gas Plan. This can be accomplished either by targeting areas where blended gas will be used or by expediting the modernization of the whole system.

In addition to raising safety and reliability concerns, Mr. Walker also raises concerns about the availability of hydrogen. He explains that:

while hydrogen for combustion at relatively low mixture percentages does not appear to have availability issues—current hydrolysis technology is capable of such production—there needs to be a further assessment as to

⁸² Walker Aff., ¶ 47.

⁸³ P. Sofronis, I. Robertson, D. Johnson - University of Illinois at Urbana-Champaign: “Hydrogen Embrittlement of Pipeline Steel: Causes and Remediation”, *available at* https://www.energy.gov/sites/prod/files/2014/03/f12/09_sofronis_pipe_steels.pdf

⁸⁴ Walker Aff., ¶ 48.

⁸⁵ Walker Aff., ¶ 50.

⁸⁶ Walker Aff., ¶ 49.

whether there will be reliable availability of the 16.45% hydrogen blend proposed by the CBP (2.8Bcf). There does not appear to be a readily available partner midstream provider who could deliver the volumes needed to meet the CBP's goals. Either hydrogen would need to be blended into the existing natural gas transmission pipeline system or new hydrogen pipelines built.^[87]

3. *The CBP and ICF Analysis include erroneous assumptions about the installation rate of Combined Heat and Power facilities in the District.*

The ICF Technical Study cited in the Climate Business Plan projects a “theoretical potential of more than 750 appropriate sites for Combined Heat and Power (CHP) in the District, which could provide 912 MW of electrical generation”⁸⁸ if all sites are implemented.⁸⁹ But the ICF Technical Study does not identify how many of the sites are actually planned to be installed, and references that the penetration of CHP units could “grow to 12 units per year by 2026 and remain stable through 2034.”⁹⁰ In his affidavit, Mr. Walker states that based on his understanding of the typical CHP process from other utilities’ CHP processes, each installation could take 12-15 months. As such, a significant effort would be needed to reach 12 installations a year on WGL and the target installation client’s part. Mr. Walker further explains that the potential actual total CHP installations at the pace WGL indicates in the CBP would be closer to ~100 -120 (or 100-120 MW) which is significantly less than the theoretical total of installations and MW replaced cited in the Study and Plan.⁹¹

⁸⁷ Walker Aff., ¶ 60.

⁸⁸ *Formal Case No. 1142, Climate Business Plant*, p. 13.

⁸⁹ Walker Aff., ¶ 19.

⁹⁰ Walker Aff., ¶ 20.

⁹¹ Walker Aff., ¶ 21.

4. *The CBP does not adequately address regulatory changes that may be needed to mix hydrogen or renewable natural gas into the existing system.*

Natural gas delivery infrastructure in the United States falls under the jurisdiction of the federal pipeline safety regulations (49CFR192).⁹² As Mr. Walker explains, the impact of mixing the geologically and non-geologically sourced gas into one system is not completely known, and changes in regulations may be needed to adapt these federal regulations to allow for the integration of RNG and hydrogen into natural gas transmission and distribution infrastructure if the use of these alternative sources becomes prevalent in the US.⁹³ Further, state agencies - primarily public service commissions - would then need to update their regulations to coincide with any federal regulatory changes since they are the agencies that typically enforce the pipeline safety regulations at the state level on gas utilities. Mr. Walker also explains that there is a possibility that additional regulations will be developed for the siting of the needed pipelines to transport RNG and hydrogen from the source of such to the market areas nationwide in the volumes needed to make these two alternatives sources of energy viable and cost effective that don't exist currently at the FERC Level.⁹⁴

C. Recommendations for Next Steps

The District is on the cutting edge of tackling greenhouse regulation and energy sector transformation. As Dr. Stanton explains, there are only a few examples of states that have progressed further and could, therefore, provide a definitive roadmap for the PSC to follow as it

⁹² PHMSA, 49 CFR 192, available at https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/49_192_highlight_8_15.pdf

⁹³ Walker Aff., ¶ 32.

⁹⁴ Walker Aff., ¶ 33.

explores how best to support the District’s climate policy goals. Nevertheless, the procedures and regulations that are being used in other U.S. jurisdictions could provide a window into this active and growing area of state and local policy making.⁹⁵

Mr. Walker, however, cautions that with the exception of CA, AltaGas’ Climate Business Plan and its US peers appear to focus more on ‘easy wins’ like boosting efficiency and buying “certified gas.” He explains that while “these efforts have their place, [] in the scope of a 30-year timeline – other utilities and countries, especially in Europe, have moved far beyond this stage and are implementing more comprehensive climate action plans with a heavier focus on infrastructure that will utilize hydrogen and renewable natural gas much more extensively, as well as the integration of renewable energy sources at varying percentages.⁹⁶

Based on OPC’s preliminary review of AltaGas’ Climate Business Plan, it is clear that the CBP is merely a preliminary step towards developing a comprehensive plan for how the Companies can support the District’s environmental policies and evolve its business to reduce reliance on the sale of natural gas. Because more work needs to be done, OPC encourages the Commission to open a new proceeding similar to what is occurring in at least four jurisdictions—New York, Massachusetts, Rhode Island, and California—to comprehensively review the heating sector transformation in the District, the associated economic, environmental, and technological challenges, and the impact of such a transformation on ratepayers. The Commission should subsequently task the Company, OPC, and other stakeholders with developing a roadmap to

⁹⁵ See Stanton Aff. at ¶¶ 60 – 86 (providing various jurisdictional examples and efforts).

⁹⁶ Walker Aff., ¶ 66.

address these challenges to ensure that the distribution system is efficiently planned and is reliable and safe on both a short- and long-term basis.

IV. CONCLUSION

WHEREFORE, for the reasons stated above, the Office respectfully requests that the Commission consider the above comments regarding AltaGas' Climate Business Plan and commence a new proceeding that is specifically aimed at examining the regulatory and business steps that are needed to support the District's climate policies.

Respectfully Submitted,

/s/ Sandra Mattavous-Frye_____

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Dated: June 26, 2020

ATTACHMENT A

**BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA**

In the Matter of

**the Merger Application of AltaGas
Ltd. and WGL Holdings, Inc.**

§
§
§
§

Formal Case No. 1142

**AFFIDAVIT OF
ELIZABETH A. STANTON, PHD**

Attachment A

**On Behalf of the
Office of the People's Counsel
for the District of Columbia**

June 26, 2020

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EXHIBIT LIST

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I. INTRODUCTION & QUALIFICATIONS

1. My name is Elizabeth A. Stanton, and I have been retained by the Office of the People's Counsel for the District of Columbia (OPC) to review the Climate Business Plan filed by AltaGas, Ltd. (AltaGas or Company) with the District of Columbia Public Service Commission (Commission or PSC) in Formal Case No. 1142.
2. I am the founder and Director of the Applied Economics Clinic (Clinic), a non-profit consulting group. The Clinic provides expert testimony, analysis, modeling, policy briefs, and reports for public interest groups on the topics of energy, environment, consumer protection, and equity. The Clinic also provides training to the next generation of expert technical witnesses and analysts through applied, on-the-job experience for graduate students in related fields and works proactively to support diversity among both student workers and professional staff.
3. I am a researcher and analyst with more than 19 years of professional experience as a political and environmental economist. I have authored more than 140 reports, journal articles, books and book chapters as well as more than 40 expert comments and oral and written testimony in public proceedings on topics related to energy, the economy, the environment, and equity. My articles have been published in *Ecological Economics*, *Climatic Change*, *Environmental and Resource Economics*, *Environmental Science & Technology*, and other journals. I have also published books, including *Climate Change and Global Equity* (Anthem Press, 2014) and *Climate Economics: The State of the Art* (Routledge, 2013), which I co-wrote with Frank Ackerman. I am also co-author of *Environment for the People* (Political Economy Research Institute, 2005, with James K.

Boyce) and co-editor of *Reclaiming Nature: Worldwide Strategies for Building Natural Assets* (Anthem Press, 2007, with Boyce and Sunita Narain).

4. My recent work includes Integrated Resource Plan (“IRP”) and Demand-Side Management (“DSM”) planning review, analysis and testimony of state climate laws as they relate to proposed capacity additions, and other issues related to consumer and environmental protection in the electric and natural gas sectors. I have submitted expert testimony and comments in state dockets in New Hampshire, Massachusetts, Vermont, Indiana, Illinois, Louisiana, and Minnesota as well as several federal dockets. In my previous position as a Principal Economist at Synapse Energy Economics, I provided expert testimony in electric and natural gas sector dockets. I also led studies examining environmental regulation, cost-benefit analyses, and the economics of energy efficiency and renewable energy. Prior to joining Synapse, I was a Senior Economist with the Stockholm Environment Institute’s (“SEI”) Climate Economics Group, where I was responsible for leading the organization’s work on the Consumption-Based Emissions Inventory (“CBEI”) model and on water issues and climate change in the western United States. While at SEI, I led domestic and international studies commissioned by the United Nations Development Programme, Friends of the Earth-U.K., and Environmental Defense Fund, among others.
5. I earned my Ph.D. in economics at the University of Massachusetts-Amherst, and have taught economics at Tufts University, the University of Massachusetts-Amherst, and the College of New Rochelle, among other colleges and universities. My curriculum vitae is attached to this Affidavit as Attachment (A)-1.

6. I am submitting this affidavit on behalf of the Office of People’s Counsel of the District of Columbia (“OPC” or “Office”). This affidavit and the accompanying exhibits were prepared by me or under my direct supervision and control.

II. SUMMARY OF AFFIDAVIT & FINDINGS

7. OPC retained me to review policy and economic aspects of AltaGas’ Climate Business Plan (“CBP” or “Climate Business Plan”)¹ and the attached Renewable Natural Gas Study (“RNG Report”)² that was prepared by ICF Resources, LLC (“ICF”).

8. My findings can be summarized as follows:

- First, the CBP examines only one scenario, with a limited set of options to achieve the District’s required emission reductions. It does not adequately address other pathways to achieve emission reductions, such as the role of electrification, energy efficiency, or accelerated pipeline replacement activities.
- Nor does the CBP address the pressing concerns of how to achieve the transition to a low emission environment affordably and equitably.
- The CBP appears to rely heavily on initiatives that the Company would like to be supported through ratepayer funding. The Commission should continue to monitor these requests with a critical eye.

¹ *Formal Case No. 1142, In the Matter of the Merger of AltaGas Ltd. and WGL Holdings, Inc.* (“*Formal Case No. 1142*”), Climate Business Plan for Washington D.C. (“CBP” or “Climate Business Plan”), filed March 16, 2020.

² *Formal Case No. 1142, Climate Business Plan, Appendix D, “Study on the Use of Biofuels (Renewable Natural Gas) in the Greater Washington, D.C. Metropolitan Area, March 2020”* (“RNG Report”), filed March 16, 2020.

- While AltaGas’ analysis and publicly provided materials do not provide sufficient information regarding assumptions, data, and methods to allow comprehensive third-party review, certain AltaGas and ICF assumptions and conclusions appear to be erroneous or inconsistent with other recent analyses.
 - The District is at the forefront of jurisdictions confronting the challenges that carbon reduction policies pose to gas utilities. However, there are several other jurisdictions that are confronting a similar transition that the Commission may be interested in monitoring to inform its own activities.
9. At this preliminary stage, the CBP is insufficient to fully ascertain the role of AltaGas’ operations in aiding the District’s clean energy and climate goals. As I will outline below, I recommend that the Commission continue to gather more information and outline a clear path for how it plans to proceed.

III. DISCUSSION

A. AltaGas’ CBP provides a limited view of how WGL can help further the climate and environmental goals of the District

10. As part of the terms of acquiring Washington Gas Light Company (“WGL” of “the Company”), the District of Columbia’s sole natural gas distribution utility, AltaGas was required to “file with the Commission a long-term business plan on how it can evolve its business model to support and serve the District’s 2050 climate goals (e.g., providing innovative and new services and products instead of relying only on selling natural gas).” The merger terms also require AltaGas to hold bi-annual public meetings to report on and discuss its progress on the business plan after it is filed.

11. AltaGas’ CBP offers one scenario for technical specifications to achieve the District’s required emission reductions (which I address further below). However, it fails to provide full consideration of other scenarios that could also achieve these reductions while doing a better job of adhering to the MEDSIS Guiding Principles (*see* Table 1).

Table 1. MEDSIS Guiding Principles

Principle	Description
Sustainable	Meet energy needs of present without comprising ability of future generations to meet their own needs
	Protect natural resources; reduce emissions and energy consumption
	Promote economic growth and innovation
	Promote social equity: Recognize impact of energy usage on daily life, strengthen community involvement, and provide equal access
Well-Planned	Poles and wires able to withstand high impact event; optimal use of distributed energy resources; include stakeholder input
Safe & Reliable	Utility and distributed generation safe and reliable; data collection and sharing to update interconnection rules and and service options
Secure	Best-practice physical and cybersecurity protections and risk management
Affordable	Distribution is just and reasonable and balances desires of customers and utilities
Interactive	Interactive and flexible energy delivery system
Non-Discriminatory	Energy system open to competition, provides customer choice, and utilizes customer data to better serve customers; reduce or eliminate barriers to DERs

Source: Smart Electric Power Alliance. May 31, 2019. Modernizing the Energy Delivery System for Increased Sustainability: Final Report v1.0 of the DCPSC MEDSIS Stakeholder Working Groups. Available at: <https://dcpdc.org/PSCDC/media/PDFFiles/Final-Report.pdf>

1. *The CBP does not account adequately for affordability and equity concerns.*

12. As OPC is the statutory representative of ratepayers in the District, I would like to draw particular attention, to the MEDSIS principles related to social equity and affordability:

- **Promote social equity:** Recognize impact of energy usage on daily life, strengthen community involvement, and provide equal access

- **Affordability:** Distribution is just and reasonable

13. AltaGas' CBP presents a suite of new investments in programs and infrastructure but does not present a detailed plan to pay for these investments. Rather, the CBP refers repeatedly to "socializing costs" and ensuring "cost recovery" concerning end-use, transmission, and sourcing and supply.³ If implemented as written, the CBP could translate into substantial costs for ratepayers. While AltaGas never explains its plan to "socialize" costs, this term implies a spreading of costs across members in a society. This kind of vague suggestion of cost planning is not sufficient to adhere with the District's MEDSIS principles of social

³ See, e.g. *Formal Case No. 1142*, Climate Business Plan, p. 3 (stating that WGL will "seek regulatory cost recovery" for its sourcing and supply initiatives and will "Socialize cost across customer base"); p. 28 (under general policy considerations stating that "Washington Gas will seek consideration for the following over-arching regulatory mechanisms[:]. . . Developing a cost recovery mechanism that would socialize the costs and benefits of gas use to all energy users."); *Id.* (under Policy-End Use stating that the "Policies to facilitate measures specifically related to energy efficiency promotion and programs as well as accelerating the deployment of high-efficiency equipment and appliances include: . . . Ensuring cost recovery and enabling utilities to earn a return on investment (ROI) for investments in next-generation end-use technology; Allowing for cost recovery associated with the promotion of ready-now lower GHG emissions appliances, contractors' education, demonstration pilots, and similar items; . . . Utilizing accelerated recovery mechanisms to support infrastructure investment in service areas of high CHP/demand potential;. . . Applying tiered performance incentives (e.g. ROI adders) to support the implementation of behavioral energy efficiency programs."); p. 29 (under policy transmission and distribution stating that "other policies that policymakers and the DC PSC can pursue to facilitate GHG emissions reduction during the transmission and delivery of natural gas, include[e]:. . . Cost recovery for investments in new detection equipment and personnel and/or pilot project participation; [and] Built-in incentives for performance that reward timely deployment and results."); *Id.* (under Policy-Sourcing and Supply stating that "The development of RNG production sources for national, regional and local supply scenarios in the greater Washington, D.C. metropolitan region are all contingent upon Washington Gas being able to gain approval of some kind of legislative and/or regulatory structure that will include a timely cost recovery mechanism for Washington Gas." And that "this policy structure should address the following. . . Allocate incremental cost of low carbon gas supply to all customers in the District; [] Rate base and approve return for investments in interconnection facilities and equipment to facilitate access to low carbon gas supplies needed to meet gas quality specifications and standards (odorization, metering, gas chronometers, emergency shut off valves, etc.); [and] Rate base of investment in larger facilities such as pipelines and low carbon gas production, supply facilities and recovery of pipeline capacity costs that would support and facilitate the development and access to RNG and other low carbon supply").

equity and affordability. To achieve MEDSIS standards, all DC energy plans and programs must transparently analyze and discuss the distribution of costs and benefits across specific actors including utility investors, ratepayers, and taxpayers. For those costs to be borne by either customers or taxpayers, a transparent presentation of costs requires analysis of the distribution of costs by customer type, income groups, and other social groupings, such as race and ethnicity.

