FC1179 - 2024 - G - 1405

RECEIVED 2024 DEC 10 4:44 PM

GOVERNMENT OF THE DISTRICT OF COLUMBIA
OFFICE OF THE ATTORNEY GENERAL

BRIAN L. SCHWALB
ATTORNEY GENERAL

Public Advocacy Division
Housing and Environmental Justice Section

PUBLIC VERSION

E-Docketed

December 10, 2024

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

Re: Formal Case No. 1179 – In the Matter of the Investigation into Washington Gas Light Company's Strategically Targeted Pipe Replacement Program.

Dear Ms. Westbrook-Sedgwick:

Enclosed, please find a public version of the Direct Testimony of District of Columbia Government Witness Dr. Asa S. Hopkins in the above-captioned proceeding. A confidential version of Dr. Hopkins' testimony is being filed under separate cover. If you have any questions regarding this filing, please contact the undersigned.

Sincerely,

BRIAN L. SCHWALB
Attorney General

By: *<u>/s/ Brian R. Caldwell</u>*
BRIAN R. CALDWELL
Senior Assistant Attorney General
(202) 727-6211 – Direct
Brian.caldwell@dc.gov

cc: Service List

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA

Formal Case No. 1179

IN THE MATTER OF THE INVESTIGATION INTO WASHINGTON GAS LIGHT COMPANY'S STRATEGICALLY TARGETED PIPE REPLACEMENT PROGRAM

Direct Testimony of Dr. Asa S. Hopkins

PUBLIC VERSION

On Behalf of the District of Columbia Government
Exhibit DCG (A)

December 10, 2024

Table of Contents

EXHIBITS

I. INTRODUCTION AND QUALIFICATIONS

Q1 Please state your name, business address, and position.

A1 My name is Asa S. Hopkins. My business address is 485 Massachusetts Ave., Suite 3, Cambridge, Massachusetts 02139. I am the Senior Vice President, Consulting, at Synapse Energy Economics, Inc (Synapse). Among other work, I lead Synapse's consulting regarding the future of gas utilities, and I also work extensively in the related area of building decarbonization technology and policy.

Q2 Please describe Synapse.

A2 Synapse is a research and consulting firm specializing in energy industry regulation, planning, and analysis. Synapse works for a variety of clients, with an emphasis on consumer advocates, regulatory commissions, and environmental advocates.

Q3 Please describe your professional experience before beginning your current position at Synapse.

A3 Before joining Synapse in 2017, I was the Director of Energy Policy and Planning at the Vermont Public Service Department from 2011 to 2016. In that role, I was the director of regulated utility planning for the state's public advocate office, and the director of the state energy office. I served on the Board of Directors of the National Association of State Energy Officials. Prior to my work in Vermont, I was an AAAS Science and Technology Policy Fellow at the U.S. Department of Energy ("DOE"), where I worked in the Office of the Undersecretary for Science to develop the first DOE Quadrennial Technology Review. Prior to my time at the DOE, I was a postdoctoral fellow at Lawrence Berkeley National Laboratory, working on appliance energy efficiency standards. I earned my PhD and Master's degrees in physics from the California Institute of Technology and my Bachelor of Science degree in physics from Haverford College. My resume is included as Exhibit DCG(A)-1.

Q4 Have you previously testified before the District of Columbia Public Service Commission (PSC or Commission)?

A4 Yes. I testified on behalf of the District of Columbia Government (DCG or the District) in Formal Case No. 1142 (FC 1142), *In the Matter of the Merger of AltaGas, Ltd. and Washington Gas Holdings, Inc.,* and in Formal Case No. 1169, *In the Matter of the Application of Washington Gas Light Company for Authority to Increase Existing Rates and Charges for Gas Service* -- Washington Gas Light Company's (WGL) last general rate case decided in 2023.

Q5 Have you previously submitted comments to the Commission on other WGL accelerated pipe replacement programs?

A5 Yes. I have also assisted DGC with comments over the last few years, including a January 22, 2024 analysis evaluating the performance of WGL's current Accelerated Pipe Replacement Program known as "PROJECTpipes 2"[1] and May 2, 2023 comments on WGL's "PROJECTpipes 3" filing.[2]

Q6 Have you previously provided testimony in other jurisdictions on topics similar to those you are testifying on in this case?

A6 Yes. I have testified on "future of gas utilities" issues, as relates to capital decision-making, rates, and business risk in Quebec, Ontario, Maryland, Connecticut, Wisconsin, and New York. When I testified before the Régie de l'Energie in Quebec I was recognized as an expert in "energy transition in the gas industry, and business risk." The Ontario Energy Board qualified me as an expert on "the future of electric and gas utility regulatory and business models and associated business risk in the context of deep building decarbonization objectives."

---

[1] Formal Case No. 1154, In the Matter of Washington Gas Light Company's Application for Approval of a *PROJECTpipes 2 Plan*, District of Columbia Government's Comments in Response to Public Notices Issued on December 22, 2023, and January 8, 2024 (attached Memorandum) (Jan. 1, 2024).

[2] Formal Case No. 1175, In the Matter of Washington Gas Light Company's Application for Approval of *PROJECTpipes 3 Plan*, Initial Comments of the Department of Energy and Environment on WGL's Pipes 3 Application (May 2, 2023).

Q7 On whose behalf are you providing evidence in this case?

A7 I am testifying on behalf of DCG.

Q8 What is the purpose of your testimony?

A8 The purpose of my testimony is to review WGL's proposed Revised Application for Approval of the District Strategic Accelerated Facility Enhancement SAFE Plan (District SAFE), filed on September 27, 2024, and evaluate whether WGL has met its burden to show that District SAFE is an appropriate and necessary response to the risk associated with leak-prone assets on WGL's distribution system.

Q9 How is your testimony organized?

A9 After this introduction, my testimony continues in Section 2 with a summary of my conclusions and recommendations. Section 3 evaluates WGL's proposal against the Commission's requirements in Order 22003. Section 4 analyzes WGL's proposal in the context of the Company's competitive and policy environment. Section 5 discusses alternative approaches that produce a safer and more financially sustainable path. Section 6 lays out principles and practices for gas system planning that WGL should employ to provide assurance of prudent decision-making. Section 7 concludes.

Q10 Are there any exhibits attached to your testimony?

A10 Yes. In addition to my resume, I have attached certain data responses from WGL that I relied upon while preparing my testimony. These exhibits were prepared by me or under my direction.

II. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Q11 What conclusions do you draw in this case?

A11 I find that:

- WGL has not met the requirements set out by the PSC in Order 22003. It merely proposed a program that is very similar to previous programs, instead of one responding to the PSC's call for a "new normal." Specifically, WGL's application is not responsive to the PSC's requirements on minimizing stranded asset risk, incorporation of the District's climate laws, accounting for electrification, cost-effectiveness, and identifying alternatives for reducing leak rates and risk.
- WGL's approach to addressing gas safety risk through a replacement-based approach is not financially or competitively sustainable and could lead to increased safety and financial risk on the gas system over time.
- WGL's approach does not reduce risk from gas once it passes the meter and enters buildings and it does not reduce excavation-related risk.
- Alternative approaches that incorporate retirement and repair alongside targeted replacement reduce safety risk more than WGL's approach while being less expensive and reducing financial and competitive risk.
- WGL's current gas system planning processes are insufficient to the task of planning and managing through the energy transition and are not sufficient to meet the confidence threshold required to approve accelerated cost recovery.

Q12 What are your recommendations to the PSC based on these conclusions?

A12 I recommend that the PSC:

- Reject the accelerated cost recovery in WGL's proposed District SAFE plan.

- Reiterate its requirement that WGL take all necessary capital and operational actions to maintain a safe and reliable gas system, and that WGL may request incorporation of prudently incurred costs through rate cases.

- Order WGL to develop an alternative gas safety capital plan that is consistent with District policy and takes financial sustainability and competition risks into account. Such a plan could justify accelerated cost recovery.

III. EVALUATION OF WGL'S FILING AGAINST THE REQUIREMENTS OF PSC ORDER NO. 22003[3]

Q13 Could you please summarize the requirements that the PSC placed on WGL for its filing in this case?

A13 In Order No. 22003, the PSC required that WGL file a plan with the following characteristics:

- An approach that considers stranded asset risk. The plan "must balance the need to replace leak-prone, highest-risk pipe segments to prevent dangerous cascading and potentially hidden "super emitter" leaks before they happen while minimizing the stranded assets as the District continues to undergo the energy transition."[4]

- A plan that targets the highest risk segments of the aging, leak-prone mains and services while considering the District's climate policies. Thus, the plan "should be narrowly focused on the aging highest-risk pipe segments that are highly susceptible to leaks, increased GHG [greenhouse

---

[3] Formal Case Nos. 1154, 1175 & 1179 (*rel.* June 12, 2024) (Order No. 22003).
[4] Order No. 22003, ¶ 48.

gas] emissions from leaks, and subsequent failures in the near future if not replaced."[5]

- A change in focus of the pipe replacement program to "address the District's climate policies which promote electrification as opposed to natural gas," including how the restructured targeted replacement program would account for any electrification programs within the District of Columbia, including "specific plans for coordination with interested stakeholders and the D.C. Government to ensure that replaced pipes are not expected to be decommissioned within 10 years of installation."[6]

- The PSC also included specific requirements such as an explanation of how advanced leak detection (ALD) is incorporated into project selection and whether ALD is a factor in the risk model,[7] an identification of "the number of miles of mains and number or services that can be decommissioned each year of the program either due to abandonment of redundant facilities or customers pursuing electrification opportunities on radial portions of the system,"[8] and the identification of "techniques, technologies, strategies, or other options the Company considered to reduce the leak rates and risk of the aging leak-prone pipes in the distribution system."[9]

Q14 What kind of revision of the PIPES 2 program is required to meet the PSC's expectations?

A14 The PSC is expecting a revised program that is more than just a continuation of past practices, writing that "it is clear that our pipeline replacement program needs to be revised to better align with both Federal and District climate imperatives."[10] The PSC further states, "In addition to redefining a 'new normal'

[5] *Id.*, ¶ 49.
[6] *Id.*, ¶ 51(l).
[7] *Id.*, ¶ 51(i).
[8] *Id.*, ¶ 51(m).
[9] *Id.*, ¶ 51(p).
[10] *Id.*, ¶ 48.

(i.e., electrification and targeted replacement as opposed to the complete replacement of over 400 miles of aging, high risk pipelines) and new targeted prioritization of highest-risk segments of the aging leak prone pipe replacements, the Commission also expects the Company's new restructured pipe replacement plan to reflect the actual rates of replacements seen over the first 10 years of PROJECT*pipes* and incorporate the lessons learned and the Commission's directives based on the Continuum Audit to establish an achievable 'new normal' for accelerated replacements."[11]

Q15 Does WGL's filing meet the requirements established by the PSC?

A15 No, it does not. Instead of redefining a "new normal" as the PSC required, WGL itself explains that the Company is "not fundamentally altering the District SAFE Plan approach from what the Commission approved through the PROJECT*pipes* 2 proceeding."[12] WGL claims to meet the PSC's requirements for a program that selects higher risk segments by proposing to evaluate projects based on risk-reduction per dollar of spend.[13] However, as I will discuss later in this testimony, WGL does not provide enough information for parties to understand how effectively the model is identifying higher risk segments or decreasing risk.

The filing also falls short when addressing an array of PSC requirements related to (1) minimizing stranded asset risk, (2) the incorporation of the District's climate laws and accounting for electrification in the updated plan, (3) cost effectiveness, and (4) the identification of alternatives to reduce leak rates. For PSC requirements related to the use of ALD and stakeholder engagement related to meeting the District's climate goals, WGL provided answers that were lacking in specifics; it stated nothing more than that these issues are being studied or could be addressed at some future date, without providing a clear path forward.

---

[11] *Id.*, ¶ 49.
[12] Exh. WG (C), at pg. 13 (Jacas).
[13] District SAFE Application, pg. 28.

WGL's description of how the JANA Lighthouse risk model produces risk scores is also lacking in specifics.[14]

Q16 What are stranded assets, and how do they differ from stranded costs?

A16 Stranded assets are gas infrastructure investments that are no longer considered used and useful, while retaining some undepreciated plant balance. A utility should be unable to recover the cost of, and return on, stranded assets because they are no longer used and useful. Stranded costs are the unrecoverable investments made on stranded assets.

Q17 What did the PSC order WGL to consider regarding stranded assets?

A17 The PSC explicitly stated that WGL's approach must balance "the need to replace leak-prone, highest-risk pipe segments to prevent dangerous cascading and potentially hidden 'super emitter' leaks before they happen while minimizing the stranded assets as the district continues to undergo the energy transition."[15]

Q18 Should WGL be considering stranded asset risk in all of its decision-making?

A18 Yes. A prudently run gas utility should be considering the risk of stranded assets in all capital investment decisions. I discuss the importance of prudent gas planning, and its close relationship with decision-making about gas safety investment strategies, later in my testimony.

Q19 In what way does WGL's filing fall short of addressing the PSC's concerns about stranded assets risk?

A19 As the process has been described in the District SAFE application, factors that contribute to stranded asset risk such as projected gas throughput and projected number of customers are not included in the analysis. WGL has not taken a

[14] Order No. 22003, ¶ 51(k).
[15] *Id.*, ¶ 48.

system-wide look at how it can maintain or develop a sustainable business model through the course of the energy transition, so it does not consider which of its assets might be stranded in the future.

Instead, WGL's sole response to the PSC's concern about stranded asset risk is to take the minimal step to propose a "notification and opt-out process to address the possibility that existing customers may intend to cease service"[16] with WGL. As proposed by WGL, the Customer Choice Pilot Program will run for three years and is a process to provide notification to the affected customers of impending replacements allowing the customers to opt out of the planned service line replacement. WGL would thereby avoid installing a new service line that would never be used and useful. The service line replacement location will be identified 12 months in advance and customers will have approximately 11 months to complete the opt-out process.[17] WGL envisions one notification only and does not plan to provide follow-up notifications or reminders for affected customers.[18]

As addressed in Witness Botwinick's testimony for DCG, however, the Customer Choice Pilot Program is not designed for success or coordination with other District programs such as the DC Sustainable Energy Utility (DCSEU).[19] This pilot is therefore not likely to be effective at limiting stranded service lines. Even if this program were well designed, it would only mitigate a small fraction of potential stranded assets, namely those service lines for which the customer is ready to electrify given short notice.

If WGL were to develop a plan which identified which services were going to be replaced a number of years in advance, and worked with other electrification programs, it could have a greater impact on stranded asset risk. It is important to note that WGL recognizes the value of a systematic process for service

[16] Exh. WG (A), pgs. 8-9 (Rogers).
[17] *Id.*, at pg. 9.
[18] WGL Response to DCG DR 4-3, attached hereto as Exh. DCG (A)-2.
[19] *See* Direct Testimony of DCG Witness Botwinick, Exh. DCG (B) at pgs. 19-20.

replacement. WGL selects services to be replaced in "conjunction with the main replacement projects" or "grouped geographically" by WGL.[20] This shows that WGL's project selection process is capable of incorporating systematic thinking and the Company could apply similar processes to identify ways to minimize or avoid stranded asset risk.

Q20 How is WGL proposing to support electrification in this filing?

A20 WGL is not proposing any actions that would support electrification or the use of other non-pipes alternatives (NPA). As Witness Botwinick explains, WGL is not proposing to undertake the kinds of data sharing or coordinated planning that would assist with electrification, nor is WGL proposing incentives for electrification that could increase the viability of electrification as an NPA that could save gas ratepayers money by avoiding more costly pipe replacements.

Q21 How is WGL proposing to consider electrification in its proposed programs?

A21 The PSC required WGL to explain how the restructured program would account for any electrification programs.[21] The Customer Choice Pilot Program is the vehicle through which WGL intends to consider electrification, by planning to "work collaboratively with interested stakeholders and District Government on the Customer Choice Pilot Program, as well as other opportunities that may benefit our customers."[22]

[20] Exh. WG (C), pg. 16 (Jacas).
[21] Order 22203, ¶ 51(l).
[22] Exh. WG (A), at pg. 11 (Rogers).

Q22 How is WGL proposing to address the PSC's requirement that the explanation related to electrification programs include "specific plans for coordination with interested stakeholders and the D.C. Government to ensure that replaced pipes are not expected to be decommissioned within 10 years of installation"?[23]

A22 Unfortunately, WGL does not present any specifics of how its proposed collaboration would happen, and the stakeholder process that WGL created around its filing in this case does not inspire confidence that a collaborative approach is possible.[24] WGL undercuts its proposed collaboration by arguing that plans for electrification are "not yet solidified" and "further extensive discussion with stakeholders is needed to better understand what role"[25] WGL can play in the process. This falls far short of the PSC's requirement for WGL to develop specific plans, in coordination with relevant stakeholders, to ensure replaced pipes will not be decommissioned within 10 years.

Q23 Can you explain why WGL's response on ALD is insufficient?

A23 The PSC required WGL to include in the application the lessons learned from the first 10 years of PROJECT*pipes,* including a description of how ALD will be used in selecting proposed projects, and whether leaks found through ALD will be evaluated differently in the risk model.[26] WGL responds by describing how it will consider and address these topics in the future.

WGL has attempted to implement ALD in the past. In 2020, as part of an amended PROJECT*pipes* 2 plan, WGL proposed an ALD pilot. In 2020, the PSC denied regulatory asset treatment and cost recovery, noting that instead of the approved vehicle-mounted methane detectors, WGL used satellite-based technology. The PSC order states that it "did not explicitly or implicitly give the Company the discretion to unilaterally switch technologies so that ratepayers end

[23] Order 22203, ¶ 51(k).
[24] *See* Direct Testimony of DCG Witness Botwinick, Exh. DCG (B), at pgs. 14-17.
[25] Exh. WG(A), at pg. 12 (Rogers).
[26] Order 22003, ¶ 51.

up funding, through regulatory asset treatment, the research and development of a technology that has apparently not yet been successfully used in an urban environment, especially one with a dense tree canopy and numerous solar arrays, as is the case in the District."[27] The PSC further instructed WGL to proceed with the program as approved.[28]

WGL does not state when or how it expects the ALD results to be incorporated into the JANA risk model. It is not proposing to directly use ALD for District SAFE, pending U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA) regulations that may direct how gas distribution companies deploy ALD.[29] While WGL discloses that leaks identified through ALD are repaired and information related to these leaks are provided to JANA as inputs to the risk model (where they are processed in the same manner as leaks detected through traditional methods), WGL is vague about timing.[30] It states that the results from ALD will be incorporated into the JANA risk model to inform risk prioritization in the future.[31]

Q24 Are you concerned about WGL's response regarding its ALD plans?

A24 Yes. My concern is twofold: (a) the PSC required WGL to present this information as part of the revised application, but WGL has not done so, and, (b) absent any firm deadlines or commitments from WGL, there is no certainty that there will be any progress in these areas.

Q25 Can you explain why WGL's response on main and service decommissioning is insufficient?

A25 The PSC ordered WGL to "[i]dentify the number of miles of mains and number of services that can be decommissioned each year of the program either due to

[27] F.C. No. 1154, Order No. 21580, ¶ 50 (*rel.* March 10, 2023).
[28] *Id.*, at ¶ 51.
[29] Exh. WG(C), at pg. 16 (Jacas).
[30] Exh. WG(D), at pg. 11 (Stuber).
[31] Exh. WG(C), at pg. 16 (Jacas).

abandonment of redundant facilities or customers pursuing electrification opportunities on radial portions of the system."[32] In response, WGL has identified 15 miles of cast iron main segments without any active services that are being evaluated for potential abandonment.[33] However, WGL does not provide a timeline for when the evaluation can proceed and when the abandonment can occur; WGL provides no evidence that 15 miles is the right number of miles to abandon given the configuration of the system and future gas demand. Nor does WGL identify any "services that can be decommissioned," declining to provide an estimate of the number of vintage service lines it expects to abandon from having no usage or customer on record.[34] WGL focused instead solely on mains, ignoring the likely impact of electrification on customers' use of WGL's service lines. Regarding the second part of the PSC's order, WGL fails to identify services that can be abandoned when customers on a radial portion electrify, nor does it identify whether this is a consideration in its Customer Choice Pilot Program. WGL also did not conduct surveys to indicate the number of WGL customers that plan to participate in the Customer Choice Pilot Program and opt out of receiving future gas service from WGL.[35]

Q26 Do you have other concerns about the content of WGL's filing?

A26 Yes, I do. First, the District SAFE plan itself (Exhibit WG(A)-1) is 42 pages long, yet it contains no breakdown of the expenditures on the program between mains and services, much less any further detail on how WGL will spend $215 million and immediately begin recovering those costs, with a return, from customers in the District of Columbia. Exhibit WG(A)-1 primarily contains arguments and justification for the program and its cost as a whole, rather than details about the program itself. This makes it nearly impossible to evaluate the implications of the proposed program for either safety or equity.

---

[32] Order 22203, ¶ 51(m).
[33] Exh. WG(C), at pg. 19 (Jacas).
[34] WGL Response to DCG D.R. 4-7 (filed Nov. 11, 2024), attached hereto as Exh. DCG(A)-3.
[35] WGL Response to OPC Data Request 1-18 (filed Nov. 15, 2024), attached hereto as Exh. DCG(A)-4.

Q27 Do you have concerns about WGL's proposed reliance on the JANA Lighthouse model?

A27 WGL's filing and plan heavily rely on the JANA Lighthouse model. This is a new tool, and the accelerated process for this docket precludes the Commission or stakeholders from developing sufficient understanding of this tool to be assured that it is the appropriate tool for prioritizing activities in this program. It is also clear the tool is a risk model, and not a substitute for gas system planning. (For example, it includes no information about the changes in gas demand on different portions of WGL's system in the future and does not account for the financial treatment or status of each asset whose safety risk is evaluated.) Regardless of what the PSC approves in this case, it should create a follow-on process by which stakeholders and the PSC can learn more about the JANA Lighthouse model and understand its inputs, methods, and outputs. In the context of F.C. No. 1178, Witness Oliphant has offered to conduct a more detailed technical workshop on the JANA Lighthouse model.[36] It is important that this process not be limited in scope to only the leak-related issues being addressed in F.C. No. 1178 but instead cover the full range of capabilities and use cases for the JANA Lighthouse model at WGL.

Q28 What do the JANA results in Witness Oliphant's testimony indicate about the value of the JANA model?

A28 Witness Oliphant testifies[37] that incidence of leaks on WGL's system is highly concentrated on the assets that the JANA model identifies as being the most leak-prone. Specifically, he testifies that the leak rate is more than 12 times greater on the 5 percent of most leak-prone assets (according to the JANA model) than on the other 95 percent of assets, and six times greater on 15 percent of assets than on the remaining 85 percent of assets. Upon further examination, the identification of leak risk with "5 percent" or "15 percent" of assets is misleading.

