



A Needs Assessment of the Hopkinton-Ashland Transfer Line Replacement Project

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Executive Summary

In 2018, Eversource filed an application before the Massachusetts Energy Facilities Siting Board (EFSB Docket No. 18-02) to increase the capacity of its Hopkinton-Ashland gas pipeline, which the Company claims is necessary to “improve system performance and reliability.” Specifically, Eversource claims the expansion is needed to satisfy: current customer gas demand; expected future customer gas demand; and a need for redundancy in the delivery system.

Eversource’s claims are insufficient, poorly substantiated, and include some errors and omissions. AEC’s analysis found that:

The project is not needed to satisfy current periods of high customer gas demand.

Eversource presents no evidence that current gas demand in the Greater Framingham area is going unfulfilled.

The project is not needed to satisfy future growth in customer gas demand.

Population growth has not been the driver behind growth in Eversource’s customer demand in Greater Framingham. Eversource’s expectations about continued growth in gas use do not match those from state and federal authorities. Massachusetts energy planning includes a reduction in gas use and rapid transition to electric heat pumps to comply with emission laws.

The project is not needed to fulfill a need for redundancy in the delivery system.

Eversource claims redundant gas transmission necessary for reliability, but most cities and towns in the Commonwealth do not have redundant gas service. More redundancy in gas lines also increases the risk and scope of stranded assets as Massachusetts transitions to net zero emissions.

The project would run counter to the Commonwealth’s emission laws.

Eversource needs to scale back its emissions drastically. Continued growth in gas use cannot satisfy the requirements of Massachusetts’ Global Warming Solutions Act and the April 2020 letter issued by the Baker Administration requiring net zero greenhouse gas emissions by 2050.

The project alternatives were not adequately considered.

Eversource failed to consider important project alternatives, including electric heat pumps, and did not supply the analysis of those project alternatives that it did consider for third-party review, making it impossible to verify the reasonableness of Eversource’s conclusions.



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1. Eversource's Argument

In June 2018, Eversource filed an application before the Massachusetts Energy Facilities Siting Board (EFSB Docket No. 18-02) to increase the capacity of its Hopkinton-Ashland Transfer Line by replacing 3.7 miles of 6-inch diameter portions of the pipeline with 12-inch diameter pipeline (see Figure 1 below).¹ In its application, Eversource claims that increasing the capacity of the Hopkinton-Ashland line is necessary to “improve system performance and reliability.”² More specifically, Eversource notes three underlying causes for this need:

1. **Current customer gas demand**—Eversource claims that the “physical limitation” posed by the existing Hopkinton-Ashland Transfer Line “could have a negative effect on customers during periods of high demand”.³
2. **Expected future customer gas demand**—Eversource claims that gas demand in the Greater Framingham area (served by the Hopkinton-Ashland Transfer Line) has increased over the last five years, and the Company “anticipates that growth will continue”.⁴
3. **A need for redundancy in the delivery system**—Eversource claims that the project will ensure that the Greater Framingham area can be reliably served from two transmission sources, which “will improve the flexibility and reliability of the system, particularly during critical wintertime operation”.⁵

Eversource's application presents its proposal to replace the existing 6-inch diameter portions of the Hopkinton-Ashland Transfer Line with 12-inch diameter pipeline such that the entirety of the pipeline will be a uniform 12 inches.⁶ By doing so, Eversource claims that the reliability of gas supply to its approximately 19,000 customers in the Greater Framingham area—which is serviced by the Hopkinton-Ashland Transfer Line bringing gas from the Wilson Street Gate Station in Hopkinton to the Pond Street Gate Station in Ashland—will be enhanced.

¹ MA EFSB Docket No. 18-02. June 2018. *Application to Support Petition before the Energy Facilities Siting Board*. Submitted by NSTAR Gas Company d/b/a Eversource Energy. p.1-1. Available at:

<https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/9407925>.

² MA EFSB Docket No. 18-02. June 2018. p.1-4.

³ MA EFSB Docket No. 18-02. June 2018. p.1-1.

⁴ MA EFSB Docket No. 18-02. June 2018. p.1-4.

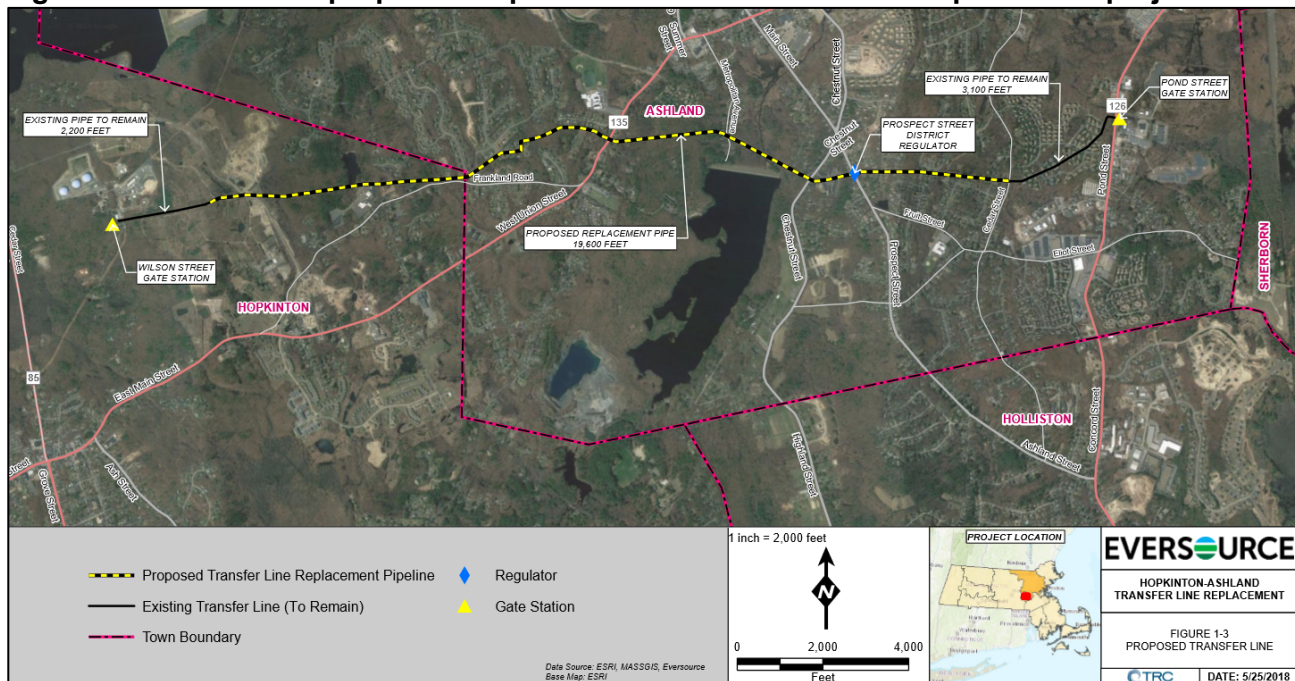
⁵ MA EFSB Docket No. 18-02. June 2018. p.1-1.

⁶ MA EFSB Docket No. 18-02. June 2018. p.2-1.



