

**Gas System Enhancement Plan (GSEP)
Working Group**

Final Report and Recommendations

January 31, 2024

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Glossary of Acronyms

AGO – Massachusetts Attorney General’s Office
Berkshire Gas – The Berkshire Gas Company
CLF – Conservation Law Foundation
DIMP – Distribution Integrity Management Program
DOER – Massachusetts Department of Energy Resources
DPU – Massachusetts Department of Public Utilities
EEA Agencies – DOER, DPU, and MassDEP, under the Executive Office of Energy and Environmental Affairs
Eversource – Eversource Energy
GHG – Greenhouse gas
GSEP – Gas System Enhancement Plan
HEET – Home Energy Efficiency Team
LAUF – Lost and unaccounted for gas
LEAN – Low-Income Energy Affordability Network
Liberty – Liberty Utilities MA
MassDEP – Massachusetts Department of Environmental Protection
NCLC – National Consumer Law Center
NPA – Non-gas pipe alternative
Unitil – Unitil Corporation
USW - United Steelworkers Union, Local 12012
Wakefield Municipal – Wakefield Municipal Gas and Light Department

Background

Section 68 of *An Act Driving Clean Energy and Offshore Wind*, St. 2022, chapter 179, requires the Department of Public Utilities to convene a stakeholder working group to “develop recommendations for legislative and regulatory changes that may be necessary to align gas GSEPs developed pursuant to section 145 of chapter 164 of the General Laws with the applicable statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N and the commonwealth’s emissions strategies.”

The Working Group comprises the following members:

Mary Gardner, Assistant Attorney General, Energy and Ratepayer Advocacy Division, Massachusetts Office of the Attorney General

Elizabeth Mahony, Commissioner, Massachusetts Department of Energy Resources

James M. Van Nostrand, Chair, Massachusetts Department of Public Utilities

Bonnie Heiple, Commissioner, Massachusetts Department of Environmental Protection

Senator Michael J. Barrett, Co-Chair of the Joint Committee on Telecommunications, Utilities, and Energy

Representative Jeffrey N. Roy, Co-Chair of the Joint Committee on Telecommunications, Utilities, and Energy

Jerrold Oppenheim, Low-Income Energy Affordability Network

Jenifer Bosco, National Consumer Law Center

Peter Dion, General Manager, Wakefield Municipal Gas and Light Department

John Buonopane, President of Local 12012, United Steelworkers Union

Heather Takle, President and Chief Executive Officer, PowerOptions

Audrey Schulman, Co-Founder and Co-Executive Director, HEET

Jonathan Buonocore, Assistant Professor, Boston University School of Public Health¹

Priya Gandbhir, Senior Attorney, Conservation Law Foundation

Sue Kristjansson, President and Chief Operating Officer, The Berkshire Gas Company

William Akley, President of Gas Business, Eversource Energy

Tatiana Roc, President, Liberty Utilities MA

Amy Smith, Director New England Jurisdiction Gas Business Unit, National Grid

Robert Hevert, President and Chief Administrative Officer, Until Corporation

The GSEP Working Group² held its first meeting on April 12, 2023, and held subsequent meetings on the following dates:

April 24, 2023

¹ While Jonathan Buonocore is on the faculty at Boston University School of Public Health, his views and comments are his alone and do not represent the stance and opinions of Boston University School of Public Health or Boston University.

² The GSEP Working Group maintained a website where the public could obtain meeting notices, agendas, approved minutes, and other items required pursuant to Open Meeting Law. G.L. c. 30A, §§ 18-25. <https://www.mass.gov/info-details/gseps-pursuant-to-2014-gas-leaks-act>

May 10, 2023
May 26, 2023
June 7, 2023
June 21, 2023
September 19, 2023
October 2, 2023
October 20, 2023
November 6, 2023
January 19, 2024

At the January 19, 2024 meeting, the members reviewed the draft Report and voted on accepting the draft as updated with comments at that meeting and providing the final Report to the DPU, the Joint Committee on Telecommunications, Utilities, and Energy, the Senate and House Committees on Global Warming and Climate Change, and the Clerks of the Senate and House of Representatives.

Roll Call Vote: 17 yes and 2 abstain. **Yes** - AGO, DOER, DPU, MassDEP, Senator Barrett, LEAN, NCLC, PowerOptions, HEET, Buonocore, CLF, Wakefield Municipal, USW, Berkshire, Eversource, Liberty, National Grid, Unutil. **Abstain** – Representative Roy, USW.

Existing GSEP Statute

In 2014, the Massachusetts Legislature passed An Act Relative to Natural Gas Leaks (the “Gas Leaks Act”). The Gas Leaks Act permitted local distribution companies to submit to the Department of Public Utilities (“DPU”) annual plans to repair or replace aged natural gas infrastructure in the interest of public safety and to reduce lost and unaccounted for gas (“LAUF”). The Gas Leaks Act, as amended, states as follows:

Section 145: Plan for replacement or improvement of aging or leaking natural gas infrastructure

(a) For the purposes of this section, the following words shall, unless the context clearly requires otherwise, have the following meanings:—

“Customer”, a retail natural gas customer.

“Eligible infrastructure replacement”, a replacement or an improvement of existing infrastructure of a gas company that: (i) is made on or after January 1, 2015; (ii) is designed to improve public safety or infrastructure reliability; (iii) does not increase the revenue of a gas company by connecting an improvement for a principal purpose of serving new customers; (iv) reduces, or has the potential to reduce, lost and unaccounted for natural gas through a reduction in natural gas system leaks; (v) is not included in the current rate base of the gas company as determined in the gas company’s most recent rate proceeding; (vi) may include use of advanced leak repair technology approved by the department to repair an existing leak-prone gas pipe to extend the useful life of the such gas pipe by no less than 10 years; and (vii) may include replacing gas infrastructure with utility-scale non-emitting renewable thermal energy infrastructure.

“Plan”, a targeted infrastructure replacement program construction plan that a gas company files pursuant to subsection (b).

“Project”, an eligible infrastructure replacement project proposed by a gas company in a plan filed under this section.

(b) A gas company shall file with the department a plan to address aging or leaking natural gas infrastructure within the commonwealth and the leak rate on the gas company's natural gas infrastructure in the interest of public safety and reducing lost and unaccounted for natural gas through a reduction in natural gas system leaks. Each company's gas infrastructure plan shall include interim targets for the department's review. The

department shall review these interim targets to ensure each gas company is meeting the appropriate pace to reduce the leak rate on and to replace the gas company's natural gas infrastructure in a safe and timely manner. The interim targets shall be for periods of not more than 6 years or at the conclusion of 2 complete 3-year walking survey cycles conducted by the gas company. The gas companies shall incorporate these interim targets into timelines for removing all leak-prone infrastructure filed pursuant to subsection (c) and may update them based on overall progress. The department may levy a penalty against any gas company that fails to meet its interim target in an amount up to and including the equivalent of 2.5 per cent of such gas company's transmission and distribution service revenues for the previous calendar year.

- (c) Any plan filed with the department shall include, but not be limited to: (i) eligible infrastructure replacement of mains, services, meter sets and other ancillary facilities composed of non-cathodically protected steel, cast iron and wrought iron, prioritized to implement the federal gas distribution pipeline integrity management plan annually submitted to the department and consistent with subpart P of 49 C.F.R. part 192; (ii) an anticipated timeline for the completion of each project; (iii) the estimated cost of each project; (iv) rate change requests; (v) a description of customer costs and benefits under the plan; (vi) the relocations, where practical, of a meter located inside of a structure to the outside of said structure for the purpose of improving public safety; and (vii) any other information the department considers necessary to evaluate the plan.

As part of each plan filed under this section, a gas company shall include a timeline for removing all leak-prone infrastructure on an accelerated basis specifying an annual replacement pace and program end date with a target end date of: (i) not more than 20 years from the filing of a gas company's initial plan; or (ii) a reasonable target end date considering the allowable recovery cap established pursuant to subsection (f). The department shall not approve a timeline as part of a plan unless the allowable recovery cap established pursuant to subsection (f) provides the gas company with a reasonable opportunity to recover the costs associated with removing all leak-prone infrastructure on the accelerated basis set forth under the timeline utilizing the cost recovery mechanism established pursuant to this section. After filing the initial plan, a gas company shall, at 5-year intervals, provide the department with a summary of its replacement progress to date, a summary of work to be completed during the next 5 years and any similar information the department may require. The department may require a gas company to file an updated long-term timeline as part of a plan if it alters the cap established pursuant to subsection (f).

- (d) If a gas company files a plan on or before October 31 for the subsequent construction year, the department shall review the plan within 6 months. The plan shall be effective as of the date of filing, pending department review. The department may modify a plan prior to approval at the request of a gas company or make other modifications to a plan as a condition of approval. The department shall consider the costs and benefits of the plan including, but not limited to, impacts on ratepayers, reductions of lost and unaccounted for natural gas through a reduction in natural gas system leaks and improvements to public safety. The department shall give priority to plans narrowly tailored to addressing leak-prone infrastructure most immediately in need of replacement.
- (e) If a plan is in compliance with this section and the department determines the plan to reasonably accelerate eligible infrastructure replacement and provide benefits, the department shall issue preliminary acceptance of the plan in whole or in part. A gas company shall then be permitted to begin recovery of the estimated costs of projects included in the plan beginning on May 1 of the year following the initial filing and collect any revenue requirement, including depreciation, property taxes and return associated with the plan.
- (f) On or before May 1 of each year, a gas company shall file final project documentation for projects completed in the prior year to demonstrate substantial compliance with the plan approved pursuant to subsection (e) and that project costs were reasonably and prudently incurred. The department shall investigate project costs within 6 months of submission and shall approve and reconcile the authorized rate factor, if necessary, upon a determination that the costs were reasonable and prudent. Annual changes in the revenue requirement eligible for recovery shall not exceed (i) 1.5 per cent of the gas company's most recent calendar year total firm revenues, including gas revenues attributable to sales and transportation customers, or (ii) an amount determined by the department that is greater than 1.5 per cent of the gas company's most

recent calendar year total firm revenues, including gas revenues attributable to sales and transportation customers. Any revenue requirement approved by the department in excess of such cap may be deferred for recovery in the following year.

- (g) All rate change requests made to the department pursuant to an approved plan, shall be filed annually on a fully reconciling basis, subject to final determination by the department pursuant to subsection (f). The rate change included in a plan pursuant to section (c), reviewed pursuant to subsection (d) and taking effect each May 1 pursuant to subsection (e) shall be subject to investigation by the department pursuant to subsection (f) to determine whether the gas company has over collected or under collected its requested rate adjustment with such over collection or under collection reconciled annually. If the department determines that any of the costs were not reasonably or prudently incurred, the department shall disallow the costs and direct the gas company to refund the full value of the costs charged to customers with the appropriate carrying charges on the over-collected amounts. If the department determines that any of the costs were not in compliance with the approved plan, the department shall disallow the costs from the cost recovery mechanism established under this section and shall direct the gas company to refund the full value of the costs charged to customers with the appropriate carrying charges on the over collected amounts.
- (h) The department may promulgate rules and regulations under this section. The department may discontinue the replacement program and require a gas company to refund any costs charged to customers due to failure to substantially comply with a plan or failure to reasonably and prudently manage project costs.

Recommendations of the Working Group

This report represents a compilation of the recommendations of the working group to the Legislature. This section of the report is divided into two sections. Section A compiles the proposed revisions to the existing GSEP statute, section 145 of chapter 164. For each proposed revision, the proponent of such revision is identified, followed by a brief statement explaining the basis for the proposed change. Then other members of the working group supporting the revision are identified. If there is opposition to such revision, such opponents are identified, along with an explanation of the basis for such opposition.

Section B of the report examines broader concepts that are not captured by proposed legislative revisions, such as termination of the GSEP itself in favor of base rate recovery of the costs associated with measures to address leak-prone pipes.

A. Proposed Statutory Revisions

Several of the proposed statutory revisions involve terms that are used throughout the statute. To avoid redundancy, the following section identifies those proposed changes that would be made to terms that appear throughout the statute. The section thereafter lists the other proposed statutory changes.

1. Duplicative Changes

- Addition of “repair” (in addition to replace)

Note: HEET proposes “advanced leak repair” rather than “repair.”

Statute Locations: Section (a) – Definitions: Eligible Infrastructure Replacement, Plan, Project; Section (b); Section (c); Section (e).

Proposed by: Senator Barrett; EEA Agencies

Proposal Statements:

EEA Agencies - As a component for achieving net zero, the Commonwealth must reduce gross GHG emissions to at least 85% below the 1990 baseline level in 2050. Therefore, rather than solely investing in and installing new pipe infrastructure through the GSEPs, the GSEPs should determine where repairing leak-prone pipe is the better long-term financial and environmental choice.

Supported by: AGO; LEAN; NCLC; CLF; HEET (with clarification); PowerOptions; Jonathan Buonocore (with clarification)

Supporting Statements:

AGO – Including “repair” codifies the Department’s current interpretation of the GSEP statute and emphasizes the need to address leaks in a cost-effective manner to avoid stranded assets.

LEAN and NCLC (joint comments) - appropriately broadens potential alternative actions.

HEET (with clarification) –Advanced leak repair is the only type of repair currently allowed as part of the GSEP.³ Advanced leak repairs are different from normal repairs in that these types of repairs do not fix one leak at a time, but instead all the leaks along long sections of large diameter mains,⁴ significantly reducing or eliminating emissions from that section of the pipe for decades at a fraction of the cost of replacement.⁵ To ensure that gas utilities cannot access accelerated cost recovery funds for “normal” gas leak repairs, the term “repair” in the GSEP statute should have the word “advanced leak” in front of it. This edit should be enacted throughout the GSEP legislative language wherever repair is mentioned.

Jonathan Buonocore (with clarification) – The clarification seems appropriate and agree that this change allows for implementation of an option that removes known hazards related to utility gas distribution.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - Does not oppose the addition of repair to the extent this revision is concerned with maintaining the integrity of pipeline. Believes that while replacement is and should remain the preferred method of remediating compromised pipeline consistent with existing law that short- and or mid-term repairs in certain cases may also consistent with the original mission of the GSEP.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – The LDCs do not suggest or endorse the term “repair.” The proposed revisions to shift the focus of GSEP from pipeline replacement to repair are not consistent with the fundamental purpose of the statute and the public policy that underpins it. Namely, the elimination of all leak-prone infrastructure to maintain a safe and reliable gas distribution system and reduce GHG emissions. A shift in policy that prioritizes repair over replacement does not reduce the risk that leak-prone pipe poses to people, property, and the environment. Both cast iron and cathodically unprotected steel will continue to pose concerns as they age. As leak prone pipe gets older, the failure rate continues to increase (i.e., asset performance is not static and degrades over time). Each LDC’s DIMP is designed to reduce risk, improve safety, and eliminate emissions on the gas distribution system. The plain language of An Act Driving Clean Energy and Offshore Wind, St. 2022, c. 179, Section 68, states “that any change recommended shall enable natural gas local distribution companies to maintain a safe and reliable gas distribution system during the commonwealth’s transition to net zero emissions.” A shift in focus that favors "repair" over replacement is not only inconsistent with the LDC’s DIMP, but it also impinges on the LDCs’ business judgement concerning the management of a safe and reliable natural gas distribution system and is inconsistent with the plain language in the Drive Act. This also is inconsistent with the statutory mandate for the GSEP Working Group, which makes clear that any change to G.L. c. 164, § 145 must

³ See M.G.L.c. 164, § 145(a) “eligible infrastructure replacement.”

⁴ Large-diameter pipes are not known to rupture catastrophically during frost heaves and thus the main reason to replacement them is to reduce the emissions from their leaks.

⁵ Examples of advanced leak repair include sleeving (lining the inside of the pipe with a flexible plastic insert), robots (such as the CISBOTs, which can move down the pipes injecting the joints with a sealant), keyholing (small holes are created over the pipe joints to seal them without trenching), and cured-in-place pipeline renewal systems (lining the inside of pipes with a durable composite).

enable natural gas local distribution companies to maintain a safe and reliable gas distribution system. Moreover, it is more cost-effective and in the best interest of customers to replace pipe segments rather than undertaking extensive repairs that only serve to defer inevitable replacements.

Roll Call Vote: 11 yes, 7 no, and 1 abstain. **Yes** - AGO, DOER, DPU, MassDEP, Senator Barrett, LEAN, NCLC, PowerOptions, HEET, Buonocore, CLF. **No** – Wakefield Municipal, USW, Berkshire, Eversource, Liberty, National Grid, Unitil. **Abstain** – Representative Roy.

- Addition of “retirement” (in addition to replace)

Statute Locations: Section (a) – Definitions: Eligible Infrastructure Replacement, Plan, Project; Section (b); Section (c); Section (e).

Proposed by: Joint LDCs (Berkshire; Eversource Energy; Liberty; National Grid; Unitil)

Proposal Statements: Codifies DPU practice.

Supported by: AGO; LEAN; NCLC; CLF; HEET (with clarification); PowerOptions; Jonathan Buonocore (with clarification)

Supporting Statements:

AGO – Including “retirement” codifies the Department’s current interpretation of the GSEP statute and emphasizes the need to address leaks in a cost-effective manner to avoid stranded assets.

LEAN and NCLC (joint comments) - appropriately broadens potential alternative actions.

HEET (with clarification) – The Department has recently issued its Order on the future of gas (D.P.U. 20-80), the summary of which was titled “Beyond Gas.” The Commonwealth will transition off gas. The question now is how it will do that transition. Retirement and transition of gas pipes to water-based thermal systems are critical components of how to move beyond gas. Retirement means capping the gas pipe and moving the customer to all electric appliances. Transition would mean piping temperature through water to buildings. The water can deliver heating, or heating and cooling. The water could be heated (and/or cooled) in a central plant, or the water could be at an ambient temperature with heat pumps in each building taking the temperature needed from the water. Given the gas utilities’ understandable concerns about safety, it can only be assumed they will be relieved to deliver temperature through water, instead of through an explosive gas.