---

[36] F.C. No. 1178, *In the Matter of the Investigation into Washington Gas Light Company's System Leak Protection Practices,* September 20, 2024 Technical Conference, Transcript from First Technical Conference on September 20, 2024, at pages 87-88.

[37] Exh. WG(E), at pgs. 17-18 (Oliphant).

This is because some assets are much larger than others. In response to a DCG data request, Witness Oliphant clarifies that the "5 percent" of assets on which 40 percent of leaks occurred represent 44 percent of WGL's mains and 1 percent of service lines. In aggregate length, I estimate these assets are about 23 percent of WGL's pipe miles (combining the length of services and mains). It is likely that all of WGL's cast iron mains are in the 533 miles of mains that are in the "top 5 percent" of assets. The "15 percent" of assets on which 51 percent of leaks were observed are 39 percent of WGL's system length.[38] It would have been more accurate to say that the leak rate on 23 percent of WGL's pipe miles is 2.1 times greater than on the other assets, and the leak rate on 39 percent of WGL's system length is 1.65 times greater than for the other 61 percent.

While the leak risk does appear to be somewhat concentrated on the assets that the JANA model identified as higher risk, it is not clear that JANA's performance is any better than would be accomplished by simply estimating that leaks are more likely to occur on older assets or those made of cast iron or bare steel. Upon evaluating the leak risk distribution implied by Witness Oliphant's testimony, the JANA results simply indicate that some assets have somewhat higher leak rates than others—something of which the PSC and WGL are already well aware given the extensive PHMSA interest in cast iron and other leak-prone materials.

I was also able to evaluate the risk distribution provided by WGL in response to a DCG data request.[39] My analysis shows that across the first 100 miles of prioritized mains, simply ordering pipes by age and material (wrought iron first, then cast iron from older to newest) produces an estimate of the cumulative risk that is just 2.5 percent lower than the risk optimized using the JANA Lighthouse model. In short, all of the complexity and detail of the JANA Lighthouse model would allow WGL to reduce estimated risk by less than 3 percent more than using

---

[38] WGL Response to DCG D.R. 2-2 (filed Dec. 5, 2024), attached hereto as Exh. DCG(A)-5.

[39] WGL's Confidential Response to DCG DR 1-7 (filed Nov. 18, 2024), attached hereto as **CONFIDENTIAL** Exh. DCG (A)-6.

a simplistic model based on age and material alone. WGL could surely further reduce this gap by focusing activities on old mains in more densely built areas where the consequences of an event are likely to be higher. (Focusing replacement activities in denser areas would also reduce stranded asset risk, because pipes in these areas are more likely to be "trunk" lines with longer expected useful lives than the "leaves" or "twigs" in less dense areas.) Regarding optimizing the balance between mains and services, risk reduction per unit length is higher for mains, but costs are also higher. The net result is that overall risk reduction per dollar spent is roughly comparable. Simplistic focus on older and more leak-prone service materials in locations with greater consequence is also likely to be almost as good for optimization as the full JANA Lighthouse estimate.

IV. WGL'S CURRENT AND PROPOSED APPROACHES TO GAS SYSTEM RISK REDUCTION ARE NOT SUSTAINABLE

Q29 Please describe WGL's approach to leak risk, as evidenced by its filing in this case.

A29 WGL's approach is based on replacing leak-prone assets with less leak-prone assets made of newer materials. WGL claims that its new risk model will allow it to identify the highest risk assets to replace, thereby allowing it to reduce risk faster than it replaces pipe. (That is, replacing 5 percent of leak-prone pipes would reduce risk by more than 5 percent, because the assets replaced are riskier than average.) WGL will also undertake required leak surveys and address leaks that it finds (or which are reported to it) through either repair or replacement.

On a proportional basis, WGL's approach targets services more than it targets mains. While WGL will replace all leak-prone services associated with mains it replaces, it has also set aside a substantial additional sum to replace services that are not associated with the mains it replaces. Overall, it appears that about 70 percent of WGL's proposed budget over three years would go to services, and 30 percent to mains. This prioritization may be justified based on risk assessment, because service lines are by definition closer to buildings than mains and the consequence of an incident on a service could be commensurately higher.

WGL plans to spend an accelerating quantity of money on this effort: $50 million for a portion of 2025, $75 million in 2026, and $90 million in 2027. While WGL does not state a planned approach or budget for the period after 2027, WGL's Application (Exh. WG(A)-1) argues that eliminating leak-prone pipe by 2045 would require a rapid increase in the pace of main and service line replacements.

Q30 What does WGL propose to accomplish with its investment of $215 million in pipe replacement?

A30 WGL plans to replace 12.4 miles of main, 996 leak-prone service lines associated with those mains, and 2,612 other services not associated with those mains.

Q31 What is the per-unit cost for each of these different activities?

A31 WGL is unable to break out the cost of main replacement from the cost of service line replacement associated with mains, and it states that the combined effort to address mains costs $10.7 million per mile.[40] WGL states that replacing a service line as a standalone project costs an average of $35,300.[41] While WGL does not break out the cost of mains versus services for combined projects, if we assume that service line replacements in those contexts cost no more than service lines as standalone projects, the cost of main replacements alone is at least $7.9 million per mile, and more likely between $8 and $9 million per mile.[42]

---

[40] WGL Response to DCG D.R. 3-11 (filed Nov. 26, 2024), attached hereto as Exh. DCG(A)-7.

[41] *Id*.

[42] There are an average of about 80 services per mile replaced (996 services over 12.4 miles); at $35,300 each they would cost about $2.8 million. $10.7 million minus $2.8 million is $7.9 million. If services with mains cost less to replace than stand-alone services, then the per-mile cost for mains is greater.

Q32 Could you put those per-unit costs in context?

A32 An average WGL residential heating customer uses about 627 therms of gas per year. If we assume a delivery rate of about $0.7778/therm and a monthly customer charge of about $20.70, which are WGL's proposed rates in Formal Case No. 1180, that is about $736 in annual payments to WGL. Even disregarding the cost of capital and taxes, it would take about 48 years for a typical residential customer to pay back the cost of the service line serving them, assuming no change in gas use. The expected lifetime of the service, as determined in WGL's depreciation study presented in F.C. No. 1180, is just slightly longer than this simple payback time, at 55 years,[43] and reductions in gas use are expected under District policy. Put another way, the present value of current customer payments over 30 years, calculated at a 7.88 percent cost of capital, is less than $8,000. If each service line replacement were treated as a new customer connection, and the utility calculated the required customer contribution in aid of construction according to General Service Provision 14, customers would be asked to contribute substantial sums, well in excess of $25,000, toward the cost of their service line. Because these costs are for replacement rather than new connections, however, other WGL customers will pay this cost instead.

As WGL shows in Table 1 of its Application, WGL's main replacement costs are substantially higher in the District of Columbia than in Maryland, and higher than other urban gas utilities. If WGL replaces a 0.1-mile leak-prone main with no downstream connection (e.g., a spur), WGL's average costs would imply spending $1.07 million to provide gas to fewer than 10 services. If these were typical residential customers, the simple payback time would be more than 145 years.

[43] F.C. No. 1180, Exh. WG (G)-2, Statement E, pg. 29.

Q33 What are your concerns with WGL's approach?

A33 I have several concerns. First, the cost of asset replacement is very high compared to the revenues associated with those assets, as I just discussed. These costs put WGL's rates on a trajectory to rapid increase, regardless of any District policy or competitive forces that could exacerbate those increases. Nowhere in WGL's Application or testimony does it provide any evidence that it has considered whether these investments make financial sense, or how it would use revenue estimates when evaluating which services or mains to prioritize in replacement. WGL has not met the PSC's requirement that "WGL's new PIPES plan must demonstrate greater cost-effectiveness."[44]

WGL's approach produces only gradual reductions in risky assets over the next 20 years. As Exhibit WG(A)-1 points out, pipe replacement at the proposed pace is not sufficient to address all leak-prone pipe on WGL's system over that period. Accelerating replacement further would cost more and increase competitive risk versus electricity, while replacing pipe at WGL's proposed pace would leave hundreds of miles of leak-prone pipe across the District even after 20 years and thereby fail to mitigate the safety and reliability risk posed by that pipe.

WGL's approach does not reflect the fact that the future of the gas system in the District of Columbia will be different from the past. If WGL expected to see steady growth in sales throughout the lifetime of the replaced assets, WGL could potentially sustain investments on the scale of its proposal without driving noticeable rate increases. In that case, WGL might not even need accelerated cost recovery because revenues would rise between rate cases. But as WGL makes clear, it perceives a need for accelerated cost recovery through an increasing rate rider in order to collect the funds for leak-prone pipe replacement. So, WGL implicitly understands that it is no longer in a situation with rising sales, but it has not accounted for this by rethinking its approach to leak risk.

[44] Order 22003, ¶ 50.

WGL might be able to sustain rate increases if gas offered a compelling cost advantage over other options for similar service. However, gas and electric rates in the District are close enough that there is competition between these fuels. WGL's approach will result in rising delivery rates that make gas service less competitive. This decrease in competitiveness risks driving accelerating customer defection, which would in turn drive further rate increases. Once customers begin to account for future rate increases driven by their neighbors' choices, they may choose to make the same choice themselves, thus driving rapid change.

WGL's attitude appears to be unmoved by the PSC's exhortation that it needs to account for the District's climate policies when developing its leak-prone pipe plan. District policy in favor of building electrification, alongside Federal support from the *Inflation Reduction Act*, will exacerbate underlying competitive stress between gas and electricity. District policy explicitly envisions a future that is very different from the past.

Finally, WGL's approach fails to account for the safety and reliability implications of financial unsustainability. If WGL is unable to charge rates that allow it to recover its full revenue requirement, because increases in rates would drive further sales and customer erosion, it may not have sufficient funds to maintain and operate a safe and reliable system while also making necessary capital investments to address leaking or risky assets. It may also have a difficult time attracting and retaining a workforce of highly skilled and trained employees with the expertise to effectively operate and maintain the system. WGL's business-as-usual approach to addressing leak-prone pipes would make this risky and potentially unsafe future more, rather than less, likely.

Q34 Have you conducted analysis of the cost-effectiveness of WGL's approach with respect to the value of decreasing risk?

A34 Yes. Based on data provided in WGL's response to a DCG data request, I estimate that WGL's proposed replacements during the three years of the proposed plan would reduce the quantified risk by at most [redacted]

[redacted] percent (assuming that WGL's highest risk assets are replaced), while replacing about 1 percent of mains and just under 3 percent of services.[45] The dollar value that the JANA risk model assigns to these reductions, assuming that new pipe has 4 percent of the risk of pipe being replaced,[46] would be [redacted] million per year. This compares unfavorably to the carrying cost of the $215 million that WGL would spend to achieve those risk reductions, which I estimate is around $30 million per year to start (a revenue requirement increase of well over 10 percent).[47] As WGL points out in response to a DCG data request "the system continues to age and the overall risk will continue to increase at a rate that outpaces the impact of the proposed planned replacement activities."[48] This means that ratepayers will spend around $30 million per year more, yet the system risk will decrease in absolute terms. WGL's proposed approach does not meet the need for a different approach that lowers absolute risk while containing costs.

Q35 Could WGL reduce risk more for the same budget by reallocating funds between mains and services?

A35 My analysis of the JANA data provided in Exh. DCG(A)-6 indicates that WGL could reduce risk (as estimated by the JANA tool) marginally more if it were able to replace exactly the set of assets with the greatest risk reduction per dollar of cost. However, the blend that WGL has chosen, if it targets the highest risk mains and services, is likely to be reasonably close to the most risk that could practically be reduced for the amount of investment that WGL proposes to make. While this speaks well of WGL's proposed blend of mains and services, it also means there is little room for optimization within the replacement paradigm that could make the overall proposition more cost-effective.

---

[45] Based on data from **CONFIDENTIAL** Exh. DCG (A)-6 (WGL Confidential Response to DCG DR 1-7).
[46] Based on Exh. WG(E), at pgs. 11-12 (Oliphant).
[47] The carrying cost of these three years' investment decreases over time as the assets depreciate.
[48] WGL Response to DCG DR 1-11 (filed Nov. 18, 2024), attached hereto as Exh. DCG (A)-8.

Q36 Have you conducted any quantitative analysis of the rate pressures associated with WGL's approach to leak-prone pipe risk?

A36 Yes. I used Synapse's Gas Rate Model (GRM) to project WGL's rates in a future that reflects WGL's proposal. Our GRM models the revenue requirement of a regulated gas utility, accounting for both operating and capital expenses, along with taxes and depreciation. The GRM allows Synapse to examine different scenarios for gas system investment and operating costs with different numbers of customers and volumes of sales, producing a projection of the revenue requirement and associated average rates.

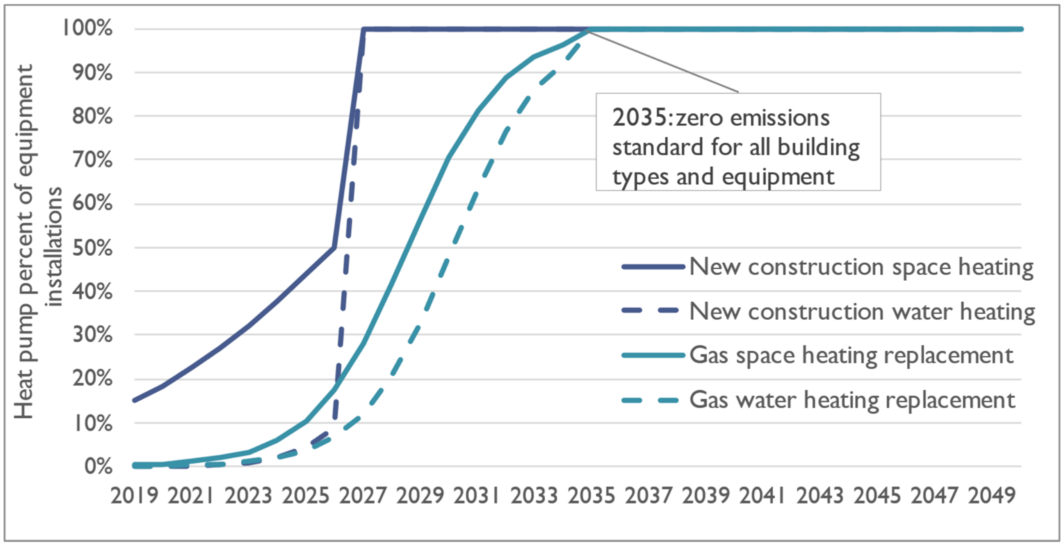
Q37 When considering the long-term implications of WGL's proposal, did you assume that WGL's efforts would accelerate beyond the level proposed in this case?

A37 No. For my analysis I have assumed that WGL's expenditures on leak-prone pipe replacement would continue at the 2027 level, adjusted for inflation. This means that the costs and revenue requirements I assume after 2027 are conservative and lower than would be implied by WGL's Application (Exhibit WG(A)-1).

Q38 What did you assume regarding gas sales and customer counts?

A38 I assumed that the District achieves its economywide goal of carbon neutrality by 2045, building on known policies. Figure 1 displays the forecasted heat pump market share trajectories used in our stock-turnover modeling using Synapse's Building Decarbonization Calculator. These trajectories are based on compliance with District climate policies and future mandates and do not necessarily reflect current trends. I assume the market share trajectories for commercial buildings are the same as residential buildings and assume the market share for electric cooking and drying equipment are the same as heat pump water heater trajectories.

Figure 1. Heat Pump Market Share Trajectories

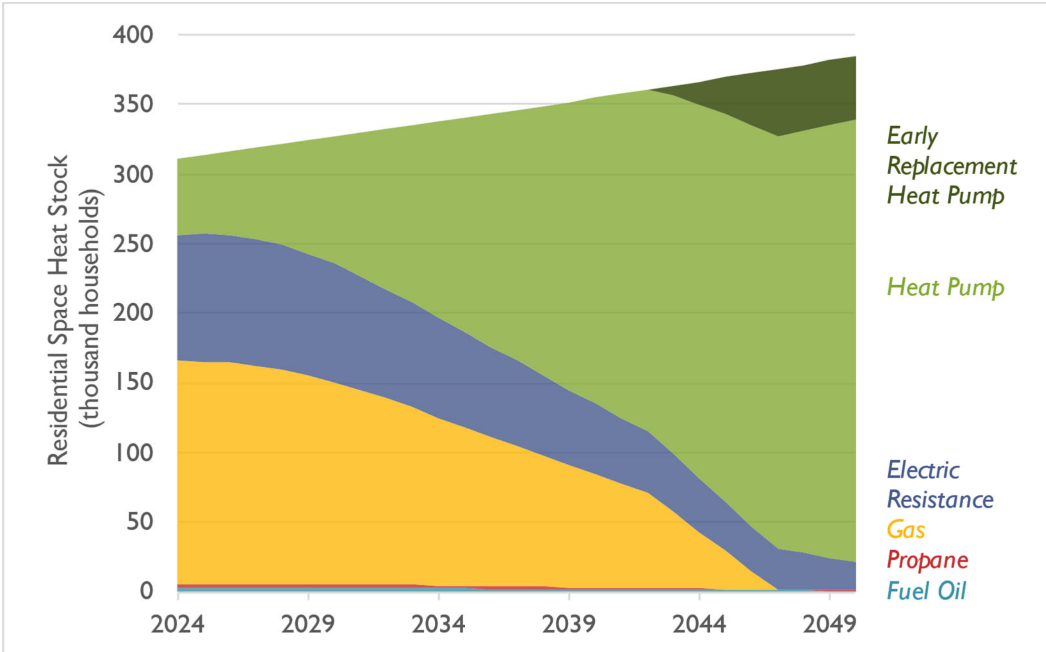


The modeling assumes that heat pump market shares in new construction will reach 100 percent by 2027, because the District's net-zero energy building code for new construction goes into effect in 2026. I assume heat pump market shares for existing buildings with baseline natural gas equipment will reach 100 percent by 2035, aligned with the DCG's *Carbon Free DC*, 2045 Strategic Policy Roadmap.[49] Finally, I expect the market share trajectories for heat pump water heaters to lag slightly behind space heat pumps, given the relatively nascent market for heat pump water heaters compared to space heat pumps. (Electric resistance water heaters may also be adopted; either technology results in the same reduction in gas use.) The resulting installed stock of space heating equipment in the residential sector can be seen in Figure 2.

---

[49] District of Columbia Government, *Carbon Free DC: 2045 Strategic Policy Roadmap* (2023), at pg. 2, https://doee.dc.gov/sites/default/files/dc/sites/doee/service_content/attachments/CFDC%20Policy%20Roadmap_FINAL.pdf.

Figure 2. Modeled policy-consistent residential space heating equipment stock



This stock-turnover modeling assumes that the small number of residential customers who would still be using gas in 2045, due to having already installed equipment with lifetimes over 13 years, choose to replace that equipment with electric alternatives before the end of its useful life. This is reasonable because, as I will show below, gas rates by the early 2040s will have risen substantially from current levels and customers will see immediate savings from electrifying.

Q39 What policies are you referring to when you say that your modeling reflects existing policies?

A39 The District has multiple policies promoting the creation of net-zero energy buildings, which are highly efficient buildings that are all-electric and generate or procure enough renewable energy to meet or exceed their annual energy consumption.[50] The current energy conservation code includes a voluntary net-

[50] Department of Energy & Environment. "Green Building in the District." Accessed 9/24/2024 Available at: https://doee.dc.gov/service/greenbuilding.

zero energy code.[51] The *Greener Government Buildings Amendment Act of 2022* requires new District-owned buildings and substantial improvement projects that receive 15 percent or more of their funding from the District to comply with this net-zero energy code.[52] By 2026, all new and substantial improvements to commercial buildings and residential buildings taller than three stories must meet net-zero energy standards.[53]

Another policy helping the District make progress towards its 2045 goal are the Building Energy Performance Standards (BEPS), which set energy performance targets for specific existing building types. Reducing the amount of energy that buildings use directly reduces emissions associated with this energy usage. The standard currently applies to privately owned buildings 50,000 square feet or larger and District-owned buildings 10,000 square feet or larger. In 2027, privately owned buildings 25,000 square feet or larger must also comply with the BEPS, and starting in 2033, all buildings over 10,000 square feet must comply.[54]

In addition to increasing building energy efficiency, electrification of existing buildings will be important to achieving the District's requirement to be carbon neutral by 2045, established by the *Climate Commitment Amendment Act of 2022*. Electrification is expected to be a primary compliance pathway for energy and emissions reduction under BEPS. The DC Council has accelerated the trend towards electrification by passing laws such as the *Healthy Homes and Residential Electrification Act of 2024*, which created the Breathe Easy Program

---

[51] 2017 District of Columbia Energy Conservation Code Appendix Z. 2020. Available at: https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/2017%20DC%20Energy%20Conservation%20Code_Appendix%20Z.pdf.

[52] *Greener Government Buildings Amendment Act of 2022.* D.C. Law 24-306. Effective March 10, 2023. Available at: https://code.dccouncil.gov/us/dc/council/laws/24-306.

[53] *Clean Energy DC Building Code Amendment Act of 2022.* D.C. Law 24-177 Effective September 21, 2022. Available at: https://code.dccouncil.gov/us/dc/council/laws/24-177.

[54] Building Innovation Hub. "BEPS Standards and Compliance Rules Finalized." Accessed 9/24/2024. Available at: https://buildinginnovationhub.org/special-update-beps-rules-released/.

to provide 30,000 low-income and moderate-income households with electrification retrofits.[55]

Federal government buildings in the District of Columbia are also electrifying. For example, Executive Order 14057 establishes that the Federal Government will lead by example to achieve a net-zero emissions building portfolio by 2045 and achieve a 50 percent emissions reduction below 2008 levels by 2032.[56] The Federal Building Performance Standard, issued pursuant to E.O. 14057, aims to reduce on-site greenhouse gas emissions in Federal buildings by promoting deep energy retrofits and electrification upgrades.[57]

Q40 What are the resulting trajectories for WGL gas sales and customer counts?

A40 WGL's sales per customer have been falling for the last decade, so as customer growth ends due to public policy and market forces, sales will fall faster. Figure 3 shows the trajectories for gas sales and customer counts used throughout my analysis.