Given existing levels of demand and expected load increases, Eversource claims the project is needed to resolve potential reliability issues.⁷ According to the Company, increasing the diameter of the Hopkinton-Ashland pipeline will enable it to “independently supply gas to the Pond Street Gate Station, in the event of a loss of service” from its other source of transmission—Algonquin Gas Transmission (AGT).⁸

Figure 1. Eversource’s proposed Hopkinton-Ashland transfer line replacement project



Source: MA EFSB Docket No. 18-02. June 2018. Application to Support Petition before the Energy Facilities Siting Board. Submitted by NSTAR Gas Company d/b/a Eversource Energy. Attachment A. Available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/9407925>

According to the Company, the 6-inch diameter portions of the pipeline become bottlenecks that limit gas supply when temperatures fall below 40 degrees Fahrenheit.⁹ Eversource claims that cold weather coupled with high demand would force the Greater Framingham area (including the towns of Ashland, Hopkinton, Southborough, Framingham, Natick, Sherborn and Holliston) to rely on gas transmission from AGT only.¹⁰

This white paper reviews Eversource’s claims finding errors, overstatements, and an incorrect interpretation of Massachusetts’ emissions law.

⁷ MA EFSB Docket No. 18-02. June 2018. p.2-5.
⁸ MA EFSB Docket No. 18-02. June 2018. p.2-5.
⁹ MA EFSB Docket No. 18-02. June 2018. p.2-5.
¹⁰ MA EFSB Docket No. 18-02. June 2018. p.2-3.



2. No Evidence of Continued Growth in Gas Needs

Eversource presents no evidence in its application of curtailments or other unmet needs in the Greater Framingham area: Current gas needs appear to be served adequately by the existing Hopkinton-Ashland pipeline.

While Eversource provides clear documentation of a growth in its customer demand in recent years, the Company's application does not provide information on the causes of this increase. According to the application, growth in gas demand has been high in the towns Eversource indicates are most relevant to the Transfer Line upgrade project—Ashland, Framingham, Holliston, Natick and Sherborn. According to the Company's application:

The total hourly flow rate for these five towns from the Pond Street Gate Station is 3,409,820 cubic feet per hour, thus the increases in these towns in 2017 accounts for approximately 8 percent of total hourly flow in the area.¹¹

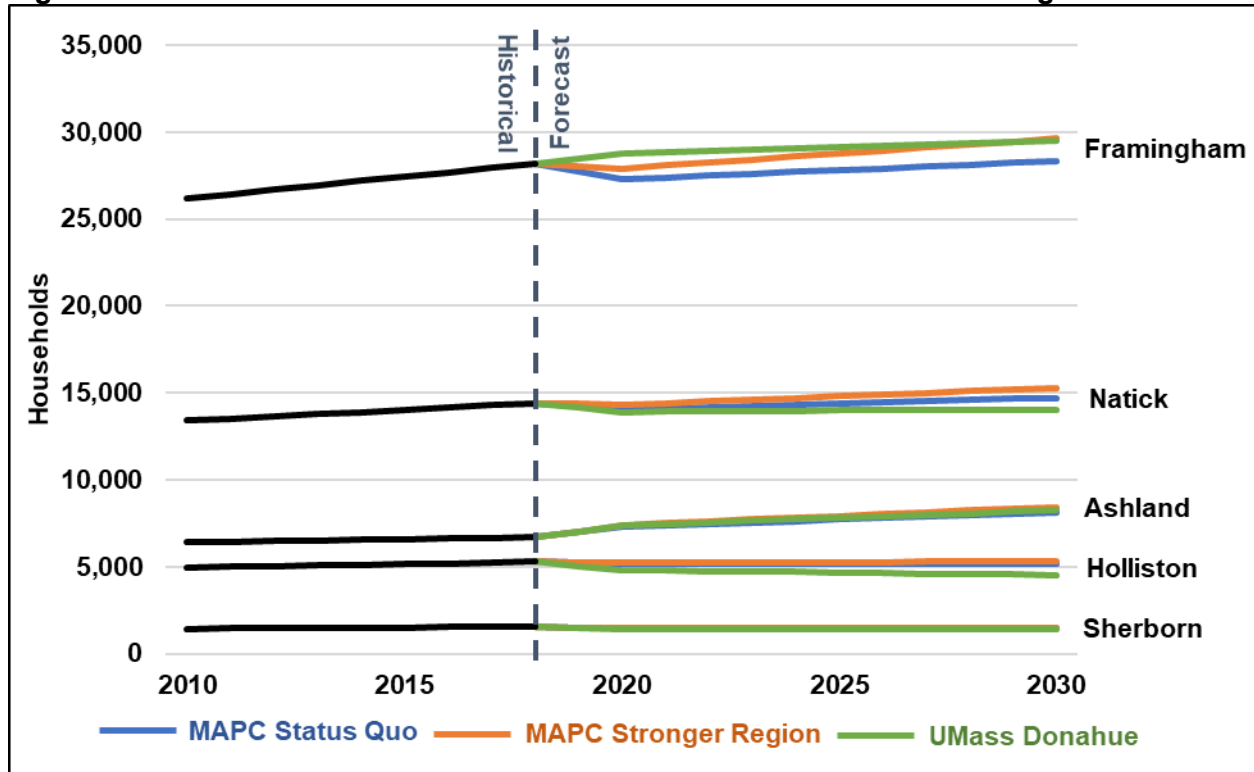
The bulk of this growth cannot have been caused by housing or population growth in the area: the growth in total households across these towns between 2010 and 2018 was just 1.0 percent per year.¹² The expected future growth to 2030 in total households across these towns ranges from a low of negative 0.4 percent per year in Sherborn to a high of 1.7 percent per year in Ashland (see Figure 2).

¹¹ MA EFSB Docket No. 18-02. June 2018. p.2-6.

¹² The annual growth rate of 1.0 percent represents the historical growth in total households over the 9-year period between 2010 and 2018.



Figure 2. Historical and forecasted total households in the Greater Framingham area



Sources: 1) "Households and Families: 2010". U.S. Census Bureau. 2010 Census Summary File 1. QT-P11. Available at: <https://data.census.gov/cedsci/>; 2) "Households and Families". U.S. Census Bureau. 2014-2018 American Community Survey 5-Year Estimates. S1101. Available at: <https://data.census.gov/cedsci/>; 3) UMass Donahue Institute. March 2015. Vintage 2015 Population Projections. Available at: <http://pep.donahue-institute.org/>; 4) Metropolitan Area Planning Council (MAPC). 2014. Metro Boston Population and Housing Demand Projections. Provisional Municipal Forecasts; Status Quo and Stronger Region Scenarios. Available at: <https://www.mapc.org/learn/projections/>

The most likely cause of past growth in gas demand, therefore, is homes and businesses switching from other forms of heating to gas. In its application, Eversource notes that:

[T]he Company has seen the addition of a significant number of new customers in these municipalities, given the recent economic development in the area. In the past five years...the Company has seen a large increase in requests for service in Framingham, Ashland, Sherborn, Natick and Holliston.¹³

The Company's claim that this growth will continue, however, is unsubstantiated.