2. *The CBP does not adequately address the District's electrification policies.*

14. The District of Columbia Department of Energy and Environment (DOEE) developed the *Clean Energy DC: Climate and Energy Action Plan* (“DC Action Plan”) as a roadmap for how the District plans to achieve its clean energy goals.

15. The DC Action Plan specifically calls for electrification to displace fossil fuel combustion stating that “The share of end-use energy coming directly from electricity or fuels produced from electricity must increase from less than 20% in 2010 to over 50% in 2050, displacing fossil fuel combustion.”⁴ The DC Action Plan also includes electric heat pumps among the characteristics of high performance buildings, and recommends that the District update building codes to make heat pumps more feasible, promote conversion to electric heat pumps for deep retrofits, and support related training and certification for HVAC technicians.⁵

⁴ *The District of Columbia Climate and Energy Action Plan*, at 5, August 2018, available at: https://doee.dc.gov/sites/default/files/dc/sites/ddoe/page_content/attachments/Clean%20Energy%20DC%20-%20Full%20Report_0.pdf

⁵ *Id.*, pp. 62, 67-68, 80, 116.

16. AltaGas' CBP rejects electrification of heating end uses in favor of a set of emission reduction measures that are largely speculative on a commercial scale, including "renewable" natural gas and "green" hydrogen injected into the existing gas delivery system, and the use of "gas heat pumps."
17. With regards to renewable natural gas (RNG), the DC Action Plan recommends a two-step process in order of priority: first, any end uses currently using natural gas that can be electrified should be; and second, investigate the use of biologically derived fuels to supply any remaining end uses.
18. The DC Action Plan makes no mention of hydrogen injection, or gas heat pumps. Instead it highlights electric-based systems for heating and cooling, including neighborhood-scale energy systems. DOEE has also funded research on ground source heat pumps⁶ and included electric heat pumps among strategies for improved energy efficiency.⁷
19. AltaGas's CBP offers one additional scenario that complies with the District's emissions goals but dismisses its own electrification-focused scenario on the basis of cost. Unfortunately, AltaGas has not made available any of the assumptions, data, or methods that would make it possible for stakeholders and third-party experts to review and evaluate

⁶ DOEE, *Notice of Funding Availability - A Characterization Study of Direct Geothermal Resource Potential for Ground Source Heat Pump Technologies*, October 20, 2017, available at: <https://doee.dc.gov/release/notice-funding-availability-characterization-study-direct-geothermal-resource-potential>

⁷ DOEE, *BEPS Working Group Session # 4 - Energy Efficiency Strategies and the Prescriptive Path*, September 17, 2019, available at: <https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/BEPS%20WG4%20Session%20Notes.pdf>

these claims. AltaGas' claim that its preferred scenario is more affordable should be robust enough to withstand outside review—a minimum standard in any public process.

20. AltaGas' choice to reject heating electrification and instead embrace less established technologies is surprising and out of step both with the District's plans, and policies and programs for reducing emissions from the heating sector nation-wide.

21. AltaGas' rejection of electrification is also out of step with actions that are being taken in other jurisdictions. Across the United States, there has been a widespread adoption of heating and water heating electrification technologies, such as air-source heat pumps and solar-powered hot water. Every state in the country except Georgia has some kind of electric-based renewable thermal program or policy.

22. Many states are providing incentives to their residents to adopt renewable energy or electrify their home energy systems by offering equipment rebates, tax credits and other tax incentives, loans and grants. For example:

- Thirty-seven states offer equipment rebates on electric heat pump and/or renewable thermal energy systems. Some of these rebates are flat amounts—like Hawaii's \$750-\$1,000 rebate for solar water heating⁸—and some are scaled to the size of the system installed or the amount of fossil fuels displaced—like South Dakota's \$250

⁸ *Water Heating*, Hawai'i Energy, available at: <https://hawaiienergy.com/for-homes/rebates/water-heating>.

per ton for electric air source heat pumps⁹ or New York's \$1.25 per kilowatt-hour of displaced thermal load for solar water heating systems.¹⁰

- Seventeen states offer a tax credit or tax exemption to purchase and/or install renewable energy systems—most commonly for solar and geothermal devices. For example, Connecticut offers 100 percent sales tax exemption for the purchase and installation of home solar or geothermal energy systems.¹¹ South Dakota offers a \$50,000 property tax exemption for small wind, solar, biomass, hydro and geothermal systems.¹²
- Nine states offer loan programs to install an electric heat pump system and/or solar water heating system. For example, Nebraska offers a low-interest loan (1.5 percent) for qualifying homeowners to finance an air source or ground source heat electrical heat pump.¹³

⁹ 2020 South Dakota Heat Pump Rebates, Otter Trail Power Company, available at: https://www.otpco.com/media/3103/sd_heatpump-rebatetable.pdf.

¹⁰ Solar Thermal Incentive Program – New York, DSIRE, July 23, 2015, available at: <https://programs.dsireusa.org/system/program/detail/4490>.

¹¹ DSIRE, Sales and Use Tax Exemption for Solar and Geothermal Systems - Connecticut, July 1, 2019, available at: <https://programs.dsireusa.org/system/program/detail/2613>.

¹² South Dakota Public Utilities Commission, Energy Efficiency Tax Incentives, May 30, 2014, available at: <https://puc.sd.gov/energyefficiency/default.aspx>.

¹³ DSIRE, Clay Electric Cooperative, Inc - Solar Thermal Loans – Florida, November 15, 2018, available at: <https://programs.dsireusa.org/system/program/detail/3060>.

- Some states, like New Hampshire¹⁴ and Massachusetts,¹⁵ also offer grant programs to support renewable thermal and/or electrification projects.

23. Ultimately, electrifying home heating equipment is a widespread, trusted strategy to lower emissions and heating costs.

3. *The CBP does not adequately address the role of energy efficiency in reducing carbon emissions.*

24. The energy efficiency savings included in AltaGas' CBP preferred plan do not appear to be additional to that already required in the District. At present, the District's gas energy efficiency programs are administered by the DC Sustainable Energy Utility (DCSEU). In accordance with the CleanEnergy DC Omnibus Act, the District's Public Service Commission formed a working group to develop metrics for electric and gas company energy efficiency and demand response ("EEDR") programs, with the goal of establishing utility-led EEDR programs that are not duplicative of those now offered by the DCSEU.¹⁶

25. Prior to the CleanEnergy DC Omnibus Act, DOEE established performance benchmarks for DCSEU for the five-year period between FY2017-FY2021. In FY2017, DCSEU exceeded the Year 1 maximum target of 0.5 percent, achieving 0.6 percent savings. In FY2018, DCSEU exceeded the cumulative Year 2 maximum target of 1.0 percent,

¹⁴ DSIRE, *Commercial & Industrial Renewable Energy Grants – New Hampshire*, June 7, 2017, available at: <https://programs.dsireusa.org/system/program/detail/5104>.

¹⁵ Massachusetts Department of Energy Resources, *Leading by Example Grants*, available at: <https://www.mass.gov/service-details/leading-by-example-grants>.

¹⁶ *Formal Case No. 1160, In the Matter of the Development of Metrics for Electric Company and Gas Company Energy Efficiency and Demand Response Programs Pursuant to Section 201(b) of the Clean Energy DC Omnibus Amendment Act of 2018*, ("Formal Case 1160"), Energy Efficiency And Demand Response (EEDR) Metrics Working Group Report, filed January 30, 2020 ("EEDR January 30, 2020 Report").

achieving 1.2 percent savings. For FY2021, DCSEU’s cumulative gas energy efficiency target is 2.5 to 3 percent.^{17,18} (For reference, continuing DCSEU’s minimum pace of 0.5 percent annual incremental gas savings would add up to *8 percent in 2032 and 17 percent in 2050*—before accounting for gradual retirement of measures over time.)

26. In contrast, AltaGas’ CBP calls for cumulative energy efficiency savings of *4 percent by 2032 and 14 percent by 2050*, even though it includes measures not currently offered by DCSEU: behavioral programs and “gas heat pumps.” These savings goals have a baseline of 2006 (compared to 2014 for DCSEU’s goals).

27. It should also be noted that in its DC Action Plan and Sustainable DC 2.0 Plan, the District has set out to achieve a long-term energy savings target of a 50 percent reduction in District-wide energy use by 2032 from a 2012 baseline.¹⁹ Even after adjusting for different baseline years, this savings target is more than 12 times greater than the 2032 savings recommended in AltaGas’ CBP.

¹⁷ DC Office of the Deputy Mayor for Planning and Economic Development, *Contract DOEE-2016-C-0002*. Awarded to Vermont Energy Investment Corporation, April 5, 2017, available at: http://app.ocp.dc.gov/Award_attachments/CW51134_VermontEnergyInvestmentCorporationContractNoDOEE-2016-C-0002executedApril52017.pdf

¹⁸ NMR Group *et. al.*, *Performance Benchmark Assessment of FY2018 DC Sustainable Energy Utility Programs*, submitted to the District of Columbia Department of Energy and Environment, June 25, 2019, available at: <https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/DCSEU%20FY2018%20Performance%20Benchmarks%20Report%20-%20FINAL%20DRAFT.pdf>

¹⁹ *Formal Case No. 1160*, EEDR January 30, 2020 Report, ¶ 16.

4. *The CBP does not adequately address the role of accelerated pipeline replacement activities.*

28. The pipeline repairs and replacement included in AltaGas' preferred plan do not appear to be additional to those already required and planned under PROJECT*pipes* 1 or proposed by WGL under PROJECT*pipes* 2. AltaGas' CBP calls for a continuation of the PROJECT*pipes* work—a 40-year program to replace all gas distribution—not a change, addition, or acceleration of that program.

29. The PROJECT*pipes* program began in 2014.²⁰ The 40-year replacement timeline extends beyond the District's 2050 carbon neutrality policy deadline.

30. The AltaGas/WGL Merger Commitment No. 74 required that "AltaGas and Washington Gas shall, within twelve (12) months after Merger Close, develop a proposal to accelerate PROJECT*pipes* to a 30-year program rather than a 40-year program." AltaGas' CBP does not include provisions for any acceleration.²¹

5. *The AltaGas CBP closely follows the American Gas Association playbook, which itself presents an incomplete view as to how gas utilities can further jurisdictional climate goals*

31. The American Gas Association ("AGA") is an industry organization representing more than 200 gas utility companies, which together serve 95 percent of all gas customers across

²⁰ *Formal Case 1115, Application of Washington Gas Light Company for Approval of a Revised Accelerated Pipe Replacement Program ("Formal Case 1115")*, Order No. 17602, rel. August 21, 2014.

²¹ *Formal Case No. 1142, In the Matter of the Merger of AltaGas Ltd. And WGL Holdings, Inc.*, Order No. 19396, Appendix A, p. 28, rel. June 29, 2018.

the United States.²² AGA advocates on behalf of its members on various gas industry issues and promotes the delivery of gas to homes and businesses.²³

32. For nearly a decade AGA has published its annual “AGA Playbook” to provide up-to-date information on gas and the gas industry, claiming that gas is “the solution for a clean energy future”.²⁴ The AGA playbook discusses recent trends in the gas industry as well as the organization’s long history. The 2020 playbook also covers the opportunities and challenges that face the gas industry in an effort to promote a path forward for gas as “the best energy choice.”²⁵

33. AltaGas cites the AGA Playbook as the source of its CBP’s arguments that gas is reliable, affordable, and highly efficient when compared to electricity for similar end uses.²⁶ In doing so, AltaGas attributes to the AGA Playbook the claim that gas is “over 99 percent reliable and affordable, costing \$879 less per year than a comparable home using electricity for heating, hot water, cooking and clothes drying.”²⁷

34. Neither the AGA Playbook nor AltaGas’ CBP provide explanation or verification of these findings. Missing are their underlying data, assumptions, methodology, description of scenarios, and any other basic information conventionally expected to substantiate

²² American Gas Association, *American Gas Association Overview*, March 4, 2019, available at: <https://www.aga.org/research/fact-sheets/american-gas-association-overview/>.

²³ American Gas Association, *Mission*, available at: <https://www.aga.org/about/mission/>.

²⁴ , American Gas Association, *American Gas Association Playbook*, 2020, available at: <http://playbook.aga.org/>.

²⁵ *Id.*

²⁶ *Formal Case No. 1142*, Climate Business Plan, p. 25.

²⁷ *Id.*

analytical work. In a public process such as this one, making calculations behind asserted modeling results available for review and verification by stakeholders and their third-party experts is a basic, universally respected minimum standard for accuracy.

B. The CBP and underlying studies have technical deficiencies.

35. As a threshold issue, neither AltaGas' CBP nor the attached studies provide sufficient information regarding the assumptions, data, and methods that were used to develop the analysis. The lack of this information inhibits the ability for third-party review and verification. It is my understanding that when OPC contacted AltaGas to get the underlying workpapers as another party requested through discovery, OPC was directed to the AltaGas website. The "workpapers" provided on the website are limited and not in native file format.
36. The lack of underlying information is also apparent in other ways. For example, during the March 30, 2020 technical conference on the Commission's Environmental Notice of Inquiry, I raised my concern that the CBP did not provide any analysis as to the methods used affordability or cost reduction. When I attempted to ask questions regarding that information, and OPC was instructed to seek that information in this proceeding.
37. In addition, AltaGas has not provided sufficient information regarding its cost modeling to assess whether or not its assumptions are accurate.
38. AltaGas should demonstrate that its analysis is robust by making its underlying data, assumptions and methodology available in this public process, including by providing all the information needed to replicate, confirm and/critique its findings. AltaGas should make this information available as soon as possible.

39. Without the underlying workpapers I was only able to conduct a high-level review of the CBP. Nevertheless, AltaGas' CBP includes several assumptions that appear to be erroneous, including:

- AltaGas' assumed RNG demand for the District seems to be well within regional supply limits, but only if the District is assumed to be the only purchaser of the RNG in the local region. Supplying 13 to 41 percent of total gas demand from RNG would be much more challenging if the rest of WGL or all of Metro DC was purchasing at this same level.²⁸
- Even the least expensive RNG is expected to cost twice or more the price of natural gas. The higher the demand, the greater the cost, with ICF predicting that the most expensive RNG will sell for at least 10 times the price of natural gas.
- AltaGas assumes incorrectly that all RNG is zero emitting.
- Injection of green hydrogen and RNG into a gas distribution system requires a higher (and more expensive) standard of pipe than typically used for natural gas; no costs for this system upgrade appear to have been included in AltaGas' analysis.

C. AltaGas' reliance on the incorporation of RNG into its system is undercut by the low number of successfully-implemented utilizations.

40. To date, very few U.S. gas utilities have successfully incorporated RNG into their gas distribution systems. Summit Natural Gas of Maine²⁹ and DTE Energy of Michigan³⁰ have

²⁸ Formal Case No. 1142, Climate Business Plan at 18.

²⁹ Summit Utilities, *AGA ESG/Sustainability Reporting*, December 2019, available at: <https://www.summitutilitiesinc.com/Documents/SUI%20AGA%20ESG%20Reporting%20Metrics.pdf>

³⁰ DTE Energy, *BioGreenGas*, available at: <https://newlook.dteenergy.com/wps/wcm/connect/dte->

both introduced some RNG into their distribution systems through voluntary programs, while SoCalGas of California³¹ offers customers the opportunity for RNG to be delivered through their distribution system. Dominion Energy has also partnered with Smithfield Foods and Vanguard Renewables to produce RNG from farms in multiple states with goal of adding it to gas distribution.³²

41. In 2018, Liberty Utilities of New Hampshire³³ and CenterPoint Energy of Minnesota³⁴ submitted proposals seeking to introduce RNG into their networks but were each denied by their respective state's utility commission. In April 2020, CenterPoint Energy submitted a second proposal to the Minnesota Public Utilities Commission requesting approval to permit RNG injection into its distribution system.³⁵ In February 2020, CenterPoint also proposed the Natural Gas Innovation Act at the Minnesota Legislature, which would allow gas utilities, such as itself, "to submit an alternative resource plan to the Public Utilities Commission to offer its customers alternative fuels, such as RNG, as well as new energy-

[web/home/service-request/residential/renewables/biogreen-gas#:~:text=The%20renewable%20natural%20gas%20is,supply%20from%20other%20traditional%20sources.](http://www.socalgas.com/web/home/service-request/residential/renewables/biogreen-gas#:~:text=The%20renewable%20natural%20gas%20is,supply%20from%20other%20traditional%20sources.)

³¹ SoCalGas, *Understanding Renewable Natural Gas*, available at: <https://www.socalgas.com/smart-energy/renewable-gas/understanding-renewable-natural-gas>

³² Dominion Energy, *Renewable Natural Gas*, available at: <https://www.dominionenergy.com/company/renewable-natural-gas>

³³ New Hampshire PUC DG 18-140 – Liberty Utilities (EnergyNorth Natural Gas) *Petition for Approval of a Renewable Natural Gas Supply and Transportation Contract*, available at: <https://www.puc.nh.gov/Regulatory/Docketbk/2018/18-140.html>

³⁴ CenterPoint Energy, *CenterPoint Energy files for renewable natural gas program in Minnesota*, August, 23, 2018, available at: <https://www.centerpointenergy.com/en-us/corporate/about-us/news/1179>

³⁵ CenterPoint Energy, *CenterPoint Energy proposed tapping Minnesota-made renewable natural gas*, April 24, 2020, available at: <https://www.centerpointenergy.com/en-us/corporate/about-us/news/1337>

efficiency and carbon-capture technologies to reduce or avoid greenhouse gas emissions from natural gas use.”³⁶ Both proposals are still under review.