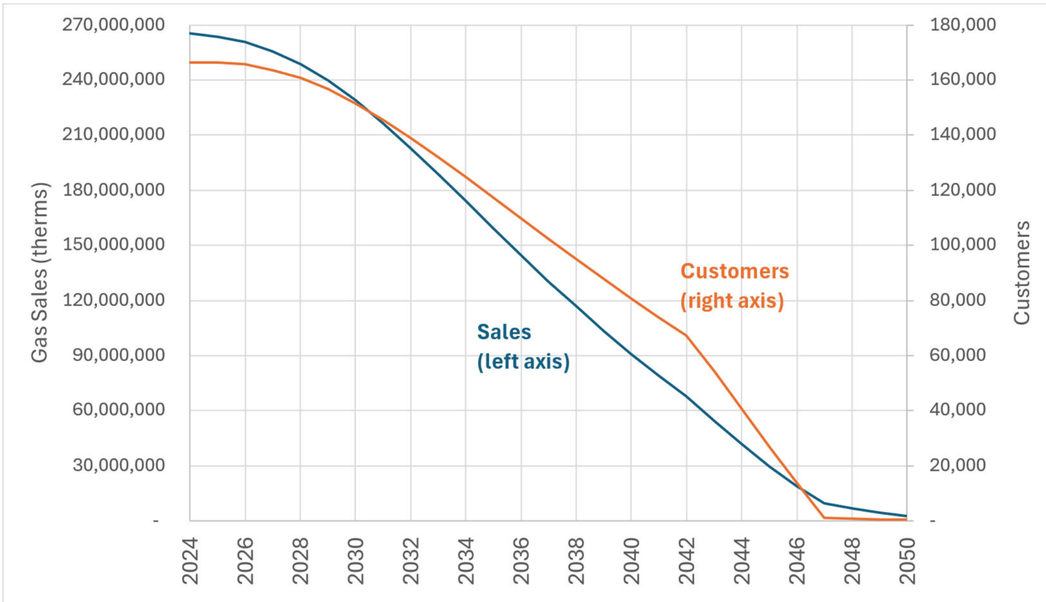
---

[55] *Healthy Homes and Residential Electrification Amendment Act of 2024.* D.C. Act 25-488. May 31, 2024. Available at: https://lims.dccouncil.gov/downloads/LIMS/52291/Signed_Act/B25-0119-Signed_Act.pdf?Id=191649.

[56] *Executive Order on Catalyzing Clean Energy Industries and Jobs through Federal Sustainability.* Executive Order 14057. Signed December 8 2021. Accessed 9/25/2024. Available at: https://www.whitehouse.gov/briefing-room/presidential-actions/2021/12/08/executive-order-on-catalyzing-clean-energy-industries-and-jobs-through-federal-sustainability/.

[57] The Federal Building Performance Standard. 2022. Council on Environmental Quality. Available at: https://www.sustainability.gov/pdfs/federal-building-performance-standard.pdf.

Figure 3. Projected policy-consistent sales and customer counts



Q41 Are the implications of these trajectories highly dependent on the details of the timeframe for policy implementation or the details of policy design?

A41 No. If a given District policy is implemented a handful of years earlier or later, it does not change the fundamental shape of these curves: steady declines in gas sales and number of customers.

Q42 What does your GRM modeling indicate regarding the impact of WGL's business-as-usual approach on its revenue requirement and rate base?

A42 My modeling shows that WGL's revenue requirement would grow steadily through mid-century, in real (inflation-adjusted) terms. In the model, which works on an annual basis rather than tracking each rate case, WGL's real revenue requirement has grown approximately 26 percent since 2021,[58] and would grow by that amount again by 2034. Figure 4 shows the modeled revenue requirement.

---

[58] This is comparable to the 24 percent (nominal) increase that WGL is requesting in F.C. No. 1180, on top of the increase from its previous rate case.

Figure 4. WGL revenue requirement in the business-as-usual case reflecting WGL's District SAFE proposal

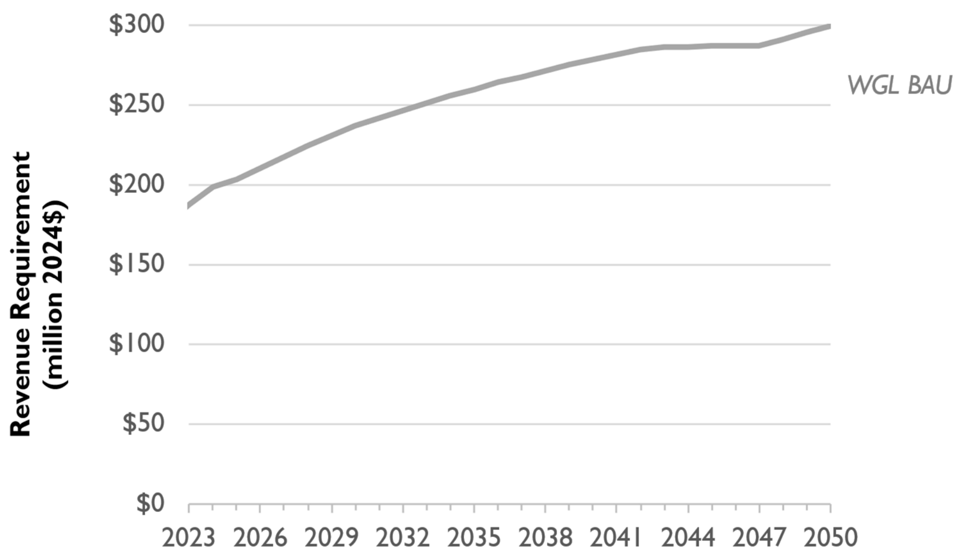
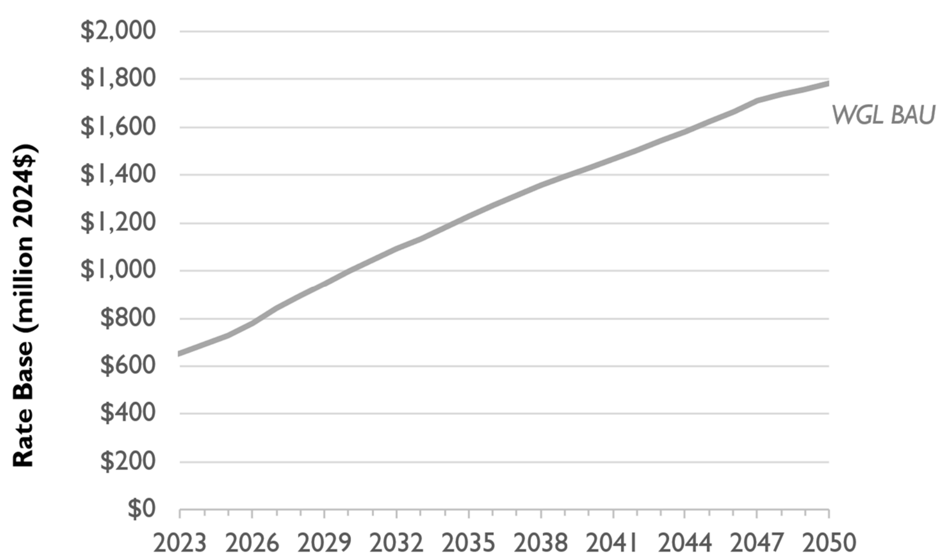


Figure 5 shows WGL's rate base, which would well more than double, in real terms, by 2050 under WGL's business-as-usual approach.

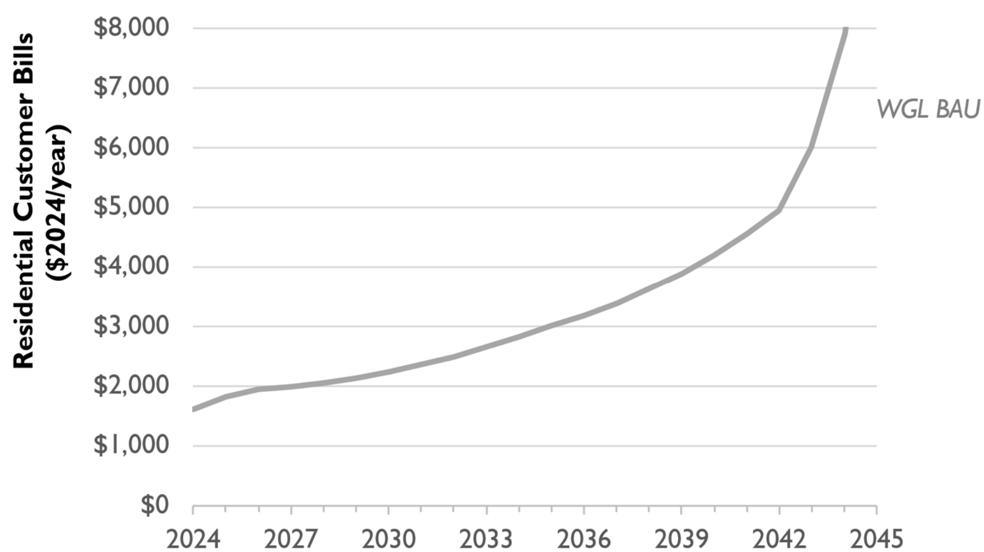
Figure 5. WGL rate base in the business-as-usual case reflecting WGL's District SAFE proposal



Q43 What happens to customer rates and bills in this case?

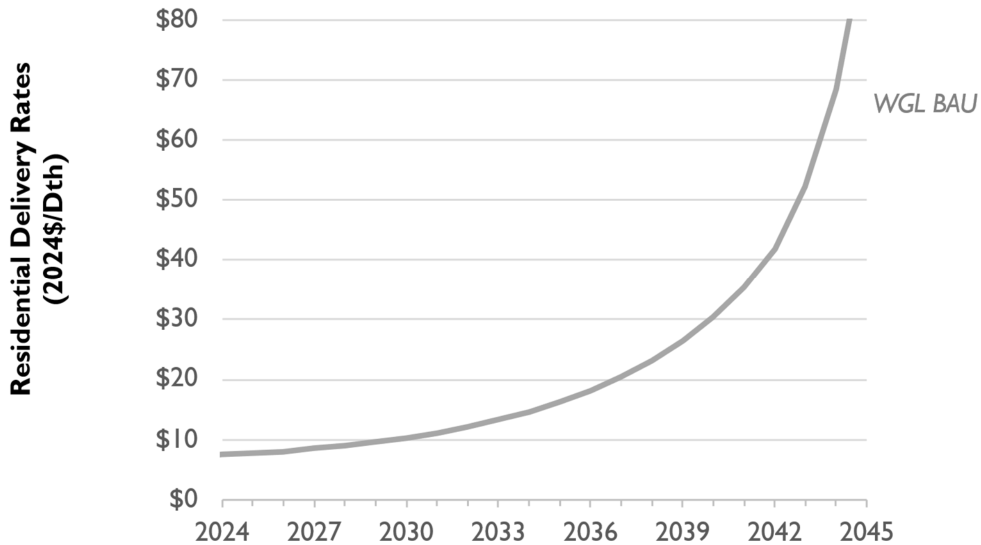
A43 Both rates and bills rise dramatically. Average residential gas bills are around $1,600/year today (including both delivery and fuel costs) and would increase 50 percent (in inflation-adjusted terms) by 2031 and double by 2036. Figure 6 shows this trajectory.

Figure 6. WGL average residential customer bill in the BAU case



Per-therm average delivery rates rise even faster, because the average customer bills reflect a decline in per-customer gas consumption and commodity fuel costs do not rise with declining sales. Figure 7 shows the modeled residential delivery rates, which increase 50 percent from current levels by 2030 and double by 2034.

Figure 7. WGL average residential delivery rate in the BAU case



Q44 Would WGL's rates rise even if sales and customers stayed flat, instead of declining consistent with District policy and the impact of competitive forces?

A44 Yes. WGL's delivery rates would rise roughly 3 percent per year faster than inflation (or about 5 to 6 percent per year in nominal terms) as a result of the utility's growing rate base and depreciation costs. Including fuel commodity costs, real rates and bills would rise by about one-third by 2030. This rise would further erode WGL's competitive position with respect to electricity, driving a growing risk of falling sales and faster increases in rates.

Q45 In the policy-compliant case, have you assumed that the unrecovered investments in retired service lines and meters are stranded?

A45 No. I have not assumed that the unrecovered costs of assets are stranded; instead, the investment remains in rate base through at least 2050 even though the assets are retired. This approach leaves a large rate base in 2045 and beyond, even though there is little to no revenue to recover this investment. Accelerated depreciation could reduce or eliminate this stranded cost risk, or utility investors could eventually recognize this loss after the analysis period.

Q46 What impact do these rising rates have on the competitiveness of gas relative to electricity for space and water heating?

A46 Electricity becomes by far the less expensive option. Today, the Potomac Electric Power Company's default marginal electric rate (above 400 kWh/month) is about 16.6 cents/kWh while WGL's default winter gas service costs about $1.28 per therm. In a common unit of $/million British thermal units (MMBTU) of energy delivered, electricity is $48.60 per MMBTU while gas is $12.80 per MMBTU (although WGL's ongoing rate case proposes to increase this amount to about $15/MMBTU). This means that if electric equipment is more than 3.8 times as efficient as gas equipment (or 3.24 times if WGL's rate increase is approved), electric equipment will be less expensive to operate. Many heat pump options (especially for water heating) meet these thresholds today, compared with typical gas combustion equipment. However, when gas delivery rates have doubled (i.e., by 2034 following WGL's approach), and all-in gas costs rise to over $1.85/therm, choosing electric equipment would save hundreds of dollars per year or more. 2034 is well within the lifetime of heating equipment installed today, and customers may take such increases into account when selecting equipment. In making this comparison, I assume that electric rates will remain roughly constant in real terms. This is based on my assessment that increasing revenue requirements associated with electric system investment will be counteracted by increasing sales from electric vehicles and electrifying buildings; this is the approximate result I have seen in states where my Synapse colleagues and I have modeled the electric rate impact of electrification.[59]

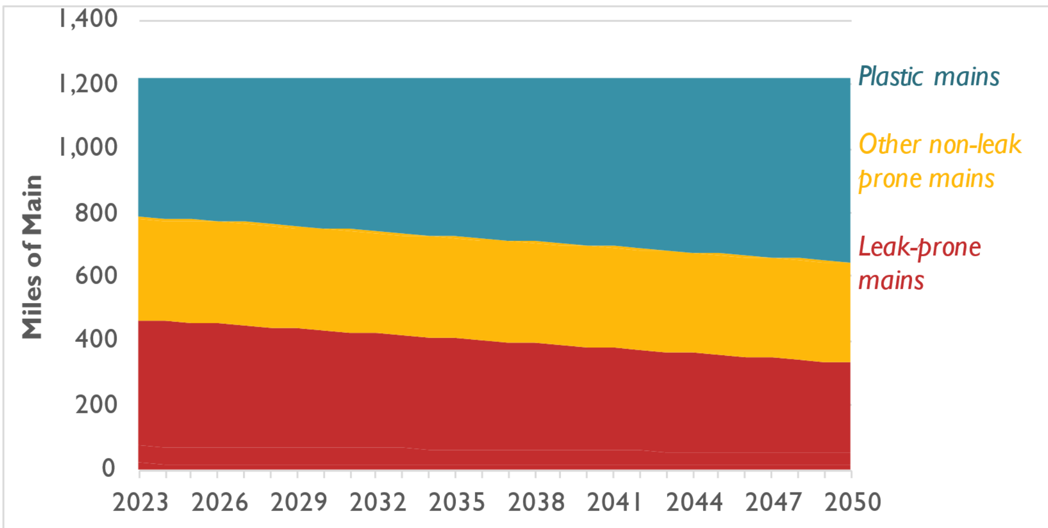
Q47 Does WGL's proposed approach reduce risk associated with leak-prone pipe?

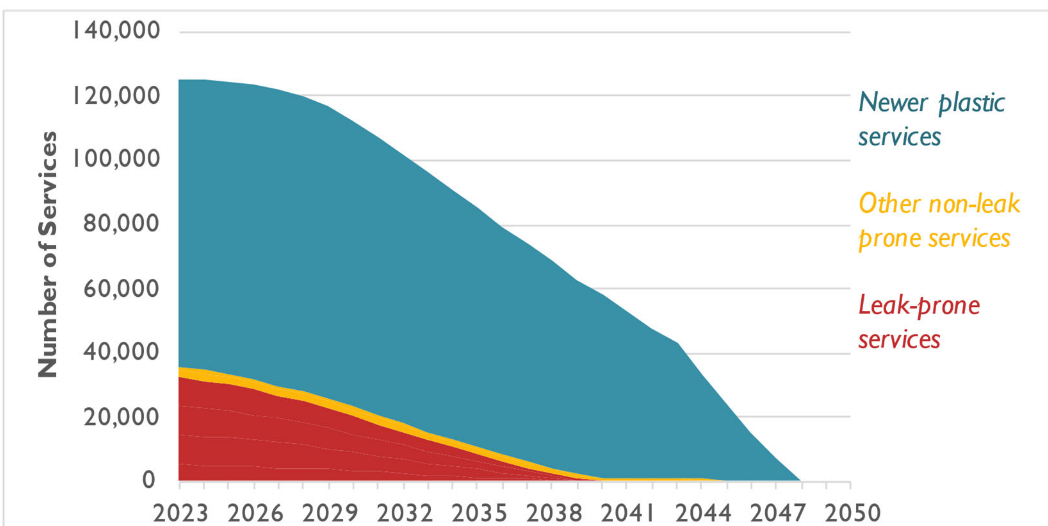
A47 WGL's approach gradually reduces the amount of aging and leak-prone pipe in the District. Figure 8 shows the composition of WGL's mains and services under

[59] See, for example, Shenstone-Harris, S., et al. January 2024. Electric Vehicles are Driving Rates Down for All Customers. Synapse Energy Economics. Available at https://www.synapse-energy.com/sites/default/files/Electric%20Vehicles%20Are%20Driving%20Rates%20Down%20for%20All%20Customer%20Update%20jan%202024.pdf.

WGL's replacement-based approach. When developing this figure, I have assumed that WGL decommissions service lines as customers depart the system, thereby eliminating risk associated with those lines. If WGL maintains service lines in the hope that a future occupant of the building will reconnect gas service, the safety benefits of electrification are not achieved.

Figure 8. Composition of WGL's (a) mains and (b) services under WGL's BAU approach

a) 

b) 

As shown in part (a) of this figure, even under WGL's proposed expanded budget for accelerated pipe replacements, WGL's system retains more than 70 percent of today's leak-prone mains in 2050. Meanwhile by 2050, all mains installed before

1980 (including at least 250 miles of main not currently categorized by WGL as leak-prone) will be more than 70 years old, and thus potentially ready to be retired. While WGL's risk modeling may indicate that risk is highest among a small subset of WGL's assets today, and those assets could be retired before 2045 through substantial system investments, WGL's modeling does not account for further material degradation in the intervening years, which WGL states will result in potentially growing risk.[60]

Q48 Does WGL's approach address gas safety risk on the customer side of the meter or excavation risk?

A48 No. WGL's approach does not reduce risk from gas once it passes the meter and enters buildings and it does not reduce excavation-related risk. In addition to adverse air quality and health impacts from combustion in buildings,[61] continued gas service presents a continued safety risk to building occupants. For example, a contractor ruptured a gas line in Haymarket, VA in October of this year, resulting in a home explosion,[62] and interior piping led to an explosion in the Columbia Heights neighborhood of D.C. in September 2024.[63]

Q49 Do these model results support your concerns regarding WGL's proposed approach to leak-prone pipe?

A49 Yes. These model results confirm that WGL's business-as-usual, replacement-led approach to reducing the safety risk from leak-prone pipe is unsuitable for the competitive and policy environment in which WGL operates. WGL's proposed path leads to escalating revenue requirements, rates, and bills. At the same time, it

[60] *See*, Exh. DCG (A)-8.

[61] Lewis, T. January 19, 2023. "The Health Risks of Gas Stoves Explained" *Scientific American*. Available at https://www.scientificamerican.com/article/the-health-risks-of-gas-stoves-explained/.

[62] Albert, J. and NBC Washington Staff. October 16, 2024. "Contractor ruptured gas line before Virginia home explosion, fire dept. says." *NBC Washington*. Accessed at: https://www.nbcwashington.com/news/local/contractor-ruptured-gas-line-before-virginia-home-explosion-fire-dept-says/3743600/ on December 9, 2024.

[63] Murillo, M. October 3, 2024. "A month after a gas explosion, residents of a DC apartment building still can't return home." *WTOP News*. Accessed at https://wtop.com/dc/2024/10/after-a-gas-explosion-residents-of-a-dc-apartment-building-are-still-not-allowed-to-return-home/ on December 9, 2024.

will make WGL's service less competitive, only moderately reduce the drivers of risk, and increase long-term risk to the utility's ability to provide safe and reliable service.

V. AN ALTERNATIVE APPROACH TO GAS SYSTEM RISK REDUCTION

Q50 Could you please describe the range of alternatives for risk reduction, beyond WGL's approach?

A50 The safety and environmental risks associated with aging pipe can be addressed using three general actions: replacement, repair, and retirement. All of these actions are consistent with the 2011 PHMSA Call to Action on pipeline safety.

Replacement: Replacing older pipe with new, plastic pipe reduces leaks due to the lower leak propensity of plastic material and better joints between plastic components. An advantage of replacement is that customers do not need to make changes to their building systems. Disadvantages include that the pipe remains at risk of excavation or other damage and that this is commonly the most expensive option for reducing safety risk.

Repair: Repairing pipe when a leak is identified directly reduces leaked gas. Advantages of repair include its relatively low cost, the fact that it focuses directly on identified risks, and the fact that customers do not need to make changes to their building systems. Disadvantages include the shorter lifetime of repairs compared to new pipe, the need to identify leaks before repairing them, and that the pipe remains at risk of excavation or other damage. In addition, high-consequence leak events (including explosions) may be associated with brand new leaks, so may not be avoidable without very rapid detection and mitigation actions.

Retirement: Retiring gas pipe means separating it from the gas system, sealing it in accordance with safety regulations, and ceasing to use it to provide gas service. An advantage of retiring gas pipe is that it completely removes all safety risk associated with the pipe, including excavation and damage risk. The primary disadvantage is that it requires customers to electrify or find other fuel sources for their equipment.

When developing an approach to managing risk, a gas utility chooses some combination of these actions. WGL's proposal is for a replacement-led approach, with reactive repairs and limited, opportunistic retirement (through its Customer Choice proposal). Other approaches could take a more balanced mix of actions, such as using replacement only when necessary and favoring retirement while taking a proactive approach to leak identification and repair.

Q51 Have you analyzed alternatives?

A51 Yes. I evaluated two alternative, balanced approaches, each of which include replacement, repair, and retirement. Both begin similarly to WGL's proposal, including replacement of high-risk mains and services, then quickly shift toward retirement as a prominent contributor to risk reduction (while continuing some replacement activities). Both begin with a focus on retiring services; retiring services can accelerate more quickly than retiring mains because there is no need for multi-customer coordination. Both approaches also include additional proactive leak surveys beyond what is required by regulation, and additional funds for rapid leak repair to clear WGL's leak backlog and address leaks quickly after they are identified. The approaches differ in the extent of their focus on retiring mains through clustered or neighborhood electrification. I refer to one approach as "managed" and the other as "unmanaged": the differentiator is whether electrification is managed by using policies and programs to target and cluster electrification in a manner that allows for the retirement of mains. When evaluating the rate and other utility impacts of these alternatives, I used the same policy-consistent trajectory for gas customers and sales that I described in evaluation of WGL's approach.

Q52 Could you provide more details on how your alternatives address leak-prone services?