¹³ MA EFSB Docket No. 18-02. June 2018. p.2-6.

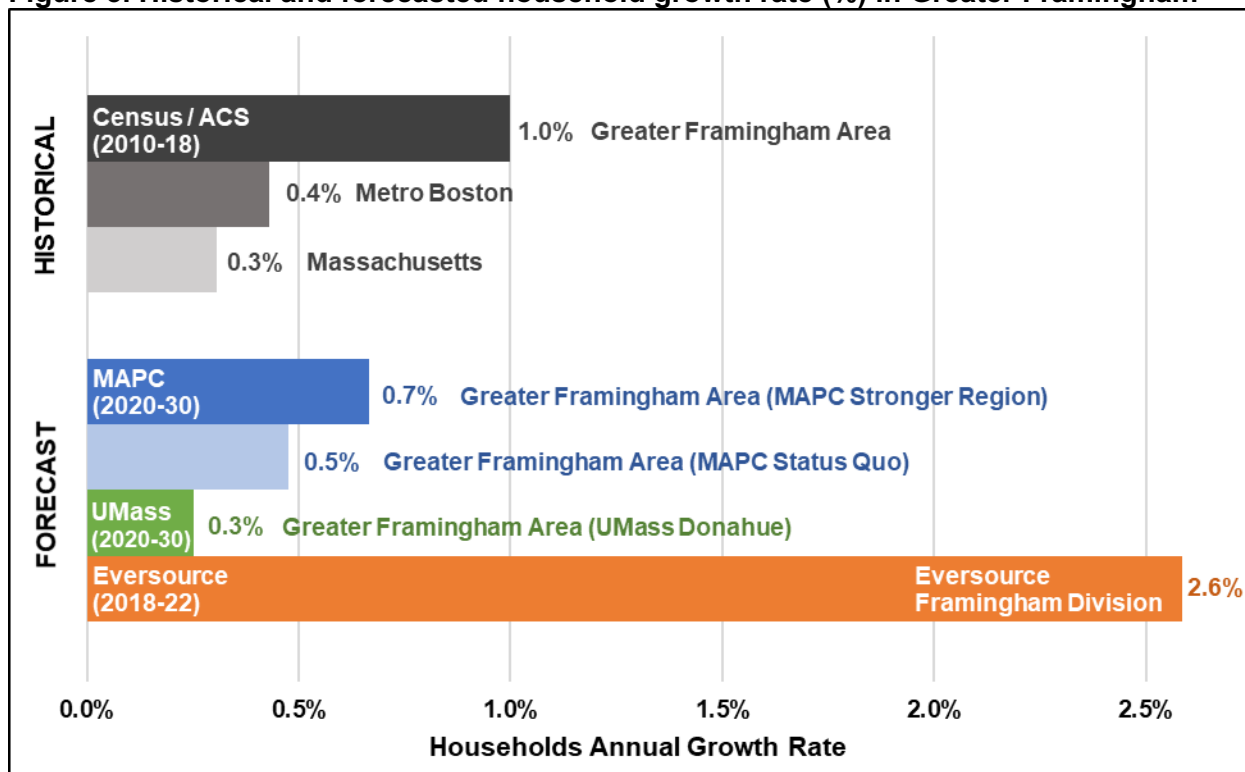


Greater Framingham area population is not expected to grow rapidly

In Eversource’s 2018 Forecast and Supply Plan, the Company expects 2.6 percent per year growth in residential customers.¹⁴ Given data on historical household growth for the local area from the U.S. Census and projected household growth for the local area from the Massachusetts Area Planning Council and University of Massachusetts, it is clear that Eversource’s projected growth in customers is too large to result from a growth in households (see Figure 3).

Eversource’s expectation of growth in gas demand, therefore, must be the result of the Company’s assumption that households will switch from other heating sources to gas.

Figure 3. Historical and forecasted household growth rate (%) in Greater Framingham



Sources: 1) "Households and Families: 2010". U.S. Census Bureau. 2010 Census Summary File 1. QT-P11. Available at: <https://data.census.gov/cedsci/>; 2) "Households and Families". U.S. Census Bureau. 2014-2018 American Community Survey 5-Year Estimates. S1101. Available at: <https://data.census.gov/cedsci/>; 3) UMass Donahue Institute. March 2015. Vintage 2015 Population Projections. Available at: <http://pep.donahue-institute.org/>; 4) Metropolitan Area Planning Council (MAPC). 2014. Metro Boston Population and Housing Demand Projections. Provisional Municipal Forecasts; Status Quo and Stronger Region Scenarios. Available at: <https://www.mapc.org/learn/projections/>; 5) MA DPU Docket No. 18-47. May 2018. Forecast and Supply Plan 2017/2018 - 2021/2022. Submitted by NSTAR Gas d/b/a Eversource Energy. Available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/9163798>

¹⁴ The annual growth rate of 2.6 percent represents Eversource’s expected growth in total residential customers over the 5-year period between 2017/18 and 2021/22. MA DPU Docket No. 18-47. May 2018. Forecast and Supply Plan 2017/2018 - 2021/2022. Submitted by NSTAR Gas Company d/b/a Eversource Energy. Available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/9163798>.



Switching from oil to gas heating cannot continue under Massachusetts law

Eversource's rapid expected growth in gas demand does not match the much lower expectations of the U.S. Energy Information Administration's (EIA's) latest Annual Energy Outlook for New England or the expectations of Massachusetts' Department of Energy Resources (DOER) and Secretary of Energy and Environmental Affairs as published in Massachusetts' current Comprehensive Energy Plan. Eversource is planning for expanded gas use while the Commonwealth is planning for a rapid transition to heating with modern electric heat pumps, reaching nearly one-third of Massachusetts homes by 2030.

In December 2018, DOER published its Comprehensive Energy Plan,¹⁵ which forecasts the Commonwealth's future energy use in five scenarios—only one of which is consistent with Massachusetts' Global Warming Solutions Act (GWSA) (that is, keeps pace with annual emission reductions needed to achieve a minimum 80 percent reduction from 1990 statewide emissions by 2050¹⁶): the “aggressive conservation and fuel switching” scenario. This scenario includes the following assumptions:

- **Heat pumps:** 766,000 residences and 20 percent of commercial square footage heated with heat pumps by 2030;
- **Energy efficiency:** 15 percent cumulative energy efficiency savings by 2030; and existing and new construction building shell improvements at 2 to 2.5 times the current pace.

To be clear, in the only scenario in Massachusetts Comprehensive Energy Plan that complies with the Commonwealth's emission law, total non-electric gas consumption in Massachusetts falls at 1.6 percent per year through 2030, driven largely by 2.2 percent per year reduction in residential gas use. To achieve its ambitious greenhouse gas emissions obligation, Massachusetts authorities are planning for heat pumps and energy efficiency, not for more gas infrastructure.

In contrast, the Plan's business-as-usual scenario (called “Sustained”) assumes:

- only a few thousand heat pumps are added in Massachusetts each year;
- the same 15 percent cumulative energy efficiency savings by 2030; and
- the current 0.5 percent per year building shell improvements.