42. In addition to individual utilities, states such as Oregon³⁷ and Nevada³⁸ have adopted regulations that allow and encourage gas utilities to incorporate RNG into their portfolios. In 2020, a bill was introduced to the Colorado General Assembly to adopt a renewable natural gas standard, which aims to establish portfolio targets for large gas utilities (serve more than 250,000 customers) on the percentage of gas purchased that is RNG.³⁹ This bill was postponed indefinitely on May 28, 2020.⁴⁰

43. While my research into hydrogen use in U.S. gas distribution systems did not identify any utilities currently engaging in this practice, a handful of international programs have researched and tested the injection of hydrogen, particularly from renewable sources (i.e. green hydrogen), into existing gas distribution systems. In the United Kingdom, a pilot program called HyDeploy injected zero-carbon hydrogen into Keele University’s gas

³⁶ CenterPoint Energy, *CenterPoint Energy proposed tapping Minnesota-made renewable natural gas*, April 24, 2020, available at: <https://www.centerpointenergy.com/en-us/corporate/about-us/news/1337>

³⁷ Oregon Legislative Assembly, Senate Bill No. 98, *Relating to Renewable Natural Gas*, 2019, available at: <https://olis.leg.state.or.us/liz/2019R1/Downloads/MeasureDocument/SB98/Enrolled>

³⁸ Nevada Legislature, Senate Bill No. 154, *Requires the Adoption of Regulations Authorizing Certain Renewable Natural Gas Activities*, February 13, 2019, available at: <https://www.leg.state.nv.us/Session/80th2019/Bills/SB/SB154.pdf>

³⁹ Colorado General Assembly, Senate Bill No. 20-150, *Adopt a Renewable Natural Gas Standard*, 2020, available at: <https://leg.colorado.gov/bills/sb20-150>

⁴⁰ *Id.*

network.⁴¹ Similar pilot programs have taken place in France,⁴² Germany,⁴³ and the Netherlands.⁴⁴ German gas pipeline operators have even presented a plan for the world's largest hydrogen grid based on former gas pipelines.⁴⁵ The Dutch government recently published an *Outlook on Hydrogen* outlining their plans to support a green hydrogen industry.⁴⁶ In the United States, researchers at the University of California Irvine, funded by SoCalGas, were the first in the nation to attempt to inject green hydrogen into a gas system in 2016.^{47,48}

⁴¹ Smart Energy International, *Hydrogen injected into gas network – first for UK*, January 7, 2020, available at: <https://www.smart-energy.com/industry-sectors/smart-energy/hydrogen-injected-into-gas-network-first-for-uk/>

⁴² ENGIE, *The GRHYD demonstration project*, November 8, 2016, available at: <https://www.engie.com/en/businesses/gas/hydrogen/power-to-gas/the-grhyd-demonstration-project>

⁴³ Hydrogen London, *Injection of hydrogen into the German gas distribution grid*, December 12, 2013, available at: <http://www.hydrogenlondon.org/news/injection-of-hydrogen-into-the-german-gas-distribution-grid/>

⁴⁴ Kippers, M.J. et al., *Pilot project on hydrogen injection in natural gas on Island of Ameland in the Netherlands*, 2011, available at: http://members.igu.org/old/IGU%20Events/igrc/igrc2011/igrc-2011-proceedings-and-presentations/poster%20paper-session%201/P1-34_Mathijs%20Kippers.pdf

⁴⁵ Radowitz, B., *German pipeline operators present plan for world's largest hydrogen grid*, Recharge, May 18, 2020, available at: <https://www.rechargenews.com/transition/german-pipeline-operators-present-plan-for-world-s-largest-hydrogen-grid/2-1-810731>

⁴⁶ Janssen, Jan Erik, Veii Jacobs, and Bart van Oorschot, *The Netherlands as a green hydrogen hub: government presents views on future of hydrogen*, Lexology, April 20, 2020, available at: <https://www.lexology.com/library/detail.aspx?g=84848b41-0541-4269-a151-30c87f6e20ff>

⁴⁷ UCI News, *In a national first, UCI injects renewable hydrogen into campus power supply*, December 6, 2016, available at: <https://news.uci.edu/2016/12/06/in-a-national-first-uci-injects-renewable-hydrogen-into-campus-power-supply/>

⁴⁸ SoCalGas, *Power-to-gas technology*, available at: <https://www.socalgas.com/smart-energy/renewable-gas/power-to-gas>

44. Gas heat pumps do not appear to be viable technology choice for low-cost heating and cooling. A gas heat pump is a type of air-source heat pump⁴⁹ that runs on gas rather than electricity. However, gas heat pumps are more expensive⁵⁰ and less readily available⁵¹ than their electric counterparts. As of 2017, the cost to produce a gas heat pump ranged from \$14,000 to \$24,000, due in large part to the unique requirements for gas heat pump engines.⁵² Due to their very small share of the U.S. heating/cooling market, customers are not broadly aware of gas heat pumps and the sales of and services for gas heat pumps are very limited.⁵³ The use of gas heat pumps for cooling is especially challenging,⁵⁴ and the reliable use of this equipment requires that its engine be run consistently over long periods of time.⁵⁵

⁴⁹ U.S. Department of Energy, *Absorption Heat Pumps, Heat Pump Systems*, available at: <https://www.energy.gov/energysaver/heat-pump-systems/absorption-heat-pumps>.

⁵⁰ Abuheibi, A., Mahderekal, I., Momen, A., and Vineyard, E., *Challenges and opportunities of Gas Engine Heat Pumps — Two Case Studies.*, Oak Ridge National Laboratory, 2017, available at: <http://hpc2017.org/wp-content/uploads/2017/05/P.4.7.4-Challenges-and-Opportunities-of-Gas-Engine-Driven-Heat-Pumps-Two-Case-Studies.pdf>.

⁵¹ *Id.*, p. 4.

⁵² *Id.*

⁵³ *Id.*

⁵⁴ Glanville, P. and Rowley, P., *Review of Research, Development, and Deployment of Gas Heat Pumps in North America.*, Gas Technology Institute, 2019, available at: <https://www.gti.energy/wp-content/uploads/2019/04/Review-of-Research-Development-and-Deployment-of-Gas-Heat-Pumps-in-North-America-June2018.pdf>

⁵⁵ Abuheibi, A., Mahderekal, I., Momen, A., and Vineyard, E., *Challenges and opportunities of Gas Engine Heat Pumps — Two Case Studies*, at 3, Oak Ridge National Laboratory, 2017, available at: <http://hpc2017.org/wp-content/uploads/2017/05/P.4.7.4-Challenges-and-Opportunities-of-Gas-Engine-Driven-Heat-Pumps-Two-Case-Studies.pdf>.

1. *ICF's findings regarding the availability of RNG to the District are not consistent with its own recent analyses.*

45. The only other recent study of U.S. RNG potential was also completed by the consulting firm ICF (*see* Figure 1).⁵⁶ The results of ICF's 2020 "Conservative" scenario match that of its 2019 "Low" scenario, and the 2020 "Achievable" matches 2019 "High" with one exception: the earlier study included one more stock material: "P2G/Methanation."⁵⁷ The total U.S. achievable potential range presented by ICF is very large: 1,600 to 3,800 million MMBtu in 2040. U.S. total RNG potential from other studies varies widely: Excluding scenarios of maximum technical potential these estimates range from 800 to 4,500 million MMBtu per year.⁵⁸

⁵⁶ For citations from AEC's literature review of RNG resources *see* Table 2, *infra*.

⁵⁷ ICF defines P2G/Methanation as follows: "The Power-to-Gas (P2G) process converts electricity to gas through electrolysis - where electricity is used to split water into hydrogen and oxygen. In the methanation process, hydrogen is processed with carbon dioxide to produce methane. If the electricity is sourced from renewable resources, the fuel product is carbon neutral. Hydrogen produced from P2G is a flexible energy product that can be used in energy storage, injected into the natural gas system to augment gas supply, or converted to methane and injected into pipelines directly." *See* ICF/AGF Study at 38.

⁵⁸ Where RNG volumes were presented as Bcf or dekatherms, they were converted to MMBtu using standard conversion factors.

Figure 1. U.S. national RNG potential comparison (million MMBtu/year)

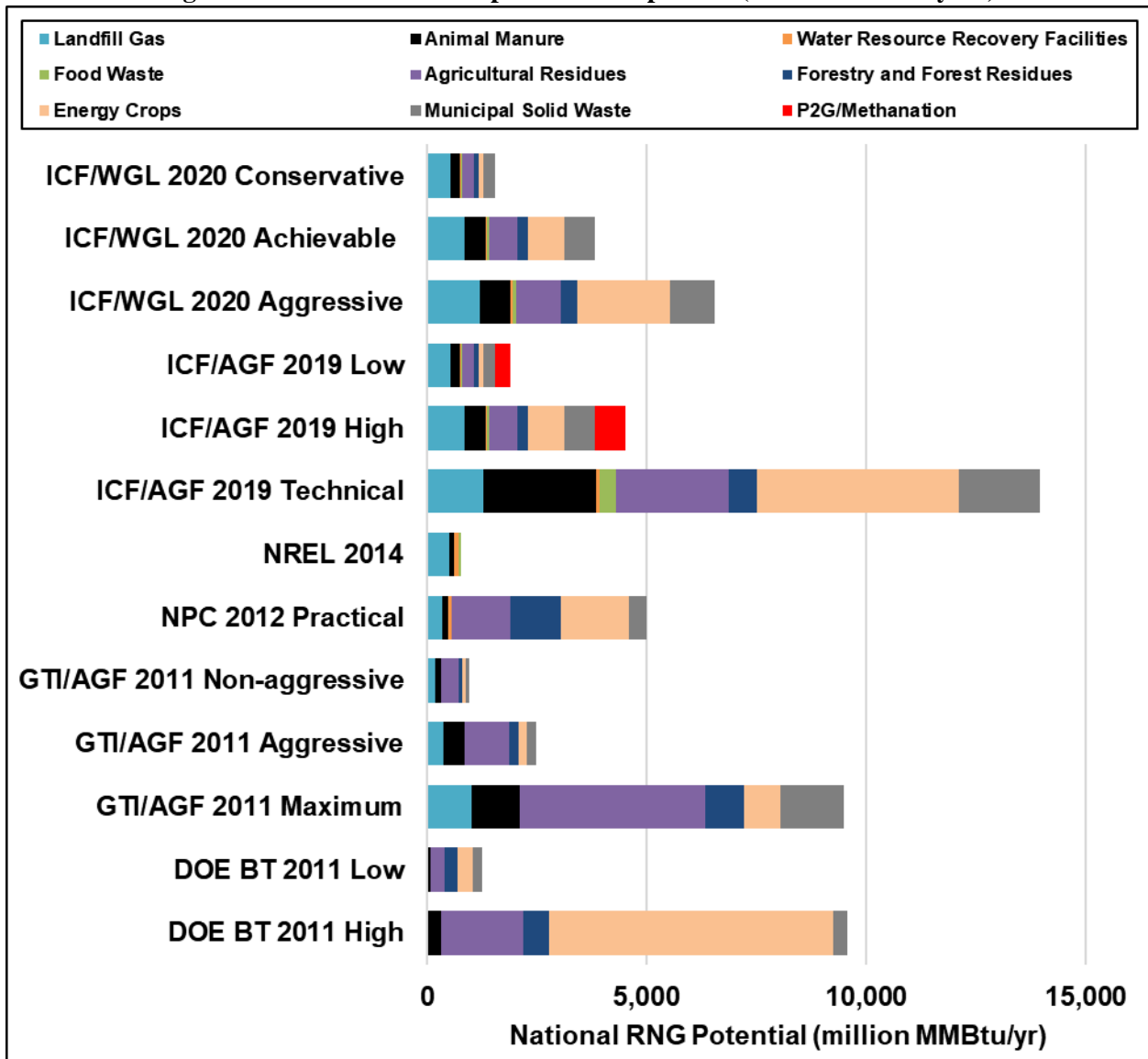


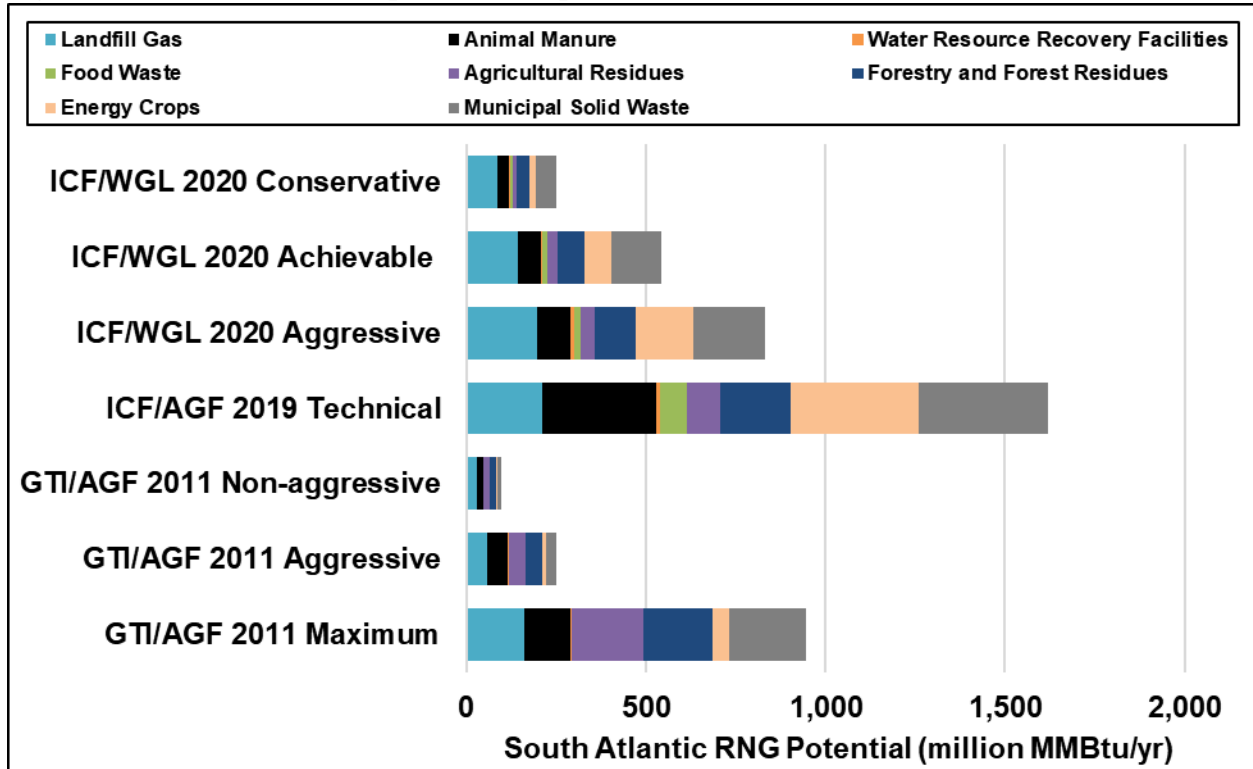
Table 2. Citations for RNG literature review

Study	Source
E3 2020	Aas, D. et al. April 2020. <i>The Challenge of Retail Gas in California's Low-Carbon Future</i> . Prepared for California Energy Commission. CEC-500-2019-055-F. Available at: https://ww2.energy.ca.gov/2019publications/CEC-500-2019-055/index.html
ICF/WGL 2020	ICF. March 2020. <i>Study on the Use of Biofuels (Renewable Natural Gas) in the Greater Washington, D.C. Metropolitan Area</i> . Prepared for Washington Gas Light Company. Available at: https://edocket.dcpsc.org/public/search/details/fc1142/597
ICF/AGF 2019	American Gas Foundation. December 2019. <i>Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment</i> . Prepared by ICF. Available at: https://www.gasfoundation.org/2019/12/18/renewable-sources-of-natural-gas/
Parker et al. 2017	Parker, N. et al. 2017. "Renewable natural gas in California: An assessment of the technical and economic potential." <i>Energy Policy</i> 111, 235-245. Available at: https://doi.org/10.1016/j.enpol.2017.09.034 .
UC Davis 2016	Jaffe, A. et al. June 2016. <i>The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute</i> . UC Davis Institute of Transportation Studies. UCD-ITS-RR-16-20. Available at: https://steps.ucdavis.edu/wp-content/uploads/2017/05/2016-UCD-ITS-RR-16-20.pdf .
NREL 2014	Saur, G., Milbrandt, A. July 2014. <i>Renewable Hydrogen Potential from Biogas in the United States</i> . National Renewable Energy Laboratory (NREL). Available at: https://www.nrel.gov/docs/fy14osti/60283.pdf
Duke 2014	Murray et. al. February 2014. <i>Biogas in the United States: An Assessment of Market Potential in a Carbon-Constrained Future</i> . Nicholas Institute for Environmental Policy Solutions, Duke University. Available at: https://nicholasinstitute.duke.edu/content/biogas-united-states-assessment-market-potential-carbon-constrained-future .
NPC 2012	Hamberg, K., et. al. March 2012. <i>Renewable natural gas for transportation: an overview of the feedstock capacity, economics, and GHG emission reduction benefits of RNG as a low-carbon fuel. Topic Paper #22</i> . A White Paper for the National Petroleum Council – Future Transportation Fuels Study. Available at: https://www.npc.org/FTF_Topic_papers/22-RNG.pdf
GTI/AGF 2011	American Gas Foundation. September 2011. <i>The potential for renewable gas: biogas derived from biomass feedstocks and upgraded to pipeline quality</i> . Prepared by the Gas Technology Institute. Available at: https://www.eesi.org/files/agf-renewable-gas-assessment-report-110901.pdf
DOE BT 2011	Sheehy, P. and Rosenfeld, J. 2017. <i>Design Principles for a Renewable Gas Standard</i> . ICF. Available at: https://static1.squarespace.com/static/53a09c47e4b050b5ad5bf4f5/t/5a56701dec212d1888aa212a/1515614239606/ICF_WhitePaper_Design_Principles.pdf Note: The DOE BT study (including the most recent update) did not estimate yields of RNG. The focus of the study is on the feedstock rather than the finished fuel. ICF used conversion efficiencies from the UC Davis work to estimate the tBtu of finished fuel (in this case, RNG) based on the feedstock potential reported in the DOE BT study.