Jonathan Buonocore (with clarification) – The clarification seems appropriate and agree that this change allows for implementation of an option that removes known hazards related to utility gas distribution.

Opposed by: USW

Statements in Opposition:

USW - Believes that while replacement is and should remain the preferred method of remediating compromised pipeline consistent with existing law that short- and or mid-term repairs in certain cases may also consistent with the original mission of the GSEP. Opposes the inclusion of “retirement” because (1) no study was presented in the working group addressing how retirements could be performed (a) to preserve the safety and reliability of pipeline for remaining users, (b) ensure occupational safety working on remaining pipeline, (c) ensure that natural gas remains cost effective for users in communities where gas is retired. Additionally, is opposed because (2) the working group did not study how the retirement of pipeline would impact communities in which natural gas was no longer or only sporadically available, and (3) the working group did not consider how retirements would impact LDC workforces (and indirectly their communities) and how sufficient staffing would be preserved to address LDC pipeline through the completion of transition.

Roll Call Vote: 17 yes, 1 no, and 1 abstain. **Yes** - AGO, DOER, DPU, MassDEP, Senator Barrett, LEAN, NCLC, Wakefield Municipal, PowerOptions, HEET, Buonocore, CLF, Berkshire, Eversource, Liberty, National Grid, Unitil. **No** - USW. **Abstain** – Representative Roy. Note: DOER, DPU, Senator Barrett, LEAN, HEET, NCLC, Buonocore prefer inclusion of both repair and retirement.

- Addition of mandates from chapter 179 of Acts of 2022, including system security, consumer protection, public safety, infrastructure reliability, and income equity as well as reference to Chapter 21N.

Statute Locations: Section (a) – Definitions: Eligible Infrastructure Replacement; Section (b).

Proposed by: Senator Barrett; EEA Agencies (Chapter 21N reference)

Proposal Statement: Senator Barrett - The same phrasing without a definition is included in Chapter 179 of the Acts of 2022 where the Legislature gave the DPU as a six-part charge for affordability and reliability. These traditional responsibilities are among the six, but so are new responsibilities like system security and reductions in greenhouse gas emissions. Proposing to echo language the Legislature already found acceptable.

EEA Agencies - The GSEP statute should be amended to acknowledge that the GSEPs should not be inconsistent with the applicable statewide GHG limits and sublimits established pursuant to chapter 21N and the Commonwealth’s emissions strategies. The Commonwealth needs all its programs to work in concert to aid in the reduction of GHG emissions.

Supported by: AGO; LEAN; NCLC; HEET; PowerOptions; Jonathan Buonocore (with request); CLF; LDCs (Berkshire; Eversource; Liberty; National Grid; Unitil) (reference to Chapter 21 only)

Supporting Statements:

NCLC – Generally in support of consumer protections, primarily ratepayer protections including affordability programs and procedural protections for customers experiencing financial hardship. NCLC considers these to be distinct from maintenance and safety issues, such as replacement of leak prone pipe.

LEAN – “Infrastructure reliability” needs further specification.

LEAN and NCLC (joint comments) - We support prioritizing affordability concerns for low-income and moderate-income consumers. Specific low-income protections are also needed as described elsewhere.

HEET – Security is one of the six mandates of the Department (safety, security, reliability of service, affordability, equity, and greenhouse gas emission reductions). For purposes of clarity, it would be best to use the exact Department mandates. All six mandates should expressly be made part of the GSEP, the gas utilities’ most expensive program. System security in this case includes cybersecurity and other attacks. It is hard to understand why the gas utilities, which are so rightly concerned about safety, would not be strongly supportive of the security of a system filled with explosive gas running underneath major cities.

With respect to reference to Chapter 21N, The entire purpose of the GSEP working group is to align GSEP with the Commonwealth’s “applicable statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N and the commonwealth’s emissions strategies.” This stated purpose should be inserted in the legislative language anywhere it might be applicable. Sublimits are critical to ensure the state stays on track to meeting its mandate. In the following statements, the utilities and USW below are rightly concerned about maintaining the safety of the gas system. Moving the gas system to one that delivers temperature to customers using a non-explosive fluid, such as water, would help ensure the safety the utilities so deeply desire.

HEET and PowerOptions (joint comments) - Consumer protection is of course a critical point. Perhaps affordability should be added too since the gas utilities’ comments below conflate consumer protection with installing new expensive gas mains.

In addition, the six mandates for the Department include the term “equity.” Income equity is a much narrower term and can be considered redundant with affordability. Restricting equity to income would mean equity could not be considered in terms of safety, access, health, etc.

Jonathan Buonocore – Agree that there will be benefits to aligning the six mandates of the Department. Additionally, some careful thought will be needed in developing the definition and the measures to track

and verify “equity.” The definition of “equity” should carefully measure the distribution of populations receiving services and exposed to hazards from the utility gas system.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – The LDCs do not object to including the reference to Chapter 21N in the GSEP statute. However, the Department has already incorporated Chapter 21N into its standard of review for GSEP. Fitchburg Gas and Electric Light Company, D.P.U. 22-GSEP-01, at 8-9 (April 28, 2023) (stating that in reviewing GSEPS, the Department must “prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits **and sublimits established pursuant to chapter 21N.**”) (emphasis added). Therefore, as a practical matter, the proposed revision may be unnecessary. If the revision is deemed necessary, the LDCs propose the inclusion of the following language: “or to align with the applicable statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N.” This inclusion ensures compliance with Chapter 21N for gas distribution and services. The LDCs condition our support of the inclusion of this language on its application to associated methane emissions and not to building code considerations, which are beyond the scope of the stakeholder working group’s statutory mandate as set forth in the Drive Act.

Opposed by: USW; LDCs (Berkshire; Eversource; Liberty; National Grid; Unitil) (everything but reference to Chapter 21N)

Statements in Opposition:

USW – Does not oppose this so much as note that there are other key considerations—e.g., improvements in safety and reliability for the duration of the pipeline’s use—missing from the amendments.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) –The LDCs oppose the proposed revision of system security. It is unclear how the inclusion of “system security” relates to GSEP or how it would be defined within the context of the program for local distribution companies planning purposes. Although flexibility in a statute is helpful to respond to individual factual situations, laws should be drafted to provide clear standards for those who apply them (the Department) and those who must comply with them (the LDCs). The addition of vague considerations would erode the precision and clarity of statute and ultimately result in an unworkable standard. As a general matter, the LDCs support the principle of system security. However, the proposed revision is not defined and overly broad. As such, the proposed standard lends itself to application on an *ad hoc* and subjective basis and could present due process issues. Moreover, the concept of system security is already captured within the existing, objective standards of safety and reliability. For these reasons, LDCs opposes the addition of this new, stand-alone consideration.

As a general matter, the LDCs support the principle of consumer protection. However, the proposed revision is not defined, overly broad, and vague. As such, the proposed standard lends itself to application on an *ad hoc* and subjective basis and therefore should not be used as a determinative factor in evaluating compliance with GSEP. The replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC’s DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by PHMSA and the Department’s Pipeline Safety Division. Pursuant to the LDC’s DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. Moreover, the concept of consumer protection is already captured within the existing, objective standards of safety and reliability.

With respect to public safety, the focus of GSEP is to replace aging or leak-prone natural gas pipeline infrastructure in the interests of public safety, system reliability and methane emission reduction, which are overarching priorities that encompass this proposed revision; therefore, adding duplicative terms will only

needlessly complicate the interpretation of the statutory language. The inclusion of the phrase “improves public safety” is unnecessary because that purpose is already achieved by replacing aging or leaking natural gas pipeline infrastructure. The replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC’s DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by the PHMSA and the Department’s Pipeline Safety Division. Pursuant to each LDC’s DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. The inclusion of the phrase “improves public safety” is therefore duplicative and unnecessary.

As a general matter, the LDCs support the principle of income equity. However, the proposed revision is not defined, overly broad, and vague. As such, the proposed standard lends itself to application on an *ad hoc* and subjective basis and therefore should not be used as a determinative factor in evaluating compliance with GSEP. Indeed, there is no objectively reasonable way for the LDCs to factor income equity into the specific calculus of whether and when a pipe should be repaired or replaced. The replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC’s DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by PHMSA and the Department’s Pipeline Safety Division. Pursuant to the LDC’s DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. The timing of replacement is (and should continue to be) driven by objective factors: maintaining safety and reliability and addressing GHG emission. While income equity is important, it should be informative, not prescriptive, within the GSEP.

Roll Call Vote on EEA Agencies’ Inclusion of Chapter 21N: 11 yes, 6 yes with clarification as noted in Supporting Statements above, and 2 abstain. **Yes** - AGO, DOER, DPU, MassDEP, Senator Barrett, LEAN, NCLC, PowerOptions, HEET, Buonocore, CLF. **Yes with clarification** – Wakefield Municipal, Berkshire, Eversource, Liberty, National Grid, Unitil. **Abstain** – Representative Roy, USW.

- Replacing “lost and unaccounted for” with “emissions”

Statute Locations: Section (a) – Definitions: Eligible Infrastructure Replacement; Section (b); Section (d).

Proposed by: EEA Agencies; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Proposal Statements:

EEA Agencies - LAUF gas includes emissions, which should be a focus of GSEPs, but also includes other elements that are addressed in other ways, such that LAUF should not be referenced in the GSEP statute. For example, LAUF includes theft, meter error, billing cycle adjustments, and damage to pipelines. Each of these elements is important and already addressed through reporting to DPU and other requirements but is outside the scope of infrastructure planning that is the purview of GSEPs.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – LAUF gas is a broad definition for a concept that is beyond the direct scope of GSEP. LAUF is caused by a variety of factors, including meter accuracy, timing differences between billing measurements and the city gate and individual customer meters, measurement accuracy of liquid inventory (e.g., LNG, propane) and pipe leaks (i.e., fugitive emissions). Because gas leaks are only one component of LAUF, it is not a reliable proxy for measuring fugitive emissions on the distribution system. While GSEP can reduce the LDC’s LAUF gas, the term “associated methane emissions” would better represent the focus of GSEP. Additionally, the LDCs recommend the term “associated methane emissions” instead of “emissions” because, as the local

distribution companies have highlighted in numerous dockets over the years, some emissions are outside the control of a local distribution company.

Supported by: AGO; NCLC; HEET; PowerOptions; Jonathan Buonocore

Opposed by: USW

Statement in Opposition:

USW - GSEP's original purpose was to reduce methane emissions, which it has proven effective in doing. Methane emissions and carbon emissions are not the same. By changing the purpose of the GSEP, these amendments could unwittingly frustrate the GSEP's legislation's original purpose—i.e., leave leaky pipe emitting methane in the ground and impacting the communities in which it sits.

2. Other Statutory Changes

Section (a): Definitions

“Eligible Infrastructure Replacement”

- Change “Replacement” in title of section to a more inclusive term, such as “measure,” “act,” or “action.”

Proposed by: Senator Barrett

Proposal Statement: More inclusive term.

Supported by: AGO; LEAN; NCLC; CLF; HEET; PowerOptions; Jonathan Buonocore

Supporting Statements:

AGO – The Department has long interpreted GSEP to apply to infrastructure repairs, as well as replacements. Changing the term to “act” or “measure” both codifies the Department’s broader interpretation and includes the possibility of including natural gas infrastructure decommissioning in GSEP.

LEAN – Appropriately broadens potential alternative actions.

NCLC – Supports phased end to special cost recovery proposed by AGO; supports this language change if this definition needs to be retained.

HEET - Suggests “measure” as the more inclusive term since measure can mean “a plan or course of action toward a particular purpose.” The GSEP needs to create its course of action to meet the critical purpose of lowering emissions.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - Opposes this change because it is vague and because the working group has not, in any meaningful way, studied how the GSEP has improved system safety and reliability on the Commonwealth’s LDC pipelines nor how abandoning or substantially departing from the GSEP’s original purpose of accelerating replacement and repair of compromised pipeline would impact gas system safety and reliability.

LDCs (Berkshire, Eversource, Liberty, Unitil, National Grid) – The LDCs oppose this proposed revision. Substituting three vague terms (i.e., “measure,” “act,” or “action”) for “replacement,” an accepted and well-understood concept central to the Department’s interpretation of the GSEP, serves only to muddy the intent of the statute and frustrate its application. Moreover, such a revision is unnecessary, as the term “Replacement” does not prescribe the like-for-like replacement of nature gas infrastructure but is broad enough to include the replacement of natural gas infrastructure with other non-gas pipe alternatives.

The LDCs are also concerned that the proposed revisions may shift the focus of GSEP from away from pipeline replacement, which is not consistent with the fundamental purpose of the statute and the public policy that underpins it. Namely, the elimination of all leak-prone infrastructure to maintain a safe and reliable gas distribution system and reduce greenhouse gas emissions. A shift in policy away from the replacement of leak-prone pipe does not reduce the risk that leak-prone pipe poses to people, property, and the environment. As required by 49 C.F.R. § 192 Subpart P, the LDCs must implement Distribution

Integrity Management Programs (“DIMPs”) that require operators to identify threats and implement measures designed to reduce risk from failure of its gas distribution pipeline.

The Legislature included a specific requirement in Section 145 that any GSEP plan must be structured so that infrastructure scheduled for replacement is prioritized to implement a company’s DIMP. G.L. c. 164, § 145(c). The gas leaks on leak-prone pipe are a result of material failure (e.g., corrosion, graphitization, cast-iron breaks) and the only way to reduce the risk from material failure is replacement. Both cast iron and cathodically unprotected steel will continue to pose concerns as they age. As leak prone pipe gets older, the failure rate continues to increase (i.e., asset performance is not static and degrades over time). To shift the focus away from replacement is inconsistent with the requirements of an LDCs’ DIMP and is inconsistent with the statutory mandate for the GSEP Working Group, which makes clear that any change to G.L. c. 164, § 145 must enable natural gas local distribution companies to maintain a safe and reliable gas distribution system. In addition, a shift away from replacement is contrary to the recommendations of the Statewide Assessment of Gas Pipeline Safety for the Commonwealth of Massachusetts that advocated for gas companies, state agencies, and interested parties to accelerate the pace of replacing leak-prone pipe. Moreover, it is more cost-effective and in the best interest of customers to replace pipe segments rather than undertaking extensive repairs, which only serve to defer inevitable replacements.

Roll Call Vote: 11 yes, 7 no, and 1 abstain. **Yes** - AGO, DOER, DPU, MassDEP, Senator Barrett, LEAN, NCLC, PowerOptions, HEET, Buonocore, CLF. **No** – Wakefield Municipal, USW, Berkshire, Eversource, Liberty, National Grid, Unitil. **Abstain** – Representative Roy.

- Additional considerations in determining eligible infrastructure replacement
- Minimization of stranded assets

Proposed by: EEA Agencies

Proposal Statement: The Massachusetts LDCs’ GSEPs include significant anticipated infrastructure investments that are designated for their current operating systems. Policies included in the 2025/2030 and 2050 Clean Energy and Climate Plans aim to reduce GHG emissions from the buildings sector, which will substantially reduce natural gas usage for heating. As a result, new investments in the gas distribution system will need to be recovered over an economic life of 10 to 30 years or less, rather than the 40- to 60-year recovery period that is currently in place. Including new options in the GSEPs (such as repair, retirement or electrification, and analysis of options), instead of solely focusing on replacement of pipelines and services, will help minimize stranded assets.

Supported by: AGO; CLF; LEAN; NCLC; HEET; PowerOptions; Jonathan Buonocore

Supporting Statements:

AGO - Minimizing stranded assets is critical from the ratepayer perspective. Ratepayers should not bear the cost of modernizing natural gas infrastructure that will be decommissioned long before its useful life ends. This is especially important for low-income ratepayers who are less likely to transition to renewable energy in the near-term and will remain on the gas system.

LEAN – Care is needed in drafting since minimizing stranded assets, by itself, can, for example, increase rates (if by accelerating depreciation) and exacerbate environmental concerns.

CLF - In its Order for D.P.U. 20-80-B, the Department of Public Utilities directed LDCs to conduct a comprehensive review of the issue of depreciation and stranded assets, including forecasting of the potential magnitude of stranded assets and identifying potential alternatives to accelerated depreciation. (D.P.U. 20-80-B at 101). Common sense dictates that this review will be used to minimize the costs associated with stranded gas pipeline assets; accordingly, the Legislature’s consideration of this matter is warranted.

NCLC – Supports minimization of new investments which are likely destined to become stranded assets and supports EEA statement urging the inclusion of new options such as non-gas pipe alternatives in the GSEP. Financial support from sources other than ratepayer funds will likely be needed to address stranded assets which cannot be avoided, as well as affordability programs for residential ratepayers.