¹⁵ Massachusetts Department of Energy Resources (DOER). 2018. *Massachusetts Comprehensive Energy Plan*. Available at: <https://www.mass.gov/files/documents/2019/01/10/CEP%20Report-%20Final%2001102019.pdf>.

¹⁶ The Baker Administration's April 2020 Letter of Determination increases minimum 2050 emission reductions from 80 percent to 85 percent. Massachusetts Executive Office of Energy and Environmental Affairs. April 2020. *Determination of Statewide Emissions Limit for 2050*. Available at: <https://www.mass.gov/doc/final-signed-letter-of-determination-for-2050-emissions-limit/download>



In this very low heat-pump scenario, total non-electric gas consumption in Massachusetts grows at 0.7 percent per year through 2030, driven by 1.1 percent per year growth in industrial gas use (Residential gas consumption grows 0.2 percent per year). The scenario does not achieve the minimum 80 percent by 2050 emission reductions under the GWSA, much less the April 2020 requirement that 2050 emissions be reduced by a minimum of 85 percent.

Massachusetts plan for 766,000 residences using heat pumps by 2030—or a little more than 30 percent of all Massachusetts households—is a consistent assumption used in several studies issued and commissioned by Massachusetts DEP and DOER since 2014. The 2014 “Commonwealth Accelerated Renewable Thermal Strategy” study¹⁷ commissioned by Massachusetts Department of Energy Resources and performed by Navigant and Meister first identified this 30 percent residential heat pump penetration by 2030 target.

Figure 4 below compares forecasted future rates of growth in residential gas demand from several sources. Starting from Eversource’s forecasted residential gas demand for the Company’s entire Massachusetts territory in 2019/20, five growth rates are compared:

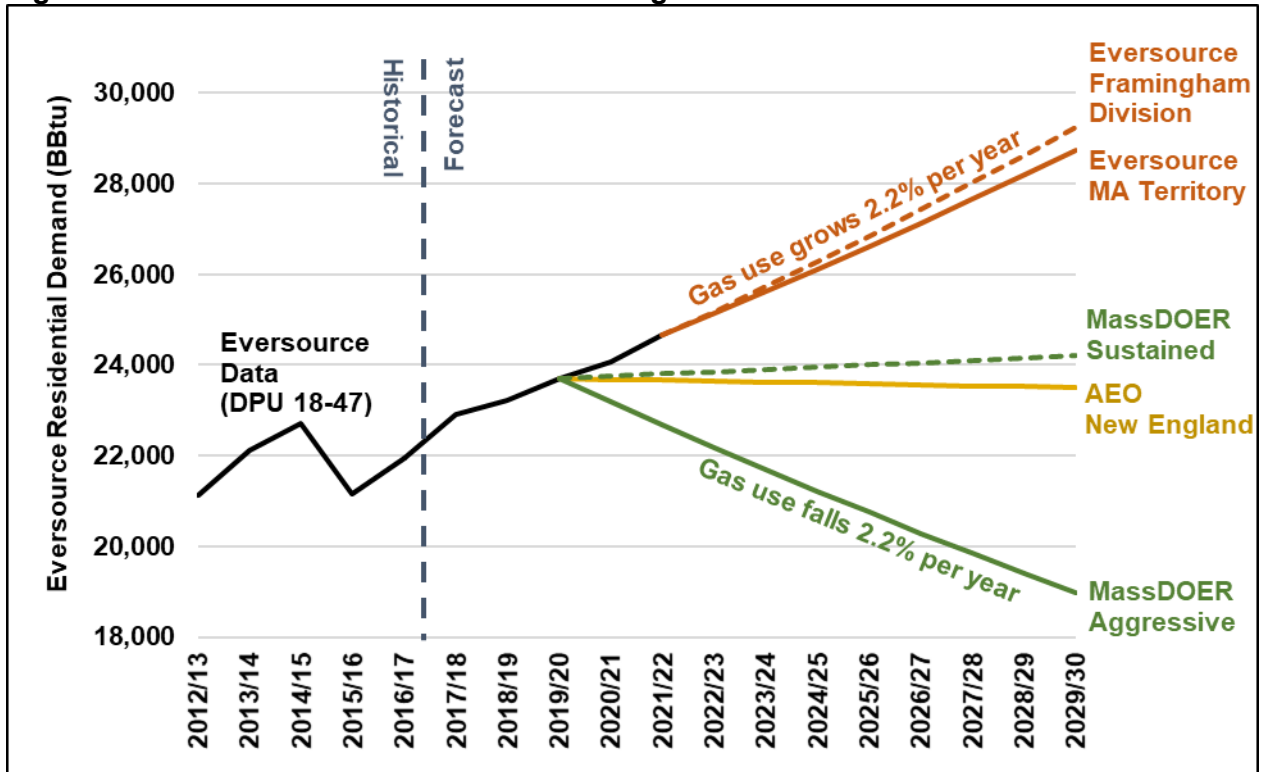
- The orange lines show gas demand continuing to grow at the rates forecasted by Eversource from 2017/18 through 2021/22 (2.2 percent per year for the Framingham division and 1.9 percent per year for the Company’s entire Massachusetts territory).
- The yellow line uses the EIA’s 2020 Annual Energy Outlook annual growth rate for residential gas growth in New England from 2020 through 2030 (-0.08 percent per year).
- The green lines are the annual growth rates from 2020 through 2030 as forecasted in the Massachusetts 2019 Comprehensive Energy Plan (0.2 percent per year for the “Sustained” business-as-usual scenario and -2.2 percent per year for the GWSA-compliant “Aggressive” scenario).

The difference between Eversource’s expanding gas use and the Massachusetts’ Comprehensive Energy Plan’s shrinking gas use are dramatic. The Commonwealth’s energy planners expect gas consumption to fall, not grow, in order to meet GWSA emission limits.

¹⁷ Navigant and Meister Consultants Group. 2014. *Commonwealth Accelerated Renewable Thermal Strategy*. Navigant and Meister Consultants Group. Prepared for Massachusetts Department of Energy. Available at: <https://www.mass.gov/doc/renewable-heating-cooling-market-strategy-report/download>.



Figure 4. Historical and forecasted residential gas demand



Sources: 1) MA DPU Docket No. 18-47. May 2018. Forecast and Supply Plan 2017/2018 - 2021/2022. Submitted by NSTAR Gas Company d/b/a Eversource Energy. Available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/9163798>; 2) Massachusetts Department of Energy Resources. December 2018. Massachusetts Comprehensive Energy Plan: Commonwealth and Regional Demand Analysis. Massachusetts Department of Energy Resources. Available at: <https://www.mass.gov/files/documents/2019/01/10/CEP%20Report-%20Final%20001102019.pdf>; 3) U.S. Energy Information Association. 2019. "Annual Energy Outlook 2020: Table 2. Energy Consumption by Sector and Source". Available at: <https://www.eia.gov/outlooks/aeo/>

Eversource supplies 56 percent of the households in its service territory, while Columbia Gas and National Grid supply 57 and 65 percent of the total households in their territories, respectively (see Table 1).¹⁸ Switching all non-gas customers to gas would only result in a 28 percent reduction in heating emissions in any of these territories,¹⁹ nowhere near the minimum 85 percent reduction

¹⁸ Eversource and National Grid share the following towns: Boston, Somerville, Natick, Wayland, and Leicester. Eversource also shares Mendon with a different utility. National Grid also shares Hanson and Lunenburg with a different utility. Each town they share was split 50/50 with the exception of Boston. In Boston, National Grid services all neighborhoods except Hyde Park, so Boston was assigned in its totality to National Grid. Together, Eversource, Columbia Gas and National Grid's territories account for 87 percent of all Massachusetts households.

