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GOVERNMENT OF THE DISTRICT OF COLUMBIA
OFFICE OF THE ATTORNEY GENERAL

KARL A. RACINE
ATTORNEY GENERAL

Public Advocacy Division
Social Justice Section

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 Comments by the Department of Energy and Environment on behalf of the District of Columbia Government Concerning AltaGas Ltd.'s Climate Business Plan. If you have any questions regarding this filing, please contact the undersigned.

Sincerely,

KARL A. RACINE
Attorney General

By: */s/ Brian Caldwell*
BRIAN CALDWELL
Assistant Attorney General
(202) 727-6211 – Office
(202) 445-1952 – Cell
Brian.caldwell@dc.gov

cc: Service List

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA

FORMAL CASE NO. 1142

Comments by the Department of Energy and Environment
on behalf of the District of Columbia Government
Concerning AltaGas Ltd.'s Climate Business Plan

I. SUMMARY

On behalf of the District of Columbia Government (the District), the Department of Energy and Environment's (DOEE), careful review reveals that AltaGas Ltd's (AltaGas) Climate Business Plan, entitled "Natural Gas and its Contribution to a Low Carbon Future – Climate Business Plan for Washington, D.C." (Plan), fails to satisfy Commitment Term No. 79 in three ways. First, the Plan presents a vision of the energy future of the District of Columbia that largely ignores the District's vision of a decarbonized future and its decarbonization policy as embodied in the Mayor's carbon neutrality pledge, the Sustainable DC plan 2.0, the Clean Energy DC plan, and the Clean Energy DC Omnibus Amendment Act. Second, the Plan is technically deficient with significant errors, falling far short of helping the District achieve its goal of carbon neutrality. Third, the Plan fails to include an actual business plan.

In short, DOEE believes, regrettably, that the Plan as submitted is incompatible with the District's climate policy and decarbonization efforts, and that the Plan contains significant technical errors in key measurements and calculations that render the findings and conclusions in the Plan wholly unreliable. DOEE is surprised by the business-as-usual approach of the Plan that sharply departs from AltaGas's stated intention—revealed during the evidentiary hearings on the merger application—to explore opportunities in renewable energy and alternative business

models to be better aligned with the Clean Energy DC plan, the Sustainable DC plan, and the District's goal of carbon neutrality. As a result, DOEE does not believe that the Plan complies with Commitment No. 79, and urges the Public Service Commission of the District of Columbia (Commission) to direct AltaGas to re-submit a plan consistent with assisting the District in achieving its climate goals and policies. Further, DOEE requests that the Commission open an investigative proceeding to evaluate the merits of the new Plan and how best to strategically and gradually phase out the use of natural gas over the next 30 years.

Below are a few highlights from DOEE's review.

- Electrification of end-use appliances such as water and space heaters has been found to be essential to meet the 2015 Paris Climate Agreement targets according to several leading authorities on decarbonization pathways, such as the Intergovernmental Panel on Climate Change (or IPCC) Reports (5th Assessment, 1.5°C Special Report), the Deep Decarbonization Pathway Project (or DDPP) (a U.N. initiative led by the Institute of Sustainable Development and International Relations), and the Obama Administration's 2016 U.S. Mid-Century Strategy for Deep Decarbonization (or MCS), as well as New Jersey's 2019 Energy Master Plan.[1] However, the Plan does not consider the Clean Energy DC plan and these authorities, especially the IPCC, DDPP and MCS reports that provided foundational support to the Clean Energy DC plan, on deep decarbonization and electrification of the building sector. Instead,

[1] https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf; http://deepdecarbonization.org/wp-content/uploads/2015/11/US_Deep_Decarbonization_Technical_Report_Exec_Summary.pdf; https://obamawhitehouse.archives.gov/sites/default/files/docs/mid_century_strategy_report-final.pdf; https://www.nj.gov/emp/docs/pdf/2020_NJBPU_EMP.pdf.

AltaGas's Plan calls for using costly and ill-suited low-carbon fuels, such as renewable natural gas, hydrogen, and synthetic methane to address relatively simple tasks like space heating and water heating.

- Both the regulatory and market trends in the District indicate that buildings will be designed or converted to use efficient electric heating. The District is currently developing the Building Energy Performance Standards (BEPS) in accordance with the Clean Energy DC Omnibus Amendment Act. BEPS requires greater energy efficiency from existing buildings with below-average Energy Star scores, which will encourage these building owners to replace their inefficient heating systems with cost-effective, high-performance electric heat pumps. The District is also in the process of moving toward a Net Zero Energy building code in the next code cycle, which will require the use of renewable energy. DOEE's benchmarking data shows that most new office buildings in the last 10 years are built as all-electric and do not use natural gas at all. The Plan does not consider the impact of these trends on the future of natural gas in the District.

- In addition, the Plan uses wrong facts in describing a false electrification scenario that does not exist, such as assuming that buildings will be heated using the most outdated and inefficient electric equipment, and double-counting the cost of electricity purchases.

- According to the Plan, about 42% of total gas demand in 2050 will come from selling conventional natural gas. This alone demonstrates that the Plan does not lead to carbon neutrality, nor does it lead to a place reasonably near carbon neutrality.

- When adjusted for the mathematical errors in the Plan, the share of conventional natural gas sold in the District in 2050 is 57%.

- According to the Natural Resources Defense Council (NRDC), the available amount of RNG and synthetic gas nationwide ranges between 3% and 7% of the total gas demand (the gas industry's estimate is 7%-12%), indicating their role as only a niche product.[2] However, the Plan assumes the availability of RNG in the amount that is several times higher than either estimates.

- The carbon intensity of RNG depends on the particular feedstock, and most prevalent feedstocks—municipal solid waste and biogenic landfill gas—are carbon positive. Even the renewable natural gas from animal manure, sometimes described as a carbon-negative gas, can lose its climate benefits significantly if the animal farms were to use agricultural best practices in mitigating fugitive emissions from its manure lagoons. This is the reason that using waste-derived energy supply can be problematic and cannot be considered "renewable" as a long-term solution: sustainability practices require that waste be reduced to the greatest extent possible and that harmful effects of waste be mitigated. Such practices in turn will decrease the supply of waste-derived fuels.

- Using hydrogen and synthetic methane for space and water heating are even less suitable. Both processes typically involve using a large quantity of renewable electricity to make another fuel. These products are necessary for activities that are

[2] See p.5, https://www.nrdc.org/sites/default/files/pipe-dream-climate-solution-bio-synthetic-gas-ib.pdf

not easily electrified, to provide greater fuel density than electricity, such as heavy-duty transportation and industrial processes. These special fuels should not be used for space and water heating, which can be met easily with electricity, obviating the need to create a special fuel. Making synthetic methane requires not only electricity but industrially-produced carbon dioxide, making the proposal even more ill-suited for simple activities like space heating.

- The Plan assumes that it will replace all gas pipes through 2050, even if the buildings are electrified and no longer use gas, at a cost that ranges between $3 billion to $4.5 billion, and asserts that electrifying buildings will lead to multi-billion dollars of stranded costs, despite AltaGas's intention in the Plan to spend $3 billion to $4.5 billion in likely stranded costs. Such creation of stranded assets will unnecessarily financially burden District of Columbia ratepayers, with the alternative being to lock the District into a greenhouse gas (GHG)-heavy infrastructure for the foreseeable future, foreclosing the possibility of accelerated decarbonization and electrification that the District has pledged to implement.

- The Merger Commitment No. 79 requires AltaGas to produce a business plan that shows how Washington Gas (WG) may move from selling gas to a new business model that is consistent with the District's carbon neutrality goal by capitalizing on a new, clean energy economy, such as heating electrification and innovative district energy systems using carbon-neutral fuels like geothermal heating and cooling for university campuses and large institutional buildings in the District of Columbia. The Plan proposes a business-as-usual approach of selling gas, and it lacks the essential

components of a business plan, such as an in-depth market analysis, cost and revenue analysis and projections, and regulatory strategies.

Given these major flaws, DOEE regrettably cannot support the Plan as satisfying the requirements of Term No. 79. DOEE requests that the Commission require AltaGas to re-submit a Plan that meets the requirements of Term No. 79, consistent with assisting the District in achieving its climate goals and policies. Further, DOEE requests that the Commission open an investigative proceeding to evaluate the merits of the new Plan and how best to strategically and gradually phase out the use of natural gas over the next 30 years.

In the review that follows, DOEE will address the first issue of policy non-alignment. DOEE's consultant, Synapse Energy Economics, which also provided testimony during the merger proceeding, will then address the second and third issues of the Plan's significant deficiencies as a technical roadmap to carbon neutrality and as a business plan.

II. COMMENTS

A. The Plan's Non-alignment with the District's Climate Policy.

1. *Future of a Natural Gas Distribution Utility in the Context of Climate Change Mitigation.*

The merger of AltaGas and WGL Holdings, Inc., approved by the Commission in June 2018, raised the issue of what role the monopoly gas distribution company should play in the District of Columbia, a jurisdiction that has committed to deep reductions in GHG emission levels. In support of the 2015 Paris Climate Agreement, the District has set an interim target of 50% reduction of citywide GHG emissions below 2006 levels by 2032. Indeed, while the merger proceeding was pending on December 4, 2017, Mayor Muriel Bowser announced the

District's pledge to achieve complete carbon-neutrality by 2050, an increase from the previous GHG reduction level of 80% by 2050.[3]

During the merger proceeding, then-Chair of the Commission, Betty Ann Kane, asked then-CEO of AltaGas, David Harris, how AltaGas could manage a distribution company that may experience a deep revenue loss—nearly 50%-- under the goal of 80% reduction of GHG emissions. Mr. Harris responded that, while achieving an 80% reduction in GHG emissions might result in a 48% revenue loss from "the regulated gas side" (i.e. WG), the merger was worth the investment because "there's a corresponding increase of 48 percent more revenue [for the non-regulated affiliates] if you're competing and turning around and putting renewable projects in…".[4] Mr. Harris later added, in voicing AltaGas's stance on GHG reduction policies, that AltaGas developed the largest hydro-generation project in North America, a "state-of-the-art" battery project in California, the first wind generation project in British Columbia, another wind project in Colorado, and biomass facilities in Michigan and North Carolina, concluding that AltaGas is "cognizant and very supportive" of policy "directions" aimed at reducing GHG emissions.[5]

However, questions remained regarding how WG, a regulated distribution utility that cannot financially benefit from the types of clean generation projects that Mr. Harris mentioned, can remain viable when the District is pursuing decarbonization efforts largely through phasing out the use of natural gas, electrifying buildings and cars, and purchasing clean electricity via a

[3] https://mayor.dc.gov/release/mayor-bowser-commits-make-washington-dc-carbon-neutral-and-climate-resilient-2050.
[4] Cross-examination of David Harris, L22, p.442 – L2, p.444, December 6, 2017, FC 1142.
[5] Cross-examination of David Harris L11, p.328 - L8, p. 329, December 6, 2017, FC 1142. It should be noted that AltaGas is currently not pursuing a battery storage project—as initially anticipated—to satisfy its merger commitment to build a 5 MW of renewable energy project.

Renewable Portfolio Standard and long-term power purchase agreements for renewable electricity. AltaGas and WGL were aware during the merger proceeding that the District's decarbonization pathway required electrification of heating: as Mr. Adrian Chapman from WGL stated, "when we read the [Clean Energy DC] plan, there's an expectation that heating requirements will be met in the future by electric needs."[6] Then-Chairman Kane asked Mr. Chapman, then-CEO of WGL, what would happen to the rates that WG levies to fund the entire pipe system replacement through 2050 (called "PROJECTpipes" and estimated to cost between $3 billion to $4.5 billion), if the gas revenues "are cut in half" due to the District's decarbonization/electrification efforts. Mr. Chapman responded that "if the throughput was reduced that substantially, the rates may get so high that the price response to remaining customers may precipitate even further erosion of use…".[7]

2. *Commitment Term No. 79*

On July 2, 2018, AltaGas accepted certain terms and commitments set forth by the Commission in order to secure the Commission's approval of the merger application.[8] These conditions included AltaGas's recognition of the scientific consensus that climate change exists, and the District's authority to regulate natural gas and other carbon-based energy sources through measures such as the Clean Energy DC Plan and the Sustainable DC Plan, as well as any future measures adopted by the District to address climate change and other public interest issues such as air quality.[9] Relevant here, AltaGas also committed to submit a long-term business plan

[6] cross-examination of Adrian Chapman, LL 2-4, p.812.
[7] Cross examination of Adrian Chapman, L1 – L5, p.807, December 7, 2017, FC 1142.
[8] Order No. 19396, Appendix A, Joint Notice Accepting Terms and Conditions, FC 1142-430 (July 2, 2018).
[9] Order No. 19396, Appendix A, FC 1142 ¶ 77 (June 29, 2018).

to demonstrate that it can evolve its business model to support and serve the District's decarbonization efforts toward carbon neutrality.[10]

Due to lingering questions about the long-term viability of a gas distribution utility in the District of Columbia, where the District pledged to become carbon-neutral through enacting measures like electrification, the parties to the merger settlement agreement – substantially negotiated by the District – included a term that would give AltaGas about 1 ½ years to develop a detailed business plan to show that it could maintain a profitable business that is consistent with electrification-driven carbon neutrality.

Pursuant to Term No. 79 of the Merger Order, the Commission ordered AltaGas to file a Plan as follows:

> By January 1, 2020, AltaGas will 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).[11]

To comply with Term No. 79, AltaGas filed a document entitled its Plan on March 16, 2020.[12] On March 18, 2020, the Commission granted a 60-day comment period.[13]

3. *The District's Deep Decarbonization Pathway and the Clean Energy DC Plan*

The Clean Energy DC Plan provides a roadmap for the District to reduce GHG emissions within its jurisdiction by 50% below 2006 levels by 2032, while simultaneously increasing

[10] Id. at ¶ 37 (UUUU & WWWW).
[11] Order No. 19396, Order, FC 1142 ¶ 39, ¶ 37(WWWW), ¶ 79 (June 29, 2018).
[12] FC1142-597, AltaGas Ltd.'s Climate Business Plan, Term No. 79 of the Settlement Agreement, (March 16, 2020).
[13] Order No. 20310, FC 1142 (March 18, 2020), ¶¶ 10 & 12.

renewable energy and reducing energy consumption, putting the District on a viable path to achieve complete carbon neutrality by 2050.[14] Currently, as directed by Mayor Bowser, DOEE is in the process of developing a 2050 Carbon Neutrality Strategy, which picks up where the Clean Energy DC Plan ends, with a consistent framework for decarbonization. Both of these plans, the Clean Energy DC Plan and the Carbon Neutrality Strategy, call for a significant shift away from natural gas use in the years prior to 2032 culminating in the eventual end to nearly all fossil fuel use by 2050.

> Achieving the District's 2032 GHG reduction target, or any future targets that are aligned with the Paris Agreement, will require a significant shift away from fossil fuels, including natural gas. Achieving its 2050 GHG carbon neutral target will require the District to eliminate fossil fuel use.[15]

The District's primary strategy to achieve this reduction and gradual elimination of natural gas use is first to shift water and space heating and cooling functions to equipment that does not use fossil fuels.