A52 My alternatives envision an approach wherein WGL provides each customer with an estimate of the year in which their service line will be replaced or retired. For many customers this date will simply be "more than 20 years from now" (because the customer is not served by any leak-prone assets), but for many others there will be an estimate that is shorter than the lifetime of gas-burning equipment like furnaces or water heaters. These customers, along with the DC SEU or other electrification programs, can use this information to plan for how to electrify end uses during the time before the service is due to be addressed. I assume that in the early years, relatively few customers will find the timing to be conducive to replacing gas equipment with electric alternatives, whereas in later years a larger fraction of customers will have electrified by the time their service is due to be addressed. I assume that if a customer has electrified before their date comes around, their service is retired rather than replaced. These assumptions are implemented in the GRM by assigning a growing fraction of the services that would otherwise be replaced to be retired instead.

Similar to the modeling of WGL's approach, I assume that as customers electrify as part of the District's path to decarbonization, their services are retired, regardless of whether the services happen to be leak-prone or were due for replacement. The change in leak-prone pipe approach does not materially affect the fate of services, because the customers electrify in any case.[64]

Q53 Could you provide more details on how your alternatives address leak-prone mains?

A53 My alternatives take two approaches to leak-prone mains. In the "managed" case, I envision that WGL estimates the year when each segment of leak-prone main is

[64] I did not model an approach where WGL provides incentives for electrification as part of a full NPA program, which could affect the need for services and the timing and opportunities for retirement. That option is discussed more fully in the testimony of DCG Witness Botwinick.

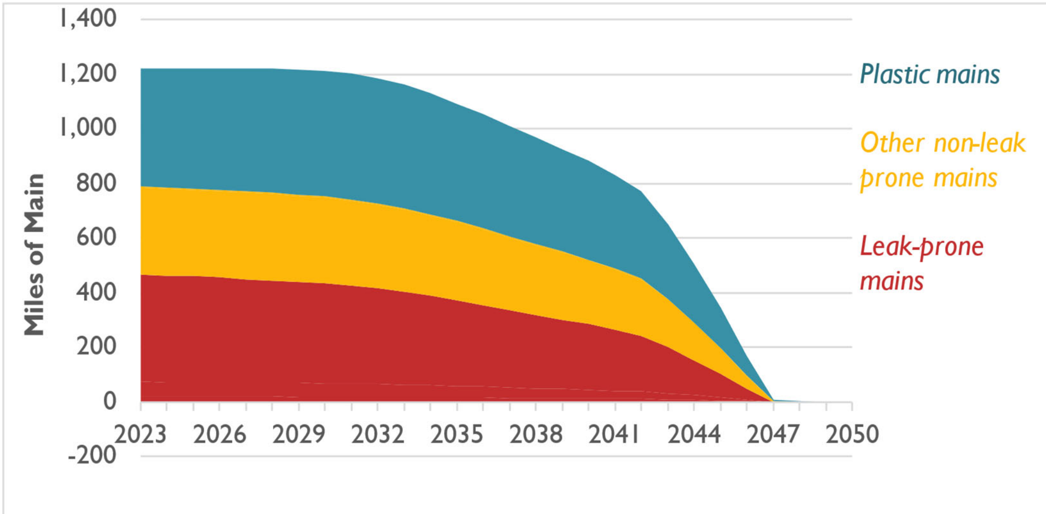
planned for replacement or retirement (similar to the service lines). In the early years, I assume that only a small fraction of these main segments is suitable for retirement due to coordination challenges among customers served by the segment. I assume that fraction grows gradually over time, eventually to 100 percent of leak-prone main identified for each year. I assume that electrification programs build from this foundation to identify clusters or blocks of buildings that can be electrified and allow their mains to be retired. These mains need not be leak-prone pipe, or pipe that was due to be retired on that schedule, although I envision that programs will focus their efforts at clustering in areas where they can reduce leak-related risk by retiring leak-prone mains and the associated services. Once the assets are no longer used and useful, they are retired. This reduces operations and maintenance costs, because the retired mains no longer incur such costs.

In the “unmanaged” case, there are no efforts to retire mains except when they happen to no longer have any customers on them or downstream of them. The result of this is that mains eventually do retire, but essentially only in the 2040s when there are very few remaining customers.

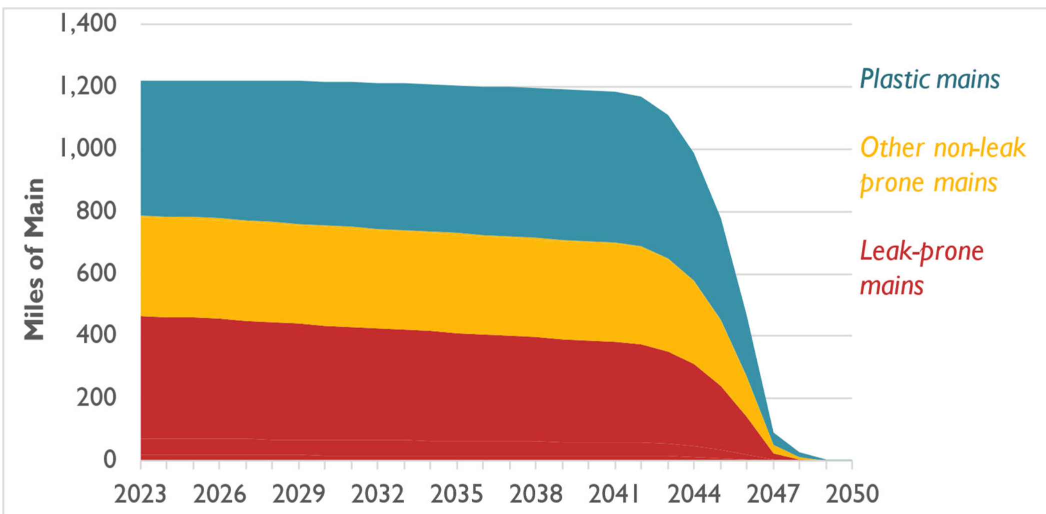
Figure 9 shows the miles of main by age and material cohort in the managed and unmanaged cases.

Figure 9. Composition of WGL's mains under the (a) managed and (b) unmanaged alternatives

a)



b)



Q54 Could you provide more details on how your alternatives address seeking and repairing leaks?

A54 For this alternative approach, I envision reducing leak risk further by increasing the frequency of ALD surveys and increasing leak repair activities to reduce the time between when leaks are found and when they are repaired. In 2021, contractors to the DOEE conducted a vehicle-based leak survey which identified

3,346 methane sources over 713 miles of District of Columbia roadway.[65] Scaled up to WGL's roughly 1,200 miles of distribution pipe, this implies there could be over 5,600 methane sources in the District of Columbia in areas served by WGL. In contrast, WGL's leak surveying and reporting approaches for 2021 identified just 1,530 leaks, so it is possible that there are more leaks than WGL has identified. To put an upper limit on the cost of leak repair, I assumed that each of the methane sources that the 2021 survey found were leaks; if they are not all leaks then the alternatives are lower cost. For these alternatives, I envision using the savings resulting from retiring rather than replacing services (and eventually mains) to bolster the operations and maintenance budgets for leak repair. (I include the cost of more frequent leak detection from the beginning.)

Q55 What would the impact of your proposed approaches be on gas safety risk, compared with WGL's approach?

A55 These alternative approaches would result in lower risk than WGL's approach. Each service or main segment that would be replaced in WGL's approach would either be replaced or retired under these approaches. Where the treatment is the same (replacement), the risk reduction will be the same. Where a service or main is retired instead of replaced, risk is reduced more due to elimination of additional risks such as in-building and excavation risk.[66] By directing savings to leak identification and repair, risk associated with active leaks is also reduced in the alternative cases. Identifying and repairing leaks more quickly than WGL currently does would reduce both the likelihood and consequence of potential safety incidents relating to those leaks.

---

[65] Formal Case Nos. 1130 & 1154, Ackley, B. and N. Philips. October 31, 2024. *2021 Fugitive Methane Emission Survey of the District of Columbia*. Prepared for the Department of Energy and Environment (filed Nov. 30, 2021).

[66] Exh. WG(E) (Oliphant) at pages 11-12 states that up to 4 and 10 percent of out-of-building risk cannot be eliminated with new materials. This risk can only be reduced by retiring the assets; retirement also has the effect of eliminating additional in-building risk.

Q56 Have you estimated the quantitative impact of your alternative approaches on system risk, compared with WGL's approach?

A56 Yes. I used the JANA-based risk data from Exh. DCG(A)-7 to estimate the best possible risk trajectories (from a risk-reduction-per-$ perspective) over the next 25 years in four cases: (1) no leak-prone pipe retirement or replacements; (2) and (3) WGL's proposal in this case, continued at the $90 million per year level through 2050, with and without abandonment of unused services; (4) the managed alternative case; and (5) the unmanaged alternative case. I assumed that risk from existing assts would rise at 2.25 percent per year, based on information contained in Exh. DCG(A)-8 that WGL's proposed programs would not result in an absolute reduction in risk. This analysis does not account for reduced risk from increased leak detection and repair. The resulting risk trajectories are shown in Figure 10. This figure shows that the risk is lowest in the managed alternative case. The unmanaged alternative case and WGL's approach with service abandonments are essentially the same until the late years when main retirement becomes possible in the unmanaged alternative case. The cumulative value of lower risk for the managed approach compared with WGL's approach with service abandonment over the 25 year period is [redacted] billion (present value of [redacted] million), whereas the advantage over WGL's approach without service abandonment is about twice as large.

Figure 10. Estimated system risk under different approaches to system risk reduction, assuming optimal targeting for risk reduction per $ spent

[[redacted]]

[redacted]

[redacted]

Q57 How do the costs of these alternatives compare with the cost of WGL's approach?

A57 After a small initial increase in cost to account for more frequent leak surveys and repairs, the alternatives result in lower revenue requirements and therefore lower rates. The managed case has lower costs than the unmanaged case, due to operations and maintenance cost savings. The managed case could also allow for greater benefits from accelerated depreciation associated with its larger stock of retired mains. Figure 11 shows the revenue requirements for these two alternatives, compared with WGL's replacement-focused approach, and Figure 12 shows the rate base.

Figure 11. Revenue requirement in the two alternative cases as well as WGL's business-as-usual (BAU) approach

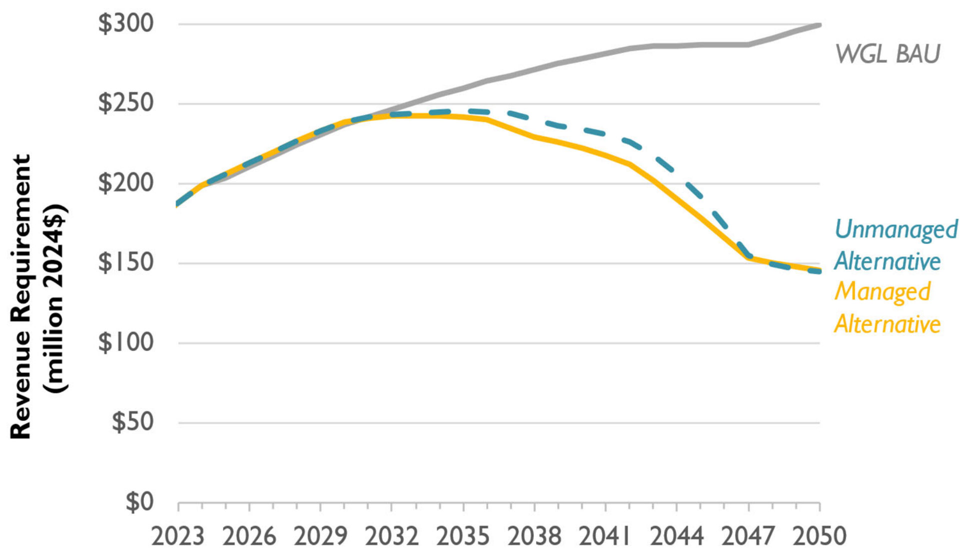
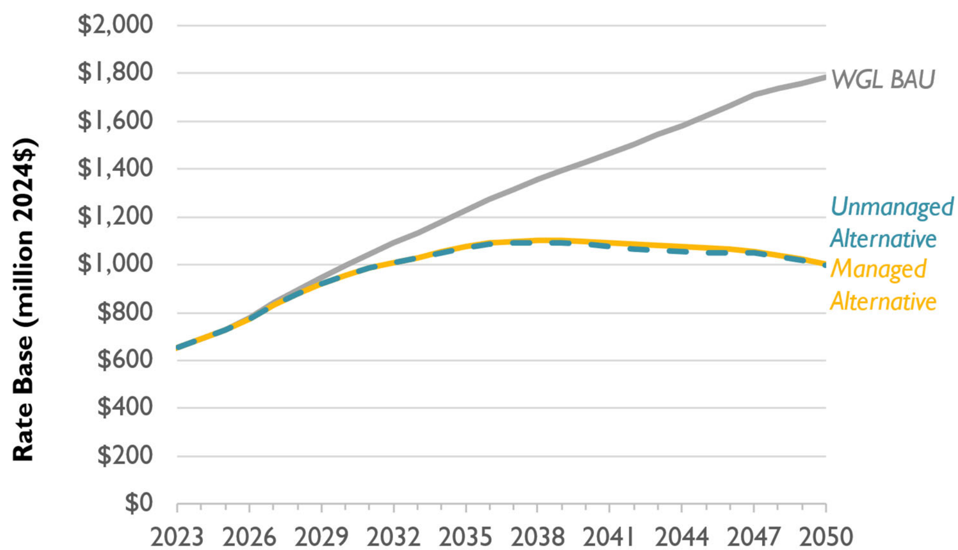


Figure 12. Rate base in the two alternative cases as well as the BAU approach



Q58 What implications do you draw from the comparative financial analyses?

A58 The alternative approaches are noticeably less expensive than the business as usual (BAU) approach, with much less rate base at risk of stranding. The cumulative revenue requirement between now and 2050 in the managed alternative case is $1.35 billion less than WGL's BAU approach, while the rate base at risk of stranding after 2050 is about $800 million less. The alternatives also noticeably reduce the number of customers that face the very high gas bills that occur after 2040. For example, while in the BAU case 77,000 residential customers would face average bills of $4,200 in 2040, in the managed alternative case just 52,000 customers face a similar bill when the bills finally rise to that level in 2043. Overall, the savings from taking an alternate approach lower the risk of financial instability associated with customer departure, as well as stranded cost risk that might threaten its access to capital markets, enabling the Company to maintain a steady hand on the safety and reliability of the system and better manage its workforce issues through the transition. It also provides more time and flexibility to target electrification assistance to low-income household and rental properties to improve the equity outcomes of the energy transition.

Q59 What implications do you draw from comparing the managed and unmanaged versions of your alternative approach?

A59 The managed case has noticeably better risk characteristics than the unmanaged case because it retires more leak-prone pipe sooner (see Figure 9). The managed case is also less expensive than the unmanaged case, due to lower operations and maintenance costs associated with the smaller system.

Q60 Do the alternatives you described mitigate the concerns you have with WGL's BAU approach?

A60 Yes. The alternatives I described are explicitly built from the knowledge that the future will not look like the past, in contrast to WGL's approach which is ignorant of this fact. The alternatives are compatible with the District's climate laws and electrification policies. The alternatives have comparable near-term costs to WGL's approach, and fall over time to be lower, all while reducing safety risks faster and more completely than WGL's proposal. By keeping rates and bills lower, WGL would face less immediate competitive threat. This would allow the utility, customers, and policymakers more time to execute essential transition steps and reduce stranded asset risks. The utility would be on a more stable financial footing and thus more able to make the necessary expenditures to maintain a safe and reliable system while managing the energy transition.

Q61 Do the alternatives you described meet the requirements of Order 22003?

A61 Yes. The PSC asked for a narrowly targeted pipe replacement program that expands the use of alternatives to replacement, mitigates the risk of stranded assets, and aligns with the District of Columbia's climate laws. This alternative approach does that, with significant benefits in system safety, financial stability (for the utility), climate, and ratepayers.

VI. GAS SYSTEM PLANNING NECESSITIES FOR A PRUDENT GAS SAFETY PROGRAM

Q62 The alternative approaches to gas safety improvement you just discussed would require changes in how WGL conducts gas system planning. Could you elaborate on what you consider to be requirements for gas system planning to support gas safety investments?

A62 Of course. At a high level, the gas system planning process should have the following four elements. The process should:

- Provide customers and programs sufficient time to plan for asset retirement and investment;
- Be consistent with policy and take an "all costs" perspective, including customer and system costs, as well as the cost of carbon and methane emissions and health impacts, when evaluating paths consistent with policy objectives;
- Take into account asset lifetime and depreciation costs when considering alternatives; and

- Use asset risk ranking methods and cost-effectiveness when making investment decisions.

Planning that incorporates these elements will provide the utility, regulator, and stakeholders with the necessary information to make decisions that will set the utility on a prudent course through the energy transition.

Q63 What role does gas system planning play in prudent investments in pipeline replacement programs?

A63 Planning is essential to prudent management of and investments in the gas pipeline infrastructure. Gas system capital planning, for both the short term (e.g., less than five years) and for the longer term (over a decade or more) is a key tool for identifying options for system growth or decline and optimization. By looking ahead multiple years and considering the usefulness of assets over their lifetimes, system planners can weigh alternatives to meet evolving system needs at the lowest cost. For example, with appropriate tools and processes in place, a system planner can compare the costs and benefits of a repair- or retirement- focused effort for leak-prone pipe (aimed at reactive responses to leaks and repair of pipe sections that show the greatest leak history) with a replacement-based approach (aimed at proactively replacing high-risk pipe). Each action in a repair-focused approach may have a shorter effective lifetime for resolving safety issues than would a replacement-focused approach, but the former also be more targeted and nimbler with the ability to adjust to changing system utilization. Retirement completely eliminates safety risk and emissions, while also avoiding stranded asset risk and reducing competitive pressure. Replacement offers a longer lifetime, with associated reduction in flexibility and increase in the need to manage stranded asset risks. If a utility is not conducting planning practices that take this kind of analysis into account, it risks making imprudent decisions for the development of and investment in its system.

Q64 How does the need for better planning relate to WGL's proposal for accelerated cost recovery for leak-prone pipe replacement?

A64 The quality of WGL's planning should be a key element of determining if the investments were prudently made. Initiating cost recovery before the investments are reviewed as part of a rate case should only be done in exceptional circumstances. In order to approve accelerated recovery, regulators should have great confidence that the investments are prudent. The PSC will retain the right to review prudency in rate cases, but WGL should be required to pass a clear confidence threshold to even begin to recovering the costs of its investments. This means the PSC must be able to trust that WGL's planning and project selection process is prudent in order to approve WGL's proposal for accelerated cost recovery. The PSC needs to trust the forecasting and risk modeling, and also trust that the utility is considering the available alternatives when deciding how to approach any given segment of pipe (main or service), as well as the overall scope and plan for its approach to gas safety. To approve the proposal, the PSC should be assured that WGL's planning process meets this bar.

Q65 Does WGL meet these requirements today?

A65 As far as I can tell, it does not.

- WGL has not undertaken long-term capital planning consistent with the principles I laid out above.
- Because of that planning failure, WGL is unable or unwilling to give customers more than 2 years' notice that their service line is scheduled to be addressed in the proposed District SAFE program
- WGL's approach is not designed to succeed alongside the District's carbon neutrality and electrification policies.
- WGL's approach does not minimize risk compared with alternatives that are lower cost and policy-consistent.

- WGL's approach does not account for the long-term safety implications of a potentially precarious financial position.

- WGL does not propose to recover the carrying costs for its programmatic investments using depreciation rates grounded in a comprehensive view of their long-term utilization and useful lives.

Q66 If the PSC rejects WGL's request for accelerated cost recovery for the District SAFE proposal, can WGL still make investments in system safety?

A66 Absolutely. WGL has an obligation as part of its franchise to maintain a safe system. It must make the prudent investments required to meet that obligation. In the event that WGL finds that its revenue is insufficient to cover its cost of service, it can and should file a rate case.

Q67 How do customers directly benefit from better gas system planning?

A67 As customers consider important capital decisions in their premises (such as the choice of heating system equipment when their existing system is approaching end of life), they benefit from understanding the full range of options they face and the cost implications of those choices. If a customer understands that the nature of their gas service is likely to change during the lifetime of their new equipment, they should be able to account for that. This type of foresight is only possible if the gas utility is planning far enough ahead to be able to provide relevant information and has reliable means to share up-to-date information with customers and other stakeholders. For example, if a customer understands that a prudent gas system transition will result in the retirement of the main that serves their home within the lifetime of the equipment, they may make a different choice. Alternatively, if they understand that they will have service but that gas delivery rates will be substantially higher, that may also inform their choice. And better and more transparent planning would allow District programs that encourage or enable customers to electrify their equipment to target assistance to households where that choice makes the most sense.

Q68 Has the PSC established any specific long-term planning obligations for WGL?

A68 To comply with the PSC's requirement that WGL develop plans to ensure replaced pipes are not expected to be decommissioned within 10 years of installation,[67] WGL must conduct planning at least 10 years in advance. WGL's planning process must allow both the utility and regulator to be certain that assets replaced are not going to be retired within 10 years.

Q69 Does meeting this requirement assure the PSC that WGL is conducting prudent long-term gas planning?

A69 No. Gas system assets have multi-decade engineering lives, while the energy transition is occurring over the course of the next two decades, so WGL's planning processes must account for the full transition, not just the next ten years.

Q70 Can you suggest some principles for long-term gas system planning, in the context of the energy transition?

A70 Yes. My colleagues and I published a white paper in the context of New York's gas planning proceeding,[68] which identified the following 14 principles and practices:

- Design all scenarios to comply with state emissions objectives.
- Integrate gas and electricity planning.
- Assess impacts on gas and electricity sales.
- Use appropriate asset lives and depreciation schedules.
- Articulate greenhouse gas constraints.
- Apply a high threshold for approving new gas infrastructure investments.

[67] Order No. 22003, ¶ 51.

[68] Woolf et al. 2021. *Long-Term Planning to Support the Transition of New York's Gas Utility Industry*. Synapse Energy Economics on behalf of Natural Resources Defense Council. Attached as Exhibit DCG(A)-9.

- Assess multiple gas utility business models.
- Develop comprehensive NPA screening frameworks.
- Adopt practices for strategic asset retirement.
- Update gas load forecasting practices.
- Account for customer actions.
- Account for risk.
- Articulate an action plan.
- Update plans periodically.