¹⁹ Assuming all non-gas customers heat with oil and EPA emission factors:



needed by 2050, or even the minimum 40-45 percent reduction widely expected to be set as the 2030 target.

Table 1. Households serviced by Eversource, Columbia Gas and National Grid

Gas Utility	# of Residential Customers	Total # of Households in Service Territory	% Share of Total
Eversource	266,713	472,135	56%
Columbia Gas	288,675	506,235	57%
National Grid	830,517	1,284,576	65%

Sources: 1) MA DPU Docket No. 18-47. May 2018. Forecast and Supply Plan 2017/2018 - 2021/2022. Submitted by NSTAR Gas Company d/b/a Eversource Energy. Available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/9163798>; 2) MA DPU Docket No. 19-135. October 2019. 2019/2020 – 2023/2024 Forecast and Supply Plan. Submitted Bay State Gas Company d/b/a Columbia Gas of Massachusetts. Available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/11382764>; 3) MA DPU Docket No. 18-148. November 2018. November 1, 2018 through October 31, 2023 Long-Range Resource and Requirements Plan. Submitted by Boston Gas Company/Colonial Gas Company d/b/a National Grid. Available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/10008562>; 4) "Households and Families". U.S. Census Bureau. 2014-2018 American Community Survey 5-Year Estimates. S1101. Available at: <https://data.census.gov/cedsci/>; 5) MASS GIS. 2015. "MassUtilities: Electricity". Available at: <http://massgis.maps.arcgis.com/apps/MapSeries/index.html?appid=7c70397fadb64c6f9c01fcfa8c2269d>

Eversource predicts that its total customer gas use will grow by 2.4 percent per year. If this growth continued until 2050 it would result in a total of 4.6 million metric tons (MMT) of carbon dioxide equivalent emissions (CO₂e) (see Figure 5). Using this high gas growth assumption, Eversource’s 2050 emissions (4.6 MMT) account for nearly all of the Commonwealth’s entire building sector emissions budget in 2050 (4.7 MMT²⁰). If Columbia Gas’s 2050 emissions are included, using their predicted growth rate of 0.8 percent per year, (3.2 MMT), a merged Eversource-Columbia overshoots the Commonwealth’s total permitted building sector emissions by the end of 2046 (see Figure 5). Including National Grid’s emissions, Massachusetts’ building sector emissions are exceeded by 2034.

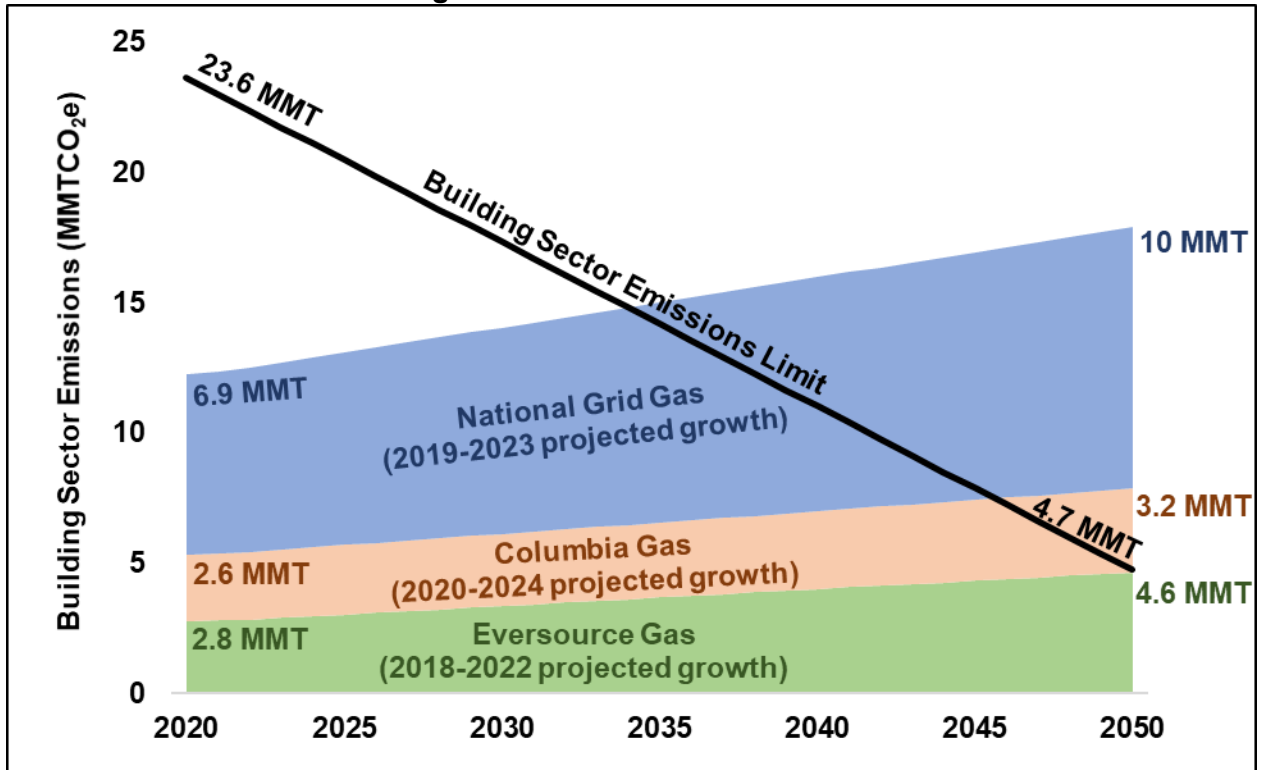
Serving all households and businesses with gas heating is simply not possible under Massachusetts’s emission law: Other methods of heating with lower greenhouse emissions must be utilized instead—as is assumed in the Massachusetts Comprehensive Energy Plan’s rapid roll-out of electric heat pumps.

U.S. EPA. Center for Corporate Climate Leadership. March 26, 2020. "Emission Factors for Greenhouse Gas Inventories." Available at: <https://www.epa.gov/sites/production/files/2020-04/documents/ghg-emission-factors-hub.pdf>

²⁰ Assuming the building sector reduces its emissions in line with the statewide goal—an 85 percent reduction in 2050 from 1990 levels.