> To achieve its 2032 GHG target, the District will clearly need to shift away from fossil fuels for buildings (natural gas and fuel oil) and transportation (gasoline and diesel) while simultaneously decarbonizing its electricity supply. For buildings, this will mean shifting to non-fossil fuel sources for heat and hot water.[16]
>
> ….
>
> Consequently, the District must transition away from equipment and technologies that currently depend on such fuels. The equipment used to heat and cool space and water in buildings is a key aspect of this transition.[17]

[14] The District of Columbia Climate and Energy Action Plan (hereinafter "Clean Energy DC") (August 2018), https://doee.dc.gov/sites/default/files/dc/sites/ddoe/page_content/attachments/Clean%20Energy%20DC%20-%20Full%20Report_0.pdf
[15] Clean Energy DC, p. 156.
[16] Id., p. 24.
[17] Id., p. 156.

This transition means that natural gas heating systems in residential and commercial buildings, which can be electrified cost-effectively in many cases, must be converted to electric systems. It also means that new buildings must be designed for electric heating systems rather than those that require the onsite use of fossil fuels: "natural gas and other carbon-intensive heating furnaces can be switched to a low-carbon energy source such as a high-efficiency electricity-based heat pump."[18]

The reliance on electrification of space and water heating as an essential decarbonization measure in both the Clean Energy DC Plan and the 2050 Carbon Neutrality Strategy is strongly supported by leading authorities on climate change mitigation.

a. Intergovernmental Panel on Climate Change

To begin with the world's leading authority on climate change mitigation, the IPCC, in its Report on Global Warming of 1.5ºC, stated with "high confidence" that global pathways to limit global warming to 1.5ºC require lower energy use and faster electrification of energy end use.[19] In fact, the Report specifically calls out the need to deeply cut methane as well as electrifying "energy end use", e.g., space and water heating:

> **Limiting warming to 1.5ºC implies reaching net zero CO_2 emissions globally around 2050 and concurrent deep reductions in emissions of non-CO_2 forcers, particularly methane (high confidence).** Such mitigation pathways are characterized by energy-demand reductions, decarbonization of electricity and other fuels, electrification of energy end use, deep reductions in agricultural emissions, and some form of CDR with carbon storage on land or sequestration in geological reservoirs. Low energy demand and low demand for land- and GHG-intensive consumption goods facilitate limiting warming to as close as possible to 1.5ºC. (emphasis added)[20]

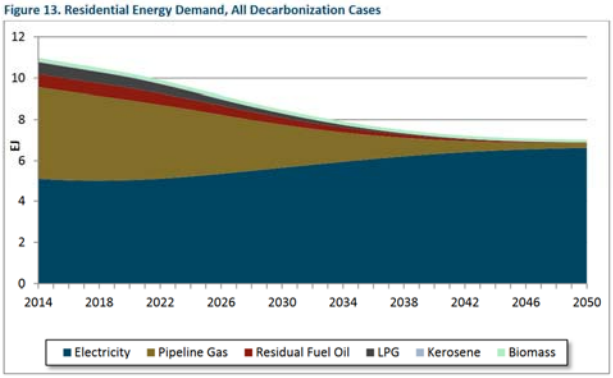
b. Deep Decarbonization Pathway Project

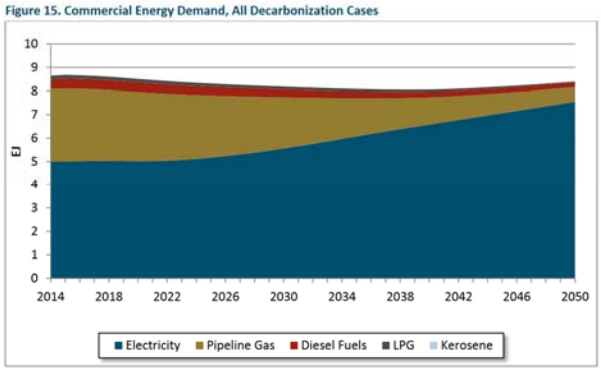
[18] Id., p. 80.
[19] IPCC Report on Global Warming of 1.5ºC (2018), p.15, C.2.2., Summary for Policymakers.
[20] Id. at p.33.

The DDPP, developed as a global initiative for the United Nations and comprising energy research teams from 15 countries with the largest GHG footprints, produced a report for the United States in November 2015. The report was primarily authored by researchers from the Pacific Northwest National Laboratory, the Lawrence Berkeley National Laboratory, and Energy + Environmental Economics. The report, articulating the "three pillars" of deep decarbonization—energy demand reduction, decarbonized electricity, electrification—provides the key finding:

> The principal finding of this study … is that it is technically feasible to achieve an 80% greenhouse gas reduction below 1990 levels by 2050 in the United States, and that multiple alternative pathways exist to achieve these reductions using existing commercial or near-commercial technologies. Reductions are achieved through high levels of energy efficiency, decarbonization of electric generation, electrification of most end uses, and switching the remaining end uses to lower carbon fuels. (emphasis added)[21]

In particular, the DDPP analysis shows that achieving 80% GHG reductions, let alone carbon neutrality, means electrifying practically all of the energy demand in the residential sector, and electrifying nearly all of the energy demand in the commercial sector, as shown in the graphs below:[22]





[21] See "Abstract," http://deepdecarbonization.org/wp-content/uploads/2015/09/US_DDPP_Report_Final.pdf
[22] See http://usddpp.org/downloads/2014-technical-report.pdf.

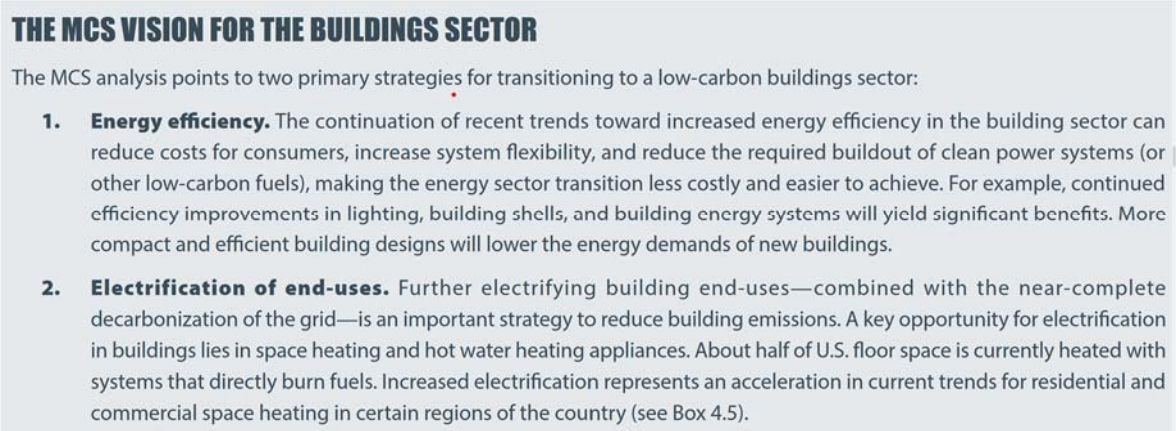
Regarding the role of renewable natural gas, hydrogen, or synthetic methane (referred to as "power-to-gas" in the Plan), the DDPP report, in discussing policy implications, states: "Biomass refining (for biogas and biodiesel, not ethanol) and **the production of hydrogen and synthetic natural gas from electricity provide alternative low-carbon fuels for applications in which electrification is difficult**" (emphasis added).[23] In the DDPP analysis, such "applications in which electrification is difficult" refers to heavy-duty transportation and industrial activities. Residential and commercial space heating and water heating represent some of the easiest applications, which is why the graphs above show nearly complete electrification of energy demand in the residential and commercial sectors.

c. United States Mid-Century Strategy for Deep Decarbonization

Lastly, the Obama Administration in 2016 submitted "the United States Mid-Century Strategy for Deep Decarbonization" to the United Nations in accordance with the 2015 Paris Climate Agreement. In the document, it recognizes the following: "Nearly all deep decarbonization scenarios show large increases in the deployment of certain technologies and strategies, including energy efficiency, electrification, wind, solar, and biomass" (emphasis added).[24]

[23] P.20, http://usddpp.org/downloads/2015-report-on-policy-implications.pdf.
[24] P.30, https://obamawhitehouse.archives.gov/sites/default/files/docs/mid_century_strategy_report-final.pdf.

Further, the MCS identifies only two strategies for decarbonizing the building sector—energy efficiency and electrification of space and water heating:[25]



THE MCS VISION FOR THE BUILDINGS SECTOR

The MCS analysis points to two primary strategies for transitioning to a low-carbon buildings sector:

1. **Energy efficiency.** The continuation of recent trends toward increased energy efficiency in the building sector can reduce costs for consumers, increase system flexibility, and reduce the required buildout of clean power systems (or other low-carbon fuels), making the energy sector transition less costly and easier to achieve. For example, continued efficiency improvements in lighting, building shells, and building energy systems will yield significant benefits. More compact and efficient building designs will lower the energy demands of new buildings.
2. **Electrification of end-uses.** Further electrifying building end-uses—combined with the near-complete decarbonization of the grid—is an important strategy to reduce building emissions. A key opportunity for electrification in buildings lies in space heating and hot water heating appliances. About half of U.S. floor space is currently heated with systems that directly burn fuels. Increased electrification represents an acceleration in current trends for residential and commercial space heating in certain regions of the country (see Box 4.5).

d. New Jersey's 2050 Energy Master Plan 2020

New Jersey provides an excellent case study for how states are approaching building decarbonization. In 2019, New Jersey Governor Phil Murphy issued an Energy Master Plan that provides a pathway to meeting the state's 2050 100% clean energy targets, and the 80% GHG reduction by 2050 requirement under the Global Warming Response Act. The Energy Master Plan is an integration of 7 underlying technical studies (energy efficiency, energy storage, solar energy, optimal voltage, offshore wind, microgrids, alternative fuel vehicles) and an Integrated Energy Plan that incorporates the findings from these studies via cost-based scenario modeling. The Energy Master Plan uses 7 main strategies, including the three pillars of deep decarbonization as shown in Strategies 3 through 5 below:[26]

[25] Id., p.60.
[26] P. 17, https://www.nj.gov/emp/docs/pdf/2020_NJBPU_EMP.pdf

3. Maximize energy efficiency and conservation and reduce peak demand	• **Continued prioritization of energy efficiency** measures and programs can significantly reduce energy consumption—including through the adoption of electric vehicles and heat pumps—and lower the costs of powering New Jersey's economy with clean energy.
4. Reduce energy consumption and emissions from the building sector	• **Building electrification reduces final energy demand** and allows buildings to efficiently utilize clean electricity for space heat and water heat. • **Electrification programs for new construction** can lay the groundwork for an in-state workforce to retrofit existing buildings.
5. Decarbonize and modernize New Jersey's energy system	• **New Jersey's electricity load doubles by 2050** due to building and vehicle electrification. • **Carefully planned grid modernization** investments can support electrification while containing costs for ratepayers. • **New Jersey's natural gas use declines to less than one fifth of today's levels by 2050**, likely reducing the need for gas distribution system expansion.

These strategies illustrate that New Jersey's approach to decarbonizing the building sector is through electrification, and they are concurrently planning to modernize the grid and reduce investment in the gas distribution system. Similar to the District's, New Jersey's approach projects an 85% reduction of gas consumption by 2050 from today's levels.

A few key findings from the Integrated Energy Plan regarding the least-cost pathway to decarbonizing buildings are as follows:

Relevant Integrated Energy Plan Findings

- **Electrification reduces annual costs by 50% in 2050, compared to retaining gas use in buildings, in order to meet emissions targets.** Electrification is cheaper, despite low natural gas costs, because emissions targets require substituting a significant fraction of natural gas with carbon-neutral fuels. In the Least Cost scenario, carbon-neutral fuels are not required until the late 2040s and are primarily used in the electricity sector. In Variation 3, carbon-neutral fuel use starts earlier, and five times as much carbon-neutral fuel is required in 2050.
- **Building heating and cooling appliance costs are lower when buildings are electrified.** Total appliance costs are lower in the Least Cost scenario compared to Variation 3 because modern heat pumps provide both heating and cooling needs, negating the need to purchase separate furnaces and air conditioners.
- **Building electrification contributes to increased New Jersey electricity demand, and shifts the electricity demand peak to winter months.** As buildings electrify, peak demand shifts from the summer (in which air conditioning drives peak demand) to the winter, in which newly electrified heat sources drive increased demand.
- **Building electrification reduces total energy use.** While building electrification increases electricity use, it reduces total energy needs because heat pumps are much more efficient than direct combustion of fossil fuels for heat. In 2050, Variation 3 requires 25% more total final energy than the Least Cost scenario.
- **Building electrification is the most cost-effective path to achieving further emissions reductions beyond those required by the GWRA.** If gas use in buildings is retained, further emissions reductions require either substituting natural gas with much more expensive carbon-neutral bio- or synthetic gases, or transitioning buildings to electrification by retrofitting gas appliances with heat pumps before their useful life is over. In comparison, in the Least Cost scenario, buildings are retrofitted during stock rollover events, in which gas appliances are replaced with heat pumps at the point of an appliance's natural retirement, thus limiting stranded assets.

In addition to New Jersey, other states such as New York and California are implementing building electrification to decarbonize the sector.[27] With respect to cities, major cities that have pledged deep cuts to GHG emissions by 2050 are actively pursuing building electrification, such as New York and Vancouver. The decarbonization pathway identified in the Clean Energy DC Plan and further elaborated upon in the 2050 Carbon Neutrality Strategy, is firmly supported by these authorities and the technical findings.

e. District of Columbia's Legislative and Regulatory Landscape

To illustrate that the "three pillars" of deep decarbonization are also embodied in the District's legislation and regulations, DOEE notes the following:

- **Energy demand reduction**: creation of DC SEU under the Clean and Affordable Energy Act; creation of the Building Energy Performance Standards (BEPS) and Utility Energy Efficiency and Demand Response programs under the Clean Energy DC Omnibus Amendment Act; the 2018 "Net-Zero-Ready" Building Energy Codes, and the anticipated Net Zero Energy Codes
- **Decarbonized electricity**: 100% Renewable Portfolio Standard under the Clean Energy DC Omnibus Amendment Act and the Distributed Generation Amendment Act; the Commission's Order on purchasing renewable electricity via long-term PPAs for Standard Offer Service
- **Electrification**: BEPS; Net Zero Energy Code; Residential Electrification Studies, including market analysis, cost-effectiveness analysis; DC SEU's Whole House Retrofit Pilot Project; Strategic Electrification Roadmap for Buildings and Transportation funded by the U.S. Department of Energy; Grid Modernization

[27] "*The Challenge of Retail Gas in California's Low-Carbon Future,*" concluding "building electrification, which reduces or eliminates the use of gas in buildings, is likely to be a lower-cost, lower-risk long-term strategy compared to renewable natural gas." https://ww2.energy.ca.gov/2019publications/CEC-500-2019-055/index.html; see also joint NYSERDA and utilities' filing on "New Efficiency: New York Implementation Plan", 3/6/2020.

Pathway under Formal Case 1130; a proposal to perform Non-Pipe Safety Alternatives (i.e., electrification) for Washington Gas's proposed pipe replacement program

4. *The Plan's Non-Alignment with the District's Climate Policy*

AltaGas's Plan filed on March 16, 2020, was intended to comply with Term No. 79. However, the Plan's proposed pathway ignores the policy, regulations, and programs that the District has designed and implemented, as embodied in the Clean Energy DC Plan, Sustainable DC Plan. The Plan is also inconsistent with the District's 2050 goal of carbon neutrality, which the District is the process of designing and implementing.