46. ICF 2020 RNG Report also provides estimates for smaller regions: the South Atlantic (MD, DE, VA, WV, NC, SC, GA, FL and Greater DC) and DC Metro (including parts of Maryland, Virginia, and West Virginia). For the South Atlantic region, the ICF 2020 RNG

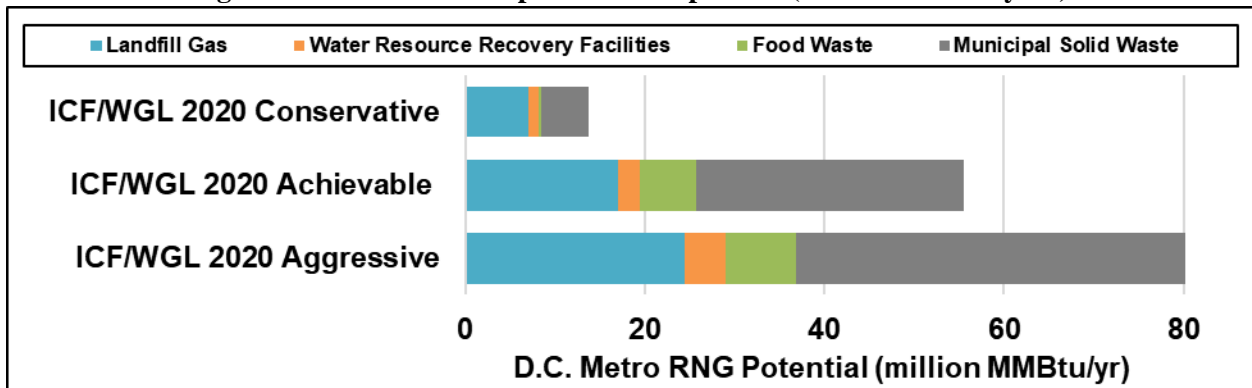
Report estimates 250 to 540 million MMBtu of achievable RNG potential (*see* Figure 2).
 In comparison, a 2011 GTI/AGF study estimated just 100 to 250 million MMBtu of achievable RNG potential.

Figure 2. South Atlantic RNG potential comparison (million MMBtu/year)



47. Only the ICF 2020 RNG Report provided an estimate of RNG potential for the greater DC region (including parts of Maryland, Virginia, and West Virginia): 14 to 56 million MMBtu of achievable RNG potential in 2040 (*see* Figure 3).

Figure 3. DC Metro RNG potential comparison (million MMBtu/year)



2. *AltaGas contention that there is, or will be, sufficient RNG source material to supply the District's gas energy needs is unrealistic.*

48. AltaGas' CBP includes replacement of 3 million MMBtu in 2032 (supplying 13 percent of District demand) rising to 7 million MMBtu in 2050 (supply 41 percent of District demand). Three to 7 million MMBtu is half or less than the ICF's conservative RNG supply potential for the DC Metro area (14 million MMBtu).

49. However, any assumption that DC would find RNG to be an affordable heating fuel choice that meets climate and reliability goals but that other jurisdictions would not find these same advantages in RNG would be very problematic. If RNG is a good choice for the District, it must also be a good choice for at least some of its neighbors. Virginia, for example, enacted a Clean Economy Act in 2020 that establishes net zero greenhouse gas emissions target for 2045.⁵⁹

⁵⁹ Virginia S.B. 94, *An Act to amend and reenact §§ 67-100, 67-101, 67-102, and 67-201 of the Code of Virginia, relating to the Commonwealth Energy Policy and Virginia Energy Plan*, (2020), available at: <https://lis.virginia.gov/cgi-bin/legp604.exe?201+ful+SB94ER+pdf>.

50. Customer demand from WGL's entire service territory in the Greater DC area was 180 million MMBtu in 2018 (the District's demand is about 17 percent of this total).⁶⁰ Supplying the same share of demand from RNG (13 to 41 percent) for WGL's Greater DC customers would require 23 to 74 million MMBtu.

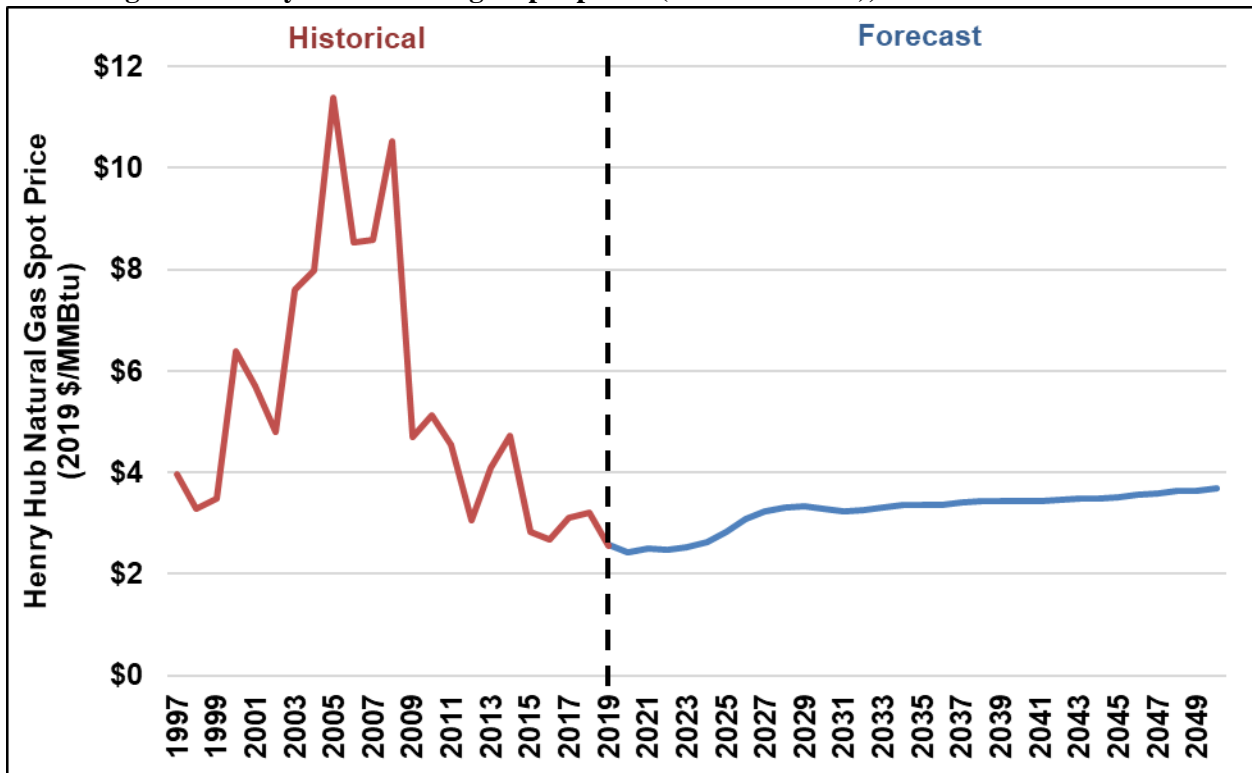
3. *The expected costs of RNG compared to that of natural gas does not result in cost savings.*

51. The expected costs of RNG do not compare favorably to that of natural gas: that is, RNG does not appear to provide a cost savings to customers and may result in a very large increase in costs. The price of natural gas in the DC region is expected to grow from around \$2.60 per MMBtu in 2019 up to \$3.70 per MMBtu in 2050 (*see* Figure 4).⁶¹ (Note that these EIA price forecasts were formulated before the onset of the 2020 COVID-19 economic contraction.)

⁶⁰ U.S. Energy Information Administration, *Natural Gas Annual Respondent Query System, Report: 176 Natural Gas Deliveries*, Released October 2019, available at: <https://www.eia.gov/naturalgas/ngqs/>.

⁶¹ All dollar values presented in 2019 dollars, converted (when necessary) using the CPI-U.

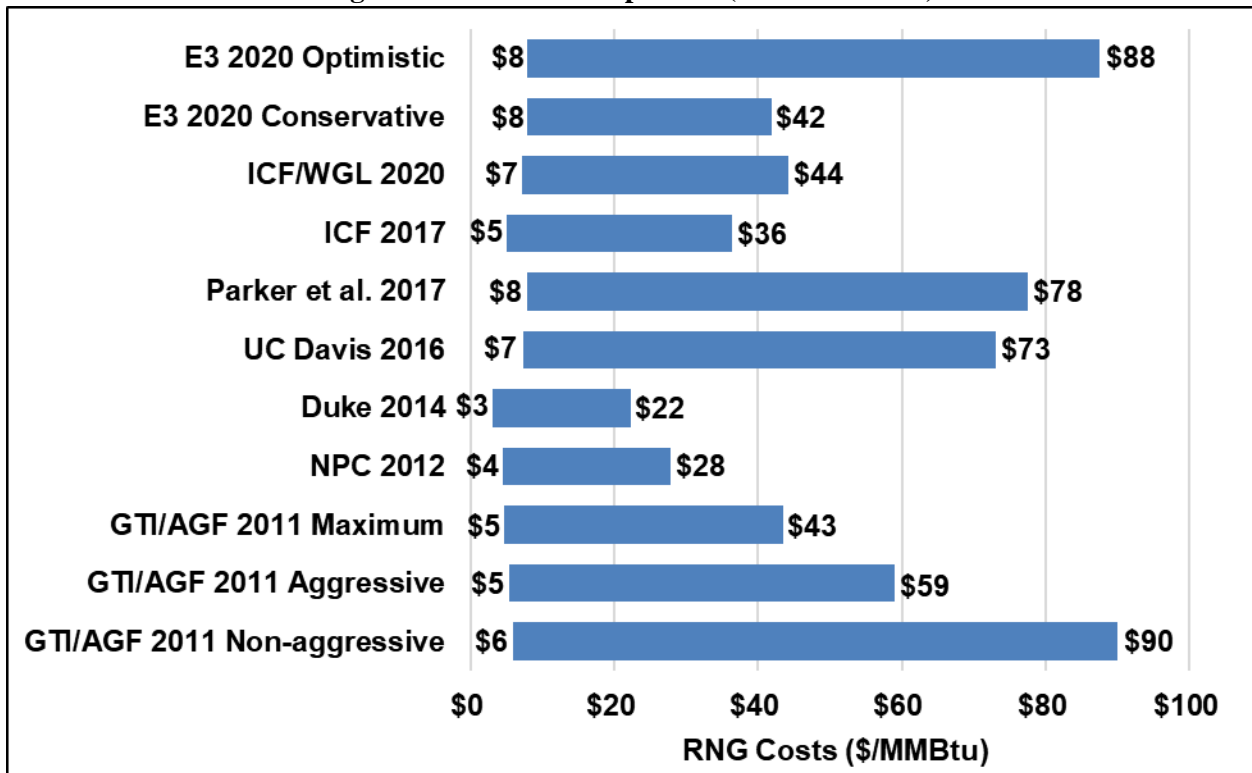
Figure 4. Henry Hub natural gas spot prices (2019 \$/MMBtu), historical and forecast



Data sources: Historical: U.S. EIA, *Henry Hub Natural Gas Spot Price: 1997-2019*, available at: <https://www.eia.gov/dnav/ng/hist/rngwhhdA.htm>; Future: U.S. EIA, *Annual Energy Outlook 2020 – Table 13. Natural Gas Supply, Disposition, and Prices*, January 29, 2020, available at: <https://www.eia.gov/outlooks/aeo/data/browser/#/?id=13-AEO2020®ion=0-0&cases=ref2020&start=2018&end=2050&f=A&linechart=~~~ref2020-d112119a.31-13-AEO2020&map=&ctype=linechart&sourcekey=0>

52. Every forecast of expected RNG prices gives a wide range of values depending on both the source material of the RNG and the extent of demand for the materials. RNG made from the least expensive materials is expected to cost \$3 to \$8 per MMBtu while that made from the most expensive materials ranges from \$22 to \$90 per MMBtu depending on the study (see Figure 5).

Figure 5. RNG cost comparison (2019 \$/MMBtu)



53. The least expensive RNG—according to the ICF 2020 RNG Report—would come from landfill gas and water resource recovery. ICF estimates the achievable RNG potential from these two materials (with costs starting at around \$7 per MMBtu) at 8 to 20 million MMBtu. Although this RNG potential is more than enough to fulfill the anticipated RNG demand of 3 to 7 million MMBtu (to supply 13 to 41 percent of total District gas demand), the District will likely need to compete for RNG supply with surrounding communities in the Greater Washington, DC metropolitan area (which includes parts of Maryland, Virginia, and West Virginia). Even at the low end of ICF’s cost estimates, RNG is still expected to cost twice as much as the price of natural gas. The higher demand for RNG, the greater the cost as more expensive RNG feedstocks are required, with ICF predicting a high end RNG cost that is at least 10 times the price of natural gas.

4. *AltaGas' assumption of zero emissions from RNG are inaccurate.*

54. AltaGas' assumption of zero emissions from RNG is incorrect, or, at best, is only correct under very special circumstances.

55. According to the ICF 2020 RNG Report: "RNG represents a valuable renewable energy source with a low or net negative carbon intensity depending on the feedstock. The GHG emission accounting methodology has a significant impact on how carbon intensities for RNG are estimated, with a lifecycle approach reflecting the full emission reduction potential, such as including credit for avoided methane emissions."⁶²

56. Leading research organizations do not support ICF's claim. A 2017 study by M.J. Bradley & Associates found that when compared to natural gas, the net lifecycle emissions of RNG provide a 40 percent emission reduction.⁶³ The National Renewable Energy Laboratory notes that for biogas to qualify under the U.S. Environmental Protection Agency's Renewable Fuel Standard (RFS), it must meet a 60 percent emission-reduction threshold.⁶⁴

57. The emissions impacts of RNG depend entirely on the specifics of its production and distribution as well as the emissions of the fuel it is displacing. Most U.S. biogas that qualifies under the RFS is produced from landfill waste, food waste, animal waste and wastewater.⁶⁵ Researchers from the European Commission have found that the feedstock

⁶² *Formal Case No. 1142*, ICF 2020 Report p. 81.

⁶³ Russel, P., Lowell, D., Jones, B., *Renewable Natural Gas*, M.J. Bradley & Associates, April 2017, available at: https://www.mjbradley.com/sites/default/files/MJB%26A_RNG_Final.pdf.

⁶⁴ Moriarty, K et al. *2017 Bioenergy Industry Status Report*, pp. 39-40, National Renewable Energy Laboratory, NREL/TP-5400-75776, April 2017, available at: <https://www.nrel.gov/docs/fy20osti/75776.pdf>.