Figure 5. Projected emissions from Eversource, Columbia Gas and National Grid gas use versus Massachusetts' building sector emissions limit



Sources: 1) Massachusetts Department of Environmental Protection. "Appendix C: Massachusetts Annual Greenhouse Gas Emissions Inventory: 1990-2017, with Partial 2018 Data" [Excel Spreadsheet]. Available at: <https://www.mass.gov/doc/appendix-c-massachusetts-annual-greenhouse-gas-emissions-inventory-1990-2017-with-partial-2018/download>; 2) MA DPU Docket No. 18-47. May 2018. Forecast and Supply Plan 2017/2018 - 2021/2022. Submitted by NSTAR Gas Company d/b/a Eversource Energy. Available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/9163798>; 3) MA DPU Docket No. 19-135. October 2019. 2019/2020 – 2023/2024 Forecast and Supply Plan. Submitted Bay State Gas Company d/b/a Columbia Gas of Massachusetts. Available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/11382764>; 4) MA DPU Docket No. 18-148. November 2018. November 1, 2018 through October 31, 2023 Long-Range Resource and Requirements Plan. Submitted by Boston Gas Company/Colonial Gas Company d/b/a National Grid. Available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/10008562>



3. Redundancy is not Required in Reliable Gas Planning

According to Eversource, the Greater Framingham area can be supplied by two existing gas transmission sources:

The Pond Street Gate Station can be supplied: (1) by Algonquin Gas Transmission, LLC (“AGT”) at the station itself; or (2) via the Transfer Line using gas supplied by AGT, Tennessee Gas Pipeline Company, LLC (“TGP”) or LNG from Eversource Energy’s LNG facility located in Hopkinton.²¹

Eversource is proposing to expand the capacity of the Hopkinton-Ashland pipeline so that it can “provide a full, independent source of supply to the Pond Street Gate Station,” and eliminate the need to “[rely] upon a secondary source at that location.”²² Eversource claims that such redundancy (i.e., having two gas transmission sources serve the same area) will allow for reliable gas service in case one source of gas “becomes unavailable”.²³ However, within Massachusetts (and throughout the United States), multiple sources of gas supply is a rare circumstance, not a requirement or planning standard (see Figure 6).

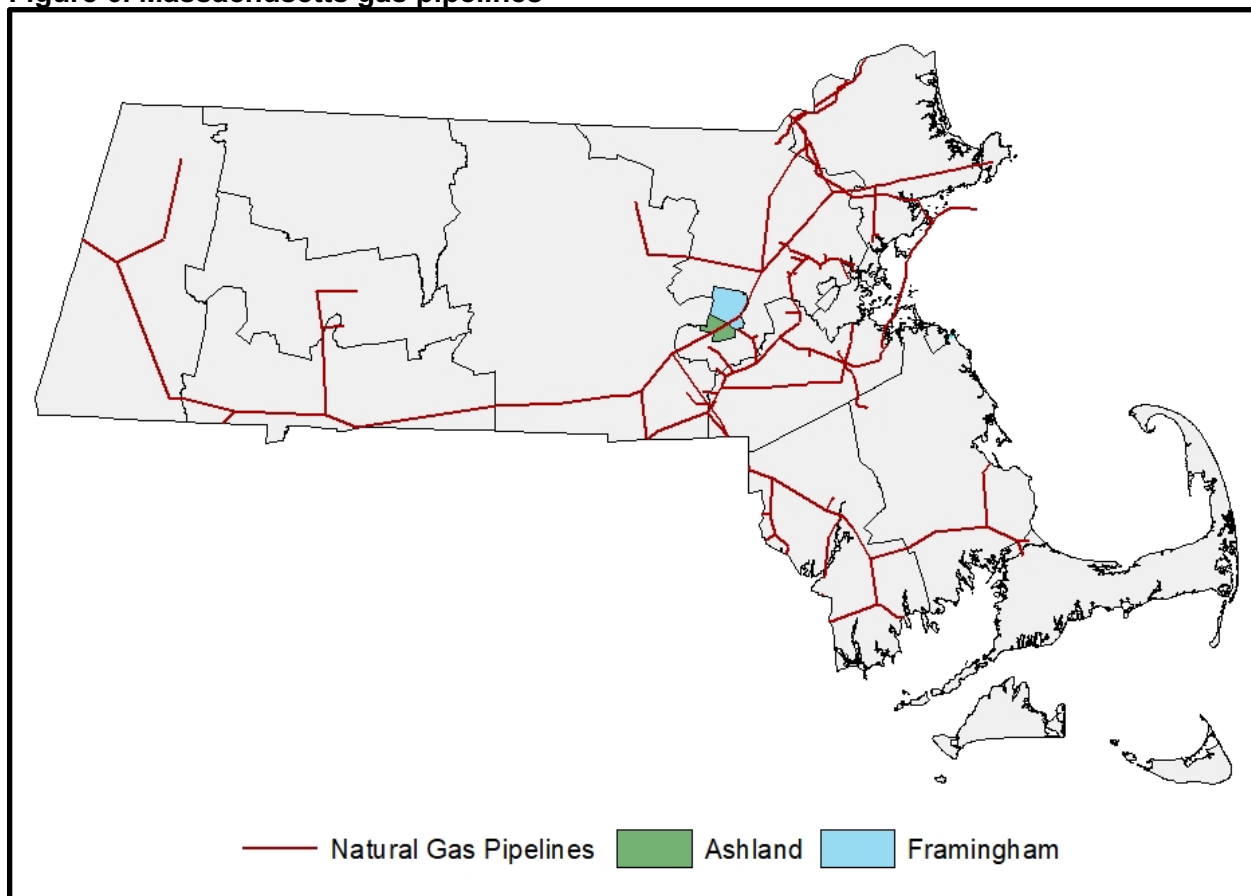
²¹ MA EFSB Docket No. 18-02. June 2018. p. 1-2.

²² MA EFSB Docket No. 18-02. June 2018. p. 1-1.

²³ MA EFSB Docket No. 18-02. June 2018. p. 1-1.



Figure 6. Massachusetts gas pipelines



Source: AEC map using: MassGIS. November 2014. "County Boundaries." <https://docs.digital.mass.gov/dataset/massgis-data-county-boundaries>; U.S. Energy Information Administration. October 2019. "Natural Gas Interstate and Intrastate Pipelines." https://www.eia.gov/maps/layer_info-m.php

Eversource's stated goal of enhanced reliability through redundant supply routes exacerbates an important financial risk to the utility (and its customers): stranded assets. New gas pipelines are built to last for 50 years²⁴ and energy distribution infrastructure is typically financed and charged incrementally to utility customers throughout the lifetime of the equipment. With Massachusetts emissions limited to net zero by 2050 it is difficult to see how a new pipeline built today could be in operation for thirty years (and perhaps even less). If gas customers pay for a new pipeline for 50 years but can only use it for 30 years, that asset becomes "stranded": payments are still due but the equipment no longer provides any value.

²⁴ Folga, S.M. 2007. *Natural Gas Pipeline Technology Overview*. Argonne National Laboratory. p. 49. Available at: http://corridoreis.anl.gov/documents/docs/technical/APT_61034_EVS_TM_08_5.pdf.



4. Eversource's Project Alternatives are Incomplete

Eversource's Hopkinton-Ashland Transfer Line application claims to have evaluated a total of seven project options: the proposed pipeline replacement project and six alternatives (see Table 2). From the incomplete information Eversource makes available in its application, alternatives to the project were ruled out for reasons including cost, reliability, environmental impact and infeasibility.²⁵ While it is essential to consider alternatives to ensure that the proposed project is the most reasonable under the circumstances, Eversource did not make its alternative analysis' inputs, assumptions or detailed results available for third-party review, making it impossible to provide critical feedback or evaluate the reasonableness of Eversource's determinations.