First, the Plan shows that about half of WG's total sales will be met through distributing natural gas in 2050. Second, the Plan fails to identify how WG can, as often asserted by AltaGas during the evidentiary hearing in Formal Case 1142, be part of the District's ongoing decarbonization efforts and climate policy. Importantly, the Plan does not address how WGL can avoid or manage the so-called "death-spiral" that Mr. Chapman raised in his response to then-Chairman Kane's question about stranded assets, and it does not discuss how WGL can reduce the capital assets, such as new pipes, that may become stranded due to the District's decarbonization efforts.

In fact, AltaGas appears to explicitly reject the District's climate goal of eliminating fossil fuel use because AltaGas adopts an alternative pathway called "Fuel Neutral Decarbonization," which does not achieve the District's goal of deep decarbonization, let alone the goal of carbon neutrality. Despite the significant flaws of this pathway, most notably a failure to achieve carbon neutrality, AltaGas unilaterally declares that this approach will result in the District meeting its climate goals:

> Over the last year, AltaGas has engaged in extensive and thorough research, leveraged its own decades of energy expertise and enlisted the respected consulting firm ICF Resources, to assess an optimal path forward for the District and its residents. **AltaGas has determined that Fuel Neutral Decarbonization is the right choice for the District to meet its Climate Goals**.[28] [Emphasis added.]

The original intent of Term No. 79 was to help identify where AltaGas can support and accelerate the District's decarbonization efforts as developed and adopted through years of research and stakeholder engagement. However, the Plan ignores the decarbonization pathway developed by the District and its stakeholders, and instead promotes an approach that is incompatible with the District's climate policy.

DOEE points out that it is unaware of a single jurisdiction in the U.S. that is committed to deep decarbonization -- i.e., 80% or greater reduction of GHG emissions -- that employs measures consisting solely of conventional natural gas, "renewable" natural gas and other manufactured low-carbon fuels, gas heat pumps, and natural gas-fired Combined Heat and Power (CHP). The reason is likely that these measures are simply inadequate to deliver deep decarbonization.

DOEE appreciates the efforts that AltaGas has made to comply with Term No. 79 and acknowledges that the task imposed by Term No. 79 is a difficult one. Nonetheless, DOEE finds it regrettable that AltaGas chose an approach that (1) ignores the District's existing climate and decarbonization policy and goals, (2) is riddled with significant technical deficiencies, and (3) fails to provide a robust business case for WG that is consistent with the District's climate policy, and the resulting so-called "death-spiral" of a utility that is in the business of distributing and selling natural gas.

[28] CBP, p. 2.

B. Synapse Energy Economics' Analysis of the CBP Regarding Technical Deficiencies as a Decarbonization Roadmap and as a Business Plan

AltaGas's CBP filing is composed of four documents: the CBP proper and three reports prepared by ICF at the direction of AltaGas. The ICF reports are the "Study on the Use of Biofuels (Renewable Natural Gas) in the Greater Washington, D.C. Metropolitan Area" (Biogas Study) required by Term No. 6 from the merger order; a Technical Study Summary Report; and the full Technical Study Report.

The CBP states that it provides a "conceptual framework that, with proper regulatory and legislative support, evolves [AltaGas's] business model in and for the District to meet the District's Climate Goals, achieving both a 50 percent GHG emissions reduction associated with natural gas use by 2032 and carbon neutrality by 2050 compared with baseline GHG emissions in 2006."[29] The CBP primarily consists of a list of actions that AltaGas or others could take to reduce or offset emissions from natural gas use in the District of Columbia. These actions generally fall into four categories: reducing fuel demand through efficiency or partial electrification; reducing methane emissions within the District of Columbia; procuring different, lower-carbon fuels to distribute to WGL customers; and offsetting remaining emissions through actions or impacts outside of the District of Columbia. As AltaGas points out, the Company is not currently in a position to take these actions, because it does not control the gas procurement for other suppliers within the District of Columbia's competitive gas marketplace, does not operate efficiency programs in the District of Columbia, and may not have the regulatory approvals necessary to pursue offsets and emerging technologies. AltaGas concludes the CBP

[29] CBP, p. 7. DOEE clarifies that the District's goal is to reduce its citywide GHG emissions—not just those associated with natural gas use—by 2032 and carbon neutrality by 2050.

with a short section identifying the numerous changes that would be required to make the Company's preferred path a reality.

AltaGas used a waterfall approach to modeling a path to reducing emissions toward the District's carbon neutrality target. The CBP claims a business-as-usual trajectory for emissions and then states the modeled emission reductions that would occur relative to that baseline as a result of each action. This waterfall begins with a 27 percent reduction below 2006 levels, which is claimed based on the natural-gas-related emissions in the District's GHG inventory for 2017, which in turn relies on data filed by WGL with the Metropolitan Washington Council of Governments, (MWCOG). Of the remaining emissions, AltaGas claims that about 45 percent would be achieved using efficiency, CHP, and partial electrification. Another 44 percent would come from reducing the carbon intensity of fuels themselves, and 6 percent from pipe replacement in the District of Columbia (e.g., the second phase of PROJECTpipes). The final 6 percent of remaining emissions would need to be offset using as-yet-undefined offsets or emerging technology options.[30]

The CBP presents the summary results from a comparison that ICF performed (and which is detailed in the Technical Study Report) between a business-as-usual case, a partial decarbonization case, AltaGas's preferred "Fuel Neutral" case, and a "Policy-Driven Electrification" case. Of these cases, only the Fuel Neutral and Electrification cases claim compliance with the District's policy objective of carbon neutrality by 2050. AltaGas claims that the Fuel Neutral case is preferred because ICF's modeling shows it to be less expensive, because

[30] The sum does not equal 100 percent due to rounding.

it offers resilience and reliability against weather-related disruptions, and because it leverages existing assets to their fullest potential.[31]

The CBP concludes with two pages listing 20 policy changes that would be necessary to enable AltaGas's preferred plan. These policies address decoupling and cost recovery (including from electric ratepayers); end-use efficiency and appliance adoption; approval for investments in the gas distribution system; and cost recovery for new kinds of low-carbon gas sourcing and supply.

1. Summary of critique

- The objective of Term No. 79 was to develop a business plan that is aligned with the District's policy of phasing out natural gas. Instead, AltaGas has presented a business-as-usual approach that continues to sell substantial amounts of fossil natural gas and promote energy efficiency, without addressing the District's underlying policy or analyzing the customer economics and choices that would challenge the utility's ability to execute such a business-as-usual approach.

- Despite a District policy objective of eliminating fossil fuel use in the District of Columbia by 2050, the CBP envisions selling a product that is at least 42 percent fossil gas in 2050. After correcting for two errors in the CBP analysis, the actual fraction is likely over 50 percent. This represents less than a 60 percent reduction from today's level of fossil gas consumption.

[31] CBP, p. 21.

- AltaGas counts as part of its progress a claimed reduction in emissions between 2006 and 2017. The CBP then counts down emissions from 2017 levels to a claim of zero in 2050. However, its 2017 starting point is wrong and underestimates emissions by more than 20 percent, compared to WGL's own recent filings. As a result, the reductions are not sufficient to reach zero in 2050. Our best estimate is that the CBP actions might be sufficient to reduce emissions by about 60 to 75 percent below 2006 levels by 2050.

- AltaGas's claimed reductions in consumption depend on 40 percent of buildings using gas heat pumps, a technology which is still in development, not available on the market today, and expected to be expensive if it does become available. AltaGas also does not explain why customers would choose to partially electrify to create hybrid systems when full electrification would be a simple and cost-effective approach for many buildings.

- The CBP assumes that renewable natural gas (RNG), green hydrogen, and power-to-gas are all carbon neutral. However, ICF's analysis shows that the RNG available in the DC region results in net positive carbon emissions. When quantifying the net emissions from manure RNG, ICF assumes that states with agricultural emissions will take no actions to mitigate these emissions through 2050, resulting in unreasonably negative net emissions. RNG is also unlikely to be available in the quantities and at the costs that AltaGas assumes.

- The CBP counts on a dramatic and unrealistic expansion of CHP, while also making optimistic assumptions about how much CHP offsets emissions in the regional

electric sector. AltaGas incorrectly assumes that regional electricity in 2050 will be only 33.5 percent sourced from emission-free sources, when states representing more than 34 percent of PJM load have already committed to emission-free power in or before 2050 and other states also have renewable and clean energy requirements. AltaGas also claims offsets due to methane emission reductions in upstream gas systems, using an approach that is explicitly not supported by one of the main certification providers.

- AltaGas claims that its preferred approach should be pursued because it is less expensive than alternatives. The CBP compares AltaGas's preferred "Fuel Neutral" scenario to an unrealistic strawman "Policy-Driven Electrification" scenario that does not include energy efficiency. AltaGas defined the two scenarios before the analysis, indicating that the conclusion to prefer the "Fuel Neutral" case was set before analysis.

- The quantitative analysis of the Fuel Neutral and Electrification cases contains multiple billion-dollar errors, so the CBP cannot be used to draw any conclusions about the cost of different approaches.

- The CBP has not adequately addressed the business model challenges that are facing WG, including the unfavorable customer economics of remaining connected to the gas system in AltaGas's preferred case.

- The CBP lists numerous fundamental changes in the policy and regulatory approach to natural gas distribution in the District, including asking electric customers to pay

for the gas utility's cost of service, without presenting any analysis or discussion of the implications of these changes.

- The CBP is not a business plan, nor does it include a process to develop a business plan that seriously addresses the uncertain future of the gas distribution business in the District of Columbia.

2. *The CBP envisions selling gas that is at least 42 percent fossil fuel to District of Columbia customers in 2050, falling far short of carbon neutrality. DOEE's corrected estimate shows 57 percent fossil fuel in 2050.*

Despite the District's public commitment to achieve carbon neutrality, the CBP explicitly states a plan to sell a product that is at least 42 percent fossil gas to District of Columbia customers in 2050.[32] In addition, AltaGas misestimates the total gas sales in 2050. Upon careful review of the proposed gas sales and emissions values presented in the CBP, along with limited workpapers provided by AltaGas, it was determined that the CBP misstates the total gas sales in 2050. Where the CBP states that total gas sales would be 17.02 BCF, the internally consistent value for total gas sales is 18.58 BCF.[33] (This is before correcting for starting at the lower level of sales at the start, as discussed below.)

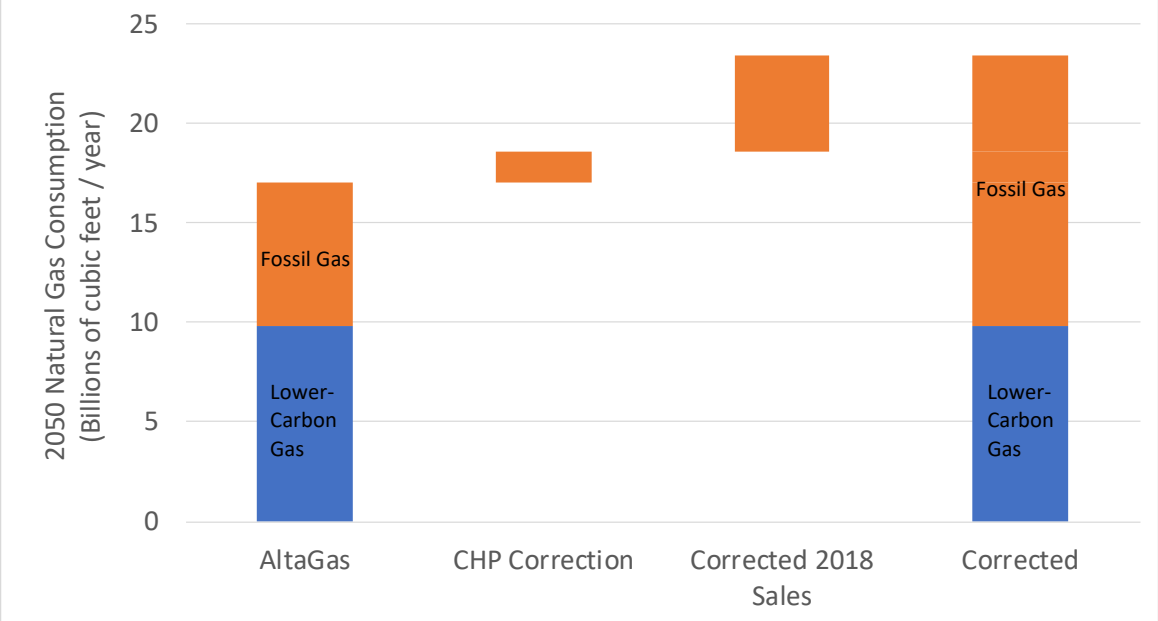
The CBP lays out a path to acquire 9.8 BCF of low-carbon gas (renewable natural gas, hydrogen, and power-to-gas). As shown in Figure 1, with total consumption of 18.58 BCF, the

[32] CBP, p. 18

[33] AltaGas claims emissions reductions in 2050 from CHP of -88 kT. This value reflects an increase in emissions from increased gas consumption for CHP facilities of 206 kT/yr, and a -294 kT/yr reduction from offsetting lower emissions in the electric sector. When adding the associated increase in gas consumption from CHP (3.87 BCF/yr) to the consumption resulting from BAU changes, energy efficiency, and hybrid heating, we find the resulting total gas consumption must be 18.58 BCF/yr in 2050.

actual fossil fuel consumption would be 8.78 BCF, or 47 percent of sales. After further adjusting sales projections up to account for the actual 2018 sales, the fossil fuel fraction would be at least 57 percent, and 2050's fossil gas consumption would be more than 40 percent of 2018's level. Retaining more than 40 percent of today's fossil gas consumption in 2050 is not consistent with the goal of carbon neutrality and the Sustainable Plan DC 2.0.

Figure 1. Corrected calculations of 2050 fossil and lower-carbon gas sales.



3. The fundamental approach of CBP is flawed and erroneously claims significant emissions reductions

The CBP is built around the idea of identifying actions that would cancel out base case emissions, rather than being built around a coherent vision for a net zero building sector in the District of Columbia. AltaGas's method leads to a brittle approach that does not withstand changes in assumptions or, as will be seen, errors in input data or calculations.

Counting down to zero from today's natural gas consumption and associated emissions necessitates having a solid grasp on today's emissions. AltaGas has the best information

regarding gas consumption through its own system, and yet the CBP is internally inconsistent regarding the starting point for gas consumption in the District of Columbia. It is also inconsistent with data provided by WGL to the U.S. Energy Information Administration (EIA) and in other filings with the Commission.