In a recent literature review, Pacific Northwest National Laboratory researchers highlighted key points from their review, including:[69]

> Gas planning capabilities and requirements need to become more detailed and transparent. Specific ideas included in these reports and proceedings include:
>
> - Gas system mapping conducted by Local Distribution Companies…
> - New solution acquisition processes…
> - Disclosure of locational system needs…
> - Comprehensive capital investment forecasts…
> - 3-step non-pipeline alternative processes…
> - Evaluating non-pipeline alternatives for safety-related projects…
> - Modeling a 'no-infrastructure option' within planning scenarios [internal citations removed]

[69] Shipley, J., J. Barlow, and G. Relf. October 2024. *Review of Literature and Utility Commission Proceedings Relevant to Integrated System Planning: Annotated Bibliography Prepared to Support the Washington Utilities and Transportation Commission*. U.S. Department of Energy. Available as FC1167-2024-M-288 at https://edocket.dcpsc.org/apis/api/filing/download?attachId=215017&guidFileName=0de24867-cfcd-421d-a008-82c6272bdf8a.pdf.

Q71 How does the evolving District of Columbia and federal policy context interact with prudent gas system planning?

A71 In order to be prudent, gas system planning must be conducted with an eye to its policy and market context. Where policies and market transitions may limit the future utility of a gas system asset, a prudent decision to invest in that asset or pursue an alternative must take those potential future limits into account. For example, the economic evaluation of alternative approaches to solve a gas system problem must account for the useful lives of the approaches and the associated depreciation rates. The utility's planning processes need to account for customers who are responding to policy signals, and simultaneously the utility's planning needs to be transparent to inform customers as they make those choices.

Q72 What are the implications of these principles for review of the prudence of a gas utility's planning processes and pipe replacement program, in the context of the energy transition?

A72 The gas system operates within the context of the well-established energy transition, and planning must account for that context in order to be prudent. When reviewing gas system investments for prudence, therefore, it is essential for regulators to consider whether the investment planning and selection process has accounted for the energy transition. For example, has the process included the items that I listed above from Synapse's New York whitepaper and the national laboratory literature review?[70] Depending on information availability, it may be possible to evaluate specific investments and whether the process of selecting and executing those investments took the energy transition into account. Looking forward towards future rate years and rate cases, it may also be necessary to set high-level guardrails for utility investment to limit stranded-cost risk, rather than select specific investments to disallow. Taking this approach would set a clear structure and expectation around making investment choices and evaluating alternatives in order to find the best investments. This approach would also make clear that a simple *status quo* approach is not prudent. In the context of WGL's

[70] *See* Exh. DCG (A)-9.

proposal in this docket, prudent investments should account for market trends and customer electrification, forecasted sales and rates, other NPAs, and District emission reduction policies and objectives.

Q73 Does the PSC's guidance to avoid replacing assets with less than a 10-year expected life establish an appropriate guardrail?

A73 This guidance is a step in the right direction. However, it is not sufficient on its own. Because mains and services have depreciation lifetimes that typically extend past 40 or 50 years, allowing the utility to replace an asset that is likely to retire within the next 11 years still presents a substantial stranded asset risk, unless the replacement is associated with appropriate depreciation rates that take the lifetime into account. Several jurisdictions, such as Oregon,[71] California,[72] and Colorado,[73] have established that gas utilities may no longer add to rate base through line extensions and assets to serve new customers. While these examples are not directly relevant to safety-based asset retirement programs, they do indicate the level of concern about stranded costs that regulators have in policy contexts very similar to the District's. The PSC could establish guardrails by establishing a cap on the utility's rate base that is linked to a modeled path through the energy transition. The utility would then need to plan a strategy that balances investment, depreciation, and retirement to maintain safe and reliable service while limiting stranded asset risk to the size of the outstanding rate base.

---

[71] Public Utility Commission of Oregon, Order No. 24-359, UG490, October 25, 2024. Available at: https://apps.puc.state.or.us/orders/2024ords/24-359.pdf.

[72] California Public Utilities Commission, Decision 22-09-026, Rulemaking 19-01-011, September 15, 2022. Available at: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M496/K987/496987290.PDF;
California Public Utilities Commission, Decision 23-12-037, Rulemaking 19-01-011, December 14, 2023. Available at: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M521/K890/521890476.PDF.

[73] Colorado General Assembly, Senate Bill 23-291. Available at: https://leg.colorado.gov/bills/sb23-291.

VII. CONCLUSIONS AND RECOMMENDATIONS

Q74 What conclusions do you draw in this case?

A74 I find that:

- WGL has not met the requirements set out by the PSC in Order 22003. It merely proposed a program that is very similar to previous programs instead of one responding to the PSC's call for a "new normal." Specifically, WGL's application is not responsive to the PSC's requirements on minimizing stranded asset risk, incorporation of the District's climate laws, accounting for electrification, cost-effectiveness, and identifying alternatives for reducing leak rates and risk.
- WGL's approach to addressing gas safety risk through a replacement-based approach is not financially or competitively sustainable and could lead to increased risk on the gas system over time.
- WGL's approach does not reduce risk from gas once it passes the meter and enters buildings and it does not reduce excavation-related risk.
- Alternative approaches that incorporate retirement and repair alongside targeted replacement reduce safety risk more than WGL's approach while being less expensive and reducing financial and competitive risk.
- WGL's current gas system planning processes are insufficient to the task of planning and managing through the energy transition and are not sufficient to meet the confidence threshold required to approve accelerated cost recovery.

Q75 What are your recommendations to the PSC based on these conclusions?

A75 I recommend that the PSC:

- Reject the accelerated cost recovery in WGL's proposed District SAFE plan.

- Reiterate its requirement that WGL take all necessary capital and operational actions to maintain a safe and reliable gas system, and that WGL may request incorporation of prudently incurred costs through rate cases.
- Order WGL to develop an alternative gas safety capital plan that is consistent with District policy and takes financial sustainability and competition risks into account. Such a plan could justify accelerated cost recovery.

Q76 Does this conclude your testimony at this time?

A76 Yes, it does.

BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA

IN THE MATTER OF:	)	
	)	
The Application of the Investigation into Washington Gas Light Company's Strategically Targeted Pipe Replacement Plan.	))))	**Formal Case No. 1179**

AFFIDAVIT

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

Asa S. Hopkins

box SIGN 4KK9K634-158WX2WW

Dr. Asa S. Hopkins

Executed this 10th day of December, 2024.

DCG (A)-1

Asa S. Hopkins, **Ph.D.,** Senior Vice President, Consulting

Synapse Energy Economics I 485 Massachusetts Avenue, Suite 3 I Cambridge, MA 02139 I 617-661-3248
ahopkins@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Senior Vice President*, April 2024 – Present; *Vice President*, April 2019 – April 2024; *Principal Associate*, January 2017 – March 2019.

Conducts research and writes expert testimony and reports related to state energy policy and planning, energy efficiency, strategic electrification, deep decarbonization, and the present and future of electric and gas utility regulatory and business models.

Vermont Public Service Department, Montpelier, VT. *Director of Energy Policy and Planning,* October 2011 – December 2016

<u>State energy planning and utility regulation</u>
• Directed the year-long development of the 2016 Vermont Comprehensive Energy Plan, including stakeholder meetings, public forums, and coordination of contributions from other departments and the Governor's office. Primary author of the executive summary and five chapters.
• Led the Department's approach to establishing budgets and performance targets for energy efficiency utilities. Oversaw staff conducting program evaluation and savings verification.
• Submitted testimony and conducted analysis in support of public advocacy and negotiation in prominent litigated regulatory proceedings.

<u>Policy development, analysis, and advocacy</u>
• Developed the structure of Vermont's 2015 Renewable Energy Standard, including its novel "energy transformation" requirement. Worked with stakeholders to develop support for the policy and with the legislature to shepherd it to passage. This policy will result in more reduction of Vermont's GHG emissions than any others passed in the last 15 years.
• Led execution of Vermont's Total Energy Study, which examined technology and policy pathways for Vermont to meet GHG emission and renewable energy goals.
• Led cost-benefit analysis of Vermont's existing net metering structure and led the development of departmental proposals for a new structure.
• Prepared and delivered public, stakeholder, and interagency presentations, including to agency and business leaders, legislative committees, and the governor.
• Oversaw programs providing financing, technical, and process assistance to clean energy projects.

During tenure, Vermont rose in the rankings on national clean energy state scorecards: ACEEE State Energy Efficiency Scorecard from 5th to 3rd and U.S. Clean Tech Leadership Index from 10th to 3rd.

U.S. Department of Energy, Washington, DC. *Special Advisor to the Under Secretary for Science / AAAS Science and Technology Policy Fellow,* September 2010 – August 2011

Dr. Hopkins served as the assistant project director for the Department of Energy's first Quadrennial Technology Review. In this role, he coordinated a team that solicited input from Department of Energy and National Laboratory staff and scientists, ran a series of public workshops, facilitated coordination with the White House, developed a set of technology assessments, and ultimately drafted the Report on the First QTR, published Sept. 27, 2011.

Lawrence Berkeley National Laboratory, Berkeley, CA. *Environmental Energy Policy Postdoctoral Fellow*, January 2009 – August 2010

Conducted technical and economic analysis to support the Department of Energy in setting the energy efficiency standards that appliances must meet in order to be sold in the United States.

California Institute of Technology, Pasadena, CA. *Graduate Research Fellow,* 2002 – 2008

Los Alamos National Laboratory, Los Alamos, NM. *Post-Baccalaureate Researcher, Theoretical Division,* June 2001 – June 2002

EDUCATION

California Institute of Technology, Pasadena, CA
Doctor of Philosophy in Physics, 2008
Master of Science in Physics, 2007

Haverford College, Haverford, PA
Bachelor of Science *summa cum laude*, in Physics with minors in Computer Science and Growth and Structure of Cities, 2001

SELECTED PROJECTS

The Future of Gas Utilities – Dr. Hopkins leads much of Synapse's work in the area of the future of gas utilities. He and his team are assisting a number of clients to understand the future of gas utilities in the context of deep building decarbonization objectives. This work includes assisting Conservation Law Foundation in Massachusetts Department of Public Utilities Docket 20-80 (an investigation into "the role of gas local distribution companies as the Commonwealth achieves its target 2050 climate goals"); the Industrial Gas Users Association in evaluation of energy-transition-related business risk to Quebecois and Ontario gas utilities; Natural Resources Defense Council in New York and Nevada's regulatory proceedings regarding the future of gas; the Colorado Energy Office regarding approaches to decision-making in the face of uncertainty, in the context of Colorado's regulatory proceedings regarding gas utility Clean Heat plans and building decarbonization; the County of San Diego (with the University of California San Diego) in developing the buildings and utilities portion of its Regional Decarbonization

Framework; the Maryland Office of People's Counsel in modeling the impact of the state's decarbonization objectives on utility sales and finances; and the District of Columbia Department of Energy and Environment in assessing Washington Gas Light's Climate Business Plan and rate case filings.

Puerto Rico Energy Bureau – Synapse has provided extensive support to Puerto Rico's electricity regulator since 2015. Dr. Hopkins has coordinated the engagement since 2018. Dr. Hopkins has led or substantially contributed to the development of Puerto Rico's first energy efficiency and demand response regulations; emergency microgrid regulations; and the review of the island's second Integrated Resource Plan and subsequent processes to optimize resilience using both transmission and distributed generation resources.

Massachusetts Comprehensive Energy Plan – On behalf of the Massachusetts Department of Energy Resources (the state energy office), Synapse and Sustainable Energy Advantage assisted DOER and its sister agencies in the development of Massachusetts's first Comprehensive Energy Plan. Dr. Hopkins assisted DOER leadership in defining the scope and approach for the CEP, to distinguish it from other state planning processes. He worked with Pat Knight to develop an approach to modeling energy transformations toward low-carbon alternatives in electricity, buildings, and transportation that are consistent with state policy and approaches while being grounded in stock turnover rates and feasible policies and programs.

Northeastern Regional Assessment of Strategic Electrification – On behalf of the Northeast Energy Efficiency Partnerships, Synapse and Meister Consultants Group identified the opportunity, costs, and benefits available if strategic electrification is adopted as a key strategy for decarbonization in New York and New England. Dr. Hopkins, Kenji Takahashi, and Pat Knight are primary authors of the resulting report, published in July 2017, which characterizes the current markets for efficiency electrification technologies (such as heat pumps and electric vehicles), identifies policies to overcome market barriers, assesses the state of electrification technologies, and models the extent of electrification both possible given market dynamics and required to meet regional greenhouse gas emission goals.

2016 Vermont Comprehensive Energy Plan – Directed the year-long development of the 2016 plan, including setting its strategic approach to current Vermont energy planning challenges and grounding it in quantitative analysis. Developed the public engagement process, then hosted expert stakeholder meetings and public forums. Adapted the results of the 2014 Total Energy Study to produce scenarios that illustrate the proposed pathways identified in the plan. Coordinated contributions from staff and leaders in other departments, and from the Governor's office. Wrote the executive summary and 5 of the 14 chapters.

Total Energy Study – Scoped and led a legislatively-mandated report on policy and technology pathways to meet Vermont's renewable energy and greenhouse gas emission goals. Designed and facilitated a focus-group-based stakeholder engagement process to identify technology and policy visions for analysis. Retained outside modeling consultant, then worked closely with them to build credible business-as-usual and policy case models of Vermont's energy economy to the year 2050 using the

TIMES/FACETS integrated assessment model. Translated those model results to make REMI PI+ calculations of impact on Vermont GDP and jobs. Synthesized qualitative and quantitative results into intermediate and final reports identifying key outcomes for policy design.

Demand Resources Plan Proceedings – In each of three, three-year cycles, led the development of the Department of Public Service's positions regarding appropriate budgets, rate and bill impacts, and performance targets for Vermont's energy efficiency utilities. Analyzed current efficiency utility performance to calibrate expected future performance. Negotiated performance metrics that reflect policy priorities. Developed new regulatory and budget treatment of research and development for behavioral energy efficiency programs.

Quadrennial Technology Review – As Assistant Project Director, managed the project activities of the eight-person core team for the U.S. Department of Energy's first Quadrennial Technology Review. This review of DOE's energy technology activities established a robust framework and codified principles used to build DOE's energy technology portfolio (including identifying the appropriate and highest-leverage activities for DOE relative to the private sector and other government actors). Extensive collaboration and discussions within DOE, as well the public through a series of workshops with industry, government, national laboratory, and academic participation, culminated in the publication of the first DOE-QTR report in September 2011. Coordinated successful stakeholder workshops; facilitated focus groups. Drafted discussion papers that served as the basis for extensive intra- and inter-agency and White House coordination and negotiation. Primary author of the final report's section on building and industrial energy efficiency. Project was completed on schedule and on budget, and met its critical milestones.

REPORTS

Takahashi, K., A. S. Hopkins, E. Carlson, S. Schadler, S. Chavin. 2024. *Memo: Assessment of Electric Grid Headroom for Accommodating Building Electrification (Revised July 2024)*. Synapse Energy Economics to New Yorkers for Clean Power.

DeLeon, S., K. Takahashi, E. Carlson, A. S. Hopkins, S. Kwok, J. Litynski, C. Mattioda, L. Metz. 2024. *Minnesota Building Decarbonization Analysis: Equitable and cost-effective pathways toward net-zero emissions for homes and businesses.* Synapse Energy Economics for Clean Heat Minnesota.

Sustainable Energy Advantage and Synapse Energy Economics. 2023. Memo: Data for Use in Economic Analysis of a Clean Heat Standard. For Massachusetts Department of Environmental Protection.

Sustainable Energy Advantage and Synapse Energy Economics. 2023. Memo: Survey of Credit-Based Policies. For Massachusetts Department of Environmental Protection.

Sustainable Energy Advantage and Synapse Energy Economics. 2023. Memo: Options for Role of Electric Distribution Companies (EDCs), Obligated Fuels, and Obligated Entities. For Massachusetts Department of Environmental Protection.

Hopkins, A. S., A. Napoleon, K. Schultz. 2023. *The High Cost of New York Gas Utilities' Leak- Prone Pipe Replacement Programs.* Synapse Energy Economics for Natural Resources Defense Council.

Carlson, E., P. Eash-Gates, B. Fagan, A. Hopkins. 2023. *Review of Northwest Natural Gas 2022 Integrated Resource Plan—Final Report: Assessing Compliance with the Oregon IRP Guidelines and the Greenhouse Gas Reduction Requirements from the Climate Protection Program.* Synapse Energy Economics for Staff of Oregon Public Utilities Commission.

Hopkins, A. S., A. Napoleon, J. Litynski, K. Takahashi, J. Frost, S. Kwok. 2022. *Climate Policy for Maryland's Gas Utilities: Financial Implications*. Synapse Energy Economics for Maryland Office of the People's Counsel.

Kwok, S., K. Takahashi, J. Litynski, A. S. Hopkins. 2022. Memo: Massachusetts DPU Docket-2080: Proposed "Common Regulatory Framework." Synapse Energy Economics for Conservation Law Foundation.

Hopkins, A. S. S. Kwok, J. Litynski, A. Napoleon, K. Takahashi. 2022. Memo: Evaluation of Draft Consultant Reports in Massachusetts DPU Docket 20-80. Synapse Energy Economics for Conservation Law Foundation.

Hopkins, A. S., A. Napoleon, S. Kwok. 2022. *Factsheet: Hydrogen & Low-Carbon Gases in New York's Electricity Future*. Synapse Energy Economics for Sierra Club.

Hopkins A. S., P. Eash-Gates, J. Frost, S. Kwok, J. Litynski, K. Takahashi. 2022. "Decarbonization of Buildings." In *San Diego Regional Decarbonization Framework*, edited by SDG Policy Initiative, School of Global Policy and Strategy, University of California San Diego. San Diego.

Frost, J. S. Kwok, K. Takahashi, A.S. Hopkins, A. Napoleon. 2021. *New York Heat Pump Trajectory Analy*sis. Synapse Energy Economics for NRDC.

Hopkins, A. S., A. Napoleon, K. Takahashi. 2021. *A Framework for Long-Term Gas Utility Planning in Colorado.* Synapse Energy Economics for the Colorado Energy Office.

Woolf, T., A. Napoleon, A. Hopkins, K. Takahashi. 2021. *Long-Term Planning to Support the Transition of New York's Gas Utility Industry*. Synapse Energy Economics for Natural Resources Defense Council.

Frost, J., J. Litynski, S. Letendre, A. S. Hopkins. 2021. *Economic Impacts of Climate Change on Cape Cod*. Synapse Energy Economics for Eastern Research Group and the Cape Cod Commission.

Hopkins, A.S., P. Knight, J. Frost. 2021. *Rhode Island Carbon Pricing Study.* Synapse Energy Economics and the Cadmus Group for the Rhode Island Office of Energy Resources.

Kallay, J., A.S. Hopkins, C. Odom, J. Ramey, J. Stevenson. R. Broderick, R. Jeffers, B. Garcia. 2021. *The Quest for Public Purpose Microgrids for Resilience: Considerations for Regulatory Approval.* Synapse Energy Economics for Sandia National Labs.

Takahashi, K., E. Sinclair, A. Napoleon, A. S. Hopkins, D. Goldberg. 2021. *Evaluation of EnergyWise Low-Income Energy Efficiency Program in Mississippi – Program Performance, Design, and Implications for Low-Income Efficiency Programs*. Synapse Energy Economics for Sierra Club and Gulf Coast Community Foundation.

Kallay, J., A. Napoleon, J. Hall, B. Havumaki, A. S. Hopkins, M. Whited, T. Woolf, J. Stevenson, R. Broderick, R. Jeffers, B. Garcia. 2021. *Regulatory Mechanisms to Enable Investments in Electric Utility Resilience.* Synapse Energy Economics for Sandia National Laboratories.

Kallay, J., A. Napoleon, B. Havumaki, J. Hall, C. Odom, A. S. Hopkins, M. Whited, T. Woolf, M. Chang, R. Broderick, R. Jeffers, B. Garcia. 2021. *Performance Metrics to Evaluate Utility Resilience Investments.* Synapse Energy Economics for Sandia National Laboratories.

Kallay, J., S. Letendre, T. Woolf, B. Havumaki, S. Kwok, A. S. Hopkins, R. Broderick, R. Jeffers, K. Jones, M. DeMenno. 2021. *Application of a Standard Approach to Benefit-Cost Analysis for Electric Grid Resilience Investments*. Synapse Energy Economics for Sandia National Laboratories.

Hopkins, A. S., S. Kwok, A. Napoleon, C. Roberto, K. Takahashi. 2021. *Scoping a Future of Gas Study.* Synapse Energy Economics for Conservation Law Foundation.

Kallay, J., A. S. Hopkins, A. Napoleon, B. Havumaki, J. Hall, M. Whited, M. Chang., R. Broderick, R. Jeffers, K. Jones, M. DeMenno. 2021. *The Resilience Planning Landscape for Communities and Electric Utilities.* Synapse Energy Economics for Sandia National Laboratories.

Shipley, J., A. S Hopkins, K. Takahashi, D. Farnsworth, 2021. *Renovating Regulation to Electrify Buildings: A Guide for the Handy Regulator*. Regulatory Assistance Project.

Letendre, S., E. Camp, J. Hall, B. Havumaki, A. S. Hopkins, C. Odom, S. Hackel, M. Koolbeck, M. Lord, L. Shaver, X. Zhou. 2020. *Energy Storage in Iowa: Market Analysis and Potential Economic Impact.* Prepared by Synapse Energy Economics and Slipstream for Iowa Economic Development Authority.

Eash-Gates, P., K. Takahashi, D. Goldberg, A. S. Hopkins, S. Kwok. 2021. *Boston Building Emissions Performance Standard: Technical Methods Overview.* Synapse Energy Economics for the City of Boston.

Camp, E., C. Odom, A. S. Hopkins. 2020. *Cost-Effectiveness of Proposed New Mexico Environment Department Oil and Gas Emissions Reduction Rules: Impacts and Co-Benefits of Reduced Volatile Organic Compound Emissions from the Oil and Gas Industry.* Synapse Energy Economics for Environmental Defense Fund.

Camacho, J., K. Takahashi, A. S. Hopkins, D. White. 2020. *Assessment of Proposed Energize Eastside Project*. Synapse Energy Economics and MaxETA Energy for the City of Newcastle, WA.

Takahashi, K., J. Frost, D. Goldberg, A. S. Hopkins, K. Nishio, K. Nakano. 2020. *Survey of U.S. State and Local Building Decarbonization Policies and Programs*. Presented at the 2020 ACEEE Summer Study of Energy Efficiency in Buildings.

Hopkins, A. S., A. Napoleon, K. Takahashi. 2020. *Gas Regulation for a Decarbonized New York: Recommendations for Updating New York Gas Utility Regulation.* Synapse Energy Economics for Natural Resources Defense Council.

Takahashi, K., A. S. Hopkins, J. Rosenkrantz, D. White, S. Kwok, N. Garner. 2020. *Assessment of National Grid's Long-Term Capacity Report*. Synapse Energy Economics for the Eastern Environmental Law Center.

Camp, E., N. Garner, A. S. Hopkins. 2019. *Cost-Effectiveness of Comprehensive Oil and Gas Emissions Reduction Rules in New Mexico: Impacts of Reduced Methane and Volatile Organic Compound Emissions from the Oil and Gas Industry.* Synapse Energy Economics for the Environmental Defense Fund.