HEET (with clarification) – If the Department accelerates depreciation of gas assets, it should also create a phased plan to decommission them as they are paid off, in a way that maintains safety and reliability. Otherwise, it is possible the customers will have to rush to pay for these assets by 2050, while the assets continue to be used long past that point, producing emissions in the Commonwealth and revenue for the local gas utility.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol)

Statements in Opposition:

USW - Does not oppose this so much as note that there are other key considerations—e.g., improvements in safety and reliability for the duration of the pipeline’s use—missing from the amendments.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol) – The LDCs oppose this proposed revision. The addition of “minimization of stranded assets” is outside the scope of the stakeholder working group’s statutory mandate as set forth in the Drive Act. The proposed revision presumes that utility investments in the natural gas distribution system will be stranded, which is logically inconsistent with the principal purpose of the GSEP statute, i.e., recognizing that ongoing investment in the system is necessary to provide customers with **safe and reliable** service. See Fitchburg Gas and Electric Light Company, D.P.U. 21-GSEP-01, at 9 n.18 (noting that despite the AGO’s contention that new mains and services installed could be obsolete in under 30 years, the Company has an obligation to provide service to customers in a safe and reliable manner while also reducing the effects of aging or leaking natural gas infrastructure). Indeed, St. 2022, c. 179 s. 68, (the statute creating the GSEP Working Group) clearly states that “any change [to the GSEP statute] recommended shall enable natural gas local distribution companies **to maintain a safe and reliable gas distribution system** during the commonwealth’s transition to net zero emissions.” The replacement of leak-prone pipe should continue to be based on the risk scores pursuant to an LDC’s DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by the U.S. Department of Transportation’s Pipeline and Hazardous Materials Safety Administration (“PHMSA”) and the Department’s Pipeline Safety Division. Pursuant to the LDC’s DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within each company’s distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. Lastly, the plain language of An Act Driving Clean Energy and Offshore Wind, St. 2022, c. 179, Section 68 states “that any change recommended shall enable natural gas local distribution companies to maintain a safe and reliable gas distribution system during the commonwealth’s transition to net zero emissions.” Therefore, the addition of “minimization of stranded assets” is not only inconsistent with an LDC’s DIMP, but it also impinges on the Company’s business judgement concerning the management of a safe and reliable natural gas distribution system and is inconsistent with the plain language in the Drive Act.

Roll Call Vote: 10 yes, 7 no, and 2 abstain. **Yes** - AGO, DOER, DPU, MassDEP, Senator Barrett, NCLC, PowerOptions, HEET, Buonocore, CLF. **No** – Wakefield Municipal, USW, Berkshire, Eversource, Liberty, National Grid, Unitol. **Abstain** – Representative Roy, LEAN.

- No increase in pipeline capacity

Proposed by: HEET

Proposal Statement: The purpose of GSEP, as well as the accelerated cost recovery that is part of the program, is to improve the safety of local customers, not to increase the amount of gas that can be sold. Investing in increasing the capacity of the gas system will only increase the potential for stranded assets as the Commonwealth moves “beyond gas” as stated in the Department’s future of gas Order (D.P.U. 20-80).

Supported by: AGO; LEAN; NCLC; CLF; EEA Agencies; Jonathan Buonocore

Supporting Statements:

LEAN - Consider total capacity of the gas system without specific approval of the DPU.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol)

Statements in Opposition:

USW - To the extent this is meant to curb the expansion of natural gas use, this is not related to the GSEP's purpose, which is to remediate existing infrastructure. Additional amendment to other sections of the law would be needed to address this. To the extent this is about limiting the discretion of LDCs to increase pipeline diameter, opposes this because it would limit LDC's discretion to select pipeline maximizing system safety/reliability and the working group did not consider, based on data, how the inclusion of such a provision would affect safety, reliability, and cost on existing users. This change fails to provide any labor standards consistent with the economic development purposes of the Commonwealth; labor standards were not considered by the working group consistent with this proposed amendment.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol) - Conceptually, LDCs are already prohibited from using the GSEP to spur the growth of the distribution system. Thus, "No increase in pipeline capacity" is already prohibited under the plain language of the GSEP since an increase in pipeline capacity "to increase the revenue of a gas company by connecting an improvement for a principal purpose of serving new customers" is not eligible for GSEP recovery. Furthermore, there are circumstances where, from an engineering perspective, a GSEP project may require an increase in pipe diameter, which is currently allowed pursuant to Department precedent. In other instances, gas companies may choose to replace low pressure leak prone pipe with pipe that operates at a higher pressure for the purpose of improving the ability to protect pipe against over pressurization. In both examples, capacity would be increased, but is not the primary driver for the project. While the LDCs maintain that this proposed language is duplicative, if inclusion is deemed necessary, the LDCs recommend that "no increase in pipeline capacity" be amended to read "for the primary purpose of increasing capacity." The alternative language allows for circumstances where a pipeline capacity increase is warranted and required for system reliability and safety based on engineering standards.

- May include "non-gas pipe alternatives"

Proposed by: LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol)

Proposal Statements: While the LDCs are generally supportive of non-gas pipe alternatives ("NPAs"), the recommendation to require NPAs as an alternative to traditional GSEP replacement projects is overly broad and does not reflect the primary responsibility of the LDCs, and the intent of the GSEP statute, to maintain safe and reliable gas distribution systems. The inclusion of NPAs as a potential alternative to GSEP adds an additional layer of complexity to GSEP due to the significant time and effort it would take to identify and evaluate every GSEP project. A NPA screening criteria would be essential to screen GSEP projects to determine if a NPA should be considered as an alternative to traditional pipe replacement. This approach enables each LDC's GSEP planning process by identifying criteria, methods, and practices for efficient screening of NPAs assuming the NPA is determined to be affordable and feasible by the local distribution company. Codifying language requiring "affordable and feasible" NPAs in a statute without first developing a NPA analysis screening process, a NPA analysis framework, and a criterion to define "affordable and feasible" is problematic. For example, the screening criteria should include, but is not limited to, the project's operational feasibility, system impact, risk score, size, scope, timing, number of customers, compliance with federal and state pipeline safety regulations including DIMP, and costs. Developing the screening criteria to determine project feasibility will allow LDCs to identify potential projects where a NPA in lieu of traditional pipe replacement should be considered (e.g., focusing on radial projects that do not impact system reliability and lower-risk projects that are not scheduled to be replaced for 2-3+ years).

The LDCs do not believe it is practical or efficient to evaluate a NPA for all GSEP projects, and in fact, may result in delays to replacement of high-risk leak prone pipe, having a negative impact on safety. As a practical matter, the LDCs cannot be expected to undertake such an analysis for every main or service replacement project or quickly adjust schedules and/or project scopes in coordination with municipal

paving schedules, which often dictate when the LDC must perform the work. Evaluating NPAs for specific locations requires more time and planning than traditional GSEP replacement projects, and consideration must be given for any changes in pipe performance, which may necessitate accelerating replacement for specific main segments and services. It will take significant time to advance a NPA to a point where it is ready to consider gauging customer interest, evaluating supporting geography, diversity of load and electric system constraints, and if the risk score for a segment rises during the evaluation period, a LDC may be required to abandon consideration of the NPA to meet its obligation to maintain safe and reliable service. Additionally, the development of a NPA screening process is better addressed in the context of D.P.U. 20-80. Ultimately, the Department, in reviewing the GSEPs, must prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N.

Supported by: LEAN; NCLC; HEET (with clarification); Jonathan Buonocore

Supporting Statements:

HEET (with clarification) – The term should be “non-gas pipe alternatives,” not “non-pipe alternatives.” This change is suggested since there are types of pipes, for instance pipes filled with water, that could supply heating and cooling to customers while meeting the Commonwealth’s emissions mandates and improving safety. HEET’s support for this change to the GSEP statute is of course dependent on the definition of non-gas pipe alternative. Please note that HEET supports a specific definition of non-gas pipe alternative,⁶ which includes the options of: (1) advanced leak repair; (2) replacement with renewable thermal infrastructure; and (3) retirement of the eligible infrastructure.

Jonathan Buonocore - Suggest that change as well to clarify that alternatives without known hazards are available under this rule. It is worth noting that along with the previously stated hazards related to the existing gas utility system (explosions, emissions, presence of hazardous air pollutants in utility gas), hazards still exist with gas pipe alternatives. “Renewable” natural gas is still methane, therefore if it leaks it will still have climate forcing properties, and the potential concentration of hazardous air pollutants in utility gas when delivered is still unknown. Hydrogen gas can also leak and poses an explosion hazard. Broadening this definition to include non-gas pipe alternative will make options without known hazards available.

Opposed by: USW

Statement in Opposition:

USW - The introduction of non-pipe alternatives represents a significant departure from GSEP’s original purpose to reduce chronically leaky/compromised pipeline already present in communities around the Commonwealth; the working group did not study how moving away from GSEP’s original purpose would affect system safety, reliability, and cost for those remaining on the system and the Commonwealth more broadly. This change fails to provide any labor standards consistent with the economic development purposes of the Commonwealth; labor standards were not considered by the working group consistent with this proposed amendment.

- May include “non-pipe alternatives,” with preference for locations in communities with environmental justice concerned (rephrased from “EJ communities”)

Proposed by: LEAN and NCLC (joint proposal)

Proposal Statement: Communities with environmental justice concerns are explicitly included here to be consistent with equity goals in state energy and climate statutes. To the extent feasible, these

⁶ HEET’s definition: “Non-gas pipe alternative,” a replacement, retirement, or advanced leak repair of eligible infrastructure that delays, reduces, or avoids the need to install new gas pipe while maintaining the safety and reliability of the gas system, as well as reducing greenhouse gas emissions as defined in Section 1 of Chapter 21N. Such alternative may include, but is not limited to, a non-emitting renewable thermal infrastructure project.

communities could be prioritized for electrification and/or networked thermal heat, and targeted decommissioning.

Supported by: HEET (with clarification); Jonathan Buonocore (with clarification); LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol) (with clarification)

Supporting Statements:

HEET (with clarification) – the intent of this edit is to ensure equitable access to non-gas pipe alternatives for all customers. However, the designation of “EJ community” is only a rough statistical proxy for a disadvantaged community (for instance, a large portion of Lexington is designated as an “EJ community”). An alternative for the suggested language might be to use the Justice40 disadvantaged community designation or to institute performance-based ratemaking that takes into account the percentage of low-to-moderate income customers connected to that year’s non-gas pipe alternatives. This could ensure equitable access while allowing non-gas pipe alternatives to be installed widely.

Jonathan Buonocore – Agree that Justice40 may function as a better definition of DJ communities.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol) (with clarification) – As described in additional detail in the LDCs statement regarding non-pipe alternatives, the LDCs are generally supportive of this concept; however, the location of the non-pipe alternatives in EJ communities should be a consideration rather than a preference. The location of a non-pipe alternatives would be based on affordability and feasibility. However, the primary focus of the GSEP must remain on pipe replacement based on risk score prioritization through identification in each LDC’s DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by the PHMSA and the Department’s Pipeline Safety Division. Pursuant to each LDC’s DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. Lastly, the plain language of An Act Driving Clean Energy and Offshore Wind, St. 2022, c. 179, Section 68 states “that any change recommended shall enable natural gas local distribution companies to maintain a safe and reliable gas distribution system during the commonwealth’s transition to net zero emissions.” Therefore, requiring a preference for locations in EJ communities, though well-intentioned, is not only inconsistent with the LDC's DIMP, but it also impinges on the LDC's business judgement concerning the management of a safe and reliable natural gas distribution system and is inconsistent with the plain language in the Drive Act.

Opposed by: USW

Statement in Opposition:

USW - The introduction of non-pipe alternatives represents a significant departure from GSEP’s original purpose to reduce chronically leaky/compromised pipeline already present in communities around the Commonwealth; the working group did not study how moving away from GSEP’s original purpose would affect system safety, reliability, and cost for those remaining on the system and the Commonwealth more broadly. This change fails to provide any labor standards consistent with the economic development purposes of the Commonwealth; labor standards were not considered by the working group consistent with this proposed amendment.

- Requires consideration of “non-gas pipe alternative,” and a finding that such alternative is infeasible or not cost-effective

Proposed by: HEET; PowerOptions (but notes that text should read “(viii) shall be a non-gas pipe alternative unless demonstrated by a gas company to be not feasible or not cost effective.”)

Proposal Statement: HEET and PowerOptions (joint statement) - To reduce stranded gas assets in the future as the Commonwealth transitions to clean electricity, non-gas pipe alternatives must be the prevailing assumptions for all GSEP pipe replacements. They should be installed wherever feasible and financially viable. How to determine the feasibility and financial viability will change over time as

technology and costs change. Thus, it is best to allow the Department to regularly assess how best to define these two terms. One potential method for cost effectiveness would be that the proposed measure is predicted to provide customers with heating at an affordable cost throughout its “used and useful” lifetime. Given that gas infrastructure is not likely to be widely used and useful past the Commonwealth’s net zero emission mandate of 2050, it is likely that many non-gas pipe alternatives will be projected to provide customer heating at a more affordable cost over their longer lifespan than new gas infrastructure.

Supported by: AGO; LEAN; NCLC; CLF; EEA Agencies; Jonathan Buonocore

Supporting Statements:

AGO – NPA analysis as a prerequisite to GSEP approval requires LDCs to be proactive about the transition to renewable energy. Although the AGO strongly supports NPA analysis as a requirement, investments in non-gas pipe alternatives should not be eligible for accelerated cost recovery. Accelerated cost recovery is not the appropriate incentive for new renewable energy infrastructure due to the cost burden on ratepayers and current uncertainty around the cost and scalability of new technology.

LEAN – Consider adding “or not affordable” to considerations. Note also that, for low-income customers, immediate bill impacts are more salient than long-term effectiveness.

CLF - In its Order in D.P.U. 20-80-B, the DPU found “that consideration of non-gas pipeline alternatives [...] is necessary to minimize investments in the gas pipeline system that may be stranded costs in the future as decarbonization measures are implemented.” (D.P.U. 20-80-B at 2). The Department defined non-gas pipeline alternatives broadly as inclusive of electrification, networked thermal, targeted energy efficiency, demand response, and behavioral and market changes. Notably, the Department stated in D.P.U. 20-80-B that in future petitions for cost recovery, LDCs must show adequate consideration of non-gas pipeline alternatives and demonstrate a lack of viability to receive approval. (D.P.U. 20-80-B at 2).

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol)

Statements in Opposition:

USW - The introduction of non-pipe alternatives represents a significant departure from GSEP’s original purpose to reduce chronically leaky/compromised pipeline already present in communities around the Commonwealth; the working group did not study how moving away from GSEP’s original purpose would affect system safety, reliability, and cost for those remaining on the system and the Commonwealth more broadly. This change fails to provide any labor standards consistent with the economic development purposes of the Commonwealth; labor standards were not considered by the working group consistent with this proposed amendment.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol) – The LDCs oppose this proposed revision. The LDCs are generally supportive of the inclusion of “non-pipe alternatives” assuming the NPA screening criteria is met and determined the NPA to be both affordable **and** feasible by the local distribution company and the NPA has been reviewed and approved by the Department in the context of the GSEP. Accordingly, the LDCs recommend revising the proposed language, “feasible or not cost-effective,” to read “feasible and cost-effective.” The same Department standard of review of the GSEP also should apply to non-pipe alternatives. The Department, in reviewing the GSEPs, must prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N. The inclusion of “a finding that such alternative is infeasible or not cost-effective” presumes that the installation of a non-pipe alternative is the preference for GSEP planning.

Roll Call Vote (noting proposal does not relate to accelerated cost recovery): 11 yes, 7 no, and 1 abstain. **Yes** - AGO, DOER, DPU, MassDEP, Senator Barrett, LEAN, NCLC, PowerOptions, HEET, Buonocore, CLF. **No** – Wakefield Municipal, USW, Berkshire, Eversource, Liberty, National Grid, Unitol. **Abstain** – Representative Roy.

- Addition of definition of “non-gas pipe alternative”

Proposed by:

EEA Agencies: “Non-pipe alternative” means activities or investments that delay, reduce, or avoid the need to build or upgrade traditional natural gas infrastructure, including, but not limited to, non-emitting renewable thermal infrastructure project defined in section 147A of chapter 164. (M.G.L. c. 164, § 147A)

HEET: “Non-gas pipe alternative,” a replacement, retirement or advanced leak repair of eligible infrastructure that delays, reduces, or avoids the need to install new gas pipe while maintaining the safety and reliability of the gas system, as well as reducing greenhouse gas emissions as defined in section 1 of chapter 21N. Such alternative may include, but is not limited to, a non-emitting renewable thermal infrastructure project.

Proposal Statements:

EEA Agencies - NPAs are an emerging cost and mitigation tool that can provide an opportunity to reduce emissions, gas system costs, and customer risk by avoiding unnecessary infrastructure spending. Inclusion of the reference to M.G.L. c. 164, § 147A was to ensure that geothermal projects (which do utilize pipes) could be considered NPAs.

HEET (with clarification) – The current definition in M.G.L. c. 164, § 147A is not specific to aging or leak prone infrastructure and does not specifically reduce emissions. The way this definition is written, GSEP’s accelerated cost recovery funds could pay for (a) energy efficiency measures or conservation methods throughout the state, or (b) infrastructure to manufacture or deliver blue hydrogen. Such measures would not result in leak-prone pipes being replaced, and thus would not ensure safety in any way for the residents near those pipes, nor would it reduce emissions from those leak-prone pipes.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – While the LDCs are generally supportive of non-pipe alternatives (“NPAs”), the recommendation to require NPAs as an alternative to traditional GSEP replacement projects is overly broad and does not reflect the primary responsibility of the LDCs, and the intent of the GSEP statute, to maintain safe and reliable gas distribution systems. The inclusion of NPAs as a potential alternative to GSEP adds an additional layer of complexity to GSEP due to the significant time and effort it would take to identify and evaluate every GSEP project. A NPA screening criteria would be essential to screen GSEP projects to determine if a NPA should be considered as an alternative to traditional pipe replacement. This approach enables the LDC’s GSEP planning process by identifying criteria, methods, and practices for efficient screening of NPAs assuming the NPA is determined to be affordable and feasible by the local distribution company. Codifying language requiring “affordable and feasible” NPAs in a statute without first developing a NPA analysis screening process, a NPA analysis framework, and a criterion to define “affordable and feasible” is problematic. For example, the screening criteria should include, but is not limited to, the project’s operational feasibility, system impact, risk score, size, scope, timing, number of customers, compliance with federal and state pipeline safety regulations including DIMP, and costs. Developing the screening criteria to determine project feasibility will allow LDCs to identify potential projects where a NPA in lieu of traditional pipe replacement should be considered (e.g., focusing on radial projects that do not impact system reliability and lower-risk projects that are not scheduled to be replaced for 2-3+ years).