One project alternative listed by Eversource—renewable energy—does not appear to have been evaluated. Another alternative—energy efficiency—does not appear to have been evaluated on the basis of cost and was not evaluated in combination with energy supply measures as one aspect of an integrated supply plan.

The Massachusetts energy efficiency program administrators' 2019-2021 three-year plan calls for annual incremental gas efficiency savings of 1.25 percent²⁶ while Eversource's market potential study claims expected business-as-usual annual gas efficiency savings of 1.2 percent and "maximum achievable" annual gas efficiency savings of 2.4 percent.²⁷ In their recent market potential studies, Massachusetts gas utilities Berkshire, Liberty, and Until report economic potential annual gas efficiency savings of 10.1 to 14.6 percent and technical potential annual gas efficiency savings of 10.4 to 15.3 percent.²⁸ None of these gas efficiency potentials appear to have been considered in Eversource's analysis of energy efficiency as a project alternative.

²⁵ MA EFSB Docket No. 18-02. June 2018. p. 3-1 to 3-6.

²⁶ MA Energy Efficiency Advisory Council. October 25, 2018. *Presentation on 2019-2021 Plan*. MA EEAC. Available at: <http://ma-eeac.org/wordpress/wp-content/uploads/Consultant-Presentation-on-PA-Oct-22-Plan.pdf>

²⁷ MA DPU Docket No. 18-110–18-119. October 2018. Natural Gas Energy Efficiency Potential Study: *Exhibit 1, Appendix N - Eversource, Pt. 1*. Submitted by Berkshire Gas. p. 15

²⁸ *Ibid. Exhibit 1, Until Natural Gas Energy Efficiency Potential Study Exhibit 1, Appendix N – Until Gas*. p. 4

Ibid. Liberty Utilities: Energy Efficiency Potential Study Exhibit 1, Appendix N – Liberty. p. 12

Ibid. Berkshire Gas: Energy Efficiency Potential Study Exhibit 1, Appendix N – Berkshire. p. 8



Table 2. Eversource’s listed project alternatives

Alternatives	Description
No-Build Alternative	“Under the No-Build Alternative, no improvements would be made to the Transfer Line and the identified need for increased pressure and volume at the Pond Street Gate Station would not be met.” (p.3-1)
Proposed Project	“The proposed Project is designed to ensure the continued reliability of natural gas distribution to the Greater Framingham area. Upon completion, the replacement of the 3.71 miles of existing 6-inch-diameter pipeline with 12-inch-diameter pipeline will relieve the existing pressure drop in the Transfer Line so that it can operate as an independent feed into the Pond Street Gate Station, in the event that an alternative source of gas supply is unavailable.” (p.3-1)
High Pressure Feed Line Alternative	“The High Pressure (“HP”) Feed Line Alternative would involve the installation of a new 5.08-mile pipeline to provide an alternative source of gas directly from the Framingham (Route 9) Gate Station in Framingham to the Pond Street Gate Station in Ashland.” (p.3-2)
Energy Efficiency	“Eversource evaluated energy efficiency as a potential alternative to the Project, and has concluded that energy efficiency measures alone would not address the operational needs of the Greater Framingham Area distribution systems and allow Eversource to reliably meet the needs of its existing customers.” (p.3-4)
Renewable Energy	Eversource lists but does not describe this alternative.
Compressed Natural Gas	“To maintain the necessary delivery pressures at Pond Street Gate Station, the Company also considered the use of additional compressed natural gas (“CNG”) supply. The CNG alternative would involve taking natural gas from another source to inject additional supply at the Pond Street Gate Station.” (p.3-5)
Portable LNG	“The Company also considered the use of portable LNG vaporizer units in the vicinity of Pond Street in order to maintain minimum operating pressures. Such portable units have no storage capacity. Instead, LNG would be delivered by truck as needed, and the truck would be connected to a trailer-mounted vaporizer for injection into the system.” (p.3-5)

Source: MA EFSB Docket No. 18-02. June 2018. Application to Support Petition before the Energy Facilities Siting Board. Submitted by NSTAR Gas Company d/b/a Eversource Energy. Available at: <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/9407925>.

Eversource also failed to consider several additional important project alternatives:

- Repairing gas leaks to avoid the release of methane, a far more potent greenhouse gas than carbon dioxide from combustion;
- GeoMicroDistricts (that is, district heating using shared ground source heat pumps located beneath public right-of-ways) despite Eversource’s proposed investment in three



GeoMicroDistrict pilot projects;²⁹

- Electrification (wide-spread adoption of electric heat pumps, as described in the Massachusetts Comprehensive Energy Plan); and
- Gas demand response measures—which could reduce peak demand for gas and mitigate the need for pipeline expansion.

Based on its purported analysis of potential project alternatives, Eversource concludes that:

[O]nly the proposed Project and the HP Feed Line Alternative served to meet the need to provide an additional source of non-AGT gas at the Pond Street Gate Station to ensure adequate system pressure and capacity.³⁰

Eversource does not provide sufficient information to substantiate this claim, does not provide stakeholders with the analysis itself (only with the Company's conclusions), and omits from its analysis several key zero-carbon alternatives: renewables, energy efficient above already-approved levels, GeoMicroDistricts, heating electrification (air- and ground-source heat pumps), and gas demand response.

²⁹ Akley, W.J. and Horton, D.P. 2019. *Direct Testimony of William J. Akley and Douglas P. Horton*. Testimony to the Commonwealth of Massachusetts Department of Public Utilities on behalf of NSTAR Gas Company d/b/a Eversource Energy, Docket No. 19-120. Available at: https://d279m997dpfwgl.cloudfront.net/wp/2020/01/Initial_Filing_Volume_2_11-8-19.pdf.

³⁰ MA EFSB Docket No. 18-02. June 2018. p. 3-6.



5. Non-Gas Alternatives Can Lower Massachusetts Emissions

Massachusetts households and businesses need secure, reliable heating, together with forward-looking business solutions to provide that heating. With the Commonwealth's greenhouse gas emissions regulations requiring a minimum 85 percent reduction by 2050, false solutions (like switching from oil to gas heating) that provide only moderate reductions in emissions while spending customer dollars building new infrastructure that lasts more than 50 years lead to more harm than good.

Eversource's decision to increase the capacity of its gas distribution system is not consistent with the Commonwealth of Massachusetts plans to drastically reduce both emissions and gas use over the next 30 years:

- **Massachusetts Decarbonization Roadmap:** In order to achieve its goal to reach net-zero greenhouse gas emissions by 2050,³¹ the Commonwealth is currently developing a Decarbonization Roadmap with a 2050 emissions limit of 85 percent or higher;³²
- **Massachusetts 2030 emission reduction targets:** Massachusetts requires, per the GWSA, that "the Secretary of [Energy and Environmental Affairs] shall, in consultation with MassDEP and the [DOER], adopt separate statewide [greenhouse gas] emissions limits for 2020, 2030, 2040 and 2050".³³ The GWSA also notes that the 2030 target should be set to "maximize the ability of the commonwealth to meet the 2050 emissions limit." Massachusetts 2030 emission limit must be set by December 31, 2020.³⁴
- **GWSA-consistent Massachusetts gas demand:** According to the Massachusetts' Department of Energy Resources (DOER) and Secretary of Energy and Environmental Affairs as published in the December 2018 Massachusetts Comprehensive Energy Plan,³⁵ residential gas use must fall by 2.2 percent per year from 2020 through 2030 (see Figure 4 above) to achieve required emission limits.