Camp, E., A. S. Hopkins, D. Bhandari, N. Garner, A. Allison, N. Peluso, B. Havumaki, D. Glick. 2019. *The Future of Energy Storage in Colorado: Opportunities, Barriers, Analysis, and Policy Recommendations.* Synapse Energy Office for the Colorado Energy Office.

Kallay, J., A. S. Hopkins, J. Frost, A. Napoleon, K. Takahashi, J. Slason, G. Freeman, D. Grover, B. Swanson. 2019. *Net Zero Energy Roadmap for the City of Burlington, Vermont*. Synapse Energy Economics and Resource Systems Group for Burlington Electric Department.

Camp, E., B. Fagan, J. Frost, D. Glick, A. S. Hopkins, A. Napoleon, N. Peluso, K. Takahashi, D. White, R. Wilson, T. Woolf. 2018. *Phase 1 Findings on Muskrat Falls Project Rate Mitigation.* Synapse Energy Economics for Board of Commissioners of Public Utilities, Province of Newfoundland and Labrador.

Hopkins, A. S., P. Knight, N. Peluso. 2018. *Massachusetts Comprehensive Energy Plan: Commonwealth and Regional Demand Analysis.* Synapse Energy Economics, Sustainable Energy Advantage, and MA DOER for the Massachusetts Department of Energy Resources.

Knight, P., D. Goldberg, E. Malone, A. S. Hopkins, D. Hurley. 2018. *Getting SMART: Making sense of the Solar Massachusetts Renewable Target (SMART) program*. Synapse Energy Economics for Cape Light Compact.

Hopkins, A. S., K. Takahashi, D. Glick, M. Whited. 2018. *Decarbonization of Heating Energy Use in California Buildings: Technology, Markets, Impacts, and Policy Solutions*. Synapse Energy Economics for the Natural Resources Defense Council.

Woolf, T., A. S. Hopkins, M. Whited, K. Takahashi, A. Napoleon. 2018. *Review of New Brunswick Power's 2018/2019 Rate Case Application.* In the Matter of the New Brunswick Power Corporation and Section 103(1) of the Electricity Act Matter No. 375. Prepared by Synapse Energy Economics for the New Brunswick Energy and Utilities Board Staff.

Hopkins, A. S., K. Takahashi. 2017. *Alternatives to Building a New Mt. Vernon Substation in Washington, DC*. Synapse Energy Economics for the District of Columbia Department of Energy and Environment.

Hopkins, A. S., S. Fields, T. Vitolo. 2017. *Policies to Cost-Effectively Retain Existing Renewables in New York*. Synapse Energy Economics for the Alliance for Clean Energy New York.

Vitolo, T., A. S. Hopkins. 2017. *The Mounting Losses at CWLP's Dallman Station: A Study of the Relative Costs of Operating Each of the Four Dallman Units*. Synapse Energy Economics for the Sierra Club.

Hopkins, A. S., A. Horowitz, P. Knight, K. Takahashi, T. Comings, P. Kreycik, N. Veilleux, J. Koo. 2017. *Northeast Regional Assessment of Strategic Electrification*. Synapse Energy Economics and Meister Consultants Group for the Northeast Energy Efficiency Partnerships.

Vermont Public Service Department. 2016. *Vermont Comprehensive Energy Plan*.

Vermont Public Service Department. 2016. *Act 199 Study on Manufacturing Competitiveness and Energy*.

Vermont Public Service Department. 2014. *Total Energy Study: Final Report on a Total Energy Approach to Meeting the State's Greenhouse Gas and Renewable Energy Goals*.

Vermont Public Service Department. 2014. *Evaluation of Net Metering in Vermont Conducted Pursuant to Act 99 of 2014*.

Vermont Public Service Department. 2013. *Total Energy Study: Report to the Vermont General Assembly on Progress Toward a Total Energy Approach to Meeting the State's Greenhouse Gas and Renewable Energy Goals.*

Vermont Public Service Department. 2013. *Evaluation of Net Metering in Vermont Conducted Pursuant to Act 125 of 2012*.

U.S. Department of Energy. 2011. *Report on the First Quadrennial Technology Review*. DOE/S-0001.

ARTICLES

Hopkins, A. S., K. Takahashi, S. Nadel. 2020. "Keep warm and carry on: Electrification and efficiency meet the 'polar vortex'." Proceedings of the 2020 ACEEE Summer Study of Energy Efficiency in Buildings.

Hopkins, A. S., K. Takahashi, L. David. 2018. "Challenges and Opportunities for Deep Decarbonization through Strategic Electrification under the Utility Regulatory Structures of the Northeast". Proceedings of the 2018 ACEEE Summer Study on Energy Efficiency in Buildings, August 2018.

Hopkins, A. S. Review of *Burn Out*, by Dieter Helm, *Science* 356, Issue 6339 (May 2017): 709, https://doi.org/10.1126/science.aam8696

Dunsky, P., A. S. Hopkins, K. Vaillancourt, M. Fabbri. 2016. "Achieving an Ultra-Low Carbon Future: Technology and Policy Pathways to Meet Vermont's GHG Goals," *ACEEE Summer Study on Energy Efficiency in Buildings.*

Greenblatt, J., A. S. Hopkins, V. Letchert, M. Blasnik. 2012. "Energy Use of U.S. Residential Refrigerators and Freezers: Function Derivation Based on Household and Climate Characteristics," *Energy Efficiency.* 10.1007/s12053-012-9158-6.

Hopkins, A. S., L. Gu, A. Lekov, J. Lutz, G. Rosenquist. 2011. "Simulating a Nationally Representative Housing Sample Using EnergyPlus," Lawrence Berkeley National Laboratory Report, LBNL-4420E.

Lutz, J.D., A. S. Hopkins, V. Letschert, V.H. Franco, A. Sturges. 2011. "Using National Survey Data to Estimate Lifetimes of Residential Appliances," *HVAC&R Research*.

Alvarez, R.M., A. S. Hopkins, B. Sinclair. 2010. "Mobilizing Pasadena Democrats: Measuring the Effects of Partisan Campaign Contacts," *The Journal of Politics* 72, 31.

Nielsen, A.E.B., A. S. Hopkins, H. Mabuchi. 2009. "Quantum Filter Reduction for Measurement-Feedback Control Via Unsupervised Manifold Learning," *New Journal of Physics* 11, 105043.

Hopkins, A. S., B. Lev, H. Mabuchi. 2004. "Proposed Magnetoelectrostatic Ring Trap for Neutral Atoms," *Physical Review A* 70, 053616.

Hopkins, A. S., K. Jacobs, S. Habib, K. Schwab. 2003. "Feedback Cooling of a Nanomechanical Resonator," *Physical Review B* 68, 235328.

TESTIMONY

Connecticut Public Utilities Regulatory Authority (Docket No. 23-11-02): Direct and surrebuttal testimony regarding the application of Connecticut Natural Gas Corporation and the Southern Connecticut Gas Company to amend their rate schedules, with focus on gas capital planning in the context of decarbonization. On behalf of the Connecticut Office of Consumer Counsel, February and March 2024.

Public Utilities Commission of the State of Colorado (Proceeding No. 23A-0392EG): Answer and cross-answer regarding the application of Public Service Company of Colorado for approval of its 2024-2028 Clean Heat Plan, with focus on rate and bill impacts. On behalf of Sierra Club and Natural Resources Defense Council, January and February 2024.

Maryland Public Service Commission (Case No. 9692): Direct and Surrebuttal Testimony of Asa Hopkins regarding the application of Baltimore Gas and Electric Company for an Electric and Gas Multi-Year Plan. On behalf of the Maryland Office of People's Counsel, August 2023.

Ontario Energy Board (EB-2022-0200): Testified as an expert on the business risk facing Enbridge Gas, Inc. related to the energy transition and other risks, as part of a rate case proceeding to set the utility's capital structure. On behalf of the Industrial Gas Users Association, 2023.

Washington DC Public Service Commission (FC 1169): Provided direct and rebuttal expert testimony regarding Washington Gas's application for an increase in rates, from the standpoint of the District of Columbia's climate and clean energy policies. On behalf of the District of Columbia Government, November 2022 and January 2023.

New York Public Utilities Commission (Case No. 22-E-0064 and 22-G-0065): Direct and Rebuttal Testimony of Alice Napoleon and Asa Hopkins regarding Con Edison's proposed gas-side investments as greenhouse gas mitigation strategies and gas extension allowance rule changes and the need for long-term planning for the gas system and adequacy of the company's non-pipe alternatives framework. On behalf of Natural Resources Defense Council, May 2022.

Régie de l'énergie du Québec (R-4156-2021): Testified as an expert on the business risk facing Quebec's natural gas utilities related to the energy transition, as part of a proceeding to set the utilities' cost of capital and capital structure. On behalf of the Industrial Gas Users Association, 2022.

Vermont Public Utility Commission (Case No. 21-1107-PET and 21-1109-PET): Addressed the impact of GlobalFoundries proposed "self-managed utility" on the general good of the state and Vermont's energy policy, with particular focus on the impact on environmental soundness and greenhouse gas emissions mitigation. On behalf of Conservation Law Foundation, June 2021.

Public Service Commission of Wisconsin (Docket No. 5-CG-106): Addressed the need for a pair of liquified natural gas facilities in light of the fossil fuel use reductions required to meet state and federal goals for mitigating climate change and the potential for cost-effective demand-side alternatives. On behalf of the Sierra Club, June 2021.

Vermont Senate Finance Committee: Provided expert testimony in the form of a presentation entitled "Updating Vermont's Renewable Energy Standard" to the Vermont Senate Finance Committee in January of 2020. Dr. Hopkins presented on the history of the standard, what has changed since 2015, and future potential.

Vermont Public Utility Commission (Case No. 17-1247-NMP): Addressed the consistency of a proposed solar generation facility with the Vermont Comprehensive Energy Plan. On behalf of Derby GLC Solar LLC, January 2018.

Washington DC Public Service Commission (FC 1142): Provided expert testimony regarding the merits of the proposed merger of Washington Gas and AltaGas, Ltd. with respect to the impact on environmental quality, with particular emphasis on the impact of utility management and its approach to climate change on the ability of the District to achieve its climate change mitigation goals. On behalf of the District of Columbia Government.

Régie de l'énergie du Québec (R-3986-2016): Provided an expert report and testimony regarding best practices in utility demand response programs, in the context of Hydro Québec Distribution's ten-year Supply Plan. On behalf of the Regroupment national des conseils régionaux de l'environment du Québec (RNCREQ).

Vermont Public Service Board (Dockets No. 8586 and 8685): Addressed the need for a proposed solar PV generator and its associated contract under PURPA rates, its economic impact on the state, and its consistency with the Vermont Electric Plan. On behalf of the Vermont Department of Public Service, July 2016.

Vermont Public Service Board (Docket No. 8684): Proposed avoided energy and capacity cost rates for use in Rule 4.100, Vermont's implementation of PURPA. On behalf of the Vermont Department of Public Service, October 2015 and May 2016.

Vermont Public Service Board (Docket No. 8600): Addressed the need for a proposed solar PV generator, its economic impact on the state, and its consistency with the Vermont Electric Plan. On behalf of the Vermont Department of Public Service, March 2016.

Vermont Public Service Board (Docket No. 8525): Introduced a memorandum of understanding between the DPS and Green Mountain Power regarding a proposed rate design, with particular focus on new critical peak price rates to be available and marketed. On behalf of the Vermont Department of Public Service, November 2015.

Vermont Public Service Board (Docket No. 7970): Addressed whether increases in the expected cost of a gas pipeline expansion project were sufficient to warrant reopening the underlying proceeding, particularly with respect to the need for the project, the economic impact on the state, and consistency with the general good of the state and the Vermont Comprehensive Energy Plan. On behalf of the Vermont Department of Public Service, May 2015.

Vermont Public Service Board (Docket No. 8311): Addressed how statutory criteria for the use of electric energy efficiency funds for electrification measures (such as heat pumps) might be met. On behalf of the Vermont Department of Public Service, January 2015.

Vermont Public Service Board (Docket No. 7862): Presented the Department's positions regarding whether Entergy Vermont Yankee should be granted a continued certificate of public good, with particular focus on the need for the plant, the economic benefit of continued operation, consistency with the Vermont Electric Plan, and whether continued operation by Entergy was in the general good of the state. On behalf of the Vermont Department of Public Service, October 2012 and April 2013.

Vermont Public Service Board (Docket No. 7833): Addressed the need for a proposed biomass electric generator and its consistency with the Vermont Electric Plan. On behalf of the Vermont Department of Public Service, October and November 2012; February and September 2013.

Vermont Public Service Board (Docket No. 7770): Addressed a number of topics related to the merger of Green Mountain Power and Central Vermont Public Service, most particularly the disposition of a windfall repayment due to ratepayers. On behalf of the Vermont Department of Public Service, January and March 2012.

Vermont Public Service Board (Docket No. 7815): Addressed consistency of a proposed long-term PPA with the Vermont Electric Plan and the utility's integrated resource plan. On behalf of the Vermont Department of Public Service, January 2012.

SELECTED PRESENTATIONS

Hopkins, A. S. “Coming Challenges to the Gas Distribution Utility Status Quo” presented at the Future of Heat Initiative, November 2024.

Hopkins, A. S. “Rising Gas Rates: The Need for Consumer-Focused Leadership in Light of a Looming Death Spiral” presented at the National Association of State Utility Consumer Advocates, November 2024.

Hopkins, A. S. “Analysis and Activism: The Gas Distribution Utility Status Quo is Unsustainable” presented at the Caltech Y Social Activism Speaker Series, November 2024.

Hopkins, A. S., S. Kwok, A. Napoleon, K. Schultz, K. Takahashi. “Massachusetts Clean Heat Standard: Policy and Regulatory Analysis” presented with Conservation Law Foundation, February 2023.

Hopkins, A. S. “IIJA, IRA, and the Growing Federal Role in Transmission—and Why States Should Care,” presented at the National Association of State Energy Officials Annual Meeting, October 2022.

Hopkins, A. S., J. Litynski, A. Takasugi. “Policy approaches to increasing electricity affordability in California,” presented to various California stakeholders on behalf of Natural Resources Defense Council, February 2022.

Shipley, J., Hopkins, A. S., Takahashi, K., & Farnsworth, D. “Renovating regulation to electrify buildings: A guide for the handy regulator,” presented with Regulatory Assistance Project, January 2021.

Hopkins, A. S. 2019. “Efficiency, Electrification, and Renewables in New England and Puerto Rico” at 2019 ACEEE Energy Efficiency as a Resource Conference, October 2019.

Hopkins, A. S. 2019. “Strategic electrification and winter cold snaps: A resource and a challenge” at 2019 ACEEE Energy Efficiency as a Resource Conference, October 2019.

Panelist on “Deep Dive Session on State and Local Electrification Roadmaps” at Electric Power Research Institute (EPRI)/Northeast Energy Efficiency Partnerships (NEEP) Electrification Summit, August 2019.

Hopkins. A. S., K. Takahashi, D. Lis. 2018. “Decarbonization through Strategic Electrification Meets Utilities and Regulation in the Northeast” at the 2018 ACEEE Summer Study on Energy Efficiency in Buildings, August 2018.

Hopkins, A. S. 2019. “Strategic Electrification: Impacts and approaches to meeting decarbonization goals in the northeastern states (and elsewhere)” at Lawrence Berkeley National Laboratory, Energy Technologies Area, August 2018.

Hopkins, A. S. 2017. “Utility Performance Regulation” at the Western States Regional Meeting of the National Association of State Energy Officials, April 2017.

Panelist on “A Regulatory Perspective of Grid Transformation” at the IEEE Innovative Smart Grid Technologies Conference, September 2016.

Panelist on the "Comprehensive Energy Plan Update" at the Renewable Energy Vermont Conference, October 2015.

Hopkins, A. S. 2015. "Vermont's Total Energy Study." Presentation at the National Association of State Energy Officials Energy Policy Outlook Conference, February 2015.

Panelist on "The Role of Energy Efficiency in Mitigating Winter Peak Issues" at the Association of Energy Services Professionals (Northeast Chapter) & Northeast Energy Efficiency Council, November 2014.

Hopkins, A. S. 2014. "Total Energy Study." Presentation at the Renewable Energy Vermont Conference, October 2014.

Panelist on "State Energy & Economic Policy Impacts on Industry Transformation" at the Power Industry Transformation Summit, April 2014.

Hopkins, A. S. 2008. "Mobilizing Pasadena Democrats: Measuring the Effects of Partisan Campaign Contacts." Presentation at the American Political Science Association Annual Meeting, August 2008.

HONORS, AWARDS, AND FELLOWSHIPS

Certified Public Manager, 2014

AAAS Science and Technology Policy Fellowship, 2010 – 2011

Dean's Award for Community Service, 2009

Delegate to the 2004 Democratic National Convention

NSF Graduate Research Fellow, 2002 – 2005

Los Alamos National Laboratory Student Distinguished Performance Award, 2002

Two-time first-team Academic All American, 2000 and 2001

Barry M. Goldwater Scholar, 1999 – 2001

OTHER ACTIVITIES

NASEO - Electricity Committee: Affiliate Co-Chair, 2020-present

Newton, MA Citizens Commission on Energy: Member 2017-2024, Co-Chair 2023-2024

Guest on Synapse Energy Economics, Inc.'s *Energy Nerd Show,* Aug 6, 2020

Board Member, National Association of State Energy Officials, 2015-16

Industrial Advisory Board for ARPA-E-funded project "Packetized Energy Management," 2016

Burlington, VT Public Works Commission: Member 2012 –2014, Chair 2015

Resume updated December 2024

DCG (A)-2

PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA

WASHINGTON GAS LIGHT COMPANY

FC 1179

WASHINGTON GAS'S RESPONSE
AND/OR NOTICE OF OBJECTION/UNAVAILABILITY TO
THE GOVERNMENT OF THE DISTRICT OF COLUMBIA

DC GOVERNMENT DATA REQUEST NO. 4

QUESTION NO. 4-3

Q. Refer to Page 9 of Witness Rogers' Direct Testimony.

A. What information will be included in the notification to impacted customers?

B. Will the Company provide any follow-up notifications or reminders for impacted customers?

WASHINGTON GAS'S RESPONSE 11/26/2024

A.

A. The Company has not developed the notice at this time.

B. No.

SPONSOR: Jessica R. Rogers
Vice President, Regulatory and Climate Strategy

DCG (A)-3

PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA

WASHINGTON GAS LIGHT COMPANY

FC 1179

WASHINGTON GAS'S RESPONSE
AND/OR NOTICE OF OBJECTION/UNAVAILABILITY TO
THE GOVERNMENT OF THE DISTRICT OF COLUMBIA

DC GOVERNMENT DATA REQUEST NO. 4

QUESTION NO. 4-7

Q. Provide an estimate for the number of vintage service lines WGL expects to abandon from "having no usage and no customer on record for 24 consecutive months or more" (District SAFE Plan page 38) over the five years of the program. In your response, provide the basis for this estimate (i.e. is it based on experience from similar customer outreach programs in WGL's history? Similar programs by other utilities?)

WASHINGTON GAS'S OBJECTION 11/12/2024

Washington Gas objects to this request on grounds that it requires a special study which has not been performed.

DCG (A)-4

PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA

WASHINGTON GAS LIGHT COMPANY

FC 1179

WASHINGTON GAS'S RESPONSE
AND/OR NOTICE OF OBJECTION/UNAVAILABILITY TO
THE OFFICE OF PEOPLE'S COUNSEL

OPC DATA REQUEST NO. 1

QUESTION NO. 1-18

Q. Please provide any surveys conducted by or for the Company that indicate the number of WGL customers that plan to participate in the Customer Choice Pilot Program and opt-out of receiving future natural gas service from WGL.

WASHINGTON GAS'S RESPONSE 11/15/2024

A. No surveys were conducted.

SPONSOR: Jessica R. Rogers
Vice President, Regulatory and Climate Strategy

DCG (A)-5

PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA

WASHINGTON GAS LIGHT COMPANY

FC 1179

WASHINGTON GAS'S RESPONSE
AND/OR NOTICE OF OBJECTION/UNAVAILABILITY TO
THE GOVERNMENT OF THE DISTRICT OF COLUMBIA

DC GOVERNMENT DATA REQUEST NO. 2

QUESTION NO. 2-2

Q. Regarding the alignment between JANA leak-prone assessment and observed leaks (Witness Oliphant's testimony at page 17, line 20 to page 18, line 8):

A. Provide the data, analysis, and workpapers used to calculate the numbers used in this excerpt, with all formulae and references intact.

B. Describe in detail how to compare "actual observed leaks" in some assets with the "leak rate" in other assets.

C. What are the units for "actual observed leaks" in this context?

D. What are the units for "leak rate" in this context?

E. Provide the full distribution from which the two data points presented in this excerpt are drawn, with 1 percent resolution. That is, what fraction of leaks are observed for the:

1. 1 percent of segments with the greatest risk of leaking?

2. 2 percent?

3. 3 percent?

4. Etc., each 1 percent out to at least 50 percent.

F. Of the 5% of assets identified as most leak prone by JANA:

1. What fraction are mains, what fraction are services, and what fraction are other types of assets?

2. What is the total length of the main segments reflected in

this set?

3. What is the total number of services reflected in this set?

G. Of the leaks that occurred on the 5% of assets identified as most leak prone by JANA:

1. How many occurred on mains?

2. How many on services?

3. How many on other types of assets?

H. Of the 15% of assets identified as most leak prone by JANA:

1. What fraction are mains?

2. What fraction are services?

3. What fraction are other types of assets?

4. What is the total length of the main segments reflected in this set?

5. What is the total number of services reflected in this set?

I. Of the leaks that occurred on the 15% of assets identified as most leak prone by JANA:

1. How many occurred on mains?

2. How many on services?

3. How many on other types of assets?

WASHINGTON GAS'S PARTIAL OBJECTION 11/8/2024

Subpart (E)

Washington Gas objects to subpart (E) of this request on grounds that it is unduly burdensome and requires the performance of a special study which has not been performed.

WASHINGTON GAS'S RESPONSE 12/04/2024

A.

A. The WGL data is hosted on secure servers which JANA accesses through queries to compile summary information (by contract JANA does not download the source data directly). The data used to support the referenced testimony were extracted from the overall results database utilizing SQL (Structured Query Language) scripts that, for all mains and services assets, selected those with the highest forecast leak rates (see below for definition) based on the JANA risk models for both the top 15% and top 5% of the assets by count (the forecast most leak prone assets) and then summing the total leaks actually observed on those assets in 2022 (based on leaks associated to specific main segments and specific services). The extracted data used for the analysis are presented in the table below:

Percentile	Total Observed Leaks on Assets (2022)	Main Leaks Observed (2022)	Service Leaks Observed (2022)
Top 15%	636	510	126
Top 5%	488	435	53

The total leaks linked to mains and services assets across all assets were also extracted from the database (1236 leaks in 2022).