The LDCs do not believe it is practical or efficient to evaluate a NPA for all GSEP projects, and in fact, may result in delays to replacement of high-risk leak prone pipe, having a negative impact on safety. As a practical matter, the LDCs cannot be expected to undertake such an analysis for every main or service replacement project or quickly adjust schedules and/or project scopes in coordination with municipal paving schedules, which often dictate when the LDC must perform the work. Evaluating NPAs for specific locations requires more time and planning than traditional GSEP replacement projects, and consideration must be given for any changes in pipe performance, which may necessitate accelerating replacement for specific main segments and services. It will take significant time to advance a NPA to a point where it is ready to consider gauging customer interest, evaluating supporting geography,

diversity of load and electric system constraints, and if the risk score for a segment rises during the evaluation period, a LDC may be required to abandon consideration of the NPA to meet its obligation to maintain safe and reliable service. Additionally, the development of a NPA screening process is better addressed in the context of D.P.U. 20-80. Ultimately, the Department, in reviewing the GSEPs, must prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N.

Supported by: PowerOptions; Jonathan Buonocore

Opposed by: USW

Statements in Opposition:

USW - The introduction of NPAs represents a significant departure from GSEP’s original purpose to reduce chronically leaky/compromised pipeline already present in communities around the Commonwealth; the working group did not study how moving away from GSEP’s original purpose would affect system safety, reliability, and cost for those remaining on the system and the Commonwealth more broadly. This change fails to provide any labor standards consistent with the economic development purposes of the Commonwealth; labor standards were not considered by the working group consistent with this proposed amendment.

- Including non-emitting renewable thermal infrastructure projects

Proposed by: EEA Agencies; HEET

Proposal Statements:

EEA Agencies - Non-emitting renewable thermal infrastructure projects⁷ are an emerging cost and mitigation tool that can provide an opportunity to reduce emissions, gas system costs, and customer risk by avoiding unnecessary infrastructure spending, and should be one of the options eligible to be implemented through GSEPs.

HEET – This text adds clarity about the permissible options for the non-gas pipe alternative.

Supported by: AGO; NCLC; CLF; PowerOptions; Jonathan Buonocore

Supporting Statements:

Jonathan Buonocore - This text clarifies additional options to explicitly include options free of many known hazards.

CLF - In its Order in D.P.U. 20-80-B, the DPU found “that consideration of non-gas pipeline alternatives [including networked thermal] is necessary to minimize investments in the gas pipeline system that may be stranded costs in the future as decarbonization measures are implemented.” (D.P.U. 20-80-B at 2).

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - The introduction of non-emitting thermal infrastructure represents a significant departure from GSEP’s original purpose to reduce chronically leaky/compromised pipeline already present in communities around the Commonwealth; the working group did not study how moving away from GSEP’s original purpose would affect system safety, reliability, and cost for those remaining on the system and the Commonwealth more broadly. Additional legislation would be necessary to address planning for non-emitting thermal infrastructure that is not contemplated by these amendments. This change fails to provide any labor standards consistent with the economic development purposes of the Commonwealth; labor standards were not considered by the working group consistent with this proposed amendment.

⁷ <https://malegislature.gov/Laws/GeneralLaws/PartI/TitleXXII/Chapter164/Section147a>

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – The LDCs are generally supportive of the inclusion of “non-pipe alternatives” assuming the non-pipe alternative screening criteria is met and determined the NPA to be affordable and feasible by the local distribution company and has been reviewed and approved by the Department in the context of the GSEP. The LDCs recommend defining “non-gas pipe alternative” as facilities other than new gas system pipe installed to replace or retire existing gas infrastructure. Including “non-emitting renewable thermal infrastructure projects” in the definition of non-pipe alternatives creates an unnecessary presumed preference of non-pipe alternatives and potentially narrows the possibility of potential projects that ultimately could be included.

“Plan”

- Can be in conjunction with an electric distribution company

Proposed by: Senator Barrett

Proposal Statement: Need joint planning to ensure that the gas and electric companies coordinate.

Supported by: AGO; LEAN; NCLC; CLF; HEET (with clarification); PowerOptions; EEA Agencies; Jonathan Buonocore

Supporting Statements:

CLF - Electrification has been established as the most economical path to achievement of Massachusetts’ net-zero greenhouse gas emissions mandate. (MA EEA, Clean Energy and Climate Plan for 2050 at xiv). In its Order in D.P.U. 20-80-B, the DPU directed the LDCs to work with the relevant electric distribution companies “to study the feasibility of of piloting a targeted electrification project in its service territory and to propose at least one demonstration project in its service territory for decommissioning an area of the gas pipeline system via targeted electrification. (D.P.U. 20-80-B at 87). Coordinating work under the GSEP with electrification is a necessary and reasonable tactic for the achievement of Massachusetts’ decarbonization goals.

HEET (with clarification) - Since the Massachusetts gas system at its peak can contain four times the energy of the electric system, what happens to the gas system will deeply impact the electric system. Integrated planning will help increase the speed, safety, and reliability of moving beyond gas, while decreasing the cost. HEET suggests that this electric and gas integrated planning should be a requirement. Such an integrated plan should be street-segment based and phased, to allow the gas system to be aligned over time with the Commonwealth’s net zero emissions mandate.

Jonathan Buonocore – Since many strategies that affect the gas system will put energy load on the electrical grid, making this integration with the electric utilities explicit will clarify a necessary component of implementing these strategies – planning and coordination in tandem with electrical utilities – is permitted.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - The introduction of planning with electrical utilities represents a significant departure from GSEP’s original purpose to reduce chronically leaky/compromised pipeline already present in communities around the Commonwealth; the working group did not study how moving away from GSEP’s original purpose would affect system safety, reliability, and cost for those remaining on the system and the Commonwealth more broadly. Believes that the primary focus of GSEP should remain on system safety and reliability.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – The LDCs oppose this proposed revision. The concept of integrated energy planning between electric and gas distribution companies is beyond the statutory mandate of the GSEP Working Group. The breadth and import of the legal, regulatory, operational, and financial issues implicated by an integrated planning framework require a more comprehensive and deliberate examination of those matters. The LDCs also opposes the proposal for GSEP planning to be done in conjunction with “other parties.” Including third parties in capital planning could introduce counter-productive interference by parties advocating for special interests and delay into the management and safe and reliable operation of the Commonwealth’s utility systems. This, in turn, would increase operational risk and increase costs to customers. This proposal also is inconsistent with

long-standing Department precedent deferring to the judgment and expertise of regulated local distribution companies when it comes to operating and maintaining their systems safely and reliably. In addition, it would not be appropriate to allow system planning to be done by entities that bear none of the safety, reliability, financial, customer service, or regulatory risk associated with owning and operating a gas system.

- Requires consideration of “all reasonable [non-combusting] alternatives to natural gas”

Proposed by: LEAN and NCLC (joint proposal) – with amendment

Proposal Statement: We recommended this as consistent with meeting the emissions goals of Chapter 21N but must offer one amendment to our original suggestion – requiring consideration of “all reasonable **non-combusting** alternatives to natural gas.” This is intended to support development of networked thermal heat as well as non-pipe alternatives. However, the addition of “non-combusting” is needed to clarify the alternatives that are being specified, and that these alternatives do not include potentially expensive and dangerous alternatives such as hydrogen blending. It is possible that this entire revision would not be needed, in light of the addition of “non-pipe alternatives” to the definition section.

Supported by: AGO; HEET (with clarification); Jonathan Buonocore (with clarification)

Supporting Statements:

HEET (with clarification) - If non-gas pipe alternatives are required wherever economically feasible, “all reasonable alternatives to natural gas” would not be needed. If NCLC and LEAN still want to use this language, then given that RNG and hydrogen are more expensive than natural gas and both gasses still create emissions, HEET suggests changing the language to requiring consideration of “non-gas pipe alternatives” instead of “all reasonable alternatives to natural gas.”

Jonathan Buonocore (with clarification) – This change further clarifies that consideration of alternatives without many known hazards can be considered.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unital)

Statements in Opposition:

USW - The introduction of planning with a focus on “all reasonable alternatives to natural gas” represents a significant departure from GSEP’s original purpose to reduce chronically leaky/compromised pipeline already present in communities around the Commonwealth; the working group did not study how moving away from GSEP’s original purpose would affect system safety, reliability, and cost for those remaining on the system and the Commonwealth more broadly. Believes that the primary focus of GSEP should remain on natural gas system safety and reliability. The working group also failed to consider how departing from GSEP’s original purpose would impact LDC system safety and reliability.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unital) – The LDCs oppose this proposed revision. The focus of GSEP is to replace aging or leak-prone natural gas pipeline infrastructure in the interest of public safety. The replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC’s DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by the PHMSA and the Department’s Pipeline Safety Division. Pursuant to each LDC’s DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. The Department, in reviewing the GSEPs, must prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N. Any additions to the Department’s standard of review should be left to the broad oversight of the Department and not prescribed by legislation.

- Analysis must include consideration of emissions reductions, reliability, safety, resilience, customers costs, public health and other benefits, and risks

Proposed by: LEAN and NCLC (joint proposal)

Proposal Statement: Proposed for consistency with the statutory objectives of this Working Group, as well as of Chapter 21N.

Supported by: AGO; CLF; HEET (with clarification); Jonathan Buonocore (with clarification)

Supporting Statements:

HEET (with clarification) - It is possible for a utility to “consider” these items and not explain how the plans were considered, nor factor these items in any way into its plans. To strengthen this provision, HEET suggests instead that the consideration must be written down, explaining how the plan meets the Department’s mandates (safety, security, reliability of service, affordability, equity, and greenhouse gas emission reductions). If the utilities are unsure about how to do this best, the Department could potentially offer guidance.

Jonathan Buonocore (with clarification) – The consideration and analysis should be written down and include a presentation of evidence that the plan meets the mandate.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - Opposed insofar as it is inextricably linked to requiring that the plan include “all reasonable alternatives to natural gas”; is supportive of including these measures in considering GSEP pipeline replacement and repairs [as described above].

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – The LDCs oppose this proposed revision. The focus of GSEP is to replace aging or leak-prone natural gas pipeline infrastructure in the interests of public safety, system reliability and methane emission reduction, which are overarching priorities that encompass these initiatives. The replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC’s DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by the PHMSA and the Department’s Pipeline Safety Division. Pursuant to each LDC’s DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. The Department, in reviewing the GSEPs, must prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N. Any additions to the Department’s standard of review should be left to the broad oversight of the Department and not prescribed by legislation.

- Requires consideration of targeted decommissioning of a gas system, based on independent assessment of costs and benefits of decommissioning

Proposed by: LEAN and NCLC (joint proposal)

Proposal Statement: Consistent with energy efficiency objectives, such as adoption of air source heat pumps, as well as principles of least-cost to achieve stated goal. Intended to accelerate targeted decommissioning. For clarity, we further recommend replacing “consideration” with “consideration and analysis.” “Independent assessment” refers to retention of a third party such as a consultant to assess the costs and benefits of decommission.

Supported by: AGO; CLF; HEET (with clarification); EEA Agencies; Jonathan Buonocore (with clarification)

Supporting Statements:

CLF - The DPU stated in D.P.U. 20-80-B that it would explore opportunities for strategic and targeted decommissioning of the gas pipeline system through electrification and networked thermal resources and has directed all LDCs to propose at least one decommissioning demonstration project in its service territory in coordination with the relevant electric distribution company. (D.P.U. 20-80-B at 15, 87).

HEET (with clarification) - If non-gas pipe alternatives are required wherever economically feasible, language requiring consideration of “targeted decommissioning of a gas system” would not be needed. Secondly, in terms of the independent assessment, there are not many experts outside of the gas industry who have the gas system expertise to handle this kind of analysis, as well as the electric-grid expertise to calculate how such decommissioning will impact the local electric grid as the local buildings move to electricity for heat. Thus, as stated above, HEET suggests the creation of an integrated electric and gas utility plan that is street-segment based and phased in a way that meets the Commonwealth’s net zero emissions mandates. With this sort of detailed plan, we can move from a lofty goal to an enactable set of actions that minimize disruption and cost. Having such a plan would help to ensure that all street segments that should be decommissioned will have a date and a plan to do so.

Jonathan Buonocore (with clarification) – Making data publicly available, to the extent able, would aid in verification of the plan. What types of consideration are included in the cost-benefit analysis? Is this financial costs to the utilities? To ratepayers? Are non-financial endpoints like climate, safety, and health included?

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - This proposal is completely beyond the scope of the working group’s statutory mandate. Moreover, the introduction of planning requiring “consideration and incorporation of targeted decommissioning or decommissioning of a gas system” represents a complete departure from GSEP’s original purpose to reduce chronically leaky/compromised pipeline already present in communities around the Commonwealth; the working group did not study how partial, targeted, or complete decommissioning would affect system safety, reliability, and cost for those remaining on the system and the Commonwealth more broadly. Believes that the primary focus of GSEP should remain on natural gas system safety and reliability. The working group also failed to consider how departing from GSEP’s original purpose would impact LDC system safety and reliability.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – The LDCs oppose this proposed revision for several reasons. First, the Department has long deferred to the judgment and expertise of regulated utility companies when it comes to operating and maintaining their systems safely and reliably and there is no reasonable basis to depart from that precedent. Boston Gas Company and Colonial Gas Company, D.P.U. 13-78, at 13 (2014) (“The Department reiterates that it. . .will not substitute its judgment for that of a utility manager as to how best to fulfill service obligations to operate its system safely and reliably.”); Boston Gas Company, Essex Gas Company, and Colonial Gas Company, D.P.U. 10-55, at 128-129 (2010) (“The Department will not substitute its judgment for utility management’s job as to how best to meet and fulfill its service obligations to maintain and operate its system consistent with safety, reliability and other considerations.”). The Department defers to the judgment of regulated utility companies because they have the most knowledge about their customers and their infrastructure. See Investigation by the Department of Public Utilities on its own Motion into Distributed Generation Interconnection, D.P.U. 11-11-E at 15 (March 13, 2013). The model proposed by LEAN and NCLC would empower a third-party to substitute its judgment for the seasoned expertise and informed judgment of the local gas distribution companies. Planning should not be done by an external third-party that bears no safety, reliability, financial, customer service, legal, or regulatory risk associated with owning and operating a utility system.

Second, if utility investment decisions are guided by a third-party entity the Department’s prudence reviews of capital investments would be encumbered and the regulatory compact would be undermined. See Bay State Gas Company, D.T.E. 05-27, at 39 (2005) (“Endorsing a specific method of replacing a utility’s unprotected steel infrastructure would not only limit the utility management’s operational flexibility, but also could encumber the Department’s future prudence reviews. Accordingly, the Department will not direct

a specific approach and will defer to the Company’s management judgment to choose the appropriate approach for the replacement of its unprotected steel infrastructure, taking into account the paramountcy of public safety and the goals of efficiency and reasonable cost.”); NSTAR Electric Company and Western Massachusetts Electric Company, D.P.U. 17-05, at 88-89 (Nov. 30, 2017) (“The Department has found that decisions regarding the level and types of capital investment to be made by a company rest, in large part, with company management. The Department also has recognized that distribution companies have full discretion to exercise judgement in maintaining the safety and reliability of their distribution system.”).

Additionally, the replacement of leak-prone pipe should continue to be based on the risk scores pursuant to the LDC’s DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by the U.S. Department of Transportation’s Pipeline and Hazardous Materials Safety Administration and the Department’s Pipeline Safety Division. Pursuant to the LDC’s DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. Lastly, the plain language of An Act Driving Clean Energy and Offshore Wind, St. 2022, c. 179, Section 68 states “that any change recommended shall enable natural gas local distribution companies to maintain a safe and reliable gas distribution system during the commonwealth’s transition to net zero emissions.”

- Requires identification of leak-prone pipes and prioritization as follows:
 - Immediate and significant health and safety concerns

Proposed by: LEAN and NCLC (joint proposal)

Proposal Statement: Consistent with statutory health and safety objectives of this Working Group.

Supported by: AGO; CLF; HEET; Jonathan Buonocore (with request)

Supporting Statements:

Jonathan Buonocore (with request) – It is worth ensuring that these definitions are created using best-available evidence, including identification of populations, buildings, and infrastructure that are within safety-relevant distances.

CLF - Identification and consideration of health and safety concerns is crucial to ensuring that energy systems are reliable, affordable, and sustainable. Further, the Legislature’s inclusion of a public health expert in the formation of the GSEP working group is clear evidence that this is a priority for Massachusetts residents.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - Opposed to this insofar as it is inextricably linked to requiring that the plan include “all reasonable alternatives to natural gas” and targeted/partial complete decommissioning for the reasons provided above; is supportive of including these measures in considering GSEP pipeline replacement and repairs.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – The LDCs oppose this proposed revision as its intent is unclear. The focus of GSEP is to replace aging or leak-prone natural gas pipeline infrastructure in the interests of public safety, system reliability and methane emission reduction, which are overarching priorities that encompasses these initiatives; therefore, adding duplicative terms will only needlessly complicate the interpretation of the statutory language. The replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC’s DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by the PHMSA and the Department’s Pipeline Safety Division. Pursuant to each LDC’s DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history,

pressure, density, proximity to structures, public buildings or business districts, and soil conditions. The Department, in reviewing the GSEPs, must prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N. The inclusion of this additional factor would be duplicative since the prioritization and review of GSEP already includes the review of aging or leak-prone natural gas pipeline infrastructure that pose viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system. Additionally, the analysis should not factor indoor gas since these emissions are outside the control of a local distribution company. This would add a level of complexity that would defeat the objective of the GSEP program and would take away the flexibility of the Department to evaluate the plans within the context of their oversight. Pipe should be replaced to reduce risk, improve safety, eliminate emissions. After those three goals, inputs should be informative, but not prescriptive.