⁶⁵ *Id.*

for biogas (i.e. landfill waste, food waste, etc.) and the method used to store it (open or closed system) have a big impact on emission reductions—finding emissions reductions as small as 3 percent and as large as 330 percent with different combinations of feedstock and storage.⁶⁶ The emissions of RNG also depend on its transport—leaks are costly from an emissions-reduction standpoint:⁶⁷ Because biogas consists mostly of the methane it captures from waste streams, it is a much more potent greenhouse gas than carbon dioxide.⁶⁸

58. According to the World Resources Institute, the claimed emission reductions of RNG depend on the notion that biogas is captured from a diverted waste stream⁶⁹—so not only do emissions reductions depend on:

- a) the emissions that would have occurred if it were not for the biogas⁷⁰ (i.e. how much would the landfill, wastewater plant or agricultural producer have emitted if its waste stream had not been diverted to biogas⁷¹),

⁶⁶ Boulamanti, A., Magilo, S., Giutoli, J., and Agostini, A., 2013, “Influence of different practices on biogas sustainability,” *Biomass and Bioenergy* 53, pp. 149-161, available at: <https://doi.org/10.1016/j.biombioe.2013.02.020>.

⁶⁷ Lyng, K. and B. Andreas, 2019, “Environmental Life Cycle Assessment of Biogas as a Fuel for Transport Compared with Alternative Fuels,” *Energies*, 12, p. 532 <https://doi.org/10.3390/en12030532>.

⁶⁸ Rudek, J., Schwietzke, S, “Not all biogas is created equal,” Environmental Defense Fund, April 15, 2019, available at: <http://blogs.edf.org/energyexchange/2019/04/15/not-all-biogas-is-created-equal/>.

⁶⁹ Gasper, R., Searchinger, T., *The production and use of renewable natural gas as a climate strategy in the united states*, World Resources Institute, April 2018, available at: <https://wriorg.s3.amazonaws.com/s3fs-public/production-use-renewable-natural-gas-climate-strategy-united-states.pdf>.

⁷⁰ Energy Systems Division, September 2011, *Waste-to-Wheel Analysis of Anaerobic-Digestion-Based Renewable Natural Gas Pathways with the GREET Model*, at 1 Argonne National Laboratory, available at: <https://publications.anl.gov/anlpubs/2011/12/71742.pdf>.

⁷¹ U.S. DA, U.S. EPA, U.S. DOE, August 2014, *Biogas Opportunities Roadmap: Voluntary Actions*

but also these impacts also depends on:

- b) the assumption that the methane being captured for the biogas would have been produced anyway. In contrast, growing crops for the sole purpose of creating biogas does not help reduce net methane emissions.

59. While RNG is widely acknowledged to facilitate some emissions reductions, not only are these emissions reductions significantly less than 100 percent, they also depend on the specifics of the RNG production and distribution process in question. Claiming that all RNG entails zero greenhouse gas emissions is not in line with the best available research, depends on a leak-free transmission and distribution system, and can only be true for RNG from a subset of source materials.

D. The District is not alone in addressing the transition to a zero-emission future.

60. The District is on the cutting edge of greenhouse regulation and energy sector transformation. Few examples exist of states that have progressed further and could, therefore, provide a definitive roadmap for the PSC to follow as it explores how best to support the District's climate policy goals. Nevertheless, I offer below several examples of procedures and regulations in other U.S. jurisdictions that provide a window into this active and growing area of state and local policy making.

1. New York

61. On March 19, 2020, the New York Public Service Commission (NY PSC) launched a proceeding to consider various issues related to gas utilities' planning procedures, stating:

to *Reduce Methane Emissions and Increase Energy Independence*, p. 18, available at: https://www.usda.gov/oce/reports/energy/Biogas_Opportunities_Roadmap_8-1-14.pdf.

“Gas utilities need to learn from recent experience and adopt improved planning and operational practices that enable them to meet current customer needs and expectations in a transparent and equitable way while minimizing infrastructure investments and maintaining safe and reliable service.”⁷² The NY PSC notes that gas utilities’ planning procedures “must be conducted in a manner consistent with the recently enacted Climate Leadership and Community Protection Act (CLCPA).”⁷³

62. The NY PSC explained that with this proceeding it aims to address several related issues, including: supply constraints, gas planning, non-pipe solutions, and gas moratoria standards, among others.

63. Since non-pipe solutions such as energy efficiency and electrification can decrease the need for additional investments in gas infrastructure, gas utilities should consider them beyond an “as-needed basis” and begin to integrate these solutions into their planning processes.⁷⁴

64. New York has launched several programs that address the intersection of natural gas and the state’s climate policy goals.

65. For example, the New York State Energy Research and Development Authority (NYSERDA) and New York State Department of Public Service (NYS DPS) have initiated a program entitled: *New Efficiency: New York*.⁷⁵ As part of this initiative, the New York

⁷² NYS PSC Case No. 20-G-0131, *Proceeding on Motion of the Commission in Regard to Gas Planning Procedures*, pp. 2-3, March 19, 2020, available at: <http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=20-G-0131&submit=Search>.

⁷³ *Id.*

⁷⁴ *Id.*, p. 7.

⁷⁵ NYSERDA and NYS DPS, *New Efficiency: New York*, 2018, available at:

State Public Service Commission (NYS PSC) issued an *Order Adopting Accelerated Energy Efficiency Targets*.⁷⁶ This 2018 initiative and order introduce building electrification as an option to simultaneously achieve the New York State's energy efficiency and climate goals:

New York State is catalyzing the innovation needed to bring energy efficiency into homes and businesses with energy benchmarking and new data-driven tools, State appliance standards and accelerated building codes, and other efforts to stimulate advancement in building electrification and heat pumps.^[77]

The New York State Public Service Commission's (PSC) December 2018 Order adopts significantly accelerated utility energy efficiency targets, which will double utility energy efficiency achievement over 2019 to 2025, including a subsidiary goal for energy savings from the installation of heat pumps.^[78]

66. In January 2020, NYS PSC issued an *Order Authorizing Utility Energy Efficiency and Building Electrification Portfolios Through 2025*,⁷⁹ which resulted in the development of

<https://www.nyserda.ny.gov/About/Publications/New-Efficiency>.

⁷⁶ NYS PSC Case No. 18-M-0084, *In the Matter of a Comprehensive Energy Efficiency Initiative*, Order Adopting Accelerated Energy Efficiency Targets, December 13, 2018, available at: <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={B330F932-3BB9-46FA-9223-0E8A408C1928}>

⁷⁷ NYSERDA and NY DPSC, *New Efficiency: New York*, 2018, available at: <https://www.nyserda.ny.gov/About/Publications/New-Efficiency>.

⁷⁸ *Id.*

⁷⁹ NYS PSC Case No. 18-M-0084, *In the Matter of a Comprehensive Energy Efficiency Initiative*, Order Authorizing Utility Energy Efficiency and Building Electrification Portfolios Through 2025, January 16, 2020, (Implementation Order), available at: <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={06B0FDEC-62EC-4A97-A7D7-7082F71B68B8}>

the *New York State Clean Heat Statewide Heat Pump Program*.⁸⁰ This program and order help further advance the development of building electrification in New York:

In its Implementation Order, the New York State Public Service Commission [] initiated a common statewide heat pump framework for New York State (“NYS”), designed to guide the efforts of the Electric Utilities and the New York State Energy and Research Development Authority (“NYSERDA”) in this area. The Electric Utilities and NYSEDA (collectively, “Joint Efficiency Providers”) support the State’s ambitious clean energy policies and particularly its efforts to advance the development of energy efficiency resources and building electrification.^[81]

This NYS Clean Heat Statewide Heat Pump Program (“NYS Clean Heat Program”) Implementation Plan (“CHIP” or “Implementation Plan”) is a key element of the State’s clean energy pathway and is designed to support customers in transitioning to energy-efficient electrified space and water heating technologies.^[82]

In general, customers are eligible for incentives under these programs no matter which heating fuel (e.g., fuel oil, natural gas, propane, biomass, electricity) they are either transitioning from or declining to include in a new construction application.^[83]

⁸⁰ NYSEDA, *NYS Clean Heat*, 2020, available at: <https://saveenergyny.ny.gov/NYScleanheat/>; NYS PSC, Case No. 18-M-0084, *In the Matter of a Comprehensive Energy Efficiency Initiative*, NYS Clean Heat: Statewide Heat Pump Program Implementation Plan, March 16, 2020, updated May 29, 2020, available at: <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={C8B4A2CD-CF7A-4149-A49B-F08DD7CAA32F}>.

⁸¹ NYS DPS Case No. 18-M-0084, *In the Matter of a Comprehensive Energy Efficiency Initiative*, NYS Clean Heat: Statewide Heat Pump Program Implementation Plan, p. 3, March 16, 2020, updated April 30, 2020.

⁸² *Id.*

⁸³ *Id.*, p. 6.

67. NYSERDA has also issued a report entitled: *Toward a Clean Energy Future: A Strategic Outlook 2020-2023*.⁸⁴ In this report, building electrification is one of NYSERDA's strategic areas of focus.

New York State will be investing over \$450 million in heat pump incentives through utilities and over \$200 million in market enabling support through NYSERDA. Achieving New York's aggressive emissions reduction goals will require a complete transformation in how New Yorkers heat and cool buildings, moving from fossil fuel-based systems to all-electric clean energy homes and buildings. This new initiative, called NY-Clean Heat, will pair consumer incentives with market-enabling initiatives to deliver electrification solutions to New Yorkers.⁸⁵

68. Among several key actions for 2020-2023, NYSERDA identifies the following:⁸⁶

Workforce development for building electrification and energy efficiency — Increase pool of skilled labor and industry partnerships to rapidly scale the nascent heat pump industry, providing economic opportunity for New Yorkers, including by making use of \$40 million in workforce development funding announced in 2020 State of the State.

Clean Heat Community Engagement and Assistance — Provide support to communities and local groups to stimulate adoption of heat pumps along with building envelope solutions, while leveraging local labor.

Clean Thermal District System — Test and demonstrate potentially scalable models for clean thermal district systems, using a NY-Prize style approach.

Clean Heat Supply Chain Development — Support development activities to draw larger HVAC companies and

⁸⁴ NYSERDA, *Toward a Clean Energy Future: A Strategic Outlook 2020-2023*, 2020, available at: <https://www.nysesda.ny.gov/About/Publications/Program-Planning-Status-and-Evaluation-Reports/Strategic-Outlook>

⁸⁵ *Id.*, p. 34.

⁸⁶ *Id.*, p. 36.

general contractors into the heat pump business and grow businesses that are selling/servicing heat pumps.

Heat-Pump-Ready Buildings — Build markets for insulation and air sealing services to accompany new heat pump solutions, to reduce thermal load and peak energy demands and increase home comfort.

69. New York utilities have also started their own initiatives to examine the impact of the gas transition on their services. For example, National Grid, a multi-state utility that serves roughly 3.6 million gas customers⁸⁷ throughout New York, Massachusetts, and Rhode Island, recently issued *Natural Gas Long-Term Capacity Report for Downstate New York*.⁸⁸

70. In the report, National Grid is proposing both RNG and hydrogen injection and some building electrification and neighborhood geothermal for its New York State gas distribution system:

We are supportive of partnering with the state of New York to achieve its Climate Leadership and Community Protection Act (CLCPA) goal of net zero Greenhouse Gas (GHG) emissions by 2050, with 85% reductions from New York’s energy and industrial emissions compared to 1990 levels and 15% carbon offsets. We are fully cognizant of the changing role of utilities, and the desire to include non-pipeline alternatives as part of the pathway to a sustainable energy future.⁸⁹

⁸⁷ National Grid, *US Principle Operations*, available at: <https://www.nationalgrid.com/about-us/what-we-do/us-principal-operations>

⁸⁸ National Grid, *Natural Gas Long-Term Capacity Report for Downstate New York*, February 2020, available at: https://millawesome.s3.amazonaws.com/Downstate_NY_Long-Term_Natural_Gas_Capacity_Report_February_24_2020.pdf

⁸⁹ *Id.*, p. 7.

71. In addition to “pursuing low-carbon gas options such as Renewable Natural Gas (RNG) and Hydrogen to increase supply and help meet carbon reduction targets”,⁹⁰ National Grid believes that they “can play an important role in building out Geothermal Heat Pumps as a targeted alternative to oil, new gas connections, and end-of-the-line Leak Prone Pipe repairs.”⁹¹

72. In 2016, National Grid connected a total of ten homes with “shared-loop GSHP systems” in a geothermal demonstration project in Downstate NY. “Building off this successful initial pilot, National Grid has proposed in its recent rate case filings a \$12M program that will connect 900 homes in Downstate NY to geothermal ground loops over the next four years.”⁹²

2. *Rhode Island*

73. On July 8, 2019, Rhode Island Governor Gina Raimondo signed Executive Order 19-06 outlining steps for a heating sector transformation that would ensure reliability and protect against climate change.⁹³ In this order, Governor Raimondo directed the Division of Public Utilities and Carriers (DPUC) and Office of Energy Resource (OER) to lead a Heating Sector Transformation effort “with the goal of reducing emissions from the heating sector while ensuring that Rhode Islanders have access to safe, reliable and affordable heating.”⁹⁴

⁹⁰ *Id.*, p. 10.

⁹¹ *Id.*, p. 42.

⁹² *Id.*, p. 47.

⁹³ Raimondo, G., *Executive Order 19-06: Heating Sector Transformation to Ensure Reliability and Protect against Climate Change*, State of Rhode Island and Providence Plantations, 2019, available at: <https://governor.ri.gov/documents/orders/Executive%20Order%202019-06.pdf>

⁹⁴ *Id.*, p. 2

74. DPUC and OER were ordered to provide Heating Sector Transformation recommendations by April 22, 2020 (see Brattle Group report below) to include:⁹⁵

Identification of the energy, economic, and environmental opportunities and challenges posed by Rhode Island's heating sector;

Development of a future state framework – through 2020 – for Rhode Island's heating sector highlighting points of intersection across our energy landscape, including the electric sector;

Identification of statutory and/or regulatory barriers to sector transformation and potential solutions to more effectively implement transformative heating solutions;

Opportunities to leverage existing programs and emerging opportunities to deliver lower-carbon heating solutions to Rhode Island households and businesses;

Identification of innovative partnership and new technologies that can provide heat to Rhode Islanders at sustainable economic and environmental levels.

75. In response to Governor Raimondo's Executive Order 19-06, the Rhode Island DPUC and OER commissioned the Brattle Group to conduct analysis and develop recommendations on the transformation of Rhode Island's heating sector. The Brattle analysis entitled: *Heating Sector Transformation in Rhode Island: Pathways to Decarbonization by 2050* ("Brattle Group Report"), notes that there are "many solutions for decarbonizing the heating sector, but they fall into three broad categories: (1) reducing energy needs by improving building energy efficiency; (2) replacing current fossil heating fuels with carbon

⁹⁵

Id.

neutral renewable gas or oil; and (3) replacing current fossil-fueled boilers and furnaces with electric ground source or air source heat pumps powered by carbon-free electricity.”⁹⁶

76. The Brattle Group further notes that:

[A]part from energy efficiency measures, which must play an important role independent of what heat solution is chosen, the decarbonization solutions” include: (1) decarbonizing fuels with renewable gas/power-to-gas (P2G) for gas customers and biofuel or power-to-liquids (P2L) for most other customers, and (2) electrifying heat via air source heat pumps (ASHP) and ground source heat pumps, including the development of GeoMicroDistricts.⁹⁷¹

77. The Brattle Group found that its scenarios focusing efforts on conversion to electric heat pumps were less expensive than scenarios focused on renewable fuels.

3. *Pennsylvania*

78. In 2019, the City of Philadelphia issued a Request for Proposals (RFP) to develop a business diversification study for its municipally-owned gas utility, Philadelphia Gas Works (PGW).⁹⁸ PGW has experienced a decrease in customer demand as a result of energy efficiency and conservation efforts in addition to the impacts of the region’s warming weather patterns. In light of the continued impacts of climate change and climate-related policies, PGW seeks input on how it will fit into a lower-carbon future while continuing to thrive financially and retain its workforce. The RFP states that:

⁹⁶ *Id.*, p. i.

⁹⁷ *Id.*

⁹⁸ Philadelphia’s Office of Sustainability, *Request for Proposals for a Philadelphia Gas Works Business Diversification Study for The City of Philadelphia*, October 2019, available at: <https://secure.phila.gov/ECONTRACT/documents/frmPDFWindow.aspx?docid=211910161339500211910181027421N&ext=pdf>

The City and PGW are interested in developing a business diversification study that provides a range of economically, and environmentally sustainable pathways for the utility to consider pursuing. Along with anticipated carbon emissions reductions, the study should also present the financial, regulatory and technological viability of each pathway.^[99]

4. *California*

79. The California's Public Utilities Commission's (CPUC)'s recently instituted a rulemaking to investigate a path forward as the state transitions away from natural gas.¹⁰⁰ In CPUC Rulemaking 20-01-007 the Commission states that:

The Commission issues this Order Instituting Rulemaking to respond to past and prospective events that together will require changes to certain policies, processes, and rules that govern the natural gas utilities in California. With respect to past events, several operational issues in Southern California prompt the Commission to reconsider the reliability and compliance standards for gas public utilities. Over the next 25 years, state and municipal laws concerning greenhouse gas emissions will result in the replacement of gas-fueled technologies and, in turn, reduce the demand for natural gas.