³¹ Massachusetts Executive Office of Energy and Environmental Affairs. 2020. "Decarbonization Roadmap." *Mass.gov*. Available at: <https://www.mass.gov/info-details/ma-decarbonization-roadmap>.

³² Massachusetts Executive Office of Energy and Environmental Affairs. April 2020. *Determination of Statewide Emissions Limit for 2050*. Available at: <https://www.mass.gov/doc/final-signed-letter-of-determination-for-2050-emissions-limit/download>

³³ Massachusetts Executive Office of Energy and Environmental Affairs. April 2020. p. 3.

³⁴ Massachusetts General Laws Chapter 6A (GWSA), Section 19. 2008. *An Act Establishing the Global Warming Solutions Act*. Available online: <https://malegislature.gov/laws/sessionlaws/acts/2008/chapter298>.

³⁵ Massachusetts Department of Energy Resources (DOER). 2018. *Massachusetts Comprehensive Energy Plan*. Massachusetts Department of Energy Resources. Available at: <https://www.mass.gov/files/documents/2019/01/10/CEP%20Report-%20Final%2001102019.pdf>.



Only zero-carbon heating solutions can provide the necessary emission reductions without wasting customers' money on 50-plus year infrastructure that will be obsolete in 30 years at the latest. Zero-carbon heating technologies that could meet the Commonwealth's needs while also delivering on legally-mandated emissions reductions include:

- **Repairing gas leaks:** Accelerating Massachusetts 20-year plan to repair and replace leaking gas infrastructure—starting with the largest leaks—can reduce heating emissions in the years before a transition to modern electric heating;
- **Electrification with heat pumps:** Replacing the use of heating fuels with electricity, by switching oil boilers and gas furnaces to electric high-efficiency air-source or ground-source heat pumps. Electrification can reduce even more harmful emissions when paired with adding renewables to the electric grid.
- **GeoMicroDistricts:** Connecting ground-source heat pump systems shared by multiple buildings creates a GeoMicroDistrict. These systems use ambient temperature differentials and electricity to pump hot and cool water to buildings to provide heating and cooling as needed and can replace aging and leaky gas infrastructure to create localized, interconnected and highly efficient temperature control systems.³⁶
- **Gas demand response:** Using real-time pricing signals and other incentives to reflect the resource cost of gas consumption through sophisticated metering infrastructure, allowing customers to change behavior in peak demand periods.³⁷ Gas demand response can help reduce price spikes, avoid costly infrastructure investments, and increase energy efficiency.³⁸
- **Deep gas energy efficiency:** Utilities run energy efficiency programs to achieve gas savings, reduce greenhouse gas emissions, and provide job creation as well as cost savings for both customers via lower utility bills and utilities via enhanced grid reliability and resiliency.³⁹ The economic potential for gas energy efficiency in Massachusetts is an order of magnitude greater than the savings approved in utility efficiency plans.

³⁶ HEET. 2019. *GeoMicroDistrict Final Report: Executive Summary*. Home Energy Efficiency Team (HEET) Massachusetts. Available at: <https://heetma.org/wp-content/uploads/2019/11/HEET-BH-GeoMicroDistrict-Final-Report-Executive-Summary.pdf>.

³⁷ Olive, L.T.W. March 2019. *A Hitchhiker's Guide to Gas Demand Response*. NERA Economic Consulting. Available at: <https://www.nera.com/content/dam/nera/publications/2019/Olive-A-Hitchhikers-Guide-to-Gas-Demand-Response.pdf>

³⁸ Weiss, J., Levine, S., Sergici, S., Thapa, A., and Grausz, L. June 2018. *Demand Response for Natural Gas Distribution: Opportunities and Challenges*. The Brattle Group. Available at: http://files.brattle.com/files/13929_demand_response_for_natural_gas_distribution.pdf

³⁹ Hoffman, H., Zimring, M., and Schiller, S.R. April 2013. *Assessing Natural Gas Energy Efficiency Programs in a Low-Price Environment*. Lawrence Berkeley National Laboratory. Available at: <https://eta-publications.lbl.gov/sites/default/files/lbni-6105e.pdf>.



6. An Incorrect Solution for an Unproven Need

Eversource claims that it must expand the capacity of its Hopkinton-Ashland pipeline in order to ensure a reliable gas supply to its customers in the Greater Framingham area.⁴⁰ Eversource's assertions regarding the need for this project are insufficient and poorly substantiated. This white paper finds that:

The project is not needed to satisfy current periods of high customer gas demand.

Eversource presents no evidence that current demand is going unfulfilled.

The project is not needed to satisfy future growth in customer gas demand.

Population growth has not been the driver behind higher customer demand in the Greater Framingham area over the last 10 years. The most likely cause of past growth in gas demand is homes and businesses switching from other forms of heating to gas, and Eversource's claim that this growth will continue is not consistent with Massachusetts energy planning and climate law.

Eversource's expectation that the residential gas use will grow by 2.2 percent between 2018 and 2022 does not match the expectations of Massachusetts' Secretary of Energy and Environmental Affairs. The Commonwealth's energy planning calls for a rapid transition to modern electric heat pumps.

The project is not needed to fulfill a need for redundancy in the delivery system.

Redundancy is not the planning standard in Massachusetts and most Massachusetts towns and neighborhoods do not have or require multiple sources of gas transmission. More redundancy in gas lines also increases the risk and scope of stranded assets as Massachusetts transitions to net zero emissions.

The project would run counter to state emission laws.

Eversource's proposed project (in which Massachusetts customers switch from oil to gas heating to reduce residential heating emissions) is not a useful climate strategy. Massachusetts energy planning counts on an immediate and continuous transition of residential and commercial heating to zero-carbon technologies like heat pumps, GeoMicroDistricts, demand response and energy efficiency in order to achieve at least an 85 percent reduction in statewide emissions, net-zero emissions by 2050, and the necessary interim targets in 2030 and 2040 to ensure that 2050 goals are met.

⁴⁰ MA EFSB Docket No. 18-02. June 2018.p.2-5.



The project alternatives were not adequately considered.

Eversource reviewed a total of six project alternatives, but failed to evaluate several key alternatives, including fixing gas leaks, GeoMicroDistricts, electrification with heat pumps, and gas demand response measures. Eversource also failed to provide any underlying evidence justifying the Company's rejection due to reasons of cost, reliability, environmental impact and infeasibility of the alternatives it did evaluate. This lack of transparency impedes stakeholders' ability to provide critical feedback or evaluate the reasonableness of Eversource's determinations.