The following calculations were conducted on the extracted data:

Leaks in top 15% of assets: 636
Leaks in remaining 85%: 1236 – 636 = 600
Leaks per %, top 15%: 636/15 = 42.40
Leaks per %, remaining 85%: 600/85 = 7.06
Relative Leak rate: 42.40/7.06 = 6.01 (roughly six (6) times)

Leaks in top 5% of assets: 488
Leaks in remaining 95%: 1236 – 488 = 748
Leaks per %, top 5%: 488/5 = 97.6
Leaks per %, remaining 95%: 748/95 = 7.87
Relative Leak rate: 97.6/7.87 = 12.4(roughly twelve (12) times)

B. The "actual observed leaks" were the actual leaks identified and associated with a specific asset. The "leak rate" is the model forecast rate of leakage for each asset in leaks per year. The top 15% and 5% most leak prone assets –

those with the highest forecast model leak rates - were identified as detailed in A above based on the model forecasts. The observed leaks on the top 15% and top 5% of the pool of assets identified as the most leak prone were summed and compared to the observed leaks on the remaining assets (those not in the top 15% (*i.e.*, bottom 85%) or top 5% (*i.e.*, bottom 95%) based on leak data from 2022.

C. The units for "actual observed leaks" are the number of leaks observed in 2022.

D. The units for "leak rate" are leaks per year (annual forecast leak rate per mile of pipe).

E. Objection

F.
1. Of the top 5% of assets, roughly 93% were mains and 7% services (by length). The analysis was specific to mains and services (did not include any other assets).
2. Roughly 533 miles.
3. 1400 services.

G.
1. 435 (roughly 89%)
2. 53 (roughly 11%)
3. None. The analysis was specific to mains and services.

H.
1. Roughly 78% by length.
2. Roughly 21% by length.
3. None. The analysis was specific to mains and services.
4. Roughly 770 miles.
5. 16,525 services

I.
1. 510 (roughly 80%)
2. 126 (roughly 20%)
3. None. The analysis was specific to mains and services.

SPONSOR: Ken E. Oliphant
JANA - Executive Vice President and Chief Innovation Officer

DCG (A)-6

CONFIDENTIAL

DCG (A)-7

PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA

WASHINGTON GAS LIGHT COMPANY

FC 1179

WASHINGTON GAS'S RESPONSE
AND/OR NOTICE OF OBJECTION/UNAVAILABILITY TO
THE GOVERNMENT OF THE DISTRICT OF COLUMBIA

DC GOVERNMENT DATA REQUEST NO. 3

QUESTION NO. 3-11

Q. What is WGL's estimated average cost per mile to replace leak-prone mains in the proposed program? Provide WGL's estimated average cost per mile (1) with, and (2) without the cost of replacing services connected to the leak-prone main.

WASHINGTON GAS'S RESPONSE 11/26/2024

A. The Company's District SAFE program includes main and service projects that are estimated at a fully loaded cost per mile, as the associated service work is necessary to maintain the flow of gas to its customers; therefore, the Company cannot provide item (2) as requested. Additionally, due to the extension of PROJECT*pipes* and the uncertainty surrounding the program parameters for District SAFE, the Company will have to adjust the estimated units and dollars for CY 2025; therefore, the units and costs for CY 2025 were not included in the average costs. The estimated average cost per mile of main with affected services is $10.7 M and average cost per service only replacement is $35.3k.

SPONSOR: Wayne A. Jacas, PMP
Director, Construction Program Strategy and Management

DCG (A)-8

PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA

WASHINGTON GAS LIGHT COMPANY

FC 1179

WASHINGTON GAS'S RESPONSE
AND/OR NOTICE OF OBJECTION/UNAVAILABILITY TO
THE GOVERNMENT OF THE DISTRICT OF COLUMBIA

DC GOVERNMENT DATA REQUEST NO. 1

QUESTION NO. 1-11

Q. What is the amount of new risk that WGL estimates will be added to the system during each year of the District SAFE program, as estimated by JANA from inter alia newly emerging methane leaks:

A. For Year 1;

B. For Year 2; and

C. For Year 3.

WASHINGTON GAS'S RESPONSE 11/15/2024

A. Please see the Company's response to FC 1179 Sierra Club Data Request Nos. 1–2 and 1–10. Until the annual budgets are approved and the project lists are known, the effect of the work on the overall system risk cannot be adequately estimated. The Company does not add additional risk to the system under the District SAFE program. While replacement activities will incrementally reduce risk for the facilities replaced, the system continues to age and the overall risk will continue to increase at a rate that outpaces the impact of the proposed planned replacement activities.

SPONSOR: Aaron C. Stuber, PE
Sr. Director – Asset Management

DCG (A)-9

Long-Term Planning to Support the Transition of New York's Gas Utility Industry

Prepared for Natural Resources Defense Council

April 30, 2021

AUTHORS

Tim Woolf
Alice Napoleon
Asa Hopkins, PhD
Kenji Takahashi

Synapse Energy Economics, Inc.

485 Massachusetts Avenue, Suite 3
Cambridge, Massachusetts 02139

617.661.3248 | www.synapse-energy.com

CONTENTS

EXECUTIVE SUMMARY

Background

New York will need to drastically reduce all fossil fuel use in order to achieve the Climate Leadership and Community Protection Act's (CLCPA) economy-wide goals of achieving 40 percent emissions reductions from 1990 levels by 2030 and net zero emissions by 2050. These goals apply to the entire economy and will have dramatic implications for the conventional natural gas (fossil gas) utilities.

Recognizing that gas utilities need to adjust to new energy and climate policy, the Public Service Commission (PSC or Commission) recently instituted a new proceeding to "establish planning and operational practices that best support customer needs and emissions objectives while minimizing infrastructure investments and ensuring the continuation of reliable, safe, and adequate service to existing customers."[1] The proceeding also aims to improve the transparency and inclusiveness of gas planning, supply and demand analysis, and management of supply constraints. As required by the PSC, the New York Department of Public Service (DPS) filed its Gas System Planning Process Proposal (DPS Proposal) on February 12, 2021.[2] While the proposal recommends important improvements to the current process, the proposal's overall vision for achieving CLCPA and other state policy goals over the long term is far too limited.

This white paper describes the planning practices necessary to guide and support the transition from today's gas industry to one that complies with the CLCPA, maintains essential energy services, manages costs, protects all customers, and promotes energy justice.[3] We recommend two overlapping but different types of plans for this purpose: (a) statewide gas transition plans, and (b) gas utility resource plans. The statewide transition plans should establish a vision for how the industry must evolve over the long-term, and the gas utility resource plans should identify the specific actions, resource investments, and infrastructure investments that each utility will undertake to achieve that long-term vision.

---

[1] New York Public Service Commission. Case 20-G-0131 - *Proceeding on Motion of the Commission in Regard to Gas Planning Procedures,* Order Instituting Proceeding, at 4 (Mar. 19, 2020).

[2] Simultaneously with issuing the Staff Gas System Planning Process Proposal, the DPS also filed the Staff Moratorium Management Proposal on February 12, 2021. This paper focuses on the Planning Process Proposal.

[3] We use the term "energy justice" to refer to a concept similar to environmental justice. Energy justice pertains specifically to energy-related benefits and burdens. According to the Initiative for Energy Justice, "[e]nergy justice refers to the goal of achieving equity in both the social and economic participation in the energy system, while also remediating social, economic, and health burdens on those disproportionately harmed by the energy system." Further, "[e]nergy justice aims to make energy accessible, affordable, clean, and democratically managed for all communities." (The Initiative for Energy Justice, https://iejusa.org.) Energy justice analyses should consider the same types of customers and communities as environmental justice analyses; the main difference between the two is the scope of impacts considered.

Long-term gas planning principles and practices

The economic analyses needed to develop statewide gas transition plans will have to be broader and more comprehensive than traditional utility integrated resource plans because of the extent of change required of the gas industry itself. Therefore both statewide transition and utility resource plans should adhere to the following principles and practices:

- Design all scenarios to comply with the CLCPA.
- Integrate gas and electricity planning.
- Assess impacts on gas and electricity sales.
- Use appropriate asset lives and depreciation schedules.
- Articulate greenhouse gas (GHG) constraints.
- Apply a high threshold for approving new gas infrastructure investments.
- Assess multiple gas utility business models.
- Develop comprehensive non-pipeline alternatives (NPA) screening frameworks.
- Adopt practices for strategic asset retirement.
- Update gas load forecasting practices.
- Account for customer actions.
- Account for risk.
- Articulate an action plan.
- Update plans periodically.

The statewide transition plans

These plans should indicate how the state as a whole will achieve New York's long-term industry goals, including emissions reductions as required under the CLCPA and other key regulatory goals. Because of the need for fundamental structural changes in the fossil gas industry, this statewide plan should include considerations of different gas utility business models, as well as enhanced consideration of rate and bill impacts particularly on low-income and moderate-income customers. These statewide transition plans should include the following elements:

- Benefit-cost analyses (BCA) to identify least cost and low risk ways of achieving the statewide transition plan and other regulatory goals.
- Rate and bill analyses of the gas and electricity utilities to identify how different strategies will affect different customer classes.
- Energy justice analyses to identify how low-income and moderate-income customers, captive customers, and disadvantaged communities will be affected by the transition plan.
- Utility financial analyses to identify how different transition scenarios will affect utility financial viability and ability to serve customers.
- Macroeconomic analyses to identify how different transition scenarios will affect economic development in New York state.

The gas utility resource plans

These utility-specific plans should indicate how each gas utility will achieve the vision and the outcomes identified in the statewide gas transition plans. The gas utility resource plans that we recommend here would be consistent with the long-term utility plans described in the DPS Proposal but would be enhanced using the long-term gas planning principles and practices described here.

The statewide transition plans and the gas utility resource plans will have some areas of overlap and some differences. Table 1 compares the two different types of plans.

Table 1. Statewide Transition Plans and Utility Resource Plans

	Statewide Transition Plan	Utility Resource Plan
Geographic scope	New York	each gas utility
Frequency of plan	five years	three years
Study period	2050 or 20 years, whichever is longer	2050 or 20 years, whichever is longer
Long-term gas industry goals	✓	✓
Long-term gas planning principles	✓	✓
Benefit-cost analysis	✓	✓
Rate and bill analysis	✓	✓
Utility financial analysis	✓	✓
Energy justice analysis	✓	✓
Integrate gas and electricity planning	✓	✓
Macroeconomic analysis	✓	–

1. Statewide Gas Transition Plans

1.1. Statewide Planning

The DPS Proposal includes a gas utility resource planning process to meet new and evolving gas industry goals. This proposal represents a significant improvement over current gas planning practices. However, the DPS Proposal lacks a long-term vision for how the New York fossil gas industry will need to evolve over time to ensure that the state can meet the goals of CLCPA, as well as other important goals such as availability of service and customer equity. Further, the DPS Proposal does not recommend a planning process to develop a long-term vision for how the industry should evolve across the entire state.

The importance of statewide planning to develop a vision and roadmap for the gas industry cannot be overstated. The changes that will be required to transform the gas industry are so broad that it would be very inefficient and unwieldy to try to address those changes on a utility-by-utility basis. Some issues, such as coordination with electric utilities, coordination with other industries in complying with the CLCPA, innovative ideas about new business models, and creative proposals for protecting consumers and ensuring energy justice, have important implications across the entire state and should not be addressed in the isolated silos of each utility. In addition to being very inefficient, this approach would likely allow many important issues to fall through the cracks between the different utilities.

Further, the changes required to transform the gas industry are so broad that they will affect many parties throughout the state, including gas and electric utilities, gas and electric utility customers, third-party providers of electric and gas products and services, consumer advocates, environmental advocates, municipalities, gas and electric utility investors, trade allies that provide energy efficiency and demand response services, and state agencies responsible for environmental protection and economic development. These parties' perspectives and interests typically span the entire state and it would be infeasible for all these parties to provide meaningful input into each of the nine utility-specific resource plans that are conducted every three years on a staggered basis, as proposed by the DPS.[4]

Finally, statewide planning is necessary to establish GHG goals for each gas utility, which is a foundational planning criterion for developing each utility's resource plan.

1.2. Long-Term Gas Industry Goals

The DPS, PSC, and the New York State Energy Research and Development Authority (NYSERDA) should lead a stakeholder process to develop a plan for transitioning from today's fossil gas industry to an industry that achieves New York's decarbonization goals, where fossil gas is completely phased out by 2050, which should incorporate sector-specific goals recommended by the Climate Action Council.[5] This statewide transition plan should help define the long-term gas utility industry structure and goals and should outline the actions necessary to achieve those goals. Such goals could include, for example:

- Continue to provide reliable energy services to all electric and gas customers. The fuel types used to provide energy services might change over time, but all customers should have access at least the level of services they have access to today.
- Keep the cost of energy services as low as reasonably possible. This goal can be pursued through sound economic analyses, as described below. It can also be pursued by animating markets and third-party providers of energy services where warranted.
- Achieve the emission reduction goals of the CLPCA.
- Ensure customer equity and energy justice for disadvantaged communities. This should be a key objective embodied in all aspects of the transition plan.
- Manage the financial health of the current electric and gas utilities to ensure that they can continue to provide low-cost reliable services where warranted, can adopt new business models, or can phase out business lines with as little disruption in energy service delivery as possible.

---

[4] DPS Proposal, p. 7.

[5] The CLCPA creates a Climate Action Council charged with developing a scoping plan of recommendations to meet these targets and place New York on a path toward carbon neutrality. The scoping plan will inform the State Energy Planning Board's adoption of a state energy plan, which will provide official policy guidance for meeting the climate targets.

The DPS Proposal mentions some of these concerns. It states, "[t]he long-term gas system planning process will help the utilities plan where, when, and how to deploy capital to ensure reliability in the future at reasonable cost and in line with State policies."[6] However, it does not clearly lay out all relevant goals. For example, customer equity and energy justice for disadvantaged communities is clearly a goal of the CLCPA but is not mentioned in the DPS Proposal.

1.3. Long-Term Gas Planning Principles and Practices

The economic analyses needed to develop statewide gas transition plans will have to be broader and more comprehensive than traditional utility integrated resource plans because of the extent of change required to the gas utility industry itself. Consequently, the following principles and practices should be adopted to ensure that the statewide gas transition plans will achieve long-term statutory and regulatory goals for the industry.

Design all scenarios to comply with the CLCPA

The GHG emission reduction requirements in the CLCPA should be assumed as a constraint in designing the scenarios to be analyzed in the long-term gas planning process. In other words, all scenarios should comply with the statutory GHG emission requirements. The GHG emissions described in the PSC 2016 BCA Order as "externalities," i.e., costs external to the monetary transactions of the utility, actually become "internal" costs to the extent they are addressed by the CLCPA.[7] They become costs that will be incurred by utilities and ultimately collected from customers. Therefore, these costs of compliance with the CLCPA should be included in all scenarios, and in all elements of the BCA: the Societal Cost test, the Utility Cost test, and the bill impact analysis.[8]

The DPS Proposal notes that the costs and benefits in the BCA should include external costs and benefits (page 22) and should properly account for GHG emissions associated with all solutions (page 26). The gas long-term plans must do more than simply estimate the amount of emissions and put a dollar value on them; they must include reference cases and scenarios that comply with the CLCPA. This approach eliminates the need to monetize GHG emissions because the monetary value of GHG emissions will be implicitly accounted for in the estimates of the costs of the scenarios that comply with the CLCPA.[9] This approach will lead to the most accurate assessment of what is needed to comply with the CLCPA. Using an administratively-determined social cost of carbon, for example, for the value of reducing GHG

---

[6] DPS Proposal, p. 7.

[7] While the CLCPA internalizes much more of the cost of GHG emissions than previous policy did, some externalities will remain even assuming full compliance with the CLCPA.

[8] Utilities might choose to conduct a sensitivity analysis where they do not comply with the CLCPA, for the purpose of identifying the costs of complying with the CLCPA. But this would be just a sensitivity; it would not be seen as a viable scenario, and it would not be used to determine the optimal long-term mix of gas resources.

[9] There may be additional, external, societal costs of GHG emissions, beyond those required to comply with the CLCPA. If so, then these impacts should be treated as externalities.

emissions will provide a different result than using the actual resources and actions that are required to comply with the CLCPA. If the administratively-determined estimate of the value of GHG emissions is too low, then the gas transition plans will not comply with the CLCPA; if it is too high, then customers will pay too much for compliance with the CLCPA.

Integrate gas and electricity planning

Complying with the provisions of the CLCPA will likely require the electrification of many end-uses, including the conversion of many fossil gas end-uses to electric end-uses. The electric local distribution companies (LDCs), local governments, and state agencies also have programs to support electrification of fossil gas end-uses. Thus, it is critical to consider electric and gas consumption, technology options, prices, and sales in an integrated manner. Each gas utility has a different relationship with the electric utility or utilities that serve its customers. In some cases, the utilities are part of the same corporate entity, in other cases not. The gas utility resource plans should incorporate and reflect each utility's situation and demonstrate how the utilities are working together.

Assess impacts on gas and electricity sales

Achieving the goals of the CLCPA will require a significant reduction in fossil gas sales over time, and perhaps the eventual elimination of fossil gas sales. As fossil gas sales begin to decline, either through electrification or other measures to comply with the CLCPA, it may become necessary for gas utilities to increase prices to recover historical, sunk costs for capital assets. This increase in prices might encourage additional fossil gas customers to switch to alternative sources of energy, creating further upward pressure on fossil gas prices, potentially leading to a death spiral for the fossil gas utilities. Such an outcome obviously has dramatic consequences for fossil gas utilities and their customers, and therefore should be accounted for in long-term planning.

Use appropriate asset lives and depreciation schedules

We agree with the DPS Proposal that asset depreciation schedules are a key input into the economic analyses of gas resources. However, the DPS treatment of depreciation schedules does not go nearly far enough.

The DPS Proposal requires that the long-term gas resource plans should include "a scenario that assumes that the full value of any new gas assets will be depreciated by 2050."[10] Assessing only one scenario, or even a set of scenarios or sensitivities, will not sufficiently capture the requirements of the CLCPA. The CLCPA establishes statutory mandates for reducing GHG emissions, therefore e*very scenario and every sensitivity* should be compliant with the CLCPA. The gas utilities' long-term plans should not include any scenarios where new gas assets are not depreciated by 2050—unless the utilities can demonstrate that such a scenario will comply with the CLCPA.

---

[10] DPS Proposal, pages 22-23.

Further, there might be scenarios where some gas assets should be phased out or retired before 2050 to achieve the GHG goals in the CLCPA. If this is the case, then depreciation schedules that are longer than the actual operating life of an asset will unduly reduce the cost of that asset and result in a skewed economic analysis in favor of that asset. This might also result in stranded costs that will have to either be recovered from customers (at a time when prices are increasing for other reasons) or by utility shareholders (at a time when they are facing increased pressures due to lower sales).

Appropriate depreciation schedules should be applied to both existing and new gas assets alike.

Articulate annual GHG constraints

Long-term gas plans should articulate all GHG constraints, including goals for 2025, 2030, 2035, 2040, 2045, and 2050. Also including GHG guidelines for each year will help ensure that the 5-year goals will be achieved and will provide clarity for the actions that need to be taken in the short- and medium-term to achieve those 5-year goals.

Apply a higher threshold for approving new gas infrastructure

Where the gas utility resource plan includes specific infrastructure investments, the plan should fully document how those investments meet the standards set in the statewide transition plan. Such documentation should include quantitative analysis of benefits, costs, and risks associated with alternatives; should demonstrate that NPAs were considered before proposing fossil gas assets; and should show that any new gas asset's useful life will end by 2050 at the latest. The higher threshold for approving gas infrastructure should reflect the risk of failing to meet the requirements of the CLCPA, as well as the cost associated with locking into large conventional investments (a negative option value).

Assess multiple gas utility business models

Compliance with the CLCPA might require fundamental shifts in gas utility business models. Therefore, long-term gas plans should assess a variety of different gas utility business models, including establishing district heating systems. Other options, such as the use of biomethane, renewably produced hydrogen, and/or synthetic natural gas could also be assessed; but these studies should be grounded in realistic assumptions about potential feedstock constraints, reflect how these fuels will be used, consider impacts to health and the environment, and properly account for the risk of perpetuating fossil gas use and increasing stranded costs associated with system infrastructure.[11] Also, it should consider the relationship between electric and gas utility business models, an assessment of gas utilities' obligation

[11] Alternative forms of fossil gas are sometimes supported with tradable emission credits or renewable credits that represent the positive environmental attributes associated with the alternative gas supply. If such alternative forms of gas are used by the utility to lower the carbon intensity of its operations to comply with the CLCPA, then the utility must demonstrate that any such credits are retained for the benefit of its customers and in no way "double-counted" by another entity. If the credits are not retained by the utility, then the alternative forms of fossil gas should be treated the same as fossil gas for the purpose of the BCA because the environmental attributes are not being used to lower the carbon intensity of the utility's operations.

to serve customers, and the level of return on equity that should be applied to new business models given a potentially different risk profile.[12]

Develop a comprehensive NPA screening framework

Per the DPS Proposal, NPAs should be evaluated for cost-effectiveness consistent with the PSC 2016 BCA Order,[13] which requires assessment from the societal perspective and at the portfolio level. We agree and recommend that the NPA screening framework account for impacts from NPAs and demand-side measures over their useful measure lives, accounting for the potential need to retire some fossil gas assets prior to 2050. In addition, the framework should consider option value (e.g., value of the flexibility to make smaller investments until more is known about the extent of the need). Further, gas utilities should periodically update their assessments of the capacity shortfalls and the evaluations on the status and performance of each NPA project.[14]

Adopt practices for strategic asset retirement

Each utility resource plan should identify where the utility plans to retire assets, and its specific plans for customer transition. In order to keep gas rates low enough to avoid mass, unmanaged defection away from gas service, the gas LDCs should adopt a strategic gas asset retirement approach under which the LDCs would geographically target customers served by a particular distribution line, and then develop a plan to retire that line by offering electrification or other alternative energy services. This approach is particularly needed for the gas lines that are aging, leaking, are due to be replaced, or have other characteristics that make retirement more cost-effective, feasible, or desirable (e.g., lines with clusters of non-heating gas customers or areas vulnerable to climate change). Although the DPS Proposal considers this strategy, more detail is needed on how it would be implemented.[15]

Update gas load forecasting practices

Each utility resource plan should include utility-specific load forecasts developed consistent with modernized statewide forecasting principles, with the necessary level of location-specific and customer class-specific forecasts required to understand geographic and financial analyses. Gas load forecasting should be aligned with and incorporate the impacts of state and local climate policies. To this end, the modeling should use the most up-to-date assumptions (e.g., on fuel-switching) and provide sufficient

---

[12] For more information, see Synapse Energy Economics, *Gas Regulation for a Decarbonized New York*, prepared for Natural Resources Defense Council, June 2020, Section 8.