The CBP begins its waterfall analysis with assumed consumption of 24.41 BCF in 2018,[34] which was developed by weather-normalizing the 2017 gas sales reported in the District's GHG inventory.[35] However, there is substantial evidence that AltaGas's 2017 starting point is incorrect:

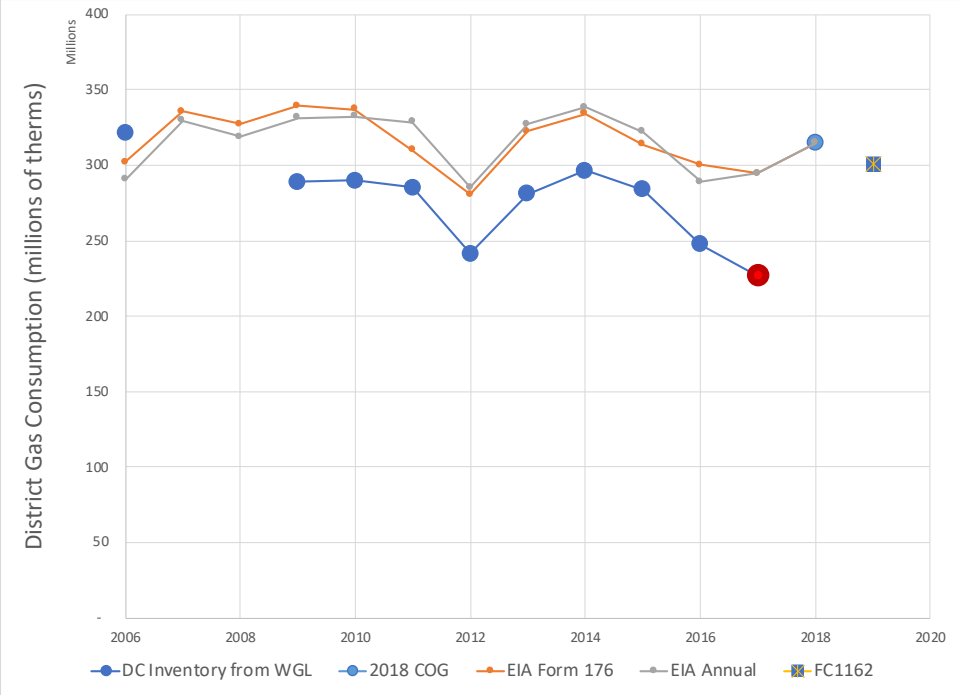
- The monthly gas consumption presented in ICF Figure 8 of the ICF Technical Study Summary Report,[36] which corresponds directly to the monthly gas consumption data available from the EIA,[37] shows consumption of more than 30 BCF.
- WGL reports total supply volume of 31.5 BCF for 2018 on EIA Form 176.[38]
- WGL reported 2018 District of Columbia consumption of 31.5 BCF in its annual report to the MWCOG.

[34] CBP, p. 18.
[35] AltaGas "WGL Responses to District of Columbia Attorney General Office Questions Relating to ICF Analysis and Assumptions in the Climate Business Plan." May 7, 2020. p. 1-2.
[36] ICF Technical Study Summary Report, p. 20.
[37] U.S. EIA. "Natural Gas Consumption by End Use." Accessed May 21, 2020 at https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_SDC_m.htm
[38] U.S. EIA. "Natural Gas Annual Respondent Query System (EIA-176 Data through 2018)." Accessed May 4, 2020 at https://www.eia.gov/naturalgas/ngqs/

- WGL uses test year sales of 30 BCF for 2019 in its rate case filing to the Commission in Formal Case 1162.[39]

Given the multiple confirmations of higher sales in 2018 and 2019, it is unreasonable to begin the CBP analysis at a sales (and therefore emissions) level almost 20 percent below the actual baseline emissions. Further, it is unreasonable to assume that the reduction represents a permanent reduction. Figure 2 shows the time series of the different data sources we have compared. It appears that WGL has provided inaccurate data to the MWCOG, which has been used as input data for the DC GHG Inventory.

Figure 2. Comparison of different data sources for District of Columbia Gas consumption (The outlier starting point for AltaGas's CBP analysis is highlighted in red.)



[39] Andrew Lawson, Direct Testimony of January 13, 2020 in Formal Case 1162 on behalf of Washington Gas Light Company. Exhibit WG (H) – 1, Schedule C, Page 1.

The CBP's discussion of emission reductions between 2006 and 2017 rests on a flawed foundation, and this flaw taints the CBP's analysis of subsequent emission reductions. If AltaGas had taken Clean Energy DC as the starting point for its future business plan development, and built a future vision without fossil fuel use, its analysis would not have been subject to this error before it even began.

While this foundational error throws all subsequent numbers and calculations in the CBP's analysis into question, there is no other choice but to continue and analyze what AltaGas has provided, making corrections to the best extent possible. Some of the emission-reduction efforts (such as efficiency and electrification) that AltaGas proposes would likely have to be scaled up to help counter this error in starting position, while others (such as CHP, RNG, and offsets) would not scale up without substantial additional effort and expense.

4. The CBP's proposed carbon offsets are suspect and contain errors

AltaGas plans to rely on extensive offsetting activities to reach a claim of "net" carbon neutrality while distributing and selling substantial amounts of fossil fuels. The offsets that AltaGas identifies are limited in potential scale and would need to be increased as part of correcting for actual consumption. Strategies that AltaGas has proposed to net out emissions include using negative-emission RNG, certified gas, CHP, and other offsets. However, the emissions reductions from these sources are incorrectly estimated in the Plan and the sources' true benefits are uncertain.

a. <u>Gas and hybrid heat pumps</u>

AltaGas's claimed reductions in consumption depend on 40 percent of buildings using gas heat pumps. AltaGas assumes that half of efficiency program participants would install a gas

heat pump starting in 2026. This rapid and comprehensive update is unreasonable to assume because gas heat pumps are a technology in their infancy. When illustrating the technology in the CBP, AltaGas uses an image of a prototype from a research project. Furthermore, gas heat pumps are expected to be more expensive than electric heat pumps, while also requiring customers to purchase an electric air conditioner, an additional cost.

A 2017 study by Oak Ridge National Laboratory and IntelliChoice Energy characterizes the cost of a gas heat pump (GHP) as follows:

> "[t]he current cost of manufacturing for both the residential and the commercial GHPs are 2 to 3 times the retail price of their conventional (electrical) counterparts. This places the GHPs at an extremely disadvantageous competitive position. Although cost could be reduced, we expect that it will always be higher than conventional counterparts, at least in the foreseeable future."[40]

The study states that the current cost of a residential-scale gas heat pump is $14,000. AltaGas did not provide the cost assumptions that informed the CBP, despite the District requesting this information.

AltaGas also does not explain why customers would choose to partially electrify to create hybrid systems when full electrification would be a simple and cost-effective approach for many buildings (as illustrated by the many new and existing buildings in the District of Columbia today that do not use gas). The market size for both gas and hybrid heat pump systems in the District of Columbia will be reduced as more homeowners participate in DC SEU programs that encourage electric heat pump conversions.

[40] Abuheiba et al. (2017) Challenges and opportunities of Gas Engine Heat Pumps – Two Case Studies. Page 4. 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

b. Renewable natural gas, green hydrogen, and power to gas

In the CBP, AltaGas has assumed, without detailed substantiation, that it will be possible to supply the District of Columbia with a portfolio of RNG, green hydrogen, and power-to-gas that will each be carbon neutral. For instance, the ICF Biogas Study supplied with the CBP presents a range of RNG portfolios based on varying production potential and regional supply but does identify the blend of RNG sources that AltaGas plans to use to meet neutrality.

One of ICF's analyses focuses on the RNG available within the Greater Washington DC Metropolitan Area. Due to regional availability, ICF estimates that feedstocks would largely be made up of landfill gas and municipal solid waste, with the potential to use water resource recovery facilities (WRRFs) and food waste.[41] However, using GHG emissions factors for RNG developed by ICF in a separate study for these specific feedstocks, this portfolio would generate positive net emissions (see Table 1).[42] Specifically, ICF's RNG GHG analysis shows that the portfolios presented in Table 3 from its study have between 11 percent and 49 percent of the emission intensity of fossil natural gas – not zero or negative. This means if AltaGas were to use the portfolio of RNG available in the Greater DC Metropolitan Area, the net emissions from gas combustion in the District of Columbia would be higher by 10 to 40 percent (40 to 150 kilotonnes/year) than what AltaGas assumes. In terms of policy, a long-term use of landfills as low carbon fuel source conflicts with the District's zero waste goal. Such waste feedstocks decrease as waste diversion increases,[43] which is a key sustainability goal for environmental

[41] Biogas Study. Table 3, p. 21.
[42] ICF. *Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment.* Table 41.
[43] This aspect includes diversion of organic food waste to digesters, which could make biogas for us in hard-to-decarbonize end uses.

protection and to reduce GHG emissions. Energy derived from landfills and municipal solid waste is not an appropriate long-term solution to achieve carbon neutrality.

Table 1. ICF range of lifecycle GHG emissions factors in the South Atlantic region (gCO2e/MJ)

RNG Feedstock	Landfill Gas	WRRFs	Food Waste	MSW	Natural Gas
Emissions Factor	22 to 26	22 to 26	-90 to -82	25 to 55	65

Source: ICF. Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment. Table 41.

Table 2. ICF estimated annual RNG production in Greater Washington, DC Metro Area by 2040, tBtu/y

RNG Feedstock	Scenario		
	Conservative Low	Achievable	Aggressive High
LFG	7.0	17.0	24.4
WRRFs	1.2	2.5	4.6
Food Waste	0.3	6.2	7.8
MSW (nonbiogenic)	5.3	29.8	43.5
Total	**13.8**	**55.5**	**80.3**

Source: ICF Biogas Study, Table 3.

Alternatively, AltaGas must be assuming it will acquire more expensive RNG that ICF estimates to have negative emissions, to balance out the carbon-positive RNG sources. However, these negative-emissions sources are based on a questionable assumption that "negative emissions" baselines will remain valid for the next three decades. For example, the assumption that manure-based RNG has sharply negative emissions is valid only under a set of questionable assumptions, including that methane will continue to be emitted or vented without any mitigation by animal farms.

Specifically, Biogas Study Figure 53, reproduced below, credits RNG from swine manure with an emissions factor of approximately -400 gCO2e/MJ and from dairy manure of

approximately -300 gCO2e/MJ, which are optimistic statements of how net-beneficial manure-based RNG is.[44] In using the GREET model from Argonne National Laboratory to estimate net emissions, ICF chose parameters that assume no flaring or other actions to mitigate methane emissions in the baseline case. In Argonne's own publications of GREET results, including those reproduced in ICF's recent national RNG study,[45] RNG from manure is credited with much smaller negative emissions. The default values in the GREET tool assume 60 percent flared gas in the base case.[46]

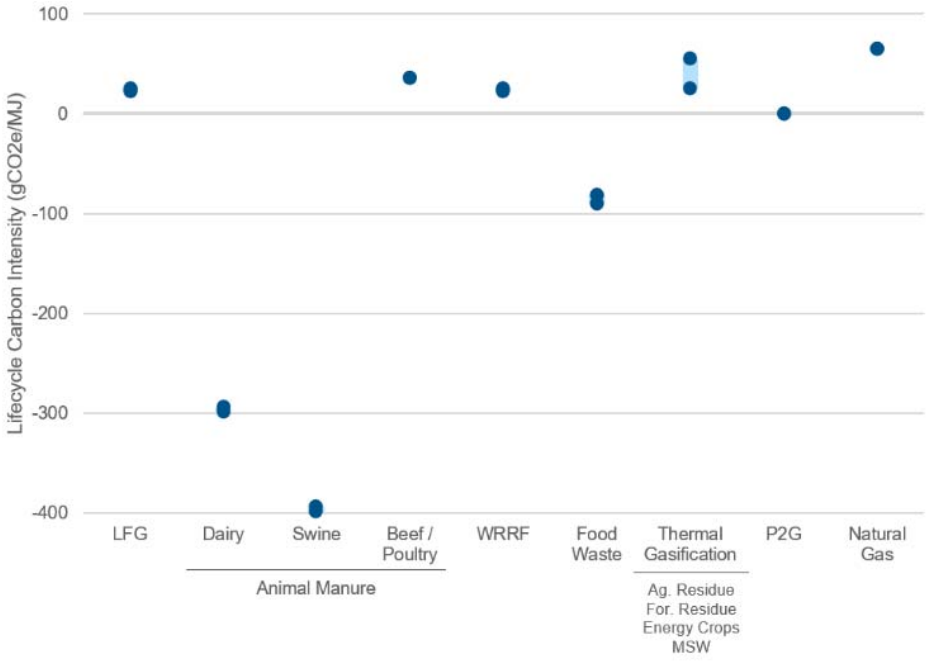
By choosing a baseline that presumes no mitigation of methane through 2050, ICF makes a highly questionable assumption that the default for dairy and swine farms will be for unmitigated methane emissions from anaerobic lagoons to continue through 2050. Additionally, this baseline ignores additional concerns, such as: (1) leaks caused while transporting the RNG between the farm and the gas transmission system; (2) the fact that more methane gets produced in digesters or lagoons than would be produced in other manure management strategies, such as spreading it on fields.[47]

A more reasonable assumption, given the market and policy trends toward a carbon-constrained world for the next few decades, is that unconstrained methane emissions will become the exception, not the rule. This would change the baseline on RNG emissions, making it more

[44] Biogas Study. Figure 53, p. 87.
[45] ICF. *Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment*. 2019. Produced for the American Gas Foundation. See Figures 35 and 36 on pages 70 and 71.
[46] The GREET tool may be downloaded from https://greet.es.anl.gov. Sheet "RNG" in the file "GREET1_2019.xlsx" shows 60% flared in the Reference Case.
[47] It should be noted that climate change represents an enormous threat of supply disruption as lagoons in particular are exposed to extreme rain and hurricane landfalls. In a scenario where RNG supply is disrupted, the consumer will need to rely on conventional natural gas.

difficult for AltaGas to acquire enough carbon-neutral RNG, and making it clearly unreasonable to assume that AltaGas will be able to acquire a carbon-neutral RNG portfolio.

Figure 3. ICF Figure 53—lifecycle GHG emission factor ranges for RNG feedstocks, South Atlantic Region



Source: ICF Biogas Study Figure 53.

The success of the District's GHG reduction efforts should not depend so heavily on an offset-based approach such as "negative-emission" manure-based RNG. AltaGas's assumption for carbon-neutral RNG will become untenable as increasingly stringent regulations on agricultural practices cause the baselines to shift and claims of negative emissions to evaporate. The District strives to serve as a model for taking sustainable, comprehensive, and aggressive action to mitigate climate change, and the District should not put itself in a position where positive action on climate change in other jurisdictions—which is exactly what the District seeks to inspire through its leadership—will cause the District to miss its goals.

Regarding hydrogen and synthetic natural gas, neither carbon neutrality nor availability at scale should be assumed. At 7.5 percent by energy, AltaGas is pushing the limit of the use of hydrogen in blended gas. Higher proportions of hydrogen would require both piping and appliance changes throughout the District.[48] The carbon neutrality of synthetic natural gas depends on finding sufficient sources of non-fossil carbon to attach to hydrogen. AltaGas suggests using carbon dioxide (CO_2) captured from breweries, presuming a CO_2 and/or hydrogen pipeline network capable of connecting breweries and other biogenic sources of CO_2 with hydrogen sources. AltaGas presents no analysis of the available quantities of biogenic or captured CO_2 or the necessary infrastructure.