- Moderate health and safety concerns

Proposed by: LEAN and NCLC (joint proposal)

Proposal Statement: In support of prioritizing most dangerous health and safety concerns (see immediately preceding item). This edit could be combined with the immediately preceding item.

Supported by: CLF; HEET (with clarification); Jonathan Buonocore (with request)

Supporting Statements:

HEET (with clarification) – Using the Department’s six exact mandates might be more clear and less likely to cause confusion or conflicts.

Jonathan Buonocore (with request) – It is worthwhile to ensure that these definitions are created in line with the best available evidence, including identification of populations, buildings, and other infrastructure within safety-relevant distances.

Opposed by: USW; HEET; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - Opposed to this insofar as it is inextricably linked to requiring that the plan include “all reasonable alternatives to natural gas” and targeted/partial complete decommissioning for the reasons provided above; is supportive of including these measures in considering GSEP pipeline replacement and repairs.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – The LDCs oppose this proposed revision as it is unclear on the overall intent. The focus of GSEP is to replace aging or leak-prone natural gas pipeline infrastructure in the interests of public safety, system reliability and methane emission reduction, which are overarching priorities that encompasses these initiatives; therefore, adding duplicative terms will only needlessly complicate the interpretation of the statutory language. The replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC’s DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by the PHMSA and the Department’s Pipeline Safety Division. Pursuant to each LDC’s DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. The Department in reviewing the GSEPs must prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N. The inclusion would be duplicative since the prioritization and review of GSEP already includes the review of aging or leak-prone natural gas pipeline infrastructure that pose viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system. Additionally, the analysis should not factor indoor gas since these emissions are outside the control of a local distribution company. This would add a level of complexity that would defeat the objective of the GSEP program

and would take away the flexibility of the Department to evaluate the plans within the context of their oversight. Pipe should be replaced to reduce risk, improve safety, eliminate emissions. After those three goals, inputs should be informative, but not prescriptive.

- Impact on vulnerable populations, including children and elders

Proposed by: LEAN and NCLC (joint proposal)

Proposal Statement: In support of prioritizing most dangerous health and safety concerns (see immediately preceding two items), as well objective of affordability.

Supported by: AGO; CLF; HEET; Jonathan Buonocore

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol)

Statements in Opposition:

USW - Opposed to this insofar as it is inextricably linked to requiring that the plan include “all reasonable alternatives to natural gas” and targeted/partial complete decommissioning for the reasons provided above; is supportive of including these measures in considering GSEP pipeline replacement and repairs.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol) – The LDCs oppose this proposed revision as it is unclear on the overall intent. The focus of GSEP is to replace aging or leak-prone natural gas pipeline infrastructure in the interests of public safety, system reliability and methane emission reduction, which are overarching priorities that encompasses these initiatives; therefore, adding duplicative terms will only needlessly complicate the interpretation of the statutory language. The replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC’s DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by the PHMSA and the Department’s Pipeline Safety Division. Pursuant to each LDC’s DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. The Department in reviewing the GSEPs must prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N. The inclusion would be duplicative since the prioritization and review of GSEP already includes the review of aging or leak-prone natural gas pipeline infrastructure that pose viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system. Additionally, the analysis should not factor indoor gas since these emissions are outside the control of a local distribution company. This would add a level of complexity that would defeat the objective of the GSEP program and would take away the flexibility of the Department to evaluate the plans within the context of their oversight. Pipe should be replaced to reduce risk, improve safety, eliminate emissions. After those three goals, inputs should be informative, but not prescriptive.

“Project”

- Expand definition of “Project” to include a Decommissioning Plan, proposed by a gas company in a plan filed under this section.

Proposed by: EEA Agencies

Proposal Statement: The definition of “project” in the GSEP statute needs to accommodate the situation where a non-gas pipe alternative involves the decommissioning of a portion of a gas company service territory in favor of a networked geothermal or electrification solution.

Supported By: AGO

- Addition of definition of “decommissioning plan”

“Decommissioning Plan,” a proposal to decommission a portion of existing natural gas infrastructure to be replaced by a non-gas pipeline alternative.

Proposed by: EEA Agencies

Proposal Statement: Decommissioning a portion of a gas company service territory raises unique issues regarding the obligation of a gas company to continue to provide natural gas service to an existing customer. Creating a defined term for “Decommissioning Plan” is necessary to address these issues.

Supported by: AGO

Section (b): Requirement to submit GSEP plans

- Includes reference to “unneeded” natural gas infrastructure

Proposed by: Senator Barrett

Proposal Statement: Need statutory mandate to as we move beyond gas. Administrative agencies and courts can then provide specificity.

Supported by: HEET; PowerOptions; Jonathan Buonocore

Supporting Statement:

HEET – The Department’s recent future of gas Order (D.P.U. 20-80) makes clear the Commonwealth is moving “beyond gas.” Thus, it is certain that some gas infrastructure will be unneeded. An electric and gas utility integrated and phased street-segment-based plan would help to determine which gas infrastructure is unneeded and when. The plan will help maintain the safety and reliability of the gas system during the transition. And of course, the less gas used in the Commonwealth, the safer we will all be.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol)

Statements in Opposition:

USW - This term is ambiguous and subjective. To the extent its inclusion is to provide for the identification of infrastructure that may be decommissioned, opposes its inclusion because it represents a complete departure from GSEP’s original purpose to reduce chronically leaky/compromised pipeline already present in communities around the Commonwealth; the working group did not study how partial, targeted, or complete decommissioning would affect system safety, reliability, and cost for those remaining on the system and the Commonwealth more broadly. Believes that the primary focus of GSEP should remain on natural gas system safety and reliability. The working group also failed to consider how departing from GSEP’s original purpose would impact LDC system safety and reliability.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol) – The LDCs oppose this proposed revision. The addition of the term “unneeded” is not only impossible to define but is outside the scope of the statutory mandate. The inclusion of this language is ostensibly based on the unfounded presumption that there are sections within the Company’s distribution system that are unnecessary and no longer “used and useful.” Additionally, the replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC’s DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by the PHMSA and the Department’s Pipeline Safety Division. Pursuant to each LDC’s DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. Lastly, the plain language of An Act Driving Clean Energy and Offshore Wind, St. 2022, c. 179, Section 68, states “that any change recommended shall enable natural gas local distribution companies to maintain a safe and reliable gas distribution system during the commonwealth’s transition to net zero emissions.” Therefore, the characterization of natural gas infrastructure as “unneeded” is not only

inconsistent with each LDC's DIMP, but it also impinges on the Company's business judgement concerning the management of a safe and reliable natural gas distribution system and is inconsistent with the plain language in the Drive Act.

- Annual targets for subsequent 10 years required

Proposed by: EEA Agencies

Proposal Statement: EEA Agencies - Establishing annual targets for the next 10 years will require the LDCs to plan over a longer time horizon (10 years instead of five) and allow the Department and other parties to track GSEP progress with “annual targets” rather than the current GSEP “interim targets” that does not specify target frequency.

Supported by: AGO; LEAN: CLF; HEET (with clarification); PowerOptions; Jonathan Buonocore (with clarification)

Supporting Statements:

LEAN – Consider periodic updates.

HEET (with clarification) – This language would be improved if the information reported every year included a list by street segment of ALL the leak-prone gas infrastructure remaining in the ground in each gas company territory (not just the street segments that are about to be replaced). This information would help electric utilities, municipalities, state agencies, developers, and residents plan better for the upcoming street disruption and potentially synergize underground infrastructure work for cost savings. This information should include all the information normally filed as part of the GSEP filings about each leak-prone street segment, such as the likely year of its replacement or decommissioning, estimated cost of the work, the risk of the infrastructure, as well as the diameter and material of the pipe (see below). This information would allow all to begin to understand better where there are opportunities for non-gas pipe alternatives.

Division	Town Name	Town Code	WONUM	DESCRIPTION	Prioritization Factor	Cost Estimate	GSEP Footage	GSEP Mileage	Operating Pressure	Exst Diameter
Leominster	Acton	ACT	1508518	24-65 CONANT ST, ACT, COUNTRY CLUB & FAIRWAY RD	13.0	\$717,126.00	2,110	0.40	60	2
Waltham	Arlington	ARL	1127516	174-219 SUMMER ST, ARL, SUMMER ST PL & BRATTLE ST	20.3	\$967,907.25	1,475	0.28	LP	6
Waltham	Arlington	ARL	1207318	2-24 ORCHARD PL, ARL	4.4	\$309,436.10	470	0.09	LP	4
Waltham	Arlington	ARL	1471419	53-131 RHINECLIFF ST, ARL	26.8	\$1,338,416.07	2,375	0.45	LP to 25	4
Waltham	Arlington	ARL	1310396	53-75 DOROTHY RD, ARL	29.4	\$264,023.49	345	0.07	LP	4
Waltham	Arlington	ARL	1429163	62-179 FRANKLIN ST, ARL	44.7	\$2,531,481.97	3,575	0.68	LP	6
Waltham	Arlington	ARL	1198194	925-1115 MASSACHUSETTS AVE, ARL	29.5	\$982,259.19	2,900	0.55	LP to 25	6
Waltham-Concord	Bedford	BED	1511469	281-314 GREAT RD, BED, PRIVATE COMMERCIAL COMPLEX	15.0	\$1,222,738.96	2,815	0.53	60	2
Waltham	Belmont	BEL	1128007	521-563 TRAPELO RD, BEL, & 6-37 MORAIN ST	21.0	\$1,503,228.28	1,235	0.23	LP	6

Sample GSEP street-segment information from the most recent GSEP report showing the work that will be performed the following year. If the utilities published where all leak-prone infrastructure is (not just that which is about to be replaced), the information would help all to plan better for the transition.

Exhibit NG-GPP-4.

Jonathan Buonocore (with clarification) – Releasing this data publicly will allow for verification, analysis and further research, including better understanding of risks posed by different pipe types.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Until) (with clarification)

Statements in Opposition:

USW - Opposes this only to the extent it would only require a plan with targets on a one-time basis for a single 10-year period. Believes that it is crucial that planning for GSEP (and any other emissions reduction activities) include reporting for the duration of transition to zero emissions. Moreover, opposes to the extent this represents a departure from the GSEP’s original purposes and goals.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unutil) (with clarification) – The LDCs oppose this proposed revision. Each gas company’s GSEP plan includes interim targets, which the Department must review to ensure that each gas company is meeting the appropriate pace to reduce the leak rate on and replace the natural gas infrastructure in a safe and timely manner. Current interim targets for leak rate reduction are appropriately established and assessed based on the required three-year leak survey cycle and thus, provide the best measure of impact of leak prone pipe replacement on leak rates. More frequent target timelines may result in an accurate comparison and may not take account of factors impacting results such

as which sections of the system are included in annual survey and weather. In addition, the current five-year plan for main replacement miles is appropriate, noting that the further out the planning horizon you set targets, the less likely those targets will be reliable. Furthermore, risk on pipes needs to be evaluated on an annual basis and as a result the targets and needs for replacement will shift to address the findings of those annual evaluations. The LDCs do not support a ten-year planning horizon because that length of time is not reliable, flexible, or consistent with risk management practices.

- Must include subtargets for replacements, repairs, and retirements

Proposed by: Senator Barrett

Proposal Statement: Requirement to provide more detailed information.

Supported by: AGO; CLF; HEET (with question); PowerOptions; Jonathan Buonocore

Question from HEET: Does this mean that each utility would have to predict the approximate number of replacements, repairs, and retirements to be completed each year for that utility to meet its emission subtargets from 2030 to 2050?

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol)

Statements in Opposition:

USW - Does not oppose the addition of repair to the extent this revision is concerned with maintaining the integrity of pipeline. N EGWA believes that while replacement is and should remain the preferred method of remediating compromised pipeline consistent with existing law that short- and or mid-term repairs in certain cases may also consistent with the original mission of the GSEP. Opposes this only to the extent it includes “retirements.” The working group did not study how retirements would affect system safety, reliability, and cost for those remaining on the system and the Commonwealth more broadly. Believes that the primary focus of GSEP should remain on natural gas system safety and reliability. The working group also failed to consider how departing from GSEP’s original purpose would impact LDC system safety and reliability.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol) – The LDCs oppose this proposed revision. The focus of GSEP is to replace aging or leak-prone natural gas pipeline infrastructure in the interests of public safety, system reliability and methane emission reduction. The inclusion of subtargets for replacement, repair, and retirements would be arbitrary since the Department in reviewing the GSEPs must prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N. Additionally, the LDCs oppose the inclusion of “repair.” The term “repair” does not eliminate risk associated with pipe failure consistent with each LDC’s DIMP; instead, a repair simply eliminates the active leak(s). Each LDC’s DIMP is designed to reduce risk, improve safety, and eliminate emissions on the gas distribution system. The plain language of An Act Driving Clean Energy and Offshore Wind, St. 2022, c. 179, Section 68 states “that any change recommended shall enable natural gas local distribution companies to maintain a safe and reliable gas distribution system during the commonwealth’s transition to net zero emissions.” A shift in focus from replacement to “repair” is not only inconsistent with each LDC’s DIMP, but it also impinges on the LDC’s business judgement concerning the management of a safe and reliable natural gas distribution system and is inconsistent with the plain language in the Drive Act.

- Schedule not inconsistent with GHG emissions limits and sublimits in Chapter 21N and commonwealth’s emissions strategies

Proposed by: Senator Barrett; HEET

Proposal Statement: HEET - The entire purpose of the GSEP working group is to align GSEP with the Commonwealth’s “applicable statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N and the commonwealth’s emissions strategies.” This stated purpose should be inserted in the legislative language anywhere it might be applicable. Sublimits are critical to ensure the state stays on track to meeting its mandate. In the following statements, the utilities and USW below are rightly concerned about maintaining the safety of the gas system. Moving the gas system to one that delivers

temperature to customers using a non-explosive fluid, such as water, would help ensure the safety the utilities so deeply desire.

Supported by: AGO; LEAN; NCLC; CLF; Jonathan Buonocore

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unital)

Statements in Opposition:

USW - opposes this inclusion to the extent it departs from GSEP's original purpose to reduce chronically leaky/compromised pipeline already present in communities around the Commonwealth—resulting in methane emissions. Believes that the primary focus of GSEP should remain on natural gas system safety and reliability. The working group also failed to consider how departing from GSEP's original purpose would impact LDC system safety and reliability.

LDCs (Berkshire; Eversource, Liberty, National Grid, Unital) – The LDCs oppose this proposed revision. The focus of GSEP is to replace aging or leak-prone natural gas pipeline infrastructure in the interests of public safety, system reliability and methane emission reduction, which are overarching priorities that encompass this proposed revision. The replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC's DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by the PHMSA and the Department's Pipeline Safety Division. Pursuant to each LDC's DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. The Department in reviewing the GSEPs must prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N. Any additions to the Department's standard of review should be left to the broad oversight of the Department and not prescribed by legislation.

- Gas companies must update targets annually

Proposed by: EEA Agencies

Proposal Statement: The current GSEP states gas companies *may* update timelines in their GSEPs based on overall progress. LDCs should be *required* to update GSEPs every year based on overall progress, to ensure that making up any shortfall in progress is part of the next GSEP.

Supported by: AGO; CLF; USW; HEET (with clarification); Jonathan Buonocore

Supporting Statements:

HEET (with clarification) - It would be better to have the gas companies update their “plans” (i.e., construction plans that are already defined within the legislative language) to meet the targets, rather than the targets themselves. The targets (i.e. the emission reductions) should be unchanging. As part of these plans, it would be best if the utilities listed in these plans all leak-prone street segments in their territories (not just those street segments that they plan to replace in the next five years), with all the standard information included in those plans. This non-critical-infrastructure information could be used by electric utilities, municipalities, customers, the state, developers, and analysts to plan how to transition these streets synergistically at the greatest speed and for the least cost.

Opposed by: LDCs (Berkshire, Eversource, Liberty, National Grid, Unital)

Statements in Opposition:

LDCs (Berkshire, Eversource, Liberty, National Grid, Unital) – The LDCs oppose this proposed revision. Each LDC's GSEP plan includes interim targets, which the Department must review to ensure that each gas company is meeting the appropriate pace to reduce the leak rate on and replace the natural gas infrastructure in a safe and timely manner. These interim targets shall be for periods of not more than six years and shall be incorporated into timelines for removing all leak-prone infrastructure. These interim targets are updated annually in the LDC's next GSEP plan. The inclusion would be duplicative and unnecessary.

Section (c): Contents of plans filed with the Department

- Requires alignment with GHG emissions limits in Chapter 21N

Proposed by: National Grid

Proposal Statement:

Supported by: AGO; LEAN; NCLC; CLF; HEET; PowerOptions; Jonathan Buonocore; LDCs (Berkshire, Eversource, Liberty, National Grid, Unital)

Statements in Support:

LEAN and NCLC (joint comments) – Supportive to the extent that this recommendation would bring utility activities in line with Chapter 21N.

HEET - The entire purpose of the GSEP working group is to align GSEP with the Commonwealth’s “applicable statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N and the commonwealth’s emissions strategies.” Thus, this stated purpose should be inserted in the legislative language anywhere it might be applicable.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unital) – The LDCs do not object to including the reference to Chapter 21N in the GSEP statute. However, the Department has already incorporated Chapter 21N into its standard of review for GSEP. *Fitchburg Gas and Electric Light Company, D.P.U. 22-GSEP-01*, at 8-9 (April 28, 2023) (stating that in reviewing GSEPS, the Department must “prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits **and sublimits established pursuant to chapter 21N.**”) (emphasis added). Therefore, as a practical matter, the proposed revision may be unnecessary. If the revision is deemed necessary, the LDCs propose the inclusion of the following language: “or to align with the applicable statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N.” This inclusion ensures compliance with Chapter 21N for gas distribution and services. The LDCs condition our support of the inclusion of this language on its application to associated methane emissions and not to building code considerations, which are beyond the scope of the stakeholder working group’s statutory mandate as set forth in the Drive Act.