Thus, in order to ensure safe and reliable natural gas service at just and reasonable rates in California, the Commission will (1) develop and adopt updated reliability standards that reflect the current and prospective operational challenges to gas system operators; (2) determine the regulatory changes necessary to improve the coordination between gas utilities and gas-fired electric generators; and (3) implement a long-term planning strategy to manage the state's transition away from natural gas-fueled technologies to meet California's decarbonization goals.^[101]

⁹⁹ *Id.*, p. 1.

¹⁰⁰ CPUC Rulemaking 20-01-007, *Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and Perform Long-Term Gas System Planning*, January 2020, available at: <https://www.transmissionhub.com/wp-content/uploads/2020/01/CAorderGasJan272020.pdf>

¹⁰¹ *Id.*, p. 2.

5. *Massachusetts*

80. On June 4, 2020, the Massachusetts' Office of the Attorney General requested that the Department of Public Utilities:

initiate an investigation to assess the future of local gas distribution company (LDC) operations and planning in light of the Commonwealth's legally binding statewide limit of net-zero greenhouse gas (GHG) emissions by 2050....[T]he Commonwealth's climate policy requirements will have profound impacts on gas distribution system management, operations, and rates.^[102]

81. According to the Massachusetts Attorney General, status quo business and operating practices are not enough for Massachusetts gas utilities to continue to meet the Commonwealth's emission reduction goals into the future:

The Department has both the authority and expertise to initiate this urgent public discussion by promptly opening an investigation that will (1) examine the gas distribution industry, regulatory, and policy changes needed to support the achievement of the Commonwealth's mandated GHG emission limits; and (2) determine what near- and long-term adjustments are necessary to maintain a safe and reliable gas distribution system and protect consumer interests as the Commonwealth transitions from fossil fuels to a clean, increasingly electrified, and decarbonized energy future by 2050.^[103]

82. At the same time, the Massachusetts' FUTURE Act (Bill H.2849 and Bill S.1940) is presently in committees of both legislative houses.¹⁰⁴ In addition to addressing the safety

¹⁰² Massachusetts Office of the Attorney General (MA AGO), *Petition of the Office of the Attorney General Requesting an Investigation into the impact on the continuing business operations of local gas distribution companies as the Commonwealth achieves its 2050 Climate Limits*, June 2020, available at: <https://www.mass.gov/doc/dpu-gas-petition/download>. p. 1

¹⁰³ *Id.*, p. 3.

¹⁰⁴ The Commonwealth of Massachusetts 191st General Court, Senate Docket No. 1953 and House

challenges associated with the Commonwealth's current gas distribution system, the FUTURE Act aims to create a path forward to a safer renewable energy future. The FUTURE Act will provide a roadmap for gas distribution companies to transition to renewable thermal technologies for heating by: (1) allowing gas companies to pipe renewable thermal energy to buildings (i.e. neighborhood geothermal); (2) allowing gas companies to replace leak-prone gas infrastructure with modern renewable thermal infrastructure; (3) including a small fee on gas bills, similar to that on electric bills, to fund renewable energy projects; (4) requiring gas companies to increase renewable thermal energy capacity each year; and (5) ensuring that the costs associated with new fossil fuel infrastructure cannot be passed along to ratepayers after 2050.¹⁰⁵

83. Similar to New York, Massachusetts utilities have been actively involved in examining alternative technologies. As a part of their latest performance-based regulatory plan, Eversource, an investor-owned utility that delivers gas to approximately 533,000 customers in Connecticut and Massachusetts, has proposed to pilot three neighborhood projects that will test geothermal networks in series of targeted scenarios, including: multi-family buildings, mixed-use residential and commercial areas, and residential neighborhoods.¹⁰⁶ The objective of the geothermal pilot projects is to understand how to

Docket No. 3719, Bill No. S.1940/H.2849, *An Act For Utility Transition To Using Renewable Energy (FUTURE)*, available at: <https://malegislature.gov/Bills/191/S1940>.

¹⁰⁵ Gas Leak Allies, *The F.U.T.U.R.E. Act (H.2849/S.1940) An Act For a Utility Transition to Using Renewable Energy*, October 2019, available at: <https://d3n8a8pro7vhmx.cloudfront.net/mothersoutfrontma/pages/2591/attachments/original/1572553462/FUTUREInfo10.23.2019.pdf?1572553462>

¹⁰⁶ MA DPU Docket No. 19-120, *Petition of NSTAR Gas Company d/b/a Eversource Energy for Approval of an Increase in Base Distribution Rates and Performance-Based Regulatory Plan for Gas Service*

replace gas use with renewable heating and cooling systems through a shared geothermal system.¹⁰⁷ In its rate case petition, Eversource claimed that:

Because geothermal networks provide a low-carbon source of heating, exploring the potential of a geothermal network is critical as the Commonwealth seeks to reduce greenhouse gas emissions pursuant to the Global Warming Solutions Act.¹⁰⁸

6. *Illinois*

84. Peoples Gas, the gas distribution company serving customers in Chicago, has had some form of a leak-prone pipe replacement program since 1981. Over the years, stakeholders claim that Peoples Gas has failed to properly design, implement, and manage these programs, which has increased the public safety risks posed by the leak-prone infrastructure in the first place. Peoples Gas' most recent gas main replacement program, the System Modernization Program (SMP), has received similar critiques.

85. Critics claim that the SMP fails to protect public safety due to: (1) the prioritization of broader system improvement objectives over public safety objectives; and (2) the

Pursuant to General Laws Chapter 164, §94 and 220 C.M.R. §§ 5.00, et seq., Exhibit ES-PMC/MRG-1, Direct Testimony of McLean Conner, P. and Goldman, M., p. 46, November 8, 2019, available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/11419982>

¹⁰⁷ HEET, *Eversource Plans Three Geothermal Pilots*, January 3, 2020, available at: <https://heetma.org/2020/01/03/eversource-plans-three-geothermal-pilots/>

¹⁰⁸ MA DPU Docket No. 19-120, *Petition of NSTAR Gas Company d/b/a Eversource Energy for Approval of an Increase in Base Distribution Rates and Performance-Based Regulatory Plan for Gas Service Pursuant to General Laws Chapter 164, §94 and 220 C.M.R. §§ 5.00, et seq.*, Exhibit ES-PMC/MRG-1, Direct Testimony of McLean Conner, P. and Goldman, M., p. 43, November 8, 2019, available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/11419982>

consistent mismanagement of the SMP causing failure to meet annual replacement targets and have a credible cost estimate:¹⁰⁹

Peoples Gas is failing to appropriately address the public safety risk it invokes to justify the SMP. Instead of implementing a program that scientifically prioritizes at-risk pipes for replacement, the company is conducting a broad, overly reactive, system-wide upgrade. The pace of SMP spending places an unjustified and unnecessary affordability burden on Chicago gas customers. The acceleration of gas system improvement investment harms Illinois' ability to meet its greenhouse gas emission targets and risks saddling ratepayers with billions of dollars of stranded investment.¹¹⁰

86. An Illinois Commerce Commission docket on this subject is anticipated.

87. This concludes my affidavit.

¹⁰⁹ Scarr, A. & Orcutt, J., *Tragedy of Errors: The Peoples Gas Pipe Replacement Program is a Poorly Designed, Mismanaged, Bad Investment for Chicago*, Illinois PIRG Education Fund, June 2019, available at: https://illinoispirg.org/sites/pirg/files/reports/Tragedyoferrors_scrn.pdf

¹¹⁰ *Id.*, p. 63.

**BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA**

In the Matter of

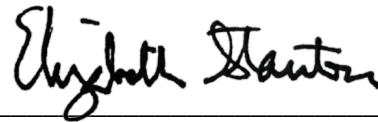
**the Merger Application of AltaGas
Ltd. and WGL Holdings, Inc.**

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Formal Case No. 1142

ATTESTATION

I declare under penalty of perjury that the foregoing affidavit was prepared by me or under my direction and is true and correct to the best of my knowledge, information, and belief.



Elizabeth A. Stanton 6/26/2020

ATTACHMENT (A)-1



Elizabeth A. Stanton, Ph.D., Director and Senior Economist

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PROFESSIONAL EXPERIENCE

Applied Economics Clinic, Arlington, MA. *Director and Senior Economist*, February 2017 – Present.

The Applied Economics Clinic provides technical expertise to public service organizations working on topics related to the environment, consumer rights, the energy sector, and community equity. Dr. Stanton is the Founder and Director of the Clinic (www.aeclinic.org).

Liz Stanton Consulting, Arlington, MA. *Independent Consultant*, August 2016 – January 2017.

Providing consulting services on the economics of energy, environment and equity.

Synapse Energy Economics Inc., Cambridge, MA. *Principal Economist*, 2012 – 2016.

Consulted on issues of energy economics, environmental impacts, climate change policy, and environmental externalities valuation.

Stockholm Environment Institute - U.S. Center, Somerville, MA. *Senior Economist*, 2010–2012; *Economist*, 2008 – 2009.

Wrote extensively for academic, policy, and general audiences, and directed studies for a wide range of government agencies, international organizations, and nonprofit groups.

Global Development and Environment Institute, Tufts University, Medford, MA. *Researcher*, 2006– 2007.

Political Economy Research Institute, University of Massachusetts-Amherst, Amherst, MA. *Editor and Researcher – Natural Assets Project*, 2002 – 2005.

Center for Popular Economics, University of Massachusetts-Amherst, Amherst, MA. *Program Director*, 2001 – 2003.

EDUCATION

University of Massachusetts-Amherst, Amherst, MA

Doctor of Philosophy in Economics, 2007

New Mexico State University, Las Cruces, NM

Master of Arts in Economics, 2000

School for International Training, Brattleboro, VT

Bachelor of International Studies, 1994



AFFILIATIONS

Global Development and Environment Institute, Tufts University, Medford, MA.

Senior Fellow, Visiting Scholar, 2007 – Present

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TEACHING EXPERIENCE

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Fitchburg State College, Fitchburg, MA

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Adjunct Professor, 2005

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Adjunct Professor, Program in Intercultural Management, Leadership, and Service, 2004

Resume dated June 2020

ATTACHMENT B

**BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA**

In the Matter of

**the Merger Application of AltaGas
Ltd. and WGL Holdings, Inc.**

§
§
§
§

Formal Case No. 1142

**AFFIDAVIT OF
ROD WALKER**

Attachment B

**On Behalf of the
Office of the People's Counsel
for the District of Columbia**

June 26, 2020

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EXHIBIT LIST

Attachment (B)-1	Rod Walker CV
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I. INTRODUCTION

1. My name is Rod Walker. I am CEO & President of Rod Walker & Associates, a Management Consultancy and Technical Advisory firm based near Atlanta, Georgia.
2. I have over thirty-five years of technical and business expertise in the natural gas industry.
3. As a natural gas engineer, I have designed, constructed, and managed hundreds of gas infrastructure projects and their associated enhancement programs while working in industry at several natural gas utilities. During my time with the Atlanta Gas Light Company, I was responsible for designing, constructing, and managing cast iron and bare steel replacement projects and programs as well as public works and system enhancement projects and programs in the greater Atlanta metropolitan area. A copy of my curriculum vitae is attached as Attachment (B)-1.
4. I submit this affidavit on behalf of the Office of People's Counsel of the District of Columbia ("OPC" or "Office"). This affidavit and the accompanying exhibit were prepared by me or under my direct supervision and control and I am familiar with all matters addressed in this affidavit.
5. The Office retained me to review and evaluate the technical and engineering aspects of the AltaGas Ltd. ("AltaGas" or the "Company") Climate Business Plan and attached studies that were filed in this proceeding to address the District's climate goals.¹

¹ *Formal Case No. 1142, In the Matter of the Merger of AltaGas Ltd. and WGL Holdings, Inc.* ("Formal Case No. 1142"), Climate Business Plan for Washington D.C. ("CBP" or "Climate Business Plan"), filed March 16, 2020.

II. SUMMARY OF FINDINGS AND RECOMMENDATIONS

6. WGL/AltaGas' Climate Business Plan takes a minimal-effort approach to the task of meeting the District of Columbia's (DC) climate goals by 2050. The Climate Business Plan's proposed reduction in future emissions relies heavily on end user efficiency/behavioral improvements (50.7%) and Renewable Natural Gas ("RNG") (29.5%) for future emissions reductions. The priority of the Climate Business Plan appears to be focused on continuing expected natural gas distribution company activities, which could be termed as "business as usual" activities, as a large part of the CBP focuses on efficiency improvements and the replacement of its aging leak prone infrastructure. The CBP is less focused on other forward-looking ideas to address carbon reduction goals in a more innovative and productive approach as it proposes minimal innovative changes and integrates the use of RNG and hydrogen as alternative fuels late in the CBP's timeframe (30 years).
7. After a review of the proposed Climate Business Plan, it is evident that it is based on questionable assumptions, unrealistic expectations, and lack of thorough analysis regarding the feasibility of many of the proposed actions in this plan. In short, the CBP:
 - Does not appear capable of addressing the amended climate goals set by the District^{2,3} namely not less than 100% of energy from tier one renewable

² DOEE, CLIMATE READY DC The District of Columbia's Plan to Adapt to a Changing Climate (2020), available at https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/CRDC-Report-FINAL-Web.pdf

³ D.C. Code § 34-808.02 as amended by the CleanEnergy DC Omnibus Amendment Act of 2018, DC Act 22-583 (Jan. 18, 2019)(enrolled original, signed), <http://lims.dccouncil.us/Download/40667/B22-0904-SignedAct.pdf> ("CleanEnergy DC Act" or "Act").

sources, 0% from tier two renewable sources, and not less than 5.5% from solar energy by 2032

- Does not assist with the city's plan to develop and begin to implement a roadmap to reduce greenhouse gas emissions by 100 percent by 2050.
- Does not address ensuring that climate risks are considered in utility rate cases for investments in new and upgraded infrastructure such as flood proofing and/or elevating natural gas infrastructure by incorporating, pressure regulating stations, odorization equipment, tanks, controls, electric components, etc.
- Does not assist with implementing long-term energy resilience planning.

8. The CBP relies on several assumptions whose feasibility seems questionable – namely:

- the installation capability of CHP facilities by 2050,⁴
- the impact that upgrades in customer behavior and efficiency upgrades can have by 2050, and,
- the reduction of consumer fuel demand by 2050

9. These assumptions need to be reevaluated for feasibility and their impact on the Climate Business Plan needs to be reassessed.

10. A regulatory and technical review of the feasibility of the Climate Business Plan resulted in the following four (4) observations:

⁴ *Formal Case 1162*, CBP, p. 13.

- Mixing of RNG as defined by the American Gas Association (“AGA”) and Certified Natural Gas into the system appears to have minimal if any impact on infrastructure and end users.⁵⁶
- Real-world production of RNG from varying sources involving filtering and refining should be checked for compliance with industry standards for BTU content and purity.
- Mixing of hydrogen into the system appears to have potential for impact on transmission and distribution infrastructure such as steel pipe embrittlement and leaks. Impact on end-user equipment needs further evaluation, but comparable implementations in Europe have shown minimal impact on residential equipment. The impact on infrastructure should be carefully evaluated and the use of hydrogen should be limited to modern sections of the system verified for compatibility with hydrogen.
- New and modified pipeline safety regulations will potentially be needed to cover the use of blended fuel (natural gas and either RNG and hydrogen) in pipelines at potentially both the federal and state agency levels.

11. A safety and reliability review of the Climate Business Plan resulted in the following five (5) observations:

⁵ AGA, Securing a Role for Renewable Natural Gas (RNG), *available at* <https://www.aga.org/research/reports/renewable-natural-gas-rng/>

⁶ *Formal Case No. 1142, Climate Business Plan, p. 18.*

- The impact of Hydrogen on the safety and reliability of transmission infrastructure needs to be evaluated further. There is a chance of embrittlement and leaks especially at injection sites and in vintage mains/fittings.
- The impact of Hydrogen on the safety and reliability of distribution infrastructure needs to be evaluated further. There is a higher chance of leaks with the use of hydrogen - especially when used in vintage mains/fittings.
- The assumption being made by the CBP is that the RNG used will adhere to the AGA definition of “pipeline-quality” gas.⁷ If the RNG does not meet that standard and there are contaminants, the impact of those must be evaluated for compatibility with the system. Verification is needed that the proposed RNG production facilities and methods are capable of producing the required volumes of RNG, while meeting the AGA definition.
- The WGL system is on a forty (40)-year schedule to replace its aging, leak-prone mains, and services. A targeted acceleration of the replacement of high-risk, vintage infrastructure would greatly enhance the safety of the implementation of a blended-gas Plan - especially where hydrogen will be used. The more efficient approach would be to accelerate the replacement

⁷ AGA, Securing a Role for Renewable Natural Gas (RNG), *available at* <https://www.aga.org/research/reports/renewable-natural-gas-rng/>

of old mains and services by expediting the modernization of the system as a whole.