5. *The CBP relies on overly optimistic biogas supply projections*

In order to meet the significant demand for RNG that AltaGas has estimated will be necessary for its system, the Company relies on overly optimistic biogas supply projections. For example, ICF assumes the national RNG market will grow at a compound annual growth rate of about 35 percent.[49] However, it is very likely that this value is overstated. RNG development so far has been driven by the transportation market, where the U.S. EPA's renewable fuel standard and California's Low Carbon Fuel Standard policies have incentivized growth. In order to expand the market to the magnitude that ICF and AltaGas envision, national policy or multiple state programs would be required such that RNG becomes widely used in buildings or electricity generation. To date, no state has adopted such policies. ICF highlights multiple regulatory and

[48] Aas, D., et al. The Challenge of Retail Gas in California's Low- Carbon Future: Technology Options, Customer Costs, and Public Health Benefits of Reducing Natural Gas Use. April 2020. Energy and Environmental Economics, Inc. Prepared for the California Energy Commission. See p. 16 and citations therein.
[49] Biogas Study, p. 19.

economic challenges in its report, including that the current policy landscape "has led to the unintended consequence of limiting the near-term potential for production and pipeline injection of RNG."[50] ICF also states that the current environment is inadequate to support the levels of RNG necessary for it to be a useful decarbonization pathway.[51] If the market does not take off at the growth rate that ICF assumes in its analysis, AltaGas will not be able to benefit from economies of scale and will not able to deliver a sufficient amount of RNG even at the high costs that the CBP assumes. The CBP should comprehensively consider this risk and inform District policymakers about future uncertainties due to a heavy reliance on RNG for AltaGas's Fuel Neutral case.

Even if the RNG market were to expand in alignment with the potential pathways in the Biogas Study, the CBP relies on the D.C. region consuming more than its reasonable share of supply. Due to the imbalance between the location of feedstocks and regional demand, it is likely that increasing competition for RNG would develop as the market advances. ICF also recognizes this in their study: "As waste diversion policies improve over time, and decarbonization efforts presumably expand in different regions, biogenic and biomass feedstocks will have increasing value, thereby increasing competition for various energy production processes."[52] AltaGas assumes that because the District would demand only its proportional share of the RNG produced in the South Atlantic region, the quantity required is reasonable. However, the South Atlantic region uses only 9.2 percent of the national non-electric-sector natural gas while having the potential to make 12 to 15 percent of U.S. RNG supply. By contrast, the Mid-Atlantic and

[50] *Id*., p 116.
[51] *Id*., p. 16.
[52] Biogas Study, p. 117.

New England regions together use 15 percent of the non-electric-sector natural gas, but only have the potential to make 8 to 11 percent of the RNG. AltaGas should recognize that it will be in competition with the colder regions of the United States for access to RNG should the market materialize and other gas utilities choose to pursue a path comparable to AltaGas's favored path.

It is also important to consider the potential RNG demand of the industrial sector. In the ICF Biogas Study, figures show that industrial electrification has the highest GHG abatement cost, around $900 per ton of CO_2 equivalent.[53] Given this abatement cost, decarbonizing industries will be willing to pay more for RNG than buildings. Even electric generation will be competing for RNG eventually, as a flexible combustion resource such as RNG or P2G could become an important resource for managing a low-carbon grid. In terms of policy, the District recognizes that there are activities that may be difficult to decarbonize through electrification, such as heavy industrial activities and heavy transport fuels. RNG must be reserved for activities that are difficult to decarbonize, not for space and water heating for which there already exists cost-effective, affordable solutions.

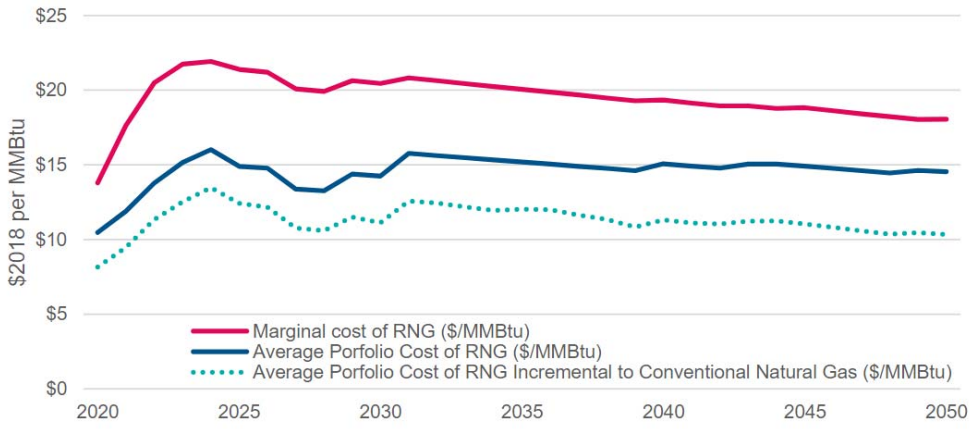
Furthermore, biogas combustion at the source (landfills, farms) can save gas upgrading and transportation costs, and could be a more lucrative path for would-be RNG producers. If AltaGas aims to displace a significant portion of the District's future demand for natural gas with RNG, they must comprehensively consider the needs of their many future competitors and the resulting impact on supply and cost—and inform District policymakers of their findings.

[53] *Id.*, p. 3.

6. *The CBP mis-estimates the cost of RNG*

In a functioning and competitive market, the price of a commodity is set by the marginal supplier. If an RNG market were to develop as AltaGas claims it will, the same economic principles would also hold true. This means that the low-cost suppliers of RNG would not be selling their gas at their cost (as assumed by the CBP). They would sell their product at the price set by the higher-cost marginal supplies. ICF shows the difference between the average portfolio cost of RNG and the marginal cost of RNG in its Technical Study Report. ICF Technical Study Report Figure 14 shows that the marginal cost is roughly 30 percent higher than the average cost.[54]

Figure 4. ICF Figure 14—incremental cost of RNG for WGL's portfolio



Source: ICF Technical Study Report Figure 14.

While it is possible that RNG with a lower carbon intensity could sell for higher prices, and the higher carbon intensity for lower prices, it is not clear that the CBP uses a market clearing price approach for the various levels of emissions as opposed to a cost-based approach.

[54] ICF Technical Study Report. Figure 14 on p. 14.

While ICF presents a price range for each RNG feedstock, it is unclear how these are used to produce total cost estimates. Since suppliers will price their RNG closer to the marginal cost shown in the ICF's Figure 14 than the average portfolio cost that CBP assumes, AltaGas should recognize that RNG will cost more than the CBP assumes and adjust its scenarios accordingly. Based on ICF's Figure 14, it appears that price at the marginal cost would roughly double the incremental cost of RNG supply, adding about one billion dollars to the cost of the preferred case.

a. "Certified" natural gas

AltaGas plans to rely on procurement of certified natural gas from third-party vendors to reduce 2050 GHG emissions by 31 kilotons per year (or 1.8 percent of 2006 emissions). These claimed reductions to emissions outside the District (essentially offsets) are problematic. Specifically, WGL declines to provide its own definition for certified gas, deferring this task to a future "longer-term effort."[55] Though AltaGas's term for this product suggests that the product is "certified," there are no official standards in place to validate this certification or verify that these entities are providing incremental benefits above what is already occurring in the industry.

Research shows that one of the main entities offering certified natural gas is the Independent Energy Standards (IES) Corporation TrustWell™ Responsible Gas products. However, IES specifically notes in its materials that, "While the program provides a robust quantification of the reduction in production methane emissions versus an industry benchmark per volume of natural gas produced, at this time *it is not intended to be used as a carbon offset*

[55] CBP, p. 20.

linked to end-user combustion of the purchased natural gas with the low methane attribute"[56] [emphasis added]. IES also states that its certification is reliant upon self-certified information provided by producers, rather than third-party verification. It is particularly troubling that AltaGas is promoting the use of a product type as a carbon offset that, according to a prominent product vendor, is not intended to be a carbon offset.

In short, AltaGas fails to adequately define the term "certified natural gas," the status of certified natural gas depends on third-party vendors that are unregulated by any authoritative body, and a prominent vendor of certified gas states that it is not intended to be used as a carbon offset. Therefore, the claim that this measure will provide with 31 kilotons of offsets to the District's GHG emissions is not supported and should not be counted.

b. Combined heat and power

The CBP depends on CHP to deliver 88 kilotons/year of negative (offsetting) emissions by 2050. AltaGas assumes that CHP demand for gas will increase emissions in the District by 206 kilotons. However, in order to claim that CHP reduces rather than increases emissions, it then questionably assumes that using gas-fired CHP will offset emissions from using grid-supplied electricity in the PJM region by 294 kilotons. Achieving this level of emission reductions depends on two problematic assumptions: (1) deploying CHP at a substantially

[56] Independent Energy Standards Corporation, "TrustWell™ Standard Definitional Document." January 1, 2020. Accessed via https://ies.co/trustwell/.

increased pace in the District, and (2) natural gas electric generation remaining the marginal source of electric generation in the region through 2050.[57]

There are currently 9 CHP installations in the District, totaling 31.8 MW of electric capacity.[58] The CBP envisions rising gas rates (due to the use of RNG and rising gas distribution rates) and yet also assumes that CHP will expand by an additional 120 MW by 2050. AltaGas does not explain why an increasing number of customers would choose to deploy a CHP system in a future with rising gas prices, or how CHP would compete with genuinely carbon-neutral heating options such as the large-scale ground- or water-source heat pumps that some university campuses are building (for instance, Swarthmore College and Amherst College).[59] In fact, ICF reports that it did not conduct a "detailed market study considering economics and policies" when deciding on assumptions for CHP deployment.[60]

More importantly, AltaGas assumes that CHP would run throughout the year, so its assumed emissions reductions on the electric grid in 2050 depend on a fossil fuel generator serving as the marginal generation resource in all or nearly all hours in PJM. This assumption is seriously flawed. PJM's power mix will include a higher share of renewable power by 2050, and

[57] AltaGas also assumes that the District's renewable portfolio standard works differently than it currently does, with respect to REC purchases to match CHP electric consumption. The RPS as currently formulated is an obligation on electricity suppliers, and self-supply via on-site generation does not require matching RECs. AltaGas assumes that RECs would be required, even in the CHP case. The current structure may need to evolve toward AltaGas's assumption as the District approaches 100 percent renewable in order to prevent CHP and other on-site generation from acting as a route around the RPS, so AltaGas's assumption for the long-term is a reasonable one.

[58] U.S. Department of Energy. "U.S. DOE Combined Heat and Power Installation Database." Accessed at https://doe.icfwebservices.com/chpdb/state/DC on May 22, 2020.

[59] See "Decarbonizing Swarthmore's Energy Systems" at https://www.swarthmore.edu/sustainability/decarbonizing-swarthmores-energy-systems and "Decarbonization of Our Campus Energy System" at https://www.amherst.edu/amherst-story/today/green-amherst/climate-action-plan/decarbonization-of-our-campus-energy-system

[60] ICF Technical Study Report, p. 22.

hourly dispatch modeling is required to determine what generation will actually be on the margin in this future. As the annual emission-free energy portion rises, the number of hours will grow in which variable renewables, combined with storage and nuclear power, meet the full needs of the region. During these hours, CHP will not reduce emissions. As ICF points out in the Technical Study Report, non-emitting resources are already on the margin in 15 percent of hours across the region.[61]

Problematically, ICF's assumed future of electricity does not reflect the expected increase in low-carbon or zero-carbon generation. Instead, ICF assumed that the non-emitting portion of PJM's generation mix would only rise from 31.2 percent to 33.5 percent.[62]

Table 3. ICF percentage of total PJM generation

Type	2020	2025	2030	2035	2040	2050	Definitions
Wind/Solar	5.1%	8.4%	9.8%	10.5%	10.4%	10.8%	Wind/Solar only
Renewable	7.3%	11.0%	11.9%	12.6%	12.9%	13.6%	Wind/Solar/Hydro/Biomass/Landfill
Clean	31.2%	32.7%	32.9%	33.1%	33.2%	33.5%	Wind/Solar/Hydro/Biomass/Landfill/Nuclear

Source: Reproduction of table from footnote 98 of the ICF Technical Study Report.

This seems to ignore the fact that Virginia,[63] Maryland,[64] and New Jersey[65] have all joined the District in adopting goals for 100 percent emission-free power by 2050. Together with the District, these states represent more than one-third of electric sales in PJM. That is, these states alone would require PJM generation to be more renewable than ICF assumes. In addition,

[61] ICF Technical Study Report, p. 19.
[62] ICF Technical Study Report, p. 91.
[63] Virginia Legislative Information Systems "HB 1526 Electric utility regulation; environmental goals." https://lis.virginia.gov/cgi-bin/legp604.exe?201+sum+HB1526
[64] Maryland General Assembly. "Clean Energy Jobs." http://mgaleg.maryland.gov/mgawebsite/Legislation/Details/SB0516?ys=2019rs
[65] State of New Jersey: Air Quality, Energy and Sustainability. "New Jersey's Clean Energy Picture." https://www.nj.gov/dep/aqes/opea-clean-energy.html

Pennsylvania and Virginia, with its large solar and wind portfolio, are anticipated to join the Regional Greenhouse Gas Initiative, which will further drive down the carbon intensity of generation in PJM. When combined with the 25 percent renewable electricity requirement by 2025 in Illinois, other renewable portfolio requirements across PJM (and their likely further increases over the intervening decades), and the existing nuclear fleet in the region, ICF's assumption of only 33.5 percent emissions-free power in 2050 is clearly a substantial underestimate.

For comparison, the 2020 Annual Energy Outlook (AEO) from the U.S. EIA, which reflects only policies that are binding and enacted as of its modeling, shows the PJM region with 42 percent emissions-free electricity in 2050.[66] EIA completed this modeling before Virginia passed its 100 percent renewable energy law. Increasing the Dominion (Virginia) region of EIA's modeling to 100 percent emission-free would raise the PJM-wide value to 48 percent. Any further action to expand zero-emission electricity by PJM states will only raise this fraction, and it is unreasonable for AltaGas to plan as though no further state or federal policy action will occur over the next 30 years. A higher zero-emission fraction (at least 48 percent vs. 33.5 percent) would result in a decrease in the PJM marginal emission rate, likely below the 818 lb/MWh level that ICF assumes. For comparison, ISO-New England in 2018 had only a small amount more emissions-free energy than EIA's 2050 reference case for PJM[67] and its marginal emission rate was 655 lbs/MWh.[68]

[66] U.S. EIA. Annual Energy Outlook 2020. Table 54 (Electric Power Projections by Electricity Market Module Region). Accessible via https://www.eia.gov/outlooks/aeo/data/browser/#/.
[67] 57 percent after accounting for imports, with a smaller portion of variable renewables than is likely in PJM.
[68] ISO-New England. *2018 ISO New England Electric Generator Air Emissions Report*. May 2020. Available at https://www.iso-ne.com/static-assets/documents/2020/05/2018_air_emissions_report.pdf.

The District intends to be carbon neutral not just in 2050, but also in the years past 2050 while the electric grid continues to decarbonize. As modeled by ICF, CHP increases net emissions if annual marginal grid emissions fall below 570 lbs/MWh. Even if ICF's marginal emissions estimate is correct for 2050, the CBP fails to address the further emission reductions that would be required elsewhere in the heating system to counterbalance the falling benefit of CHP as the grid continues to decarbonize. In short, even if the CBP's approach of using offsets and CHP worked in 2050, it may not work for the years past 2050.

c. Purchased offsets

AltaGas plans to use an undefined set of carbon offsets or emerging technologies to cancel the remaining 4 percent of emissions. After correcting for the various miscalculations of energy use and emissions described above, the District would require a substantial increase in the use of these uncertain and undefined products and technologies to reach its goal in 2050 using the approach proposed by AltaGas. In making long-term decisions about meeting policy goals, the District should not depend on the hope that some kind of new technological solution will emerge. AltaGas should have at least tried to close the gap with solutions known and characterizable today, without the use of offsets. Global decarbonization will require solutions to difficult technological problems, such as decarbonized jet fuel or the production of cement or steel. Decarbonizing buildings is not one of these challenges, and AltaGas should be able to present a path for the District's buildings that does not rely on speculative future technologies or offsets.

d. Cumulative emissions gap to carbon neutrality

The following table summarizes an approximate set of corrections to AltaGas's emission reduction assumptions. Each of these corrections is uncertain because we do not have access to AltaGas's underlying models. In total, this set of corrections indicates emission reductions of approximately 70 percent below today's levels. Given uncertainty in our corrected assumptions, we believe the best estimate is that AltaGas's proposed plan would reduce net emissions between 60 and 75 percent below today's levels. However, even this best estimate is likely overstating the amount of achievable reductions given, again, the artificially low 2017 baseline used.