Opposed by: USW

Statement in Opposition:

USW - Cannot agree, based upon the other edits made to the legislation, because it is inconsistent with the original purposes of the GSEP. Believes that the primary focus of GSEP should remain on natural gas system safety and reliability. The working group also failed to consider how departing from GSEP’s original purpose would impact LDC system safety and reliability.

- Requires comparison of eligible infrastructure repair and replacement between EJ populations and non-EJ populations

Proposed by: EEA Agencies

Proposal Statement: In the Clean Energy and Climate Plan for 2050, EEA said that communities of color and low-income neighborhoods face disproportionately higher exposure than other areas to health and climate risks because of decades of decisions about siting highways, power plants, and other sources of pollution. The proposed language would provide a layer of data collection that could shed light on the environmental disparities between EJ Communities and non-EJ Communities and assist the Commonwealth in addressing those disparities.

Supported by: AGO; CLF; NCLC (with clarification); HEET (with clarification); Jonathan Buonocore (with clarification)

Statements in Support:

NCLC – Supports the general concept and the opportunity to gain additional data to address the needs of disproportionately burdened communities. We note the importance here of using an accurate screening tool

to identify communities with environmental justice concerns, communities of color, and low-income neighborhoods as these are not identical. Further, we note the importance of ongoing communication and consultation with these communities.

HEET (with clarification) – Suggests using the term “advanced leak repair” rather than repair. The likely intent of this legislative language is to examine the equity of infrastructure repair and replacement, however the definition of EJ communities as enacted in Massachusetts includes high-income areas in municipalities such as Lexington. A better method of ensuring equity would be to use the designation of Justice40 Communities instead, or if the percentage of low-income customers connected to the leak-prone and non-leak-prone infrastructure were tracked. Additionally, if ALL leak-prone infrastructure information was public information (suggested above), researchers could consider the impact of equity in much greater depth.

Jonathan Buonocore (with clarification) – The Justice40 communities will serve as a much better definition of EJ communities. Agree that making leak-prone infrastructure public will better allow measurement and verification. Additionally, some thought will need to be put into the definition of equity and goals to be achieved.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - Does not necessarily oppose this change but needs clarification concerning what the practical implications of the proposed language.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – The LDCs support reporting on replacements by location (EJ versus non-EJ) for informational purposes. However, the objective considerations of safety, reliability, and emissions reductions should continue to be the primary focus under GSEP and the analysis for GSEP project selection should not include environmental justice as part of the risk ranking process. Requiring a comparison of eligible infrastructure repair and replacement between EJ populations and non-EJ populations, though well-intentioned, would not, and should not, influence the annual GSEP replacement. To do so would not only be inconsistent with each LDC’s DIMP, but it also impinges on each LDC’s business judgement concerning the management of a safe and reliable natural gas distribution system. Additionally, the LDCs oppose a shift in focus from replacement to repair. The term “repair” does not eliminate risk associated with pipe failure consistent with each LDC’s DIMP; instead, a repair simply eliminates the active leak(s).

Note of Abstention: *LEAN* – Need additional information before choosing a position. More precise specification is needed of environmentally disadvantaged populations.

- Requires comparison of GHG emissions reductions from eligible infrastructure repair and replacement with other investment alternatives, including electrification

Proposed by: EEA Agencies

Proposal Statement: Rather than solely investing in and installing new pipe infrastructure through the GSEPs, the GSEPs should determine where other investment alternatives, such as repairing leak-prone pipe or electrification, are the better long-term financial and environmental choice.

Supported by: AGO; LEAN; NCLC; CLF; HEET (with clarification); PowerOption; Jonathan Buonocore

Supporting Statements:

LEAN – Low-income bill impact concerns, however, are short term, which must also be part of the analysis.

CLF - Electrification has been established as the most economical path to achievement of Massachusetts’ net-zero greenhouse gas emissions mandate. (MA EEA, Clean Energy and Climate Plan for 2050 at xiv). In its Order in D.P.U. 20-80-B, the DPU directed the LDCs to work with the relevant electric distribution companies “to study the feasibility of of piloting a targeted electrification project in its service territory and to propose at least one demonstration project in its service territory for decommissioning an area of the gas pipeline system via targeted electrification. (D.P.U. 20-80-B at 87). Coordinating work under the GSEP with

electrification is a necessary and reasonable tactic for the achievement of Massachusetts' decarbonization goals.

HEET (with clarification) – If non-gas pipe alternatives were required wherever technically and economically feasible, this comparison would not be needed. If this legislative change was enacted, perhaps conventional GSEP gas pipe replacement and different methods non-gas pipe alternatives (assuming this includes retirement with electrification, advanced leak repair, and renewable thermal infrastructure) should be the items compared?

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - Opposes this inclusion to the extent it departs from GSEP's original purpose to reduce chronically leaky/compromised pipeline already present in communities around the Commonwealth—resulting in methane emissions. Believes that the primary focus of GSEP should remain on natural gas system safety and reliability. The working group also failed to consider how departing from GSEP's original purpose would impact LDC system safety and reliability.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – The LDCs oppose this proposed revision. The focus of GSEP is to replace aging or leak-prone natural gas pipeline infrastructure in the interests of public safety, system reliability and methane emission reduction, which are overarching priorities that encompass this proposed revision. The requirement of “comparison of GHG emissions reductions from eligible infrastructure repair and replacement with other investment alternatives, including electrification” goes beyond the scope of GSEP and would add a level of complexity that would defeat the objective of the program and encumber the Department's ability to evaluate the plans within the context of their oversight. Coordinated gas and electric planning is better addressed in the context of D.P.U. 20-80 or a new proceeding dedicated to that purpose.

- Eliminates target end date of 20 years from filing of initial plan and “reasonable target end date”

Proposed by: EEA Agencies

Proposal Statement: Where investment alternatives, such as repairing leak-prone pipe or electrification, are the better long-term financial and environmental choice, a target end date for pipeline replacement is not appropriate.

Opposed by: AGO; USW; NCLC; HEET; PowerOptions; Jonathan Buonocore; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

AGO - The revised statute should include a specific end date to the GSEP. As discussed below, the Massachusetts AGO proposes phasing out GSEP over the next six years, with an end date of October 1, 2030.

USW - Requires clarification of the rationale for eliminating these terms as they seem both relevant and necessary to ensure transparency and accountability—no matter what infrastructure changes are deemed reimbursable under the GSEP.

NCLC – Supports the position of the Attorney General's Office.

HEET and PowerOptions (joint comments) - GSEP, with its carrot of the accelerated cost recovery and the federal mandate to replace leak-prone infrastructure, can be re-configured to become the perfect vehicle for transitioning the gas system over time to non-combusting clean energy. Stopping the program does not mean the gas utilities will stop replacing aging infrastructure with new gas pipes. What is needed is the ability to replace those aging gas pipes with non-emitting renewable thermal infrastructure that can meet our Commonwealth's net zero emissions mandate. Instead of ending the GSEP, HEET suggests:

- Creating an integrated gas and electric utility street-segment phased plan to allow for a less expensive and faster transition.

- Starting a gradual mandated ramp-up in miles of non-combusting thermal infrastructure installed each year. This ramp up gives gas companies time to source the needed skills, workforce, etc. A gas company can meet the required mileage through installing thermal infrastructure or through traditional electrification of the buildings on the street. If a gas company cannot meet the required speed, the Department may deny it accelerated cost recovery for the following year.
- Lengthening the overall GSEP period while reducing the miles of pipe replaced each year to allow for gas companies to have time to learn and adjust to thermal infrastructure installation and operations.

The result would allow the gas utilities to replace leak-prone pipe while moving away from unsafe gas, reducing emissions and future stranded assets. It would allow workers and the utilities to transition to a new decarbonized business model.

LDCs (Berkshire, Eversource, Liberty, National Grid, Until) – The LDCs oppose the elimination of target end date of 20 years from filing on initial plan and reasonable target end date. A defined target end date is required to ensure the LDC’s interim targets, which the Department must review, are set at an appropriate pace to reduce the leak rate on and replace the natural gas infrastructure in a safe and timely manner. A date certain by which GSEP work will be completed is useful for planning purposes and measuring progress. Accordingly, each LDC should have a date certain by which their GSEP will end, and that date should be informed by the specific facts and circumstances of each LDC.

Note of Abstention: LEAN – Need additional information before choosing a position.

- Changes requirement to file summary from every five years to annually, beginning October 31, 2023

Proposed by: EEA Agencies

Proposal Statement: Annual submissions of the natural gas companies’ repair/replacement summary of leak-prone pipe should provide the Department and stakeholders with a more precise picture of any progress being made to address leak-prone pipe, and hold the LDCs accountable.

Supported by: AGO; LEAN; CLF; USW; HEET; Power Options; Jonathan Buonocore

Supporting Statements:

LEAN – Planning targets are needed and shorter goals may be appropriate provided bill impacts are addressed, particularly for low-income households.

HEET - The utilities do file reports on GSEP work in their GREC reports, although sometimes in font sizes that are unreadable by humans.⁸ HEET supports this reporting requirement and suggests it should also include information on all leak-prone infrastructure remaining in the gas utility territory (whether or not it is about to be replaced) by street-segment, including costs, risk, material, and diameter. This information would give the most comprehensive report of progress completed and work still to be performed. Preferably the information should be in a reasonable font size to meet the letter and intent of the law.

Opposed by: LDCs (Berkshire, Eversource, Liberty, National Grid, Until)

Statements in Opposition:

LDCs (Berkshire, Eversource, Liberty, National Grid, Until) – The LDCs oppose the proposed change to the requirement to file a summary from every five years to annually, beginning October 31, 2023. The natural gas local distribution companies file annually an annual GSEP plan to be reviewed and approved by the Department on October 31. This GSEP plan is updated annually and includes many, if not all, of the elements presented in the five-year summary. To adopt the proposed changes would create redundant and duplicative reporting. If additional information is required for the Department’s review, that determination should be left to the broad oversight of the Department and not prescribed by legislation.

- Summary includes GHG emissions reductions attributable to plan

Proposed by: HEET

⁸ For an illustration of an unreadable font, please see:
<https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/14894989>

Proposal Statement: The purpose of the GSEP Working Group, as well as any potential legislative changes that result from it, is to ensure GSEP is aligned with the Commonwealth’s net zero emissions mandate. Given this, it is reasonable to have gas companies include estimated progress toward this goal in their reports. This estimate should include not just the reduction of leaks from advanced leak repair and replacement with new gas pipe, but also an estimate of the emission reductions from the reduced gas use in the connected buildings over the lifetime of the measures of infrastructure installed.

Supported by: AGO; CLF; NCLC; Jonathan Buonocore; LDCs (Berkshire, Eversource, Liberty, National Grid, Unital) (with clarification)

Statements in Support:

LDCs (Berkshire, Eversource, Liberty, National Grid, Unital) (with clarification) - A summary of emission reductions attributable to the GSEP plan is already included in the annual filing. The GSEP plan includes the annual updated estimated distribution system-wide leak rate (“Aggregate Leak Rate”) based on the United States Environmental Protection Agency’s assigned leak factors for the various types of piping materials. The LDCs have structured GSEP plans to reduce the Aggregate Leak Rate. Each LDC’s annual GSEP plan also includes a five-year forecast of CO2e reductions. Therefore, to adopt the proposed changes would create redundant and duplicative reporting. If additional information is required for the Department’s review, that determination should be left to the broad oversight of the Department and not prescribed by legislation.

Opposed by: USW

Statement in Opposition:

USW - Opposes this inclusion to the extent it departs from GSEP’s original purpose to reduce chronically leaky/compromised pipeline already present in communities around the Commonwealth—resulting in methane emissions. Believes that the primary focus of GSEP should remain on natural gas system safety and reliability. The working group also failed to consider how departing from GSEP’s original purpose would impact LDC system safety and reliability.

Note of Abstention: LEAN – Need additional information before choosing a position. GHG reductions attributable to plan is complicated by electrification since reductions therefrom will (hopefully) change over time, depending on electricity generation fuel. Also, from the viewpoint of state emissions targets, it is not clear how reductions would be attributed when due to GSEP electrification.

- Department must require gas company to file an updated long-term timeline

Proposed by: HEET

Proposal Statement: Currently the Department is allowed to alter the revenue cap for GSEP. If the Department does so – for instance so that a gas company is not allowed to spend as much money per year -- it will not be able to replace as much infrastructure that year. Under this circumstance, having the gas companies report on the long-term results of that change will help the Department and the public to understand the implications.

Supported by: AGO; LEAN; NCLC; CLF; PowerOptions; Jonathan Buonocore

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unital)

Statements in Opposition:

USW - In general, supports LDC transparency relative to the pipeline repair and replacement planning, so long as they are consistent with the GSEP. Would like clarification before commenting further or being identified as supporting this change.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unital) – The LDCs oppose this proposed revision. First, each gas company’s GSEP plan includes interim targets, which the Department must review to ensure that each gas company is achieving the appropriate pace to reduce the leak rate on its distribution system and replace its leak-prone natural gas infrastructure in a safe and timely manner by the GSEP’s targeted end date. These interim targets shall be for periods of not more than six years and shall be incorporated into timelines for removing all leak-prone infrastructure. Second, the inclusion of the term “long-term timeline”

is exceedingly vague so as to frustrate its practical application and legal interpretation. The LDCs caution that extending the interim targets beyond the six-year period would be ineffective since it cannot be anticipated that a longer-term forecast would be accurately captured.

Section (d): Department review of plan

- Required considerations include extent to which the use of low-carbon gas resources offsets or reduces emissions, advances objective of energy policy of the state (including Chapter 21N)

Proposed by: LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Proposal Statements: The work performed by the LDCs under GSEP have reduced methane emissions in the Commonwealth. The LDCs are supportive of efforts to continue leveraging GSEP to minimize emissions. The LDCs also note that the Department has already incorporated Chapter 21N into its standard of review for GSEP. Fitchburg Gas and Electric Light Company d/b/a Unitil, D.P.U. 22-GSEP-01, at 8-9 (Oct. 31, 2022) (April 8, 2022) (stating that in reviewing GSEPS, the Department must “prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits **and sublimits established pursuant to chapter 21N.**”) (emphasis added).

Opposed by: AGO; USW; HEET; PowerOptions; Jonathan Buonocore

Statements in Opposition:

AGO - The supply, cost, and feasibility of “low-carbon gas resources” are unknown and highly uncertain at this time. Hydrogen, in particular, presents technical limitations of scaling production and can be less safe and more expensive than natural gas. Development of “low-carbon gas resources” should not be eligible for accelerated cost recovery, which the AGO believes should be phased out (as discussed in Part Two, below).

USW – Opposes this inclusion because it represents a departure from GSEP’s original purpose to replace/repair chronically leaky/compromised pipeline already present in communities around the Commonwealth; the working group did not study how such a inclusion would affect system safety, reliability, and cost for those remaining on the system and the Commonwealth more broadly. Believes that the primary focus of GSEP should remain on natural gas system safety and reliability. The working group also failed to consider how departing from GSEP’s original purpose would impact LDC system safety and reliability.

HEET and PowerOptions (joint comments)– Low-carbon gasses are generally considered to be enewable natural gas or hydrogen. These gasses will increase customer energy bills significantly, while not reducing at all the need for leak-prone gas pipe replacement, or the looming problem of stranded assets. Additionally, if the “low carbon” gas is hydrogen, it can reduce safety since hydrogen is the smallest molecule in the universe (meaning it’s very hard to contain in pipes) and it is corrosive to most leak-prone pipe materials. Combustion of hydrogen can also produce NOx, which produces health effects including asthma, therefore the use of hydrogen presents equity issues. It has a much wider explosive range than natural gas and its flame is hard to see under many circumstances. It would be surprising if the utilities (being so safety conscious) would want hydrogen. And even if these fuels are considered fossil-fuel free, they are not emissions free. Thus, HEET suggests using the term “non-gas pipe alternative” instead of “low-carbon gas resources.”

Section (e): Department acceptance of plan

- Adds reference to “emissions reductions”

Proposed by: EEA Agencies

Proposal Statement: EEA Agencies - Where investment alternatives, such as repairing leak-prone pipe or electrification, are the better long-term financial and environmental choice, eligible infrastructure replacement should not be the sole factor the Department considers in accepting a GSEP. Emission

reductions should be added as a consideration in the Department's acceptance of GSEPs.

Supported by: AGO; LEAN; NCLC; CLF; HEET; PowerOptions; Jonathan Buonocore; LDCs (Berkshire, Eversource, National Grid, Unitil)

Statements in Support:

LDCs (Berkshire, Eversource, National Grid, Unitil) - The work performed by the LDCs under GSEP has reduced methane emissions in the Commonwealth. Unitil is supportive of efforts to continue leveraging GSEP to minimize emissions. Because emission reductions are already part of the existing GSEP statutory framework and the Department's review, revisions to the law are not necessary to effectuate this purpose.

Opposed by: USW; Liberty (with clarification)

Statements in Opposition:

USW - Before approval can be considered, need clarification as to how emissions reductions will be measured and calculated, what the baseline will be, what would constitute a sufficient reduction, and what low-carbon gas resources are acceptable to the agencies.

Liberty (with clarification) -Opposes the additional reference to "emission reductions." A summary of emission reductions attributable to the GSEP plan is already included in the annual filing. The GSEP plan includes the Aggregate Leak Rate based on the United States Environmental Protection Agency assigned leak factors for the various types of piping materials. The Company has structured its GSEP to reduce the Aggregate Leak Rate. The Company's annual GSEP plan also includes a five-year forecasted of CO₂e reductions. Therefore, adopting the proposed changes would create redundant and duplicative reporting. If additional information is required for the Department's review should be left to the broad oversight of the Department and not prescribed by legislation.