- A pilot program prior to the introduction of hydrogen into the system to monitor the impact on the infrastructure and end user equipment is needed to improve the safety of the eventual introduction of hydrogen system-wide. Similar pilot programs have been done in Europe and can be used as a guide.⁸

12. A review of the feasibility of blending different gasses into the same system resulted in the following three (3) observations:

- RNG that adheres to industry standards from the American Gas Association (AGA) for Btu content, quality and purity should have no significant feasibility issues in a blended-gas system
- Certified gas should have no significant feasibility issues in a blended-gas system as it is simply traditional natural gas that has been responsibly sourced with minimal environmental impact and minimal emissions.
- Hydrogen has no known negative interactions with the other gasses proposed for used in a blended-gas system, however its impact on the infrastructure and end-user equipment should be evaluated as discussed in other sections of this report.

⁸ See e.g. International Gas Union Research Conference – 2008-2011 Pilot Project on Hydrogen Injection in Natural Gas on Island of Ameland in The Netherlands, Kiwa Gas Technology 2011, available at http://members.igu.org/old/IGU%20Events/igrc/igrc2011/igrc-2011-proceedings-and-presentations/poster%20paper-session%201/P1-34_Mathijs%20Kippers.pdf

13. A review of the impact that the Climate Business Plan could have on end users resulted in the following two (2) observations:

- The use of RNG/Certified gas in the system should have no significant impact on residential end users and most industrial customers assuming that the RNG adheres to the AGA definition as given in the CBP and that the gas meets industry standards for purity and Btu content.
- The use of Hydrogen in the system at a low percentage blend should have minimal impact on end users, but a study on the impact to appliances and equipment must be performed prior to use. Impact to industrial customers must be assessed on a case-by-case basis.

14. A review of the availability of these alternate fuels proposed by the Climate Business Plan resulted in the following three (3) observations:

- While current technology is available to produce hydrogen at the levels needed for the CBP, the reliability of those production sources, and the transportation reliability/availability of the hydrogen needs further evaluation to ensure that the volumes of hydrogen would be accessible to WGL in DC for use in its' gas system.
- RNG availability will depend on the amount of funding available for the various RNG sources to ensure enough volumes are produced close to WGL's gas system. Costs will reflect the differences in the level of specialized infrastructure and equipment that is needed to produce RNG at commercial quality standards and volumes.

- Certified Gas is currently available in the quantities proposed by the CBP and various standards are evolving with new sources likely.

15. In addition to the Climate Business Plan, I also reviewed other climate plans done by WGL's peers and other jurisdictions around the country and globally. The Climate Business Plan is comparable to some US-based peers who have enacted similar, efficiency-focused plans such as South Carolina's Climate, Energy and Commerce Plan, the MA Clean Energy and Climate Plan for 2020, and the PA Climate Action Plan. The Climate Business Plan does not make as significant an effort at making large shifts in new technology adoption, new infrastructure implementation or system modernization efforts as many other jurisdictions – particularly WGL's European counterparts who are significantly further ahead in adapting to future climate concerns. The Climate Business Plan also makes minimal effort to accelerate the adoption of alternate non-natural gas energy sources and keeps as its primary focus, maintaining natural gas usage in a business as usual approach. Within the context of the United States-based, the CBP will be marginally effective at achieving a significant shift in emissions reduction and transition to sustainable energy use.

16. Due to the various questionable assumptions, focus on maintaining the status quo as much as possible and not addressing alternate energy sources, the Climate Business Plan does not appear capable of meeting the amended goals set forth by the District.

III. DISCUSSION

17. This affidavit and the discussion within are not intended to provide an exhaustive study of the CBP, but rather highlights some of the primary issues with the CBP given the data that has been made available.

A. *Technical Assessment of the CBP*

18. AltaGas/WGL contracted with ICF Consulting to conduct a study of alternative approaches to emission reduction strategies for the District of Columbia to meet these commitments. This study was designed to address whether or not emissions from the natural gas system in DC could be reduced consistent with the District's emissions reductions goals and identify the appropriate role for WGL's natural gas system in the future.

1. *Combined Heat and Power Installation Rate*

19. The ICF Study cited in the CBP projects a "theoretical potential of more than 750 appropriate sites for Combined Heat and Power (CHP) in the District, which could provide 912 MW of electrical generation"⁹ if all sites are implemented.

20. The Study does not identify how many of the sites are actually planned to be installed and references that the penetration of CHP units could "grow to 12 units per year by 2026 and remain stable through 2034."

21. From our understanding of the typical CHP process from other utilities' CHP processes, each installation could take 12-15 months, which means a significant effort is needed to reach 12 installations a year on WGL and the target installation client's

⁹ *Formal Case No. 1142, Climate Business Plant, p. 13.*

part. Regardless, the potential actual total CHP installations at the pace WGL indicates in the CBP would be closer to ~100 -120 (or 100-120 MW) which is significantly less than the theoretical total of installations and MW replaced cited in the Study and Plan.

2. *Efficiency Improvements*

22. The CBP assumes that efficiency improvements and behavioral modifications with an ~53% adoption rate can greatly reduce the amount of wasted energy. The “End User” section of the CBP accounts for approximately 50% of the CBP’s future emissions reductions.
23. Efficiency improvements are a cornerstone of the CBP – comprising just over half of the proposed future emissions reductions. While new building standards, behavioral modifications, CHP, etc. can all make a big impact on the total amount of energy used, the amount suggested in the CBP is unlikely. In the RNG Report, the claim is made that building construction improvements and an aggressive adoption rate of new meters by 2050 will reduce energy consumption. The ICF report also relies on behavioral programs to reduce residential energy use by 0.85%/customer.¹⁰ While these types of activities will undoubtedly reduce demand for NG, the assumption that that reduction can be sustained through 2050 is unsupported. Long-term programs like this typically have diminishing returns in efficiency improvements as time goes on. In addition, current gas appliances and end-user equipment is already fairly efficient to begin with.

¹⁰ *Formal Case No. 1142*, Climate Business Plan, Appendix D, “Opportunities for Evolving the Natural Gas Distribution Business to Support the District of Columbia’s Climate Goals” (“RNG Report”), filed March 16, 2020.

24. These three assumptions need to be reevaluated for feasibility. Lack of feasibility, if found, would have a significant impact on the performance of this Plan in meeting the goals set by the District and the CBP’s overall effectiveness.

3. *Projected Gas System Volumes*

25. The CBP assumes a reduction in total gas system volume by 2050 of 30.2% implying a reduction in demand for natural gas. This number is inclusive of the proposed addition of RNG and Hydrogen to the system.

26. The CBP’s projected volumes are as follows:¹¹

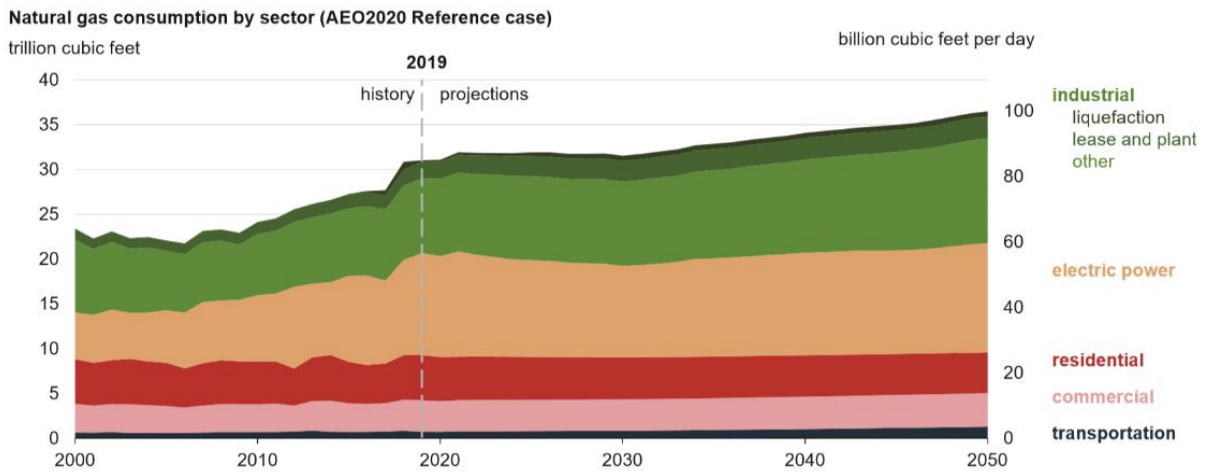
YEAR	Total BCF	RNG BCF	% System RNG	P2G+ Green Hydrogen BCF	Total Low-Carbon Gas BCF	Percent of Low-Carbon Gas
2018	24.41	-	0%	-	-	0%
2025	24.22	0.48	2%	-	0.48	2%
2032	23.20	3.00	13%	-	3.00	13%
2050	17.02	7.00	41%	2.80	9.80	58%

27. The EIA in their 2020 Annual Energy Outlook estimates that by 2050 there will be a moderate uptick in natural gas consumption in the US: *“Industrial and electric power demand drives U.S. natural gas consumption **growth** but consumption in the residential and commercial sectors remains relatively flat across the projection period in the AEO2020 Reference case.”*¹²

¹¹ Formal Case No. 1142, Climate Business Plan, p. 18.

¹² EIA, 2020 Annual Energy Outlook – Natural Gas, available at www.eia.gov/outlooks/aeo (emphasis added).

Industrial and electric power demand drives U.S. natural gas consumption growth—



28. The EIA’s benchmark assessment contradicts the estimates made in the CBP. The Company should provide further information on how changes to its projected volume assessment or a reassessment of the impact that this assumption makes on its conclusions.¹³

B. Technical Assessment of Renewable Natural Gas and Hydrogen

29. The CBP attempts to set up an “all or nothing” dilemma in its approach to the combination of natural gas usage and electrification. The approach taken by the WGL Plan uses what it calls a “fuel-neutral” tact which will preserve customer choice and maintain the use of natural gas. The CBP does not address the reduction of natural gas use beyond efficiency reductions similar to what has been done for decades. Most climate plans within and without the US include a combination of efficiency and alternate fuel sources together with the use of some electrification.

¹³ The EIA 2019 Energy Outlook provides a near-identical projection of moderate growth. See EIA 2019 Energy Outlook, p. 27, available at <https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf>

30. Renewable Natural Gas (RNG) is a term that is defined by the AGA and AltaGas' Climate Business Plan as gas that: "is derived from biomass or other renewable resources and is a pipeline-quality gas that is fully interchangeable with conventional natural gas."¹⁴

31. "Hydrogen" in the Climate Business Plan refers to the use of hydrogen gas as a combustion fuel. Hydrogen has been produced for combustion by using electricity to split water into its constituent gasses for decades through a process called electrolysis. This hydrogen then goes on to be used in hydrogen fuel cells or mixed with natural gas for combustion in combustion engines and home appliances. This mixture is often referred to as Hydrogen Compressed Natural Gas (HCNG).¹⁵

1. Regulations Concerning the Simultaneous Use of Geologically and Non-Geologically Sourced Gas in One System

32. Natural gas delivery infrastructure in the United States falls under the jurisdiction of the federal pipeline safety regulations (49CFR192).¹⁶ While the impact is not completely known, changes in regulations may be needed to adapt these federal regulations to allow for the integration of RNG and hydrogen into natural gas transmission and distribution infrastructure if the use of these alternative sources becomes prevalent in the US.

¹⁴ *Formal Case No. 1142*, Climate Business Plan, p. 18; AGA, Securing a Role for Renewable Natural Gas (RNG), available at <https://www.aga.org/research/reports/renewable-natural-gas-rng/>.

¹⁵ Nanthagopal, K., *et al.*, Hydrogen Enriched Compressed Natural Gas, 15 THERMAL SCIENCE 4, pp. 1145-1154, available at <http://www.doiserbia.nb.rs/img/doi/0354-9836/2011/0354-98361100044N.pdf>

¹⁶ PHMSA, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, 49 CFR 192, available at https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/49_192_highlight_8_15.pdf

33. In turn, state agencies - primarily public service commissions - would need to update their regulations to coincide with any federal regulatory changes since they are the agencies that typically enforce the pipeline safety regulations at the state level on gas utilities. In addition, there is a possibility that additional regulations will be developed for the siting of the needed pipelines to transport RNG and hydrogen from the source of such to the market areas nationwide in the volumes needed to make these two alternatives sources of energy viable and cost effective that don't exist currently at the FERC Level.

2. *Technical Feasibility of Mixing Geologically and Non-Geologically Sourced Gas in One System*

34. From review of information available on the subject, the mixing of RNG with traditional, geologically sourced gas in the existing gas distribution system appears to be feasible and does not pose any readily apparent technical issues.

35. RNG production takes many forms and the gas produced by these varied sources is of varying Btu content and purity. Real world RNG must be refined, filtered, and checked for purity—a key part of any business plan involving the use of RNG.

36. To achieve this feasibility, RNG mixed into the existing gas system should adhere to industry standards for Btu content, quality, and purity.

37. Hydrogen poses a different set of concerns. The proposed use case for hydrogen is blending it into the existing natural gas transmission system so new hydrogen pipelines would not be needed. However, this approach would have to be vetted for risk and safety and if so, new regulations will still be needed for these existing pipelines which

are now carrying a new product with different risk and safety factors from conventional natural gas.

38. In order to blend hydrogen into the distribution system in a way that mitigates increased risk of issues, it should only be used in areas of the system that are composed of infrastructure capable of receiving the gas blend without significant leaks. Specifically, areas of WGL's system currently slated for replacement should be avoided or replaced prior to the introduction of hydrogen. I address this issue further below.

C. Consistency of the CBP with the Primary Drivers of Safety and Reliability

1. System Safety and Reliability During Implementation of Climate Plan

39. The most important driver for safety and reliability on a natural gas distribution system has and continues to be maintaining strong infrastructure that safely holds the natural gas. This is the reason many utilities are replacing aging leak prone infrastructure (e.g. cast iron, ductile iron, unprotected steel) with modern materials (e.g. plastic and coated/protected carbon steel) as replacement reduces the associated risk and emissions from leaking natural gas. Based on my experience in performing assessments and due diligence in over 30 utilities across the United States, most utilities in the US have either already replaced their aging leak prone mains and services or are accelerating their replacement to 20 years or better.

40. As gas companies and regulators are addressing climate change policies, the traditional safety concerns must be viewed in context with the future planned uses (or decommissioning) of the system. For RNG, improvements to the infrastructure are not as critical.

41. However, to the extent a utility plans to use hydrogen in its system the portions of the natural gas distribution system using hydrogen need to be upgraded as discussed prior in this document with modern materials because the properties of these alternative fuels could cause leaking in older mains and services even more so than natural gas. In order for WGL to integrate the use of hydrogen in its natural gas system, the Company will need to accelerate the replacement of its aging leak prone mains and services in the portions of the system where hydrogen will be introduced.
42. Hydrogen in the distribution system poses a challenge when assessing the relative safety of the addition to end users/the public. Before hydrogen is introduced as an alternative to natural gas, it is important that the Commission vet and understand all of the risks and parameters associated with the mixing and use of hydrogen in a natural gas distribution system (mains and services) and in end user appliances and systems. The Commission and the Company should look to systems that are 10-15 years ahead in hydrogen implementation for direction.
43. Most gas companies are planning to test the introduction of hydrogen in a “pilot” area of their system with new modern materials in a small section of the system that can be easily isolated for safety and reliability during a test period. A case study was done in 2008-2011 the Netherlands in which up to 20% hydrogen was mixed with natural gas to feed an isolated area with testing on piping, fittings, meters and appliances being done.¹⁷ Studying these programs and implementing a similar pilot program would be ideal for WGL to learn the nuances and impact of blended gas.

¹⁷ See e.g. International Gas Union Research Conference – 2008-2011 Pilot Project on Hydrogen

44. There are many risk factors that hydrogen shares with natural gas such as susceptibility to leaks in old main, need for leak prevention and detection systems, etc. However, Hydrogen also differs from natural gas in that it has a larger set of conditions in which ignition is possible. Also, having a molecular weight of almost 1/16th that of natural gas, Hydrogen is more susceptible to leaking at mechanical joints and in older, leak prone pipe.¹⁸
45. The National Renewable Energy Laboratory, at the request of the Department of Energy, conducted an assessment of the relative risk of various percentages of hydrogen-natural gas blends using data gathered by the Gas Technology Institute (“GTI”). That assessment suggested that higher concentrations of hydrogen in distribution pipeline, (up to 50%) present a minor increase in overall risk (in both probability and severity of impact). However, in services, the risk is much higher at those concentrations due to the potential for confined spaces and trapped gas. The blending threshold at which the increased risk transitions from minor to moderate is at approximately 20% hydrogen.¹⁹ Higher concentrations of Hydrogen would require further technical studies before implementation.