Table 4. Approximated corrections to AltaGas emission reduction assumptions, in thousands of metric tons

	AltaGas		**Approximate Correction**		**Notes**
	Impact	Emissions	Impact	Emissions	
2018 emissions		1,296		1,671	Based on WGL 2018 sales reported to EIA
BAU to 2050	-41	1,255	-53	1,618	Scaled up to higher per-customer consumption
Energy efficiency (gas heat pumps)	-239	1,016	-277	1,341	Scaled up to higher per-customer consumption. 10% reduction in GHP adoption rate
Hybrid heat pumps	-235	781	-303	1,038	Scaled up to higher per-customer consumption
CHP consumption	+206	987	+206	1,244	Same
Distribution system	-74	913	-74	1,170	Same
CHP electric sector offsets	-294	619	-236	934	Assume 655 lbs/MWh marginal emissions in 2050
Certified gas	-31	588	0	934	Not to be used as an offset
RNG	-372	216	-298	637	Assume RNG has 20% net emission of fossil gas
P2G	-74	142	-37	600	Discounted to account for uncertain access to non-fossil CO_2
Green Hydrogen	-74	68	-74	526	Same
Remainder to be offset		**65***		**526**	**69% below 2018 level**

*Note: * Differs due to rounding.*

7. *The CBP scenario analysis is deeply flawed*

a. The CBP compares WGL's preferred future only to an unrealistic strawman scenario

AltaGas refers to the proposed measures discussed thus far its preferred Fuel Neutral Decarbonization scenario. In addition, AltaGas outlines two scenarios: a so-called "Policy-Driven Electrification" case as well as a "Partial Decarbonization" case. DOEE does not discuss or examine the Partial Decarbonization case in these Comments because this scenario fails to meet the District's climate targets, and AltaGas does not suggest otherwise in the plan. For these reasons, the "Partial Decarbonization" scenario does not merit further consideration. However, should the Commission wish the parties to evaluate the merits, if any, of the Partial Decarbonization scenario, DOEE requests to reserve the right to do so at that time.

In a typical scenario planning, the planner weighs the costs, risks, benefits, and implications of various measures to find an optimal solution. In this case, however, AltaGas's consultant on the plan, ICF, notes that AltaGas at the outset predefined the so-called Fuel Neutral scenario, as well its methodology and major assumptions. AltaGas then directed ICF to compare it against an unrealistic so-called "Policy-driven Electrification" scenario that AltaGas constructs as a strawman. In short, AltaGas determined its preferred case before understanding its costs, risks, benefits or implications, and it has presented this flawed case to the District as a favored option, comparing it only against an unrealistic "Policy-Driven Electrification" scenario. Such a planning approach is not data-driven and does not appear to be intended at finding an optimal solution. Therefore, this approach is not particularly helpful in informing the District's policymakers on the best pathway forward to meet the District's climate and energy goals.

The so-called "policy-driven electrification" scenario is an unrealistic strawman for two major reasons:

(1) First, it does not include energy efficiency and assumes that buildings will use old, inefficient, outdated heating systems that no developers of new buildings in the District would use anymore. Troublingly, it assumes that all buildings currently heated with electric resistance, or using electric resistance water heaters, will continue to use this baseline technology for the next 30 years, while every new building in the District is built for or adapted to use efficient heat pumps. This flawed assumption ignores the District's new "net-zero ready" building energy codes that require highly efficient performance from heating appliances, and this standard is likely to be more stringent in the next building code cycle. The Building Energy Performance Standards, established under the Clean Energy DC Omnibus Amendment Act, will also encourage building owners to choose electric heat pumps that provide higher efficiency at the time of equipment replacement. This assumption is clearly unacceptable and contradicts market trends and customer economics for electric systems in the District. Efficiency programs to replace resistance with heat pumps for space and water heating would save substantial energy and money, while also reducing winter peaks in the electrified case. DOEE, with the help of electric utilities, are examining in various forums, including in Formal Case 1162, how best to improve the performance of electric heating systems.

In a further unrealistic assumption, AltaGas assumed that heat pump water heaters

would achieve only a coefficient of performance of 2.0 (compared to typical traditional gas water heater efficiency of between 0.6 and 0.7 and electric resistance of 0.95 to 1.0). However, heat pump water heaters with an efficiency factor of 4.0 are available on the market today.[69] Both newly electrifying and already electric buildings in the District will be able to take advantage of this improving technology, but AltaGas has not included it in this scenario.

In AltaGas's preferred, so-called Fuel Neutral scenario, AltaGas assumes a very high level of energy efficiency for heat pumps using natural gas. However, for the electrification scenario, it assumes no energy efficiency work would be undertaken. This type of cherry-picking of assumptions not only demonstrates a biased approach that skews results, it also undermines the credibility of the plan. If AltaGas were interested in a meaningful and honest comparison, it could have included these kinds of efficiency efforts in its electrification scenario. However, it chose not to do so.

(2) Second, AltaGas appears to assume that the Washington Gas will maintain a complete gas system capable of serving every customer until 2050 *even if the District opts to electrify all buildings and transportation.* In short, in this case the building and transportation sectors move away completely from using natural gas, but AltaGas plans on behaving as if gas service is continuing business-as-usual. In making this assumption, AltaGas deliberately creates an enormous stranded asset problem that could be avoided.

[69] Rheem, "Professional Prestige® ProTerraHybrid Electric with LeakGuard™ is the most efficient water heater available", Accessed May 21, 2020 at https://rmc-cdn.s3.amazonaws.com/media/uploads/iat/sites/36/2020/04/HP-350-5-RHEEM-GenV-hybrid_0403.pdf.

Such an assumption would not represent prudent utility management. Prudent utility managers would, once the District's course has been set for the electrification case, identify which assets could be retired rather than replaced as they reached the end of their service lives or suffered leaks. Prudent utility managers would also develop an approach to reduce the revenue requirement in concert with declining sales, leaving less (or even no) unrecovered cost. This likely means some combination of accelerated depreciation and "prune the tree"[70] approaches to electrification—or face the risk of write-offs or bankruptcy for an imprudent utility. The PSC, District government, and public deserve a complete, realistic, and even-handed look at what this option entails, rather than an unrealistic strawman that assumes imprudent utility managers.

AltaGas also could have developed and tested blended scenarios (such as a scenario that uses RNG for CHP and existing district heating networks, but electrifies all other buildings, or other mixed approaches). AltaGas has the best information to provide insights about what may be viable approaches that reside between full electrification and its gas-dominated proposal. Such an exploration would have been informative and insightful for the public and the District's policymakers including the Commission. However, AltaGas chose not to do so.

AltaGas states that the Fuel Neutral case is more resilient and reliable than the alternative because "multiple energy sources and distribution networks incorporated within the Fuel Neutral Decarbonization approach provide an inherent redundancy of energy supply, reducing the

[70] By "prune the tree" approaches we mean a strategic approach to identifying distribution lines that are in need of repair or investment and then targeting electrification efforts to those lines so they can be removed from service.

District's risk exposure to disruptions in energy delivery from weather or other events."[71] However, AltaGas's analysis does not reflect the key fact that customer use of natural gas equipment is dependent on electricity. Furnaces, boilers, water heaters, cooktops, ovens, and dryers have electric ignitions, while electric fans and pumps move heated water and air, and also exhaust air to maintain safe indoor environments. In fact, due to their inability to provide service if either the electric or gas supplies are unavailable, natural gas end-uses are marginally less reliable and resilient than electric-only systems. AltaGas also neglects to mention that when a pipe distribution system is disrupted due to extreme weather events, the duration of outage can last weeks and months, and pose far greater danger to public safety due to risks of explosion. The CBP's errors in estimating costs and savings in its scenarios number in the billions of dollars

Perhaps the most significant errors in AltaGas's analysis of an electrification scenario are miscalculations of the costs and benefits that skew the results by billions of dollars. These errors render AltaGas's conclusions about its so-called Fuel Neutral scenario and the electrification scenarios completely unreliable.

Pages 41 and 42 of the CBP present estimated costs for the scenarios that AltaGas specified and instructed, and ICF subsequently analyzed. ICF's detailed costs are presented in the Technical Study Report. Of greatest relevance here are the building-sector costs presented in ICF Table 15 on page 74, and reproduced here:

[71] CBP, p. 4.

Table 5. ICF Table 15—change in building sector costs by cost category ($2018 million)

Sub-Category	Partial Decarbonization	Policy-Driven Electrification	Fuel Neutral Decarbonization
Fuel Costs	**-406**	**1878**	**467**
Certified Natural Gas	30	0	24
Natural Gas Purchases	-603	-4298	-721
Incremental Electricity Purchases	0	6175	-358
Premium for RNG/P2G/Hydrogen	166	0	1522
Equipment and Retrofit Costs	**0**	**1922**	**693**
Residential Equipment and Retrofit Costs	0	1108	381
Commercial Equipment and Retrofit Costs	0	814	312
Energy Efficiency Programs	**495**	**0**	**1756**
Residential Energy Efficiency Programs	382	0	763
Commercial Energy Efficiency Programs	114	0	227
Combined Heat & Power (CHP)	0	0	766
Total Building Sector Costs	**89**	**3799**	**2916**

Source: ICF Technical Study Report, Table 15 on page 74.

And the system-level cost estimates presented in ICF Table 9 on page 62, also reproduced here:

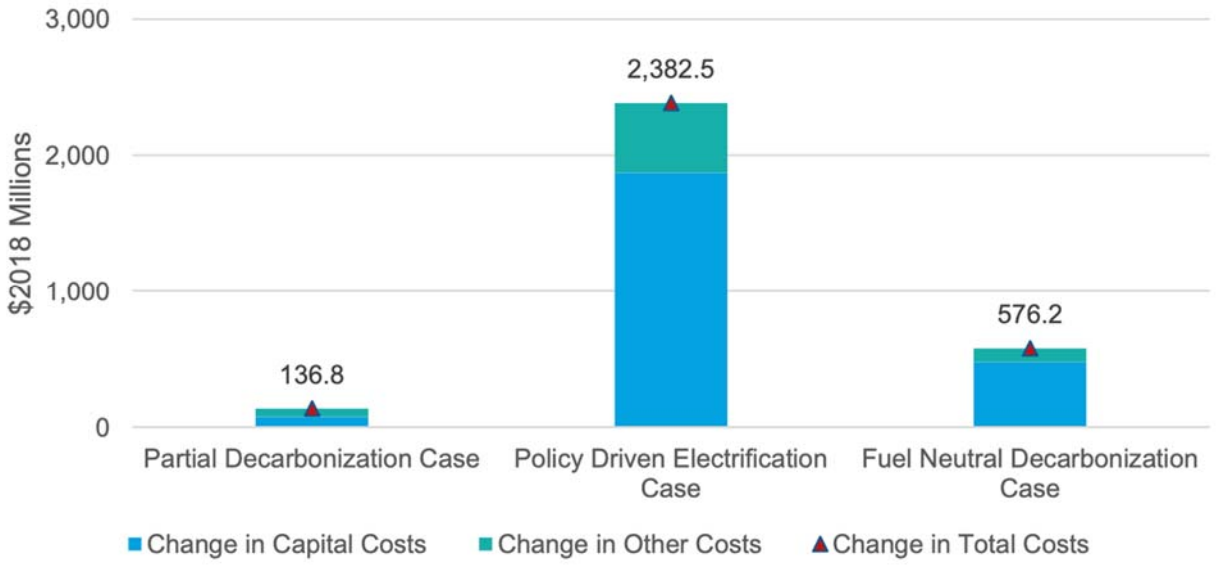
Table 6. ICF Table 9—comparison of additional cumulative 2020–2050 cost elements beyond those evaluated in scenarios ($2018 millions)

Impact	Policy Driven Electrification Case	Fuel Neutral Decarbonization Case	Additional Costs in Policy Driven Electrification Case
Cumulative Incremental Costs in Study Results (Million$)	6,532	3,843	+2,690
High Level Estimation of Transmission and Distribution Costs to Accommodate Peak Demand Growth – Using SEU Approach	$2,800 +/-	0	+$2,800 +/-
Unrecovered Cost of Service 2020-2050 (at Current Rates)	$4,600 +/-	$3,600 +/-	+$1,100 +/-
Stranded Rate Base in 2050	1,500 to $2,100 or more	0	+$1,500 to $2,100 or more
Final Customer Transition Costs	$800 +/-	0	+ $800 +/-
System Decommissioning Costs	+ Unknown	0	+ Unknown
Reliability and Resiliency Costs	+ Unknown	0	+ Unknown
BAU Costs of 100% RPS – Not Included in incremental Power Generation Production Costs	+ Unknown	+ Unknown	Negligible

Source: ICF Technical Study Report, Table 9 on page 62.

ICF also presents a figure showing the changes in power sector costs to meet new electric loads (ICF Figure 54 on page 97):

Figure 5. ICF Figure 54—change in PJM total production cost by case from 2020–2050



Source: ICF Technical Study Report, Figure 54 on page 97.

Together, ICF Tables 15 and 9, and ICF Figure 54 show the basis for AltaGas and ICF's claim that the Electrification case is about $2.7 billion dollars more expensive than the Fuel Neutral case. However, the analysis is flawed and its conclusion cannot be supported for the following reasons:

b. ICF counts the cost of electricity supply and infrastructure twice

ICF presents three substantial costs resulting from increased electric consumption: (1) $6.2 billion for "incremental electricity purchases" (ICF Table 15); (2) $2.4 billion for "PJM total production cost" (ICF Figure 54); and (3) $2.8 billion for transmission and distribution (ICF Table 9).

In response to a question from the District, AltaGas stated that the $6.2 billion "incremental electricity purchases" figure is based on residential and commercial electric rates and is intended to reflect the "impact of changes in … electricity consumption to the cost of energy purchases for customers." Retail rates include both the cost of energy supply and the cost of infrastructure. However, the second and third of ICF's assumed costs are exactly these two costs: the increased costs of electric supply in the wholesale market, and increased costs for electric infrastructure.

ICF has counted these costs twice, and one version of the calculation must be removed. While ICF's methodology for calculating incremental wholesale and infrastructure costs are imperfect (see below for a discussion of our concerns), these methods are a more rigorous way to estimate the incremental cost of electric consumption than the retail rate. Reflecting on these, we see that the entire $6.2 billion cost assigned to the "incremental electricity purchases" should be removed from the analysis of the electrification scenario. The same logic reduces the cost of the Fuel Neutral case by about $1.2 billion.