- Includes consideration of enabling "the safe and reliable interconnection, distribution, and metering of low-carbon fuel resources"

Proposed by: Unitil

Proposal Statement: Reducing the carbon content of the natural gas delivered to customers leverages the existing gas system and minimizes disruptions to energy consumers. This proposal also promotes customer affordability and equity by limiting the need for customers to change their existing energy equipment in the near term. Leveraging the existing natural gas system is critical because it will take time to develop a comprehensive and coordinated electric and natural gas system planning framework to ensure, among other things, adequate capacity (generation, transmission, and distribution) to accommodate increased loads driven by electrification. More immediately, adding renewable natural gas ("RNG") and Certified Gas to the supply portfolio will produce environmental benefits, contributing to the Commonwealth's environmental goals. Adding physical RNG to the supply portfolio also would improve supply availability and diversity, both important gas supply planning considerations.

Supported by: USW; Berkshire; Liberty; National Grid

Statements in Support:

USW - Supports insofar as this language is consistent with the original purposes of the GSEP.

LDCs (Berkshire Gas Company, Liberty, National Grid) - As previously stated, Berkshire, Liberty, and National Grid are generally supportive of the inclusion of "non-pipe alternatives," assuming the non-pipe alternative criteria is met and determined the NPA to be affordable and feasible by the LDC and the NPA has been reviewed and approved by the Department in the context of the GSEP, which would include the safe and reliable interconnection, distribution, and metering of low-carbon fuel resources. The same Departmental standard of review used for traditional GSEP projects would also apply to non-pipe alternatives. Ultimately, the Department, in reviewing the GSEPs, must prioritize safety, security, reliability of service, affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N.

Opposed by: AGO; LEAN; NCLC; HEET; Jonathan Buonocore

Statements in Opposition:

AGO - Accelerated cost recovery under GSEP has resulted in significant cost burdens on ratepayers. The Attorney General’s Office supports a phased end to GSEP, not expanding the “activity” that is eligible for accelerated cost recovery.

HEET - Renewable natural gas or hydrogen will increase customer energy bills considerably, while not reducing the need for leak-prone gas pipe replacement, or the looming problem of stranded assets. Combustion of hydrogen can also produce NOx, which produces health effects including asthma, therefore the use of hydrogen presents equity issues. Additionally, in the case of hydrogen, it can significantly reduce safety. HEET is surprised the safety-conscious gas utilities would even consider hydrogen. Finally fossil free fuels when burned still create emissions.

Jonathan Buonocore – “Renewable” natural gas is still methane and will still have climate forcing properties if it leaks. RNG and hydrogen both have known hazards, including safety and explosion hazards if leaked.

Section (f): Project documentation for prior year

- Changes 1.5% to 3.0% as cap on annual change in revenue requirement

Proposed by: LDCs (Berkshire, Eversource, Liberty, National Grid, Unil)

Proposal Statement: In 2019, the Department revised the cap calculation and raised the cap to three percent, stating that this cap would remain in effect until further ordered. See, e.g., Fitchburg Gas and Electric Light Company, D.P.U. 18-GSEP-01, at 30 (2019). The proposed change to the cap captured in the legislation is purely a housekeeping edit to reflect current Department precedent.

Supported by: USW

Opposed by: AGO; LEAN; NCLC; HEET; Jonathan Buonocore

Statements in Opposition:

AGO - Strongly opposes codifying the Department’s increase in the cap on annual change in revenue requirement. As discussed in Part Two, below, the cap should be lowered annually so that the GSEP ends in October 2030.

LEAN and NCLC (joint comments) – Affordability is a key concern, to which a 3 percent annual increase would be an obstacle.

HEET – The intent of the revenue requirement is to make sure that the cost of GSEP does not significantly increase customer’s bills, but that instead those bills remain relatively affordable. Non-combusting thermal infrastructure such as networked geothermal will have a higher infrastructure cost. However, it is predicted also:

- To result in lower heating and cooling bills for customers because of its efficiency (six times that of a gas boiler), and thus maintain affordability.
- Decrease price volatility since the “fuel” is beneath our feet, reducing the potential for worldwide price swings to affect market prices here.
- Decrease costs of electric grid upgrades since the efficiency of this infrastructure will also reduce the needed upgrades the electric grid from electrification (in comparison to air source heat pumps). National Grid is already estimating it needs a seven-fold increase in investment by 2029 in the electric grid to meet future demand.
- Finally, such non-combusting thermal infrastructure would also help the Commonwealth meet its emissions mandates.

Thus, HEET suggests instead changing the 1.5% revenue cap to the requirement for an energy bill affordability test for customers. This energy bill affordability test should be calculated in terms of its impact on both gas and electric bills for the customers.

Section (g): Rate changes

- Addition of affordability protections for low-income consumers into the GSEP statute

Proposed by: LEAN and NCLC (joint proposal)

Proposal Statement: We strongly support the addition of affordability protections for low-income consumers into the GSEP statute. Although gas and electricity rates have been volatile, the latest LEAN analysis of bill impacts of fully converting from residential gas to electric ASHP heat showed bill increases of about 40% (down from about 60%) -- difficult for most households, an impossible choice for low-income households without significant support.

We recommend the following:

- (a) The incremental low-income customer heating cost impacts of each Plan should be quantified, including fuel, equipment, and the growth of per-customer fixed costs for those who remain on the gas system. LEAN estimates that the costs of electrification for low-income households in Massachusetts at about \$6B in total.
- (b) Additional sources of funding, other than a predominant reliance on ratepayer funding, must be identified, quantified, and ultimately allocated to fill the affordability gap for low-income households. Otherwise, these families will face increasingly unaffordable energy burdens with dire consequences for health and safety. Sources of support might include unallocated federal funding in hand, available increased federal funding, reallocation of RGGI (or other existing revenue streams), and the state budget. We recognize, of course, that there are many demands on these sources, but submit that our Commonwealth has undertaken a fundamental obligation, along with emissions reduction, to assure adequate resources for basic needs such as affordable heat.

Supported by: HEET; Jonathan Buonocore

Supporting Statements:

HEET (with clarification): Electric rates are clearly outside of the scope of the GSEP statute. However, one potential way to allow more low-to-moderate income customers to transition to clean electricity would be to change the electric rate design so heat pump customers do not have higher energy bills.⁹ Doing so would help the Commonwealth meet its net zero emission mandates. In terms of the GSEP statute, HEET suggests changing the 1.5% revenue cap to an energy bill affordability test for customers. Local renewable energy will have less price volatility, and radically efficient technology like networked geothermal is predicted to result in lower customer energy bills.¹⁰ If these predictions are true, then it would be good to have at least the option to replace more infrastructure faster if it is possible to do so while maintaining the affordability of energy bills for customers. Since the transition of the gas system will have a large impact on the electric grid and electric bills, this energy bill affordability test should be calculated in terms of the predicted impact on both the total energy bills (gas and electric) for the customers.

Opposed by: LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – The LDCs support efforts to ensure affordability for our customers, however, oppose this proposed revision because it is beyond the scope of the GSEP Working Group. The focus of GSEP is to replace aging or leak-prone natural gas pipeline infrastructure in the interest of public safety. The inclusion of these proposed development of standards would add a level of complexity that would defeat the objective of the program and encumber the Department’s ability to evaluate the plans within the context of their oversight and substitute theoretical regulatory prescriptions for the business judgement of the companies that have an intimate working

⁹ Heat Pump-Friendly Cost-Based Rate Designs, Energy Systems Integration Group, 2023. <https://www.esig.energy/wp-content/uploads/2023/01/Heat-Pump%E2%80%93Friendly-Cost-Based-Rate-Designs.pdf>

¹⁰ Inflection Point: When Heating with Gas Costs More January 2021 – White Paper Applied Economics Clinic, <https://static1.squarespace.com/static/5936d98f6a4963bcd1ed94d3/t/5fff6f26240e712d080225f5/1610575655937/Inflection+Point+White+Paper+AEC+13Jan2021.pdf>

knowledge of their own unique distribution systems. The replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC's DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by PHMSA and the Department's Pipeline Safety Division. Pursuant to each LDC's DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. Any additions to the Department's standards should be left to the broad oversight of the Department and not prescribed by legislation. Additionally, the topics of energy burden and affordability should be informed by data and analysis. Accordingly, the Department has opened an investigation into these topics in D.P.U. 24-15.

Section (h): Department regulations

- Within 12 months, Department is required to promulgate rules and regulations that “include a performance-based financial incentive to a gas company to reduce and retire more miles of gas infrastructure each year through non-gas pipe alternatives in a manner that maintains customer affordability.”

Proposed by: HEET

Proposal Statement: Performance-based ratemaking is an effective method of incentivizing desired actions with utilities. Such ratemaking can include strong disincentives for undesired actions. Since performance-based ratemaking can be updated more easily than legislation, the incentives and disincentives can be adjusted over time as needed to achieve the desired effect for the least cost to the customer. Given the feedback around affordability, text about it was added. Additionally, given the feedback from the utilities, the language has been shifted from “utility-scale non-emitting renewable thermal infrastructure” to “non-gas pipe alternatives,” so long as this is defined as “a replacement, retirement or advanced leak repair of eligible infrastructure that delays, reduces or avoids the need to install new gas pipe while maintaining the safety and reliability of the gas system, as well as reducing greenhouse gas emissions as defined in section 1 of chapter 21N. Such alternatives may include, but is not limited to, a non-emitting renewable thermal infrastructure project.”

Supported by: CLF; PowerOptions; Jonathan Buonocore; Berkshire (with clarification); Liberty (with clarification); National Grid (with clarification)

Statements in Support:

CLF - This is consistent with the Department's considerations in D.P.U. 20-80, especially where it seeks to “address the practicality of [...] strategies [...] including modification of line extension policies that assume long-term sales revenue, shifting revenue from traditional rate base to performance-based mechanisms that incent reduced emissions, and rate structures that protect LMI customers.” (D.P.U. 20-80-B at 58).

Liberty and Berkshire (with clarification) - As previously stated, while Liberty and Berkshire are generally supportive of the inclusion of “non-pipe alternatives,” assuming the non-pipe alternative criteria is met and has determined the NPA to be affordable and feasible by the local distribution company and the NPA has been reviewed and approved by the Department in the context of the GSEP. However, the proposed language should not be limited to building utility-scale non-emitting renewable thermal energy infrastructure but should encompass a broader range of potential non-pipe alternative projects/solutions.

National Grid (with clarification) - National Grid supports if language is expanded to include all types of NPAs. As proposed the language is biased towards network geothermal.

Opposed by: AGO; LEAN; NCLC; USW; Eversource

Statements in Opposition:

AGO - The Department should not provide the utility companies with additional financial incentives that will increase costs for ratepayers. Ratepayers should not bear the cost burden of the energy transition,

especially because there is too much uncertainty around the specifics of the transition at this time. The costs associated with building thermal energy infrastructure should be recovered in base rate cases.

LEAN and NCLC (joint comments) – Discussion or creation of any PBR would be best handled outside of the GSEP process. Further analysis would first be needed. In all events, affordability for low-income ratepayers must be assured.

USW - Opposes a requirement to promulgate such a regulation because it is not support demonstrating how such a regulation would advance system safety and reliability similar to better than the GSEP. For example, (1) the working group’s deliberations did not do comparisons of the results of GSEP’s original replacement/repair strategies to this regulatory proposal with regard to (a) their respective abilities to preserve the safety and reliability of pipeline for remaining users, (b) ensure occupational safety working on remaining pipeline, (c) ensure that natural gas remains cost effective for users in communities where gas is retired. Additionally, is opposed because (2) the working group did not consider how the retirement of pipeline would impact communities in which natural gas was no longer or only sporadically available, and (3) the working group did not consider how retirements would impact LDC workforces (and indirectly their communities) and how sufficient staffing would be preserved to address LDC pipeline through the completion of transition in its deliberations.

Eversource - A financial incentive or disincentive to reduce and retire gas infrastructure to build utility-scale, non-emitting renewable thermal energy infrastructure is inappropriate for a PBR. The results of an NPA assessment are beyond the control of the Company. Any possible inventory reduction must be supported by a viable project, including 100% customer acceptance. To assign a financial incentive or disincentive to such projects is unreasonable.

Statement in Clarification:

Unitil - As noted above, Unitil is generally supportive of including the consideration of non-pipe alternatives in the context of the GSEP. However, Unitil does not support a narrow definition of “non-pipe alternatives” which favors specific technologies because the universe of options is likely to evolve over time.

- Infrastructure must comply with Chapter 21N mandated GHG emissions reductions

Proposed by: HEET

Proposal Statement: The purpose of the GSEP working group is to align the program with the Commonwealth’s net zero emissions mandates. It seems logical that the infrastructure installed must comply with those mandated emissions reductions.

Supported by: LEAN; NCLC; CLF; PowerOptions; Jonathan Buonocore

Statements in Support:

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) (with clarification)

Statements in Opposition:

USW - Opposes this inclusion because it represents a departure from GSEP’s original purpose to replace/repair chronically leaky/compromised pipeline already present in communities around the Commonwealth; the working group did not study how such a inclusion would affect system safety, reliability, and cost for those remaining on the system and the Commonwealth more broadly. Believes that the primary focus of GSEP should remain on natural gas system safety and reliability. The working group also failed to consider how departing from GSEP’s original purpose would impact LDC system safety and reliability.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) (with clarification) - The addition of the phrase: “infrastructure must comply with Chapter 21N mandated GHG emissions reductions” is unnecessary. The LDCs already have the obligation to comply with Chapter 21N mandated GHG emissions reductions.

Section (i) (NEW): Development of standards

- Department required to develop standards “to inform a decision by a gas company whether to install a non-gas pipe alternative, to repair the gas infrastructure, or to replace the gas infrastructure with new gas infrastructure”

Proposed by: HEET

Proposal Statement: There need to be standards to make the decisions of when to (a) repair the pipe with advanced leak repair; (b) replace the pipe with non-emitting thermal infrastructure; (c) replace it with new gas pipe; or (d) retire the pipe. These standards might change over time as technology improves. Regulation is a more flexible way than legislation to create and update standards and thus might be more applicable as the technology improves. Please note: the language above has been changed to “non-gas pipe alternative” with the assumption that that term is defined to include all of the above options except (c).

Supported by: CLF; PowerOptions; Jonathan Buonocore

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitol)

Statements in Opposition:

USW - Opposed to this because it is premised on DPU having authority to direct an LDC to diversify into another mode of energy generation and distribution; is unaware of any Massachusetts law providing such authority. Even assuming DPU held this authority, is concerned that the enforcement of such regulations could incentivize gas LDCs to leave the Commonwealth without a suitable replacement to steward their gas infrastructure through transition to net zero. Additionally, needs clarification with regard to the DPU’s staff capacity/expertise vis a vis renewable thermal energy generation and distribution.

LDCs (Berkshire; Eversource, Liberty, National Grid, Unitol) – The LDCs object to the proposal for several reasons. First, this conflicts with long-standing Department precedent. The Department has long deferred to the judgment and expertise of regulated utility companies when it comes to operating and maintaining their systems safely and reliably. Boston Gas Company and Colonial Gas Company, D.P.U. 13-78, at 13 (2014) (“The Department reiterates that it. . .will not substitute its judgment for that of a utility manager as to how best to fulfill service obligations to operate its system safely and reliably.”); Investigation by the Department of Public Utilities on its own Motion into Distributed Generation Interconnection, D.P.U. 11-11-E at 15 (March 13, 2013) (“Because they have the most knowledge about their customers and their electric distribution infrastructure, the Distribution Companies are best situated to determine what constitutes optimal interconnection [to the electric distribution system.]”); Boston Gas Company, Essex Gas Company, and Colonial Gas Company, D.P.U. 10-55, at 128-129 (2010) (“The Department will not substitute its judgment for utility management’s job as to how best to meet and fulfill its service obligations to maintain and operate its system consistent with safety, reliability and other considerations.”).

Second, if utility investment decisions are guided by the Department or a third-party entity the Department’s prudence reviews of capital investments would be encumbered, and the regulatory compact would be undermined. See Bay State Gas Company, D.T.E. 05-27, at 39 (2005) (“Endorsing a specific method of replacing a utility’s unprotected steel infrastructure would not only limit the utility management’s operational flexibility, but also could encumber the Department’s future prudence reviews. Accordingly, the Department will not direct a specific approach and will defer to the Company’s management judgment to choose the appropriate approach for the replacement of its unprotected steel infrastructure, taking into account the paramountcy of public safety and the goals of efficiency and reasonable cost.”); NSTAR Electric Company and Western Massachusetts Electric Company, D.P.U. 17-05, at 88-89 (Nov. 30, 2017) (“The Department has found that decisions regarding the level and types of capital investment to be made by a company rest, in large part, with company management. The Department also has recognized that distribution companies have full discretion to exercise judgement in maintaining the safety and reliability of their distribution system.”).

Joint Comment: *LEAN and NCLC*- With an amendment to include electrification, LEAN and NCLC would consider supporting (e.g., “to inform a decision by a gas company whether to retire gas infrastructure and replace it with non-emitting renewable thermal energy infrastructure, replace it with building

electrification and/or non-pipes alternatives, repair the gas infrastructure, or replace the gas infrastructure with new gas infrastructure”). However, we do not support development of standards that would facilitate accelerated cost recovery for more activity for an extended period.

Roll Call Vote: 8 yes, 7 no, and 4 abstain. **Yes** - AGO, Senator Barrett, LEAN, NCLC, PowerOptions, HEET, Buonocore, CLF. **No** – Wakefield Municipal, USW, Berkshire, Eversource, Liberty, National Grid, Unutil. **Abstain** – DOER, DPU, MassDEP, Representative Roy.