[13] New York Public Service Commission. 2016 (January 21). *Order Establishing the Benefit Cost Analysis Framework*. Case 14-M-0101 (2016 BCA Order).

[14] Synapse Energy Economics, *Gas Regulation for a Decarbonized New York*, prepared for Natural Resources Defense Council, June 2020, Section 4.

[15] DPS Proposal, p. 19.

granularity and lead time to allow implementation of NPAs.[16] Gas load forecasting should also develop long-term load forecasts leading to the long-term GHG reduction targets, which will enable the state and utilities to find policy and program gaps that they need to address for meeting the emission targets.[17]

Account for customer actions

Electricity and gas customer decisions are likely to play a critical role in the transition of the gas utility industry, especially as gas and electricity prices increase and technologies for substituting gas with electricity become more available and more economic. The long-term gas plans should consider the customer-facing economics in each scenario, differentiating customer classes as necessary, and explicitly identify policies or programs to make the adoption of efficient end-use technologies more economic for customers.

Account for risk

There are many uncertainties and unknowns about how the gas utility industry should evolve over time to comply with the CLCPA. This introduces even more risk and uncertainty than is typically addressed in utility planning processes. Long-term gas plans should acknowledge and, wherever possible, model risk of failure along different pathways. They should also account for the option value of different decisions, i.e., the path dependence that limits the ability to change course in the event of failure.[18]

Articulate an action plan

The transition of the gas utility industry will likely require multiple actions by multiple parties. It is therefore especially important that long-term gas plans articulate the major steps needed to transition from the current fossil gas utility industry to a new industry that meets the requirements of the CLCPA and other regulatory goals.

Update plans periodically

There are still many unknowns about how the gas utility industry transition will unfold, and there will likely be important new developments and information regarding technology options, fuel options, customer preferences, financial issues, customer protection issues, and more. Therefore, long-term gas plans should be updated periodically to address changing circumstances. We recommend that the statewide gas transition plans be developed every five years and the utility resource plans be developed every three years.

---

[16] Likewise, DPS Staff recommends inclusion of NPAs in load forecasts and a geographical analysis with enough granularity to clearly identify locations of anticipated localized demand growth to allow for adequate planning. (Id., p. 15).

[17] Synapse Energy Economics, *Gas Regulation for a Decarbonized New York*, prepared for Natural Resources Defense Council, June 2020, Section 4.

[18] Many of these recommendation in this section draw upon a similar analysis conducted by Synapse Energy Economics for the Conservation Law Foundation, filed in Massachusetts Department of Public Utilities Docket 20-80, and available at https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/13118067.

1.4. Comprehensive Economic Assessments

The statewide gas transition plan should be grounded in a comprehensive economic assessment using the same economic principles and concepts that would be applied in similar regulatory contexts. The economic assessment should be used to identify the lowest-cost path for decarbonizing each fossil gas utility's system, while meeting other policy goals such as provision of energy services, compliance with CLPCA, customer equity, and energy justice.

BCA should be the core of the economic assessment but is not the only component. There are several important factors that cannot or should not be included in a BCA but should nonetheless be considered as part of the economic assessment using separate analyses. These include rate and bill analysis, energy justice analysis, utility financial analysis, macroeconomic analysis, and consideration of other qualitative factors.

These different analyses are necessary because they serve different purposes, provide different outputs, and consider impacts on different parties. The outputs of different analyses cannot simply be added together into a single formulaic decision-making metric. Instead, the outputs of each of the analyses need to be considered to identify the best transition plan for all parties involved.

These different types of analyses are presented in Table 2 and discussed in more detail below.

Table 2. Overview of comprehensive economic assessment

Type of Analysis	Purpose	Parties Considered	Key Outputs
Benefit-Cost Analysis	To assess cost-effectiveness by indicating whether the benefits of the transition pathway exceed the costs	All customers on average	Present value (PV) of costs, PV of benefits, PV of net benefits, benefit-cost ratios
Rate and Bill Analysis	To assess customer equity by indicating the impact on customers' rates and bills	All customers, by customer class	change in ¢/kWh and $ per therm, change in $/month and year, by customer class
Energy Justice Analysis	To assess energy justice issues by focusing on specific customer segments and community-level impacts	Vulnerable customers[19] and disadvantaged communities	bills, energy burden, distributed energy resource participation rates, environmental and health impacts
Financial Analysis	To assess the financial viability of current and proposed utility business models	Utility management and investors	retail sales, customers, earned ROE, gross profit, net profit, earnings per share
Macroeconomic Analysis	To assess impacts on state's economy	Workforce in the state	number of jobs, state gross domestic product
Other Considerations	To account for factors that are not addressed in the other analyses	Customers, utilities, society	metrics for factors not considered above

[19] Vulnerable customers may include low-income customers, moderate-income customers, customers who are medically dependent on heating, cooling, electricity for equipment, and customers vulnerable to climate change.

The DPS Proposal discusses some of these elements, including BCA and rate and bill impact analysis. In these cases, we offer recommendations for enhancing these analyses. Other elements, such as the energy justice, financial, and macroeconomic analyses, are not included in the DPS Proposal but should be incorporated into statewide gas transition plans.

Benefit-Cost Analysis

We agree with the DPS Proposal's requirement that utilities should continue to use the practices required in the PSC 2016 BCA order and the utilities' BCA Handbooks. Further, we agree with the DPS Proposal's recommendation to improve upon current practices by (a) providing better estimates of upstream fixed and variable costs, (b) including avoided gas distribution costs, and (c) investigating the costs of renewable gas alternatives to fossil gas. Below we provide several additional enhancements to current BCA practices.

Costs and Benefits to Include

We recommend adding several items to the list of costs and benefits presented in the DPS Proposal.[20] First, the costs and benefits should include the wholesale market price suppression effects for both the electricity markets and the gas markets. In light of the potential for significantly declining fossil gas sales for compliance with the CLCPA, demand-side gas resources and electrification practices could have a substantial dampening effect on wholesale fossil gas prices.[21] Reduced gas demand could also depress the cost of increased electrification, if electricity production costs decline due to the gas price suppression effects.

We recognize that the PSC BCA order concluded that the wholesale price suppression effect should not be accounted for in the Societal Cost test because the changes in prices are essentially a transfer payment between electricity generators and customers.[22] We do not agree with this determination. The wholesale market price effects are not transfer payments; they are utility system impacts, and they should be included in the Utility Cost test and the Societal Cost test.[23]

---

[20] DPS Proposal, page 22.

[21] There are several components of fossil gas price suppression effects, sometimes called Demand Reduction Induced Price Effects (DRIPE). Basis DRIPE (how changes in fossil gas consumption in New York changes local basis), and cross-DRIPE (how change in consumption affects changes in electricity prices) may be sizable. Supply DRIPE (how a change in fossil gas consumption in New York affects Henry Hub) may be smaller. The components of fossil gas DRIPE are described in Synapse Energy Economics 2018, AESC, chapter 9, available at: https://www.synapse-energy.com/sites/default/files/AESC-2018-17-080-Oct-ReRelease.pdf.

[22] PSC 2016 BCA Order, 2016, page 24.

[23] For more discussion on these points, see *The National Standard Practice Manual for Assessing the Cost-Effectiveness of Distributed Energy Resources*, 2020, Appendix F, Section F.6.

Second, the costs and benefits of methane leaks should be accounted for in the BCA. These leaks have important implications for (a) the cost of delivering gas, and (b) the ability to comply with the CLCPA, and (c) environmental impacts even after the utilities comply with the CLCPA.

Third, the costs and benefits of indoor air quality should be accounted for in the BCA. There is increasing evidence that indoor combustion of fossil gas can have negative health impacts on the building occupants, and these impacts should be accounted for in the Societal Cost test.

Utility Cost Test

The DPS Proposal reiterates the requirement from the 2016 BCA Order that the Utility Cost test and Bill Impact analysis be used as secondary checks on the Societal Cost test, which should be the primary test for assessing cost-effectiveness. We fully support this requirement.

To the extent that the Utility Cost test is used in long-term gas plans, it is important that a societal discount rate is used rather than a discount rate based on the utilities' weighted average cost of capital.[24] A societal discount rate is consistent with the goals of the long-term gas plans. A societal discount rate also reflects the regulatory perspective, which is more appropriate in this context than the utility investors' perspective.[25] The utility investors' perspective is addressed in the utility financial analysis discussed below. Further, since the Utility Cost test will be used as a check on the Societal Cost test, using the same discount rate is necessary in order to make meaningful comparisons across the two tests.

Rate Impact Measure Test

The 2016 BCA Order directs the utilities to use the Ratepayer Impact Measure (RIM) test as a secondary check to indicate the implications of utility plans on customer rates. The DPS Proposal, however, notes that a full bill impact analysis provides better information to assess the implications on customers rates and bills.[26] We agree with this conclusion of the DPS Proposal and recommend that the rate and bill impact analysis be used instead of the RIM test. This means that utilities should no longer conduct or present the results of the RIM test in their BCAs.

Bill Impact Analyses

We agree with the DPS Proposal's framing of the use and the design of the bill impact analyses. These analyses will clearly be an important complement to the BCA because the gas and electricity bill impacts

---

[24] Note that the discount rate used in a BCA has no bearing on the utility's ability to recover its capital costs. The recovery of capital costs should be included in the costs and the benefits included in the BCA. The only impact that the discount rate has is to give different weight to the short-term versus long-term costs and benefits in the BCA.

[25] See National Energy Screening Project, *The National Standard Practice Manual for Assessing the Cost-Effectiveness of Distributed Energy Resources*, Appendix G, 2020 for more detail.

[26] DPS Proposal, page 22.

of the fossil gas transition are likely to be significant and therefore should inform some of the key decisions.

All the inputs and assumptions that are common to both the BCA and the rate and bill analyses should be the same in both analyses. For example, all scenarios in the bill impact analyses should be consistent with the scenarios in the BCA. As noted above, all of these scenarios should comply with the GHG requirements of the CLCPA.

In addition, the bill impact analyses should account for the reduction in fossil gas sales as a result of electrification of gas end-uses and other means of fuel switching. These changes in the fossil gas market will have critical implications for bill impacts. The bill impact analysis should also account for the electricity bill impacts for those customers that switch from gas to electric end-uses.

Further, the bill impact analyses should explicitly identify any changes in the number and type of fossil gas customers, as well as the number of customers who decide to switch out their gas space or water heating end-uses for other fuels. This information will be critical to understanding how the gas utility industry is transforming over time in light of CLCPA and other industry trends.

Finally, the rate and bill impact analysis should account for the number and types of customers that participate in distributed energy resource programs or otherwise install distributed energy resources. This is important to indicate the extent to which customers will experience lower bills as a result of distributed energy resources and industry changes.

Energy Justice Analysis

The energy justice analysis should build off of the rate and bill impact analysis but with a focus on low-income, moderate-income,[27] disadvantaged communities, and Environmental Justice areas.[28] This analysis should identify and quantify, to the extent possible, impacts on these groups. Metrics could include: energy efficiency and distributed energy resource participation rates for residential customers, low-income customers, moderate-income customers, and customers in disadvantaged communities and Environmental Justice Areas; energy burden for residential customers by census block; capital costs for

[27] Low-income and moderate-income customers both face barriers to managing energy bills and energy burdens that call for policy intervention; however, combining these segments into one group may result in policies that effectively address the needs of moderate-income customers but do not go far enough to lower barriers faced by low-income customers. Thus, we list both groups to emphasize that policies should be designed to address both groups distinctly.

[28] Per the CLCPA, the Climate Justice Working Group is to establish criteria for defining disadvantaged communities; however, the criteria have not been set yet. Interim criteria for disadvantaged communities include those located within New York State Opportunity Zones or communities located within census block groups that meet the HUD 50% AMI threshold and that are also located within the DEC Potential Environmental Justice Areas (NYSERDA, "Disadvantaged Communities." https://www.nyserda.ny.gov/ny/disadvantaged-communities). New York City's environmental justice law, enacted in 2017, requires city government to conduct a comprehensive study that determines which neighborhoods are considered "Environmental Justice Areas". (NYC Climate Policy & Programs. "Environmental Justice: New York City's Environmental Justice for All Report." https://www1.nyc.gov/site/cpp/our-programs/environmental-justice-study.page).

space and water heating equipment; and outdoor and indoor environmental quality impacts affecting disadvantaged communities and Environmental Justice areas.

This analysis should begin with a comprehensive assessment of current energy justice conditions in New York, using the metrics developed. It should then project these metrics into the future under different gas transition scenarios to see how they will improve upon today's conditions and make progress towards New York's energy affordability policy.[29]

Utility Financial Analysis

The utility financial analysis should forecast the fundamental financial metrics of the electric and gas utilities to monitor how well they fare under different scenarios and utility business models. A variety of different gas utility business models should be considered, including district heating systems. To the extent that other options are considered, such as the use of biomethane, renewably produced hydrogen, and/or synthetic natural gas, there should first be assessment of their potential, cost, and environmental and health impacts.

This analysis should be as quantitative as possible, using metrics such as: retail sales, number of customers, allowed return on equity (ROE), earned ROE, earnings per share, gross profit margin, net profit margin, working capital, and operating cashflow. All the inputs and assumptions that are common to both the BCA and the Utility Financial Analysis should be the same in both analyses. For example, the depreciation rates used in the BCA should be the same as those used in the Utility Financial Analysis.[30]

This assessment should consider declining fossil gas sales and increased gas prices necessary to keep utilities financially viable, and the implications this has for the business model. The new and evolving business models must be able to support the gas transition goals outlined above, including net zero carbon emissions, reliability of services, customer equity, and energy justice.

Macroeconomic Analysis

A macroeconomic analysis of gas transition scenarios should assess the job impacts of the expected increases or decreases in the investments in and operations of all energy infrastructure and energy-consuming equipment, as well as re-spending effects of potential changes in customer bills.

Macroeconomic impacts should be presented separately from the monetary values in the BCA. This is primarily because there is a great deal of overlap between the costs and benefits in the macroeconomic impact analysis and the BCA, so adding the two monetary results together can be misleading. In

[29] New York State's Energy Affordability Policy limits energy costs for low-income New Yorkers to no more than 6 percent of household income. (Governor Andrew M. Cuomo. "Governor Cuomo Announces New Energy Affordability Policy to Deliver Relief to Nearly 2 Million Low-Income New Yorkers" https://www.governor.ny.gov/news/governor-cuomo-announces-new-energy-affordability-policy-deliver-relief-nearly-2-million-low).

[30] If a discount rate is used in the utility financial analysis, it may be appropriate to use the utility weighted average cost of capital for that purpose, while the BCA should use a societal discount rate.

addition, there is no single monetary value for macroeconomic impacts that can represent economic development goals.[31] Therefore, the best indication of macroeconomic impacts from different energy scenarios is the number of job-years created in each scenario. These job-years should be presented alongside the BCA results but cannot be added onto them.

Other Qualitative Considerations

Any other non-monetary or qualitative considerations should be fully described so that they can be incorporated into the gas transition plan decisions as warranted. These might include, for example, market animation and customer satisfaction.

1.5. Process to Develop the Statewide Gas Transition Plan

In the proposal, DPS Staff have described a gas system planning process that includes substantial opportunities for stakeholder engagement and education.[32] We appreciate and support this approach. Below we make some additional process-related recommendations for the development of the more comprehensive analyses for the statewide gas transition plan.

The gas transition has substantial implications for many stakeholders, including utilities, regulators, policymakers, residents, businesses, and advocates of different varieties. The plan should therefore be developed transparently and with full participation of these different perspectives. The DPS, however, sits in a unique and central role, and should be the guide for this process with assistance from NYSERDA. We therefore frame these recommendations to the DPS to establish a process for developing the plan that solicits input, maintains transparency, and ensures that all stakeholders have access to the data and analysis they require to inform and understand the plan and how it evolves over time.

In order to reduce barriers to participation, we first recommend that the DPS establish and announce that the process will be open and collaborative. The process should include both written comments and live workshops (virtual and in person, preferably at different locations statewide and at different times of the day, to allow different modes of participation for different communities). The DPS can set the frame and tone for this process by formalizing shared principles to guide the process. These principles should include equity, transparency, open-mindedness, and dependence on evidence and analytical rigor.

The process for developing the gas transition plan should be iterative, with early stakeholder input on goals (as discussed in Section 1.2) to select or refine the specific set of analyses to be conducted. In a joint effort, the DPS, NYSERDA, and the utilities should develop and propose an open, transparent set of methodologies and assumptions, to be provided to stakeholders for review and feedback. The resulting analyses would support the DPS and stakeholders in identifying the critical choices to make in shaping

[31] Some studies use the state gross domestic product as a monetary value to indicate economic development goals. This metric is problematic for several reasons and should be used only with caution.

[32] DPS Proposal p. 10.

the transition plan, making those decisions, and beginning plan implementation. The DPS should be explicit, and all stakeholders should be aware, that it will likely be necessary to select a path forward and begin implementation even in the face of uncertainty, since there are clear economy-wide goals that provide adequate direction to guide decision-making in the near term. The limited timeline between now and 2050 does not allow indefinite study prior to action.

2. Gas Utility Resource Plans

2.1. Gas Utility Resource Planning Process

As noted above, the DPS Proposal includes a gas utility resource planning process that represents a significant improvement over current gas planning practices. However, there are several ways that the DPS Proposal can be enhanced to be consistent with the statewide planning process and ensure that gas utility resource plans meet New York's CLCPA and other regulatory goals.

First and foremost, the gas utility resource plans should be designed to follow the vision and roadmap outlined in the statewide gas transition plans. Further, the analytical practices, including methodologies, assumptions, and inputs, used in the statewide transition plans should be applied in the gas utility resource plans as well. This means that the long-term gas planning principles and practices recommended above in Section 1 should be applied to the gas utility resource plans as well. This will help ensure coordination and consistency across the state.

The gas utility resource plans should be explicitly designed to achieve the state's short-, medium-, and long-term emission reduction requirements of the CLCPA. There are several ways that the DPS Proposal can be enhanced to achieve this outcome. Several of the principles for the statewide gas transition planning process are especially important to translate to the utility-specific plans, as summarized below.

2.2. Gas Utility Resource Plan Contents

Both LDC-specific and statewide long-term gas plans should include the following elements.

- The long-range vision for the industry as a whole
- Load forecasts
- Supply resource forecasts
- Resource and capacity gap analysis for system constraints and meeting the long-term GHG targets
- Assessment of impacts of switching to electricity on electric load, in conjunction with electric utilities
- Options for meeting system capacity constraints
- Long-term scenario analysis:

  - Options for achieving the long-term vision, including gas supply options, gas alternative options, electricity alternative options, and demand-side options
  - Scenarios for using the options to achieve the long-term vision, including scenarios with fossil gas completely replaced by non-fossil gas alternatives or electricity
  - Description of how the different scenarios are evaluated and optimized
  - A preferred scenario
  - An assessment of customer impacts, including bill impacts, customer fuel-switching, and customer equity
- An action plan for meeting system capacity constraints and the long-term state GHG targets

The DPS Proposal has a section on filing requirements, which appears to address many of the items above.[33] However, it does not go far enough to articulate a long-range vision, or to standardize the specific elements that LDCs need to include in their filings.

2.3. Gas Utility Resource Plans Compared to Statewide Transition Plans

The statewide transition plans and the gas utility resource plans will have some overlap and some differences. Table 3 compares the two different types of plans.

Table 3. Statewide Transition Plans and Utility Resource Plans

	Statewide Transition Plan	Utility Resource Plan
Geographic scope	New York	each gas utility
Frequency of plan	five years	three years
Study period	2050 or 20 years, whichever is longer	2050 or 20 years, whichever is longer
Long-term gas utility industry goals	✓	✓
Long-term gas planning principles	✓	✓
Benefit-cost analysis	✓	✓
Rate and bill analysis	✓	✓
Utility financial analysis	✓	✓
Energy justice analysis	✓	✓
Integrate gas and electricity planning	✓	✓
Macroeconomic analysis	✓	-

3. RELATED REGULATORY POLICIES

In addition to the gas planning practices described above, the DPS should adopt several related policies regarding gas connection rules and cost recovery of gas assets. These policy changes will be critical for informing the state transition plans and the utility resource plans. These related regulatory policies

[33] DPS Proposal, p. 13.

should be adopted as soon as practical because they can have immediate implications for gas utility decision-making.

3.1. Gas Connection Rules

New York's obligation to serve dictates that customers can be asked to pay for new gas service connections only if the connection is over 100 feet long.[34] This burdens other customers with the risk that the cost of the connection will not be fully recovered through the new customer's rates. The State should reconsider the obligation to serve in light of gas's high costs to health and the environment, as well as the socialized costs to customers. We recommend the following:

- Require statewide, standard definitions and consistent reporting on interconnections.
- Remove incentives to gas connections by minimizing socialized costs of new connections.
- Remove or reduce the allowance of "free" line extension costs to new customers.
- Consider shifting the risk of under-collection of the line costs from customers as a whole to the new customer.
- Weigh the obligation to serve in light of socialized costs to customers, health impacts, and policy goals.

3.2. Cost Recovery

Providing regulatory guidance on cost recovery will allow utilities to take steps immediately to address this long-term issue. To this end, the PSC should:

- Provide guidance as soon as possible about how gas asset depreciation schedules should be consistent with the requirements of the CLPCA,[35] and
- Provide guidance as soon as possible about how stranded costs from gas assets will be treated for cost recovery purposes.[36]

[34] PSL Section 31.

[35] Synapse Energy Economics, *Gas Regulation for a Decarbonized New York*, prepared for Natural Resources Defense Council, June 2020, Section 7.

[36] Ibid.

CERTIFICATE OF SERVICE

I hereby certify that on this 10th day of December 2024, I caused true and correct copies of the public version of the Direct Testimony of Government of the District of Columbia Witness Dr. Asa S. Hopkins to be delivered to the following:

Cathy Thurston-Seignious, Esq.
Washington Gas Light Company
101 Constitution Avenue, N.W.
Third Floor West
Washington, D.C. 20010
Cthurston-seignious@washgas.com

Frann G. Francis, Esq.
Apartment and Office Building
Association of Metropolitan Washington
1025 Connecticut Avenue, N.W., Suite 1005
Washington, D.C. 20036
ffrancis@aoba-metro.org

Ade Adeniyi, Esq.
Office of the People's Counsel
655 15th Street, N.W., Suite 200
Washington, D.C. 20005
aadeniyi@opc-dc.gov

Christopher Lipscombe, Esq.
D.C. Public Service Commission
1325 G Street, N.W., Suite 800
Washington, D.C. 20005
clipscombe@psc.dc.gov

Timothy R. Oberleiton, Esq.
Earthjustice
1001 G St. NW, Ste. 1000
Washington, D.C. 20001
(202) 667-4500
toberleiton@earthjustice.org

/s/ Brian R. Caldwell
Brian R. Caldwell