ICF commits a similar error in valuing the production from CHP in the Fuel Neutral case. ICF assumes that customers who generate their own power with CHP not only avoid the cost of energy—which is double-counted, again, with the wholesale analysis in ICF Figure 54—but also the cost of the full commercial rate to serve them. In making this assumption, ICF misunderstands standby rates for CHP customers, which results in ICF further overstating the value of CHP. Overall, ICF overstates the net electricity value of CHP by about $1 billion.

c. <u>ICF overvalues the reduction in natural gas consumption</u>

Just as it assumed that increased electricity consumption would cost the full retail rate, ICF assumed that reduced gas consumption would avoid the full retail rate of gas service. Instead, from a system perspective, the reduced gas use that accompanies electrification would only be the commodity cost of the gas. As AltaGas is clearly aware in its discussion surrounding ICF Table 9, the fixed costs of the gas network are not avoidable by reducing consumption. Correcting this error increases the cost of the Electrification case by about $2.9 billion and the Fuel Neutral case by about $0.5 billion.

d. Errors in building system costs

There are additional errors in ICF's cost estimates (as shown in ICF Table 15) regarding the capital costs of electrification and efficiency. AltaGas's estimates for the expected changes in building sector costs are not supported by its own assumptions and is inconsistent across its analysis. Most importantly, AltaGas substantially overestimates the cost of residential and commercial equipment and retrofits for the Electrification scenario and has failed to justify the costs for the Fuel Neutral scenario.

For the residential sector under the Electrification case, AltaGas estimates $1.1 billion ($2018) for the change in equipment and retrofit costs.[72] This implies that residential customers in this case are paying an average of $7,000 per household in incremental cost (based on the assumption that approximately 159,000 customers currently using natural gas, propane or fuel oil for heating would need to electrify their space and water heating systems).[73] This cost estimate is substantially higher than AltaGas's own cost estimates of $1,000 for new construction single-

[72] ICF Technical Study Report. 2020. Table 15, p. 75.
[73] ICF Technical Study Report. 2020. Table 11, p. 68.

family homes and about $2,500 for existing single-family homes.[74] Assuming the average incremental cost is $2,000 per home under the Electrification case, AltaGas's cost estimate is overestimated by about a factor of 3. Correcting this error would reduce the total cost of this case from $1.1 billion to $326 million for the residential sector.

For residential homes under the Fuel Neutral case, AltaGas estimates a total of $1.1 billion ($2018) for the change in equipment and retrofit costs, as well as minor additional energy efficiency measures. (This cost would be split between direct customer costs and utility program costs.) This equates to $8,500 per household heating with gas, assuming that 40 percent of the total households heated with gas (174,405 households by 2050) will install gas electric hybrid systems and 38 percent of the households will install gas heat pumps, as assumed by AltaGas.[75]

AltaGas has not provided information to allow us to determine if these are incremental or total costs. The average cost per home is close to the total installed costs for homes with new forced-air gas furnace systems ($8,900 for existing homes or $9,200 for new construction) as estimated by AltaGas.[76] If the model cost is the total rather than incremental cost, then AltaGas has not included any incremental cost for hybrid heat pump systems or gas heat pumps, despite stating in the CBP that these systems would have an incremental cost. However, it is possible that the cost estimate is an incremental cost for the Fuel Neutral case, if AltaGas is assuming a reasonable cost for gas heat pumps.

[74] These represent the difference in total system cost estimates for electrified homes ($11,422 for existing and $10,228 for new construction) and conventional homes heated with natural gas ($8,942 for existing and $9202 for new construction) provided in AltaGas's response to DCG data request in a file titled "DCAOG Follow Up Questions - 5.07.2020 Responses"

[75] ICF Technical Study Report. 2020. Table 11, p. 68.

[76] AltaGas's response to DCG data request in a file titled "DCAOG Follow Up Questions - 5.07.2020 Responses"

The 2017 study by Oak Ridge National Laboratory and IntelliChoice Energy described above states that the current manufacturing cost of a residential-scale gas heat pump is $14,000. If we assume the installation cost of a gas heat pump is slightly more than the installation cost of gas furnace or heat pumps (say $3,000 per unit), the total installed cost of a residential gas heat pump would be $17,000 today. Given AltaGas's estimated furnace and AC cost of about $6,500, the incremental cost of a gas heat pump is about $11,000. Considering a potential cost decrease for gas heat pumps in the future, AltaGas's average cost estimate of $8,500 per home under the Fuel Neutral case is plausible as an incremental cost.

However, this is our assessment based on publicly available information and not based on AltaGas's cost estimate for gas heat pumps. Until AltaGas actually provides and justifies the assumed costs and performance for gas heat pumps, its proposal is based on a technology that is not yet commercially available, without even sharing what the expected cost to homeowners would be.

For the changes in costs for commercial equipment and retrofit costs and energy efficiency programs (excluding fuel costs), AltaGas estimates $814 million under the Electrification case and $540 million under the Fuel Neutral case. These costs represent about $2.51 per square foot under the Electrification case and $1.65 per square foot under the Fuel Neutral case on average across all commercial and governmental buildings, using AltaGas's commercial floor space estimate of 325 million square feet.[77]

[77] ICF Technical Study Report, page 67.

The electrification cost estimates appear to be substantially overestimated if they are the incremental costs of the retrofit measures. In AltaGas's response to the District's data request, AltaGas provided baseline and incremental HVAC and DWH retrofit cost for commercial buildings. The average incremental cost for electrifying in AltaGas's data is $1.58 per square foot, with a maximum of $2.05 in large commercial buildings. We cannot match AltaGas's provided input data with its results without access to the actual data and analysis behind the CBP. AltaGas has not provided any data to allow verification of the CBP's claims regarding the cost of commercial building improvements in the Fuel Neutral case. Together, these errors and omissions drastically undermine the credibility of AltaGas's cost analysis.

e. Errors in electric grid infrastructure costs

AltaGas suggests that an increase in peak electricity grid would likely require large investments in the electric distribution, transmission, and generation in the Electrification case and estimated the potential cost increase. AltaGas has not provided the data or analysis required to validate the assumed winter peak. However, because AltaGas's Electrification case does not include any energy efficiency, we must conclude that the winter peak loads are overstated.

Even if the winter peak load were to rise as much as AltaGas claimed, our assessment concludes that the CBP's cost estimate is too high. According to AltaGas's estimate, the potential additional cost of transmission and distribution to support the new peak demand is approximately $2.8 billion in cumulative costs from 2032 to 2050 (or approximately $0.3 billion per year). This estimate is based on an avoided cost estimate of $257/kW-year for transmission and distribution (T&D) ($231/kW-year for distribution and $27/kW-year for transmission).[78]

[78] ICF Technical Study Report, p. TS-21.

AltaGas sourced this value from a 2017 evaluation study of the DCSEU by TetraTech. However, a 2018 DCSEU evaluation study by NMR evaluated the DCSEU's avoided T&D costs and recommended a significantly lower value of $80/kW-year for the cost of avoided distribution.[79] NMR compared the $231/kW-year DC SEU value to values from similar cities and recommended a value close to that of ConEd in New York City, which the authors "believe is a reasonable upper bound given the network complexity and amount of underground infrastructure."[80] Assuming the same transmission value as assumed by AltaGas, this new value would make the entire avoided T&D cost to be about $107/kW-year, or about 59 percent lower than the AltaGas estimate. Applying this factor to the total cumulative T&D estimate in the CBP suggests that the total potential cost increase is better approximated as about $1.2 billion and that the CBP overestimated the potential cost increase for T&D by $1.6 billion. If the winter peak is lower, as would be the case with energy efficiency, the CBP value is even more overstated.

To better estimate these potential costs, the District would require a detailed assessment of the incremental cost of meeting winter peak loads and transportation electrification, including the impact of energy efficiency and distributed storage—and likely conducted in partnership with Pepco in order to access relevant data.

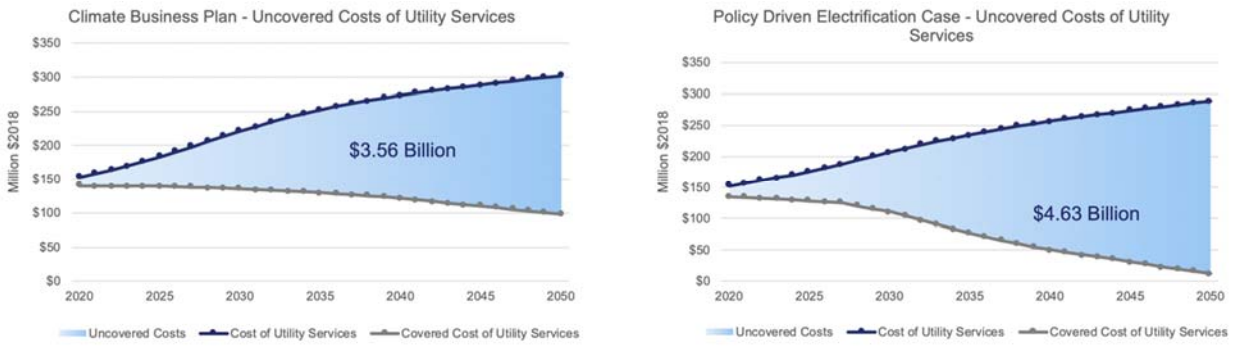
[79] NMR Group. *Performance Benchmark Assessment of FY2017 DC Sustainable Energy Utility Programs*. 2018. Available at https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/DCSEU%20FY2017%20Performance%20Benchmarks%20report%20-%20FINAL%20092818.pdf, page 37-38.

[80] *Id.*, p. 38.

f. Errors in gas infrastructure costs

AltaGas and ICF identify "unrecovered cost of service" between 2020 and 2050 of $3.6 billion in the Fuel Neutral case and $4.6 billion in the Electrification case. Together, this is the basis for AltaGas's claim that the Electrification case creates an additional $1 billion in unrecovered costs. Figure 6 is reproduced from a file provided by AltaGas in response to a request from the DCG,[81] and shows the origins of these values. According to AltaGas, the values in this figure exclude commodity costs and CBP implementation costs, and they include integrity management investments (which are assumed to be the same in both cases).

Figure 6. AltaGas unrecovered cost of utility services in the Fuel Neutral and Electrification cases



Source: AltaGas "Climate Business Plan DC OAG Discussion," April 21, 2020. Slide 18.

According to this figure, AltaGas projects that inflation-adjusted gas delivery rates would need to triple by 2050 in the Fuel Neutral Case in order to recover the full cost of service—and that even without the reduction in sales resulting from the CBP, delivery rates would need to double. Presumably these costs are what AltaGas believes are necessary to maintain its gas

[81] AltaGas "Climate Business Plan DC OAG Discussion," April 21, 2020. Slide 18.

system, including replacing the pipes through PROJECTpipes, its accelerated pipes replacement program.

In addition, according to this figure, and as discussed earlier, AltaGas is apparently assuming that Washington Gas will maintain a complete gas system capable of serving every customer until 2050 even if the District opts to electrify all buildings and transportation. In making this assumption, AltaGas deliberately creates an avoidable enormous stranded asset problem. This analysis illustrates the conflict between PROJECTpipes and the District's climate policy.

An example of a utility that has responded proactively to a similar policy situation is Corning Natural Gas in New York. In its current rate case, the utility has proposed a substantial increase in its depreciation rate in order to fully depreciate its entire ratebase by 2050 (when New York must be carbon neutral under its Climate Leadership and Community Protection Act).[82] Corning Gas's leaders understand that the utility will have reduced access to outside capital to make investments while its business shrinks in the coming decades, and the increased depreciation rate will provide the utility with cash flow to invest in maintaining safety and eliminating leaks.

Regarding system decommissioning costs, AltaGas needs to define these costs in more detail and explain how they are not already reflected in the net salvage cost associated with ongoing depreciation. If decommissioning an asset at the end of its useful life has not been

[82] Testimony of Firouzeh Sarhangi on behalf of Corning Natural Gas Corp. February 27, 2020. NY PSC Case 20-G-0101.

reflected in the depreciation expense for existing pipes, AltaGas should consider including such costs in the net salvage term in its next depreciation study.

g. Assessment of CBP's Scenario Analysis

After correcting for each of the errors described in this section, the relative costs of the Electrification and Fuel Neutral cases have reversed:

Table 7. Corrected relative scenario costs

	Scenario Cost ($2018 billion)	
	Electrification	"Fuel Neutral"
AltaGas CBP		
Buildings, transport, electricity, and fuel supply	**$6.5**	**$3.8**
Electric T&D	**+$2.8**	**$0**
Corrected fuel costs		
Overstated gas savings	+$2.9	+$0.5
Double counting of electric costs	-$6.2	-$1.2
Overvaluing of CHP	$0	+$1.1
Marginal RNG pricing	$0	+$1.0
Corrected building system costs		
Residential	-$0.8	
Commercial	-$0.2	
Corrected Electric T&D	-$1.6	$0
Corrected scenario cost	**$3.4**	**$5.2**

The net result is that the Electrification scenario, using corrected versions of AltaGas's assumptions, is cheaper than its proposal, even after including conservative versions of the T&D

costs that AltaGas treated as secondary or uncertain. The Electrification scenario would also offer a lower risk path to achieving the District's carbon neutrality goal because it does not face the concerns regarding RNG, unproven technologies, and the use of problematic offsetting approaches that characterize the Fuel Neutral case, as detailed earlier in these comments.

This section of the DCG's comments could be interpreted as an effort to show that the Electrification option is in fact the best case. That is not our intention. In fact, we have already pointed out that the Electrification case is unrealistic and invited AltaGas to provide the tools necessary to analyze other cases which maintain some productive use of pipeline gas. We are simply interested in complete, accurate, and even-handed analysis, and corrections are required in order to use the CBP analysis for this purpose. The DCG recognizes that there are real questions to address regarding the impact of electrification on the electric system, and on the risk of stranded costs in the gas system. These are questions that the CBP should have addressed, rather than identifying and then passing by.

8. *AltaGas's CBP is not a business plan and does not propose a business evolution*

Entrepreneur Stanley Rich and *Harvard Business Review* journalist David Gumpert wrote the following in 1985 regarding writing business plans:

> "We have found that the most important [fundamental often overlooked] is the accurate reflection of the viewpoints of three constituencies.
>
> - The market, including both existing and prospective clients, customers, and users of the planned product or service.
> - The investors, whether of financial or other resources.
> - The producer, whether the entrepreneur or the inventor.

> Too many business plans are written solely from the viewpoint of the third constituency—the producer. They describe the underlying technology or creativity of the proposed product or service in glowing terms and at great length. They neglect the constituencies that give the venture its financial viability—the market and the investor."[83]

The CBP suffers from this failure and struggles to indicate even a technical pathway for getting to the District's goals, with minimal explanation of the business reality for Washington Gas and AltaGas that the pathway implies.

The CBP does not at all address the future challenges posed by Washington Gas's current business model. Today, Washington Gas earns returns for its shareholders based on the value of its ratebase, and it earns its revenue requirement through the sale of gas through its pipes. The CBP addresses these complex issues involving new regulatory constructs and novel business ideas in a two-page outline.[84] These changes include:

- Changing the paradigm of competitive gas supply in the District by allowing Washington Gas to ratebase low carbon gas production resources and the pipelines necessary to reach them
- Recovering costs for the gas system from electric customers
- Recovering, and earning a rate of return on, funds invested in energy efficiency
- Accelerated recovery of some infrastructure investments
- Engaging in on-bill financing

[83] Rich, S.R. and D.E. Gumpert. 1985. "How to Write a Winning Business Plan." *Harvard Business Review*, May. Available at: https://hbr.org/1985/05/how-to-write-a-winning-business-plan.
[84] CBP, pages 27-29.