Injection in Natural Gas on Island of Ameland in The Netherlands, Kiwa Gas Technology 2011, available at http://members.igu.org/old/IGU%20Events/igrc/igrc2011/igrc-2011-proceedings-and-presentations/poster%20paper-session%201/P1-34_Mathijs%20Kippers.pdf

¹⁸ Huitt, William M, Piping Material for Hydrogen Service, 2001, available at http://www.wmhuittco.com/images/Hydrogen_Piping.pdf

¹⁹ National Renewable Energy Lab, Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues, p. 14, March 2013, available at <https://www.nrel.gov/docs/fy13osti/51995.pdf>

46. These risks are related to using existing infrastructure for the distribution of hydrogen in a mixture. Potential future hydrogen-only infrastructure would be designed differently and would carry different levels of risk.
47. The physical impact of hydrogen on PE/PVC distribution infrastructure is very minimal at standard operating conditions. There is no meaningful interaction between the gas and plastic.
48. The use of hydrogen in steel pipe can present some embrittlement concerns.²⁰ These concerns are mostly present at injection sites where the concentration of hydrogen is much higher and there is more potential for higher pressure. These concerns can be mitigated by instituting blending processes that prevent higher than normal pressures and higher hydrogen concentrations.
49. The best way to mitigate potential issues with hydrogen blends in the distribution system is to ensure that a system does not contain old, brittle distribution main and services.
50. The impact of hydrogen blended gas on transmission infrastructure is similarly focused on injections sites. Prior to the integration of hydrogen into the transmission infrastructure, there need to be processes in place to mitigate integrity issues. These processes should mostly be focused on avoiding high concentrations and high pressures.

²⁰ P. Sofronis, I. Robertson, D. Johnson - University of Illinois at Urbana-Champaign: "Hydrogen Embrittlement of Pipeline Steel: Causes and Remediation", *available at* https://www.energy.gov/sites/prod/files/2014/03/f12/09_sofronis_pipe_steels.pdf

51. There are no apparent safety or reliability issues related to the use of certified gas. The certified or “green” gas production industry is growing and appears to be capable of supplying the relatively small volumes proposed in this Plan.
52. The final blend of gas containing pipeline-quality RNG, natural gas and hydrogen should contain no contaminants or byproducts of production that are not already in the current system or that are currently being tested for.
53. Any new byproducts of the production of RNG or hydrogen that WGL expects to introduce into the system should undergo a thorough technical compatibility assessment for their impact on end user equipment and infrastructure components prior to introduction.
54. Specifically, WGL’s plan to replace its aging leak prone mains and services is on a 40-year schedule completing the replacement with modern materials (plastic and carbon steel) by 2054. A targeted acceleration of the replacement of high-risk, vintage infrastructure would greatly enhance the safety of the implementation of a blended-gas Plan as it would help ensure that hydrogen can be used in all areas of the WGL gas system sooner than the 2050 policy deadline and would reduce both risk to the public and emissions from the leaking gas distribution system infrastructure. All other things being equal, an acceleration of the replacement timeline can be accomplished either by targeting areas where blended gas will be used or by expediting the modernization of the system as a whole.²¹ As discussed above, most of the gas companies in the US who

²¹ All other things being equal refers to a properly managed and properly budgeted pipeline acceleration program. My affidavit here does not address WGL’s ability on these matters.

- still have old leaking pipes, are accelerating their replacement programs to 20 years or less for the same reasons: reduce risk to the public and reduce emissions from the leaking pipes.
55. The most important driver for safety and reliability on the WGL natural gas distribution system is for the Company to accelerate the targeted replacement of its aging leak prone infrastructure (458 miles of main and 59,741 service lines) with modern materials (plastic and carbon steel) to reduce the risk to its customers and the public and reduce emissions from leaking natural gas.
56. WGL needs to fully understand and vet the risk and parameters associated with mixing and use of hydrogen in its natural gas distribution system(mains and services) as well as customer's appliances before hydrogen is introduced and depended on as an alternative to natural gas.
2. *Ramifications to Natural Gas End Users if Different Gasses Are Used*
57. RW&A reviewed the impact of RNG on appliances, equipment & infrastructure based on the following two assumptions:
- That the RNG/Geo gas blend proposed for use in this Plan will meet industry standards for RNG and will be as defined by the CBP and the AGA as “derived from biomass or other renewable resources and is a pipeline-quality gas that is fully interchangeable with conventional natural gas.”; and
 - That the RNG proposed for use in this Plan will meet industry standards for BTU content, gas quality and purity.

58. Given the two above assumptions, RW&A did not discover any meaningful impact on non-industrial end use equipment and appliances by the addition of RNG. As such, it appears that no actions will be needed to be taken by customers if “pipeline-quality, interchangeable” RNG is mixed into the system.

59. No exhaustive research appears to have been done on the impact of hydrogen on end user natural gas equipment. Preliminary research indicates that generally acceptable blends for end-use systems fall within 5%–20% hydrogen content.²² This research generally indicates a need for actions to be taken by the end user at higher mixture ratios. The impact of hydrogen-natural gas blends on industrial end users will need to be assessed on a case-by-case basis. Maintaining customer choice in gas type as proposed in the CBP will mitigate impact and need for equipment upgrades by industrial clients but will increase the complexity of distribution.

3. *Availability of Alternative Fuels*

60. While hydrogen for combustion at relatively low mixture percentages does not appear to have availability issues—current hydrolysis technology is capable of such production—there needs to be a further assessment as to whether there will be reliable availability of the 16.45% hydrogen blend proposed by the CBP (2.8Bcf). There does not appear to be a readily available partner midstream provider who could deliver the volumes needed to meet the CBP’s goals. Either hydrogen would need to be blended

²² National Renewable Energy Lab, Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues, p. vii, March 2013, available at <https://www.nrel.gov/docs/fy13osti/51995.pdf>

- into the existing natural gas transmission pipeline system or new hydrogen pipelines will need to be built.
61. Hydrogen for large-scale energy storage or long-distance energy transfer would require much larger volumes of the gas and dedicated hydrogen transmission infrastructure will need to be built or – alternatively - approval from existing NG transmission infrastructure operators will need to be obtained. There is a lack of regulatory clarity regarding hydrogen transmission infrastructure that would need to be addressed as well, as discussed above.
62. RNG availability will depend on the amount of funding available for the various RNG sources. Costs will reflect the differences in the level of specialized infrastructure and equipment that is needed to produce RNG at commercial quality standards and volumes. To produce RNG from dairies and municipal solid waste sites, greenfield anaerobic digestion facilities must be constructed from scratch. On the other hand, upgrading the equipment needed to capture gas from wastewater treatment plants and landfills is less capital intensive and can be partially offset by waste disposal fees.²³
63. Funding aside, the volumes of RNG that are proposed in the CBP and ICF Study are significant and no precedent for that level of production at the standards needed was found.

²³ Jaffe, A. Myers, UC Davis - The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute, p. xiv, available at <https://ww2.arb.ca.gov/sites/default/files/classic/research/apr/past/13-307.pdf>

D. Comparison of AltaGas' Plan to Comparable Climate Plans

64. In addition to reviewing AltaGas' Climate Business Plan, I also did a review of peer utility and jurisdictional climate plans. While the number of plans out there are limited, I found that many of these plans have a similar reliance on efficiency upgrades and end-user behavioral modifications to achieve emissions reduction. This approach constitutes a large percentage of the emission reductions of most of the CBP.²⁴
65. Some utility climate plans also utilize RNG to reduce net emissions. For example, Southwest Gas Corp (AZ) plans on utilizing RNG for 3% of their volume by 2035, SoCalGas (CA) aims for 20% RNG by 2030, Summit Utilities (ME) is developing their own RNG production facilities and is implementing RNG, and Liberty Utilities (NH) is proposing a 5 year plan to replace 6% of its' volume with RNG and so on.²⁵ However, apart from the California utilities, most peer utilities/jurisdictions **that do have a climate plan** are planning for a 4-6% RNG by volume implementation rate. This is much less than WGL's Plan which assumes 40% of the system volume is comprised of RNG (assuming a 30% reduction in demand by 2050 or 28.7% at current volumes).
66. While comparing to peer utilities and various US jurisdictions provides some context and frame for reference, there is a larger context in which this Plan fits. In comparison

²⁴ See, e.g. South Carolina Climate, Energy and Commerce Plan, p. EX-11 https://www.eesi.org/files/ccs_sc_summary.pdf; See also MA Clean Energy and Climate Plan for 2020, p. 12, available at <https://www.mass.gov/service-details/clean-energy-and-climate-plan-for-2020>; See also PA Climate Action Plan pg. 53, available at <https://www.dep.pa.gov/Citizens/climate/Pages/PA-Climate-Action-Plan.aspx>

²⁵ AGA – 2019 RNG Activity Tracker, available at <https://www.aga.org/contentassets/12f84f5492c0400595b9ae54884dd2d7/rng-activity-tracker.docx>

to global climate action plans (with the exception of CA), AltaGas’s Climate Business Plan and its US peers appear to focus more on ‘easy wins’ like boosting efficiency and buying “certified gas.” These efforts have their place, but in the scope of a 30-year timeline – other utilities and countries, especially in Europe, have moved far beyond this stage and are implementing more comprehensive climate action plans with a heavier focus on infrastructure that will utilize hydrogen and renewable natural gas much more extensively, as well as the integration of renewable energy sources at varying percentages.

67. Comprehensive climate plans—mostly found in European countries—rely much more heavily on investing in hydrogen infrastructure and developing both the demand and supply for hydrogen than the AltaGas Climate Business Plan does.²⁶ Hydrogen for energy storage and combustion comprises a 3-4x larger portion of those plans than the Climate Business Plan. These plans did initially use blended hydrogen-natural gas in the early stages of the CBP to help create demand.

68. This concludes my affidavit.

²⁶ See, e.g. Guidehouse, Gas Decarbonisation [sic] Pathways 2020-2050, April 2020, available at <https://guidehouse.com/-/media/www/site/downloads/energy/2020/gfc-gas-decarbonisation-pathways-2020-2050.pdf>; See also Dutch Ministry of Economic Affairs and Climate Policy, Hydrogen Market in The Netherlands, June 5, 2019, available at https://ec.europa.eu/info/sites/info/files/dutch_ministry_-_hydrogen_market_in_the_netherlands.pdf

**BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA**

In the Matter of

**the Merger Application of AltaGas
Ltd. and WGL Holdings, Inc.**

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§

Formal Case No. 1142

ATTESTATION

I declare under penalty of perjury that the foregoing affidavit was prepared by me or under my direction and is true and correct to the best of my knowledge, information, and belief.



ROD WALKER 8/26/20

ATTACHMENT (B)-1

JOHN RODNEY WALKER

1320 Mayes Road, Toccoa, GA 30577 | 706-244-0894 | rwalker@rwalkerconsultancy.com



Mr. Walker is CEO & President of Rod Walker & Associates, a Management Consultancy and Technical Advisory firm, focused on providing business and technical solutions for clients.

Rod Walker is an industry executive who brings thirty-five years of technical expertise and business acumen combined with executive management experience leading organizations and serving as a trusted advisor to clients in the energy industry domestically and worldwide. His breadth of experience in the natural gas industry at an investor owned gas utility and two municipal utilities combined with his engineering background and management consultancy work allows him to provide strong leadership to organizations strategically and tactically to evaluate and provide technical and business solutions to issues they face. Mr. Walker has significant experience with all aspects of natural gas system planning, capital planning, replacement program evaluation, designing and building infrastructure as well as assessing, recommending and implementing organizational performance improvements addressing people, process, data, technology, financial infrastructure, regulatory and enterprise risk issues. Mr. Walker is an expert witness in the states of Arkansas, California, Delaware, Rhode Island and the District of Columbia on natural gas industry matters.

EDUCATION

Clemson University, Clemson SC

B. S. Civil Engineering

1985

WORK EXPERIENCE

Rod Walker & Associates Consultancy, Toccoa, GA- CEO & President (current)

2015-present

Provide overall direction for firm and associates to provide exemplary management consulting services worldwide to help organizations perform better through organizational assessments & coaching, strategic planning, workforce planning, process improvement, business planning and issue resolution; technical advisory services including due diligence review, expert witness, capital planning and projects advisory and owner's engineering services.

Contanda Terminals (formerly Westway Group), Houston TX- Vice President-Engineering

2015-2017

Hired to turn around the Engineering and Construction group within Westway, which overran projects previously from \$40 million to \$90 million with focus on changing People, Process and Data. E&C group is now stable and projects are being executed in an industry best practices manner (\$20-29 million annual spend) in since Mr. Walker's taking the helm, all on time and within budget.

Black & Veatch, Overland Park, KS- Director

2011-2015

Team lead for the Oil & Gas Practice in Management Consulting division of B&V focusing on business development and project delivery to clients worldwide in the areas of C-level advisory, due diligence advisory, utility risk assessments, organizational and critical infrastructure review and strategic planning.

Halcrow, London, UK-Director- Natural Gas Practice

2010-2011

Developed and led the Natural Gas Practice for the firm worldwide focusing on business development and project delivery to clients in the areas of due diligence advisory, utility risk assessments, organizational and critical infrastructure reviews.

R. W. Beck, Inc., Seattle WA- Principal Consultant

2006-2010

Team lead for R. W. Beck natural gas infrastructure group on directing business development and project delivery efforts for clients focused on capital program management, pipeline and natural gas facilities design, due diligence advisory and utility risk assessments.

Diversified Energy Services, Inc., Atlanta GA- Executive Vice President-Engineering

2002-2006

Led the Engineering Division of the Company providing business development and project delivery for clients in all areas of the project life cycle including pipeline and natural gas facilities design, project management, permitting, right-of-way acquisition.

- City of Toccoa, Georgia-Natural Gas Director** **2001-2002**
 Directed City of Toccoa’s natural gas utility serving 8800 customers in northeast Georgia and western North Carolina.
- City of Hartwell, Georgia- Public Works Director** **1999-2001**
 Directed the City’s utilities and street division serving 5500 natural gas customers and 8000 water and sewer customers in northeast Georgia.
- Atlanta Gas Light Company** **1985-1999**
 Served in a variety of positions at AGLC including (first to last):

 - Corporate Engineer-Perform key support functions including gas system modeling (Stoner software), reviewing and writing procedures, large project design calculations related to meeting gas flow, pressure delivery requirements.
 - Design Engineer/Drafting Supervisor -provided engineering design and coordinated all aspects of over 200 projects from concept to completion including Department of Transportation relocation, pressure improvements and new business main extension projects in Gwinnett County (\$3 million) (3rd fastest growing county in US at the time). Directed 2 draftspersons in developing project drawing and updating as-built information.
 - Engineering Supervisor- provided engineering design and coordinated all aspects of projects from concept to completion including Department of Transportation relocation, pressure improvements and new business main extension projects in Clayton, Henry and Fayette Counties (\$5 million) (other fast-growing counties in the greater Atlanta area at the time). Directed 2 pressure crews to annually inspect and maintain over 300 district pressure regulator stations, pressure points.
 - GIS Program Management-led the development of the Company’s initial geographical information system (GIS) including detailed system, hardware and software evaluation and selection, data conversion, user training and acceptance.
 - Region Design Engineer-Managed all engineering support activities related to Clayton, Henry, Rockdale and Fayette Counties including bare steel program design and oversight (\$2 million), gas system modeling (Stoner), gas facilities design and project bid package development.

PUBLICATIONS AND PAPERS

- “Strategic Directions in the Natural Gas Industry”-co-contributor*
 Black & Veatch annual survey and report on state of and issues affecting natural gas industry 2012-2015
- “Lessons learned from the San Bruno incident”*
 Presentation presented at American Public Gas Association (APGA) Operations conference 2012, 2014
- “Why Risk Assessments Are Important for Utilities”*
 Presentation presented at the Western Energy Institute (WEI) Annual Conference 2013
- “Validating Maximum Allowable Operating Pressures (MAOP)”*
 Presentation presented at the Energy Association of Pennsylvania (EAP) Spring Meeting 2012
- “Black & Veatch Aims to Ease Pipeline Challenges” North American Oil & Gas Pipelines* 2014
- “Independent Review of Hydraulic Modeling” Report (A review of the SoCal Gas System modeling of Aliso Canyon Storage outage effect on reliability of power and gas in the LA Basin) co-authored with Los Alamos National Labs (LANL)* 2016, 2017
- “Institutional Knowledge Hides the Blind Spots in an Organization”* 2018
- “How’s your TEAM Doing?”* 2018

AWARDS

- American Public Gas Association (APGA) Harry M. Cooke Award for Distinguished Service to Natural Gas Industry 2012

MEMBERSHIPS

- American Gas Association (AGA), Associate Member; American Public Gas Association (APGA), Board Member

CERTIFICATE OF SERVICE

Formal Case No. 1142, In the Matter of the Merger of AltaGas Ltd. and WGL Holdings, Inc.

I certify that on June 26, 2020, a copy of the *Office of the People's Counsel for the District of Columbia's Initial Comments on AltaGas Ltd.'s Filing Regarding Merger Terms Nos. 6 and 79* was served on the following parties of record by hand delivery, first class mail, postage prepaid or electronic mail:

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