- Earning additional return as a reward for some efficiency investments
- Performance incentives for investments in the T&D system
- Decoupling to separate revenues from sales

These would be dramatic and fundamental changes in Washington Gas's regulatory and business model. But AltaGas presents no analysis or argumentation regarding the impact or wisdom of the changes proposed, and makes no proposal regarding how its returns to shareholders or capital structure would be impacted by these changes. In these ways, the CBP fails to meet the standard required by Term No. 79.

AltaGas's CBP does not describe a vision for Washington Gas as to how it will provide customer value in a non-fossil fuel world. It does not suggest innovative services or even describe a pathway to developing such services. Absent any discussion of potential "end state" of a natural gas utility in a world without natural gas, it does not offer a transition pathway to that business.

The CBP fails to include marketing or operational approaches, and critical financial issues are addressed only in the ICF Technical Study Summary Report where they are raised only to identify that they were not fully considered. For example, ICF states "The study did not consider, except as noted, recovery of any cost of service on the gas system that would not be recovered based on existing rates…. Other costs that have not been fully accounted for in this

study that should be considered before determining a decarbonization roadmap include… natural gas system decommissioning costs, and final customer transition costs."[85]

Washington Gas and AltaGas possess unique knowledge of the financial implications of substantial changes in natural gas use on the utility, and through the utility potentially on District ratepayers. The results of such analysis would be critical inputs to District policymakers' decisions regarding decarbonization policy approaches. Yet AltaGas has presented only rough and approximate numbers, without any supporting calculations and without consideration of the realistic continuum of options facing policymakers and the public. AltaGas presents only an overly optimistic business-as-usual approach, contrasted with an extreme electrification case.

Questions AltaGas does not address (for any future scenario) include:

- What resources (assets? people? skills?) does AltaGas possess that could be levered to provide service in a fossil-fuel free economy? What new services might it provide and how will workers be transitioned?
- How will it make decisions in operating its legacy business while transitioning to new business models?
- How will it make capital decisions when challenged with stranded assets? Should leaking pipes be replaced or retired (and customers served by electrification)?
- How should a lifecycle analysis be conducted when the engineering life of an asset will outlive its usefulness?

[85] ICF Technical Study Summary Report, page 12.

- What are the required policy and regulatory changes needed to enable new business models for new service offerings?

9. *The CBP does not consider the ability of customers to make fuel choices*

The AltaGas CBP fails to think of the gas utility's business offerings from its customers' points of view. AltaGas identifies that Washington Gas would need to raise regulated delivery rates by a factor of approximately three by 2050 (in real terms), unless Washington Gas were able to raise revenue from some other source.[86] AltaGas further projects that the fuel cost for the proposed portfolio of low-carbon gas (with RNG, hydrogen, and power-to-gas) is more than double the cost of fossil gas, so the fuel supply portion of customer bills would also substantially increase.

These changes in gas price must be evaluated in the context of trends toward all-electric construction in the District. With today's rates, builders are choosing electric systems rather than gas. According to the building energy data provided under the District's building energy benchmarking law, of the 101 office buildings built in the District since 2000, 68 use no natural gas at all. Of those that use gas, only three use more than 10,000 BTU/sq. ft. per year. When customers are faced with the customer gas supply and delivery costs that AltaGas projects in its preferred case, customer choice is likely to drive further electrification unless AltaGas succeeds in shifting its revenue requirements onto electric ratepayers. There is no indication that AltaGas has taken this shift into account.

[86] AltaGas "Climate Business Plan DC OAG Discussion," April 21, 2020. Slide 18.

AltaGas does not address how it will maintain financial viability while a reduction in natural gas usage is achieved. With efficient electric heat pumps for space and water heating, and current electric and gas rates, customer bills would be comparable between electricity and gas. If gas rates increase, customers will have an increased financial incentive to choose electricity. Once customers choose electricity, it will further drive increases in the gas delivery rates.[87] AltaGas fails to directly address this dynamic of so-called "death spiral" in the CBP and lay out the implications for Washington Gas, or the customer impacts.

AltaGas fails to even mention the equity implications of these shifts. How will customer equity be considered? What is the impact on low-income customers and renters who face barriers to selecting the fuel of their choice?

Instead of directly addressing customer choice and competition, AltaGas suggests that electric ratepayers should pay for the gas system, which would keep gas rates lower, and increase electric rates.[88] AltaGas, in effect, is asking District policymakers to intervene in favor of its gas utility in the competition between two regulated utilities (Pepco and Washington Gas).

In Dr. Hopkins's testimony for the District in this proceeding, he identified this issue:[89]

> High-stakes competition shaped by regulation and policy will be an unfamiliar business position for Washington Gas, and for its regulators. Flexibility and innovation in business models may be required from all parties. In this proceeding, the Commission should consider whether AltaGas is likely to improve the District's and WGL's abilities to address the challenges this transformation could bring.

[87] There are, of course, electric system cost implications as well.
[88] CBP, page 28
[89] Testimony of Asa S. Hopkins, September 29, 2017, in Formal Case 1142 at page 51, lines 8-13.

And in his testimony supporting the merger agreement with Term No. 79, Dr. Hopkins reiterated the importance of this analysis and the expectation that AltaGas's CBP would contribute to the District-wide conversation:[90]

> Commitment 79 requires AltaGas to examine its long-term business plan and determine how it can evolve its business to serve the District's 2050 climate goals. By looking long term, and taking into account the District's stated long-term policy objectives, this should have the effect of forcing AltaGas, the Commission, and the public to think deeply about how AltaGas can contribute to, rather than undermine, the District's policies. This commitment establishes the correct order of precedence: how the utility can serve public policy objectives (as opposed to how public policy should be restrained by the utility's business model). And the biennial public meetings will provide an opportunity for public input and education, as well as identification of changed circumstances that may require modifications to the business plan. In my earlier testimony, I discussed several issues that may require business model changes (including competition between electric and gas utilities and the risk of stranded assets, especially for vulnerable communities). Since addressing these issues will be complicated and take time, establishing a formal and public process through which they can be addressed represents a good first step.

AltaGas's initial try at a CBP falls well short of these requirements.

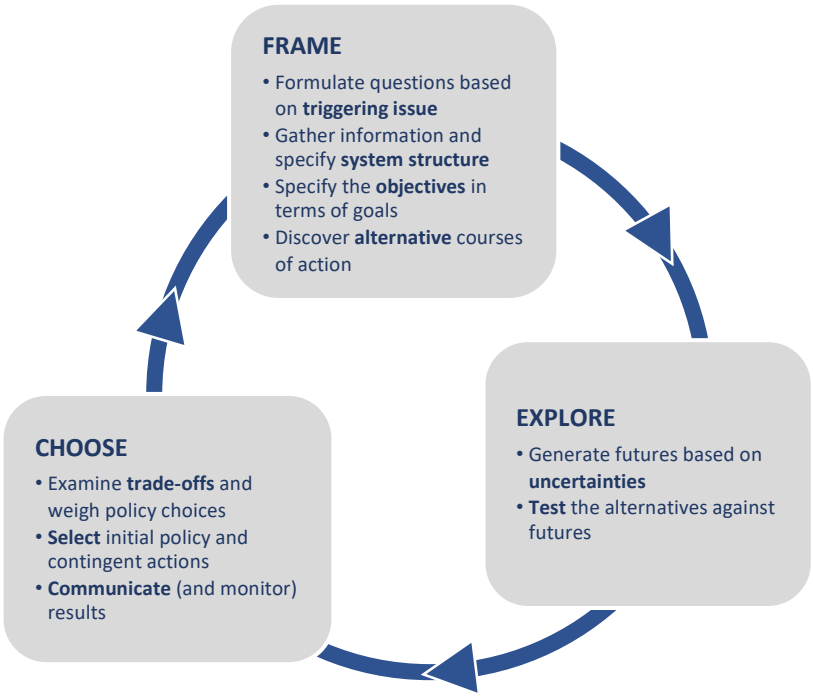
9. *AltaGas CBP does not propose a process to develop a business plan*

In critiquing AltaGas's CBP, the District does not intend to imply that there is a simple or clear pathway for a natural gas business to evolve its business model to supply less natural gas until it does not sell any fossil fuels at all. Our criticism is that AltaGas did not embrace this challenge. Nor did it attempt to articulate a process to address the challenge.

[90] Testimony of Asa S. Hopkins in Support of the Settlement Agreement, May 25, 2018, in Formal Case 1142 at page 13, lines 6-20.

When embarking into uncharted territory in which many facts are unknown, some planning regimen should be adopted to guide future decisions. One framework worth exploring is decision-making under uncertainty. Rather than planning by predicting and then acting, the plan builds in monitoring and adapting as more knowledge is gained. The generic elements of decision-making under uncertainty[91] include: framing the analysis; performing exploratory uncertainty analysis; choosing initial actions and contingent actions; and iterating and reexamining. AltaGas has made a commitment to engage every six months with the public to "report on and discuss" on its plan. The District suggests that this requirement supports an iterative process to make decisions in the face of uncertainty.

Figure 7. Planning under uncertainty framework



[91] Adapted from Marchau, V.A., W.J., Walker, W.E., Bloemen, P.J.T.M., Popper, S.W.(Eds.) "Decision Making under Deep Uncertainty: From Theory to Practice" (Springer 2019) Available at https://www.springer.com/gp/book/9783030052515.

Source: Adapted from Adapted from Marchau et. al., 2019. "Decision Making under Deep Uncertainty: From Theory to Practice," Figure 1.4.

When exploring innovation, it will be critical to navigate regulatory barriers. As AltaGas considers its future, it may wish to propose the Commission create an "Innovation Sandbox," a recognized methodology for innovation within regulated industries.[92]

III. THE DISTRICT'S REQUESTED REMEDY FOR NON-COMPLIANCE WITH TERM NO 79

As articulated in the foregoing sections by DOEE, and as demonstrated in the thorough review by Synapse Energy Economics, the Plan fails to satisfy Commitment Term No. 79. Therefore, the District respectfully requests that the Commission take rigorous remedial action.

The Commission has explicit authority to approve mergers and exercised it in this matter by imposing Term No. 79.[93] It has the authority and specific responsibility to supervise AltaGas with respect to compliance with the Settlement Terms to protect the District ratepayers on whose behalf the District Government executed the settlement in good faith, and which terms were expressly incorporated into the Commission's order approving the merger as being in the public interest.[94] As the Commission clearly stated, "[t]he Commission reserves the right to issue such

[92] See the Ontario Energy Board for one example. https://www.oeb.ca/_html/sandbox/#.
[93] D.C. Code Section 34-1001.
[94] D.C. Code Sections 34-301 and 34-403.

orders as may be necessary to implement the Proposed Merger and enforce the terms contained in the Settlement Agreement and the conditions outlined in this Order."[95]

Moreover, given that the Commission now must considers the effects of global climate change and the District's public climate commitments in its regulation and supervision of energy companies, it is critical that the Commission enforce the obligations made by AltaGas to submit a Plan that shows how it can evolve its business model to support and serve the District's 2050 climate goal.[96] AltaGas has not done that, and the Commission is well within its regulatory authority to require AltaGas to resubmit a plan that sets forth in substance a viable business model that will support the District's goal of a carbon neutral future by 2050.

In addition, the Commission has stated that it "may consider whether the AltaGas Climate Business Plan aligns with the District of Columbia's clean energy goals and targets in another proceeding. . .".[97] If the Commission believes that a separate proceeding is more appropriate to examine these issues, the District requests that the Commission open an investigative proceeding to evaluate the merits of the new Plan and how best to strategically and gradually phase out the use of natural gas over the next 30 years.

[95] F.C. 1142, Order No. 19396, ¶ 41 (*rel.* June 29, 2018).
[96] D.C. Code § 34-808.02.
[97] F.C. 1142, Order No 20342, ¶ 11 (*rel.* May 14, 2020).

CERTIFICATE OF SERVICE

I certify that on June 26th, 2020, a copy of the Comments by the Department of Energy and Environment on behalf of the District of Columbia Government Concerning AltaGas Ltd.'s Climate Business Plan was served via electronic mail on the following parties:

Brinda Westbrook-Sedgwick,
Commission Secretary
Christopher Lipscombe, General Counsel
Lara Walt, Attorney Advisor
Public Service Commission
of the District of Columbia
1325 G Street, NW, Suite 800
Washington, DC 20005
bwestbrook@psc.dc.gov
clipscombe@psc.dc.gov
lwalt@psc.dc.gov

Karen Hardwick
John C. Dodge
Cathy Thurston-Seignious
Paul S. Buckley
Meera Ahamed
Associate General Counsel
Washington Gas Light Company
1000 Maine Ave., S.W.
Washington, DC 20024
cthurston-seignious@washgas.com

J. Joseph Curran, III,
F. William DuBois,
Kenneth L. Thompson
Christopher S. Gunderson
Venable LLP
750 East Pratt Street, 7th Floor
Baltimore, MD 21202
JCurran@venable.com

Moxila A. Upadhyaya
Venable LLP
600 Massachusetts Avenue, N.W.
Washington, D.C. 20001
MAUpadhyaya@venable.com

Dennis Jamouneau
Andrea Harper
Kim Hassan
Pepco
701 Ninth Street, NW
Washington, DC 20068
djamouneau@pepcoholdings.com

Frann G. Francis, Esq.
Senior Vice President & General Counsel
Apartment and Office Building Association of
Metropolitan Washington
1025 Connecticut Avenue, NW, Suite 1005
Washington, DC 20036
FFrancis@aoba-metro.org

Anjali Patel
Timothy Oberleiton
Office of the People's Counsel
1133 15th St. NW, Ste 500
Washington, DC 20005
apatel@opc-dc.gov
toberleiton@opc-dc.gov

Hussain Karim
Alan J. Barak
Department of Energy and Environment
1200 First Street, NE, 5th Floor
Washington, DC 20002
hussain.karim@dc.gov
alan.barak@dc.gov

Andrew G. Pizor
National Consumer Law Center
1001 Connecticut Avenue, NW, Suite 510
Washington, DC 20036-5528
apizor@nclc.org

James F. Wallington
Baptiste & Wilder, P.C.
1150 Connecticut Avenue, NW, Suite 315
Washington, DC 20036
jwallington@bapwild.com

Brian Petruska
General Counsel
LiUNA Mid-Atlantic Region
11951 Freedom Drive, Suite 310
Reston, VA 20190
bpetruksa@maliuna.org

Emily W. Medlyn
U.S. Army Legal Services Agency -
Regulatory Law Office
9275 Gunston Road
Fort Belvoir, VA 22060
emily.w.medlyn.civ@mail.mil

Mark Murphy, Esq.
Mooney, Green, Saindon, Murphy & Welch, P.C. on behalf of the International Brotherhood of Teamsters Local No. 96
1920 L Street, NW - Suite 400
Washington, DC 20036
mmurphy@mooneygreen.com

Bruce Oliver
Revilo Hill Associates, Inc.
7103 Laketree Drive
Fairfax Station, VA 22039
revilohill@verizon.net

/s/ *Brian Caldwell*
Brian Caldwell
Assistant Attorney General