- Standards required to be adjusted annually for first 10 years

Proposed by: HEET

Proposal Statement: The non-gas pipe alternative thermal technology is new to gas companies, customers, regulators and installers. There will be learnings along the way that need to be incorporated. Allowing for those learnings in a smooth way through an ability to adjust standards will be critical to the success of the implementation of this new technology.

Supported by: CLF; PowerOptions; Jonathan Buonocore

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unutil)

Statements in Opposition:

USW - Concerned that DPU lacks the capacity to revise regulations of standards on annual basis, in addition to substantive concerns addressed above concerning subject matter of regulations. Needs clarification concerning how DPU would reasonably meet this requirement.

LDCs (Berkshire; Eversource, Liberty, National Grid, Unutil) - For the reasons discussed above, the LDCs oppose the development of standards “to inform a decision by a gas company whether to retire gas infrastructure and replace it with non-emitting renewable thermal energy infrastructure, repair the gas infrastructure, or replace the gas infrastructure with new gas infrastructure.” In addition, as a practical matter, a standard that changes every year is a constantly moving target that creates challenges for application and compliance.

Note of Abstention: *LEAN* – need additional information.

- Requires annual audits to ensure compliance

Proposed by: HEET

Proposal Statement: An audit is a method of ensuring compliance and creating stakeholder trust. Ensuring trust as gas companies begin to transition to thermal companies will be critical to the success of the endeavor. The stability of the companies, as well as the jobs for their workforces, depend on ensuring this stakeholder trust.

Supported by: CLF; PowerOptions; Jonathan Buonocore

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unutil)

Statements in Opposition:

USW - Does not oppose additional transparency/accountability measures relative to the GSEP but does oppose substantive changes that depart from GSEP’s scope, as discussed above.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unutil) – The LDCs oppose this proposed revision because it is beyond the scope of the GSEP Working Group, which is limited to “develop[ing] recommendations for regulatory and legislative changes that may be necessary to align gas system enhancement plans developed pursuant to section 145 of chapter 164 of the General Laws with the applicable statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N and the commonwealth’s emissions strategies.” The focus of GSEP is to replace aging or leak-prone natural gas pipeline infrastructure in the interest of public safety. The inclusion of these proposed development of standards would add a level of complexity that would defeat the objective of the program and encumber Department’s ability to evaluate the plans within the context of their oversight and substitute theoretical regulatory prescriptions for the business judgement of the companies that have an intimate working

knowledge of their own unique distribution systems. The replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC's DIMP. The DIMP was created by federal regulations and compliance with the DIMP is governed by PHMSA and the Department's Pipeline Safety Division. Pursuant to each LDC's DIMP, the LDCs rely on a leak-based assessment analysis to prioritize the replacement of distribution piping using a balanced approach of incorporating viable risks with high consequences indicated by the plan and other known attributes of facilities within the distribution system, including key factors such as age, size, material, leak history, pressure, density, proximity to structures, public buildings or business districts, and soil conditions. Any additions to the Department's standards should be left to the broad oversight of the Department and not prescribed by legislation. Furthermore, the additional layers of process and bureaucracy envisioned by this proposed revision are not efficient and would only serve to increase costs to customers.

- Failure to comply precludes recovery of the cost of eligible infrastructure investment

Proposed by: HEET

Proposal Statement: The ability of the Department to deny cost recovery for the infrastructure investment helps ensure the gas companies deliver the attention to detail necessary to meet the Department's standards. The Department already has this capability, so there should be nothing controversial about including it. This capability is good to put it in specifically given the conflict around whether or not to continue GSEP and its accelerated cost recovery. If the utilities want to continue to have access to the accelerated cost recovery, they should be willing to support this inclusion of a power the Department already has.

Additionally, HEET supports NCLC's text amendment below.

Supported by: LEAN; NCLC (with amendment); Jonathan Buonocore; CLF

Supporting Statement:

NCLC - suggest the following amendment: "Failure to comply with adopted standards shall be a factor in the Department's evaluation of the prudence of the utility's investment and ability to recover costs associated with said investment."

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - Does not oppose additional transparency/accountability measures. GSEP already requires accountability to obtain cost recovery, and any infrastructure built by the LDCs is reimbursable through rate cases, if not through GSEP. Needs to understand how this proposal would affect the status quo so that it can better evaluate the position.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) - For the reasons discussed above, the LDCs oppose the development of standards "to inform a decision by a gas company whether to retire gas infrastructure and replace it with non-emitting renewable thermal energy infrastructure, repair the gas infrastructure, or replace the gas infrastructure with new gas infrastructure." The punitive framework envisioned by HEET is counterproductive and will stifle innovation. HEET's vision for utility regulation in the Commonwealth is anathema to the Department's longstanding prudent investment and used and useful standards and would undermine the "regulatory compact." The "regulatory compact" is premised upon the idea that utilities are provided an opportunity to recover prudently incurred capital investments—as determined through an examination by the Department—plus an opportunity to earn a reasonable return on those investments.¹¹

¹¹ Town of Hingham v. Dep't of Telecomm. & Energy, 433 Mass. 198, 203 (2001); New England Telephone and Telegraph Co. v. Dep't of Pub. Utils., 371 Mass. 67, 73 (1976); Bonbright, James C., Albert L. Danielsen, and David R. Kamerschen, *Principles of Public Utility Rates* 198-209 (1988) (2nd Ed.); Phillips, Charles F. Jr., *The Regulation of Public Utilities* 21 (1993) (3rd Ed.); Boston Edison Company, D.P.U. 906 (1982), 1982 MASS. PUC LEXIS 7, *58 (Mass. D.P.U. April 30, 1982) ("[T]he service obligation, regulatory price control, and the

The prudence test determines whether cost recovery is allowed at all, and is typically applied when the utility first proposes to include the plant in rate base. NSTAR Electric Company and Western Massachusetts Electric Company, D.P.U. 17-05, at 85 (Nov. 30, 2017); Western Massachusetts Electric Company, D.P.U. 85-270, at 25-27 (1986). If specific utility investments were directed by the Department as HEET suggests, the Department’s prudence reviews of capital investments could be encumbered and the regulatory compact may be undermined. See Bay State Gas Company, D.T.E. 05-27, at 39 (2005) (“Endorsing a specific method of replacing a utility’s unprotected steel infrastructure would not only limit the utility management’s operational flexibility, but also could encumber the Department’s future prudence reviews Accordingly, the Department will not direct a specific approach and will defer to the Company’s management judgment to choose the appropriate approach for the replacement of its unprotected steel infrastructure, taking into account the paramountcy of public safety and the goals of efficiency and reasonable cost.”); NSTAR Electric Company and Western Massachusetts Electric Company, D.P.U.17-05, at 88-89 (Nov. 30, 2017) (“The Department has found that decisions regarding the level and types of capital investment to be made by a company rest, in large part, with company management. The Department also has recognized that distribution companies have full discretion to exercise judgement in maintaining the safety and reliability of their distribution system.”) (citations omitted).

B. Broader Conceptual Issues

- Terminate existing expedited rate treatment for GSEP-related costs of natural gas infrastructure replacement in favor of recovery of such costs by LDCs in base rates

Proposed by: AGO, NCLC

Proposal Statements:

AGO - The AGO supports a phased end to accelerated cost recovery under the Gas System Enhancement Program (GSEP). GSEP is, at its core, a funding mechanism that allows utility companies to recover the costs of natural gas infrastructure replacement on an accelerated timeline. Accelerated cost recovery has resulted in unchecked overspending that is not proportional to purported safety benefits. If GSEP continues at its current pace, the total cost of this initiative will be approximately \$40 billion over the next decade, an expense borne by ratepayers. GSEP costs are not only exorbitant, but the program also is inconsistent with statewide GHG emissions limits and sublimits established pursuant to Chapter 21N. In fact, accelerated cost recovery makes it *more* difficult for the Commonwealth to meet these GHG limits and sublimits by encouraging further institutionalization of natural gas infrastructure that should be largely phased out by 2050. Moreover, LDCs have a legal obligation to address leaks to ensure that their systems are safe and reliable, regardless of their funding mechanisms.¹² As they did before GSEP was instituted in 2014, the LDCs should seek cost recovery through base rate cases, which provide greater transparency and accountability. The AGO supports a phased end to GSEP’s accelerated cost recovery mechanism as a means to ease the transition away from this expensive program. The statute currently caps the amount of GSEP recoverable by LDCs at “1.5 percent of the gas company’s most recent calendar year total firm revenues...or (ii) an amount determined by the department that is greater than 1.5 percent.” Since 2019, the Department has allowed LDCs to recover 3 percent of the most recent calendar year’s total firm revenues. Part One, above, proposes codifying this increase in the amount recoverable.

support obligation are the essential components that underlie the regulatory compact which public law and policy have created between consumers and utility investors.”).

¹² M.G.L. c. 164, § 144 (“Grade 1 leaks require repair as immediately as possible and continuous action until the conditions are no longer hazardous.”); 49 CFR 192.703 (“(b) Each segment of pipeline that becomes unsafe must be replaced, repaired or removed from service; (c) Hazardous leaks must be repaired promptly.”); 22 CMR 101.00 (stating every piping system in Massachusetts shall be constructed, operated, and maintained in compliance with Minimum Federal Safety Standards under 49 CFR 192).

Rather than adopting this proposed increase in perpetuity, the AGO recommends scaling back accelerated cost recovery over the next six years before terminating GSEP entirely on October 1, 2030, as shown below.

Year	Percent of the gas company’s most recent calendar year total firm revenues
October 1, 2024	2.8%
October 1, 2025	2.5%
October 1, 2026	2.0%
October 1, 2027	1.5%
October 1, 2028	1.0%
October 1, 2029	0.5%
October 1, 2030	0.0%

Furthermore, the AGO opposes expanding the statute’s definition of “eligible infrastructure.” Some working group members have suggested broadening the definition of “eligible infrastructure” so LDCs may recover the costs of developing renewable energy infrastructure – such as networked geothermal systems – on an accelerated basis. GSEP already imposes significant ratepayer burdens; expanding accelerated cost recovery to include other kinds of construction would continue to raise costs and likely far exceed GSEP’s current \$40 billion price tag over the next decade. Additionally, the costs, feasibility, and efficacy of renewable energy systems are too uncertain at this time to justify accelerated cost recovery. As should be the case with gas pipeline infrastructure, LDCs should be required to recover the costs of geothermal and other renewable energy construction in base rate cases.

Finally, the AGO supports adjusting GSEP requirements, as proposed in Part One, above, so that its goals are consistent with the Commonwealth’s climate priorities while adequately protecting ratepayers. Accordingly, in the plans submitted to the Department, the LDCs should be required to consider all alternatives to natural gas infrastructure, targeted gas system decommissioning, and whether construction will result in stranded assets whose ongoing maintenance and operation costs will be borne by a shrinking customer base. The LDCs should also be required to report on GHG emissions reductions and demonstrate compliance with emissions limits and sublimits established pursuant to Chapter 21N.

In conclusion, accelerated cost recovery is a financial incentive for LDCs to excessively spend on natural gas infrastructure at the expense of ratepayers, all while institutionalizing a gas system that should be largely retired by 2050. By recovering the costs of addressing leak-prone infrastructure through base rate cases, LDCs will need to exercise more discretion on spending, and, by extension, the costs for ratepayers will go down. Phasing out GSEP over the next six years will significantly reduce costs, prevent stranded assets, and better align with the Commonwealth’s climate goals.

NCLC - NCLC supports an end to the special cost recovery treatment of GSEP, and the transition of the GSEP docket to a planning docket. Accelerated recovery of infrastructure costs through a monthly surcharge is an expensive way to incorporate delivery service investments into customer rates, and incentivizes spending up to any set cost cap. Removing special cost recovery, and revising the GSEP statute to accommodate informed gas system planning, will allow the Department to make careful informed decisions specifically focused on gas system planning. Part of that process should include a mapping of gas leak activity among other informational data points (which may require revisions of G.L. c. 164, § 147). Other mapping to inform the process, such as where electric load is not currently constrained, highlighting areas served by the same utility company for both gas and electric service, would be informative as the Department considers where electrification efforts could begin promptly. Cost recovery of any planned investments, however, can and should come in rate cases, where it existed for decades before enactment of the GSEP

statute and the overall rate impact of a utility's proposal can be fully assessed. In the alternative, if the updated statute does not immediately end GSEP's cost recovery component, then we would support a firm date for ending the special cost recovery treatment of GSEP. If a date must be chosen, we strongly recommend that the date added at G.L. c. 164, § 145(b) should be moved up to a date no later than December 31, 2024.

Supported by: LEAN; CLF; HEET (with clarification); PowerOptions; Jonathan Buonocore

Supporting Statements:

HEET (with clarification) - The AGO's suggested "ramp-down" of GSEP is a generous and intelligent suggestion, however HEET suggests going a step or two further. The ramp-down would allow the gas utilities to replace over ~900 miles more of gas pipe (at current costs) with new gas pipe. Taking away accelerated cost recovery will in no way stop the gas utilities from their need to replace gas pipes in order to improve safety. It just discourages them from doing so. They will continue at a slower pace without accelerated cost recovery, to replace the more than remaining 1,000 miles remaining of the small diameter cast iron mains pipe with new gas pipes. This is a lost opportunity. Every mile of gas pipe installed moves us in the wrong direction. The GSEP, with its carrot of the accelerated cost recovery, is the perfect vehicle for transitioning the gas system to non-combusting clean energy. Retaining the accelerated cost recovery (with conditions such as affordability) is a powerful lever to motivate the gas companies to install infrastructure that can meet the Commonwealth's emissions mandates. HEET instead suggests that at the same time as the GSEP mileage in new gas pipe is "ramped-down", there is a ramp-up of the mileage installed each year of non-gas pipe alternatives. The non-gas pipe alternatives ramp-up increases until they are 100% of the GSEP program. The Department can decide on the speed of this ramp up, as well as the length of the overall GSEP program, and can re-evaluate that speed every year to maintain affordability while moving to meet the limits and sublimits pursuant to chapter 21N. If a utility is unable to meet the speed, quality or affordability requirements, then the Department can take away the accelerated cost recovery for the next year or terminate the program.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - Opposes this approach. GSEP has produced a remarkable reduction in leaky pipe in the Commonwealth, but Massachusetts LDCs still have a significant inventory, largely in congested urban areas where their replacement is more expensive and also has the potential to seriously impact public safety and health. New pipeline is safer and more durable—reducing leaks and promoting public/occupational safety. Prior to the introduction of the GSEP, some LDCs routinely deferred pipe replacement, putting their workers and the public at risk. Abruptly ending accelerated cost recovery would be likely to reverse the record that the LDC's have built in proactively replacing pipeline.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) - This proposal either overlooks or deliberately ignores the fundamental purpose of GSEP and the public interest which underlies it: accelerating the replacement of leak-prone pipe to ensure the safe, efficient, and reliable delivery of natural gas to customers. This proposal is beyond the scope of the GSEP Working Group because it is tantamount to the repeal of the GSEP statute. The GSEP Working Group's mandate is limited to "develop[ing] recommendations for legislative and regulatory changes that may be necessary to align gas system enhancement plans [GSEPs] developed pursuant to section 145 of chapter 164 of the General Laws with the applicable statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N and the commonwealth's emissions strategies." The GSEP framework has been a success—appropriately balancing the safety and integrity of the distribution system with the cost to customers. The local gas distribution companies have already replaced approximately 4,109 miles of main and 199,850 services. Fitchburg Gas and Electric Light Company, D.P.U. 23-GSEP-01, Second Five-Year Review 2018-2023, at 1 (filed November 3, 2023). GSEP has provided economic benefits to the Commonwealth in the form of additional jobs.

Id. at 12, 15, 18, 22, 25, 28. Additionally, since GSEP began in 2015, this work has eliminated an estimated 7,890 gas leaks and reduced methane emissions by approximately 58,571 metric tonnes. Id. at 2. There is no reasonable basis to depart from the GSEP framework, nearly a decade into its operation, in favor of recovering replacement costs in base rates.

Roll Call Vote on AGO phased-out approach: 8 yes, 7 no, and 4 abstain. **Yes** - AGO, Senator Barrett, LEAN, NCLC, PowerOptions, HEET, Buonocore, CLF. **No** – Wakefield Municipal, USW, Berkshire, Eversource, Liberty, National Grid, Unitil. **Abstain** – DOER, DPU, MassDEP, Representative Roy. Note: AGO and NCLC do not support expanding accelerated cost recovery to non-pipe alternatives.

- Redefine an LDC’s obligation to continue to serve an existing customer in a manner that would enable natural gas service to be replaced with substitute heat or energy service (e.g., networked geothermal or electrification)

Proposed by: HEET

Proposal Statement: Gas utilities currently can only sell gas and install gas infrastructure. They also currently can only meet their obligation to serve customers using gas. This means they cannot meet the commonwealth’s net zero emissions mandate. The edits below are intended to allow them to serve their customers and conduct their business while moving toward non-combusting clean energy. Since these definitions were not within the compiled redlines, the text of the definitions are below.

- “Gas company,” a corporation organized for the purpose of making and selling or distributing and selling, gas or utility-scale non-emitting renewable thermal energy within the commonwealth, even though subsequently authorized to make or sell electricity provided however, that gas company shall not mean an alternative energy provider.
- “Non-emitting renewable thermal energy,” thermal energy that provides heating or cooling without combustion and that does not release greenhouse gas emissions as defined in section 1 of chapter 21N.
- Section 92 of 164: Section 92. On written petition of any person, having a residence or place of business in a town where a corporation is engaged in the manufacture, transmission or sale of gas or the distribution of electricity, aggrieved by its refusal or neglect to supply him with gas or electricity, the department may, after notice to the corporation to appear at a time and place therein named to show cause why the prayer of such petition should not be granted, issue an order directing and requiring it to supply the petitioner with gas or other thermal energy, as determined by the department pursuant to the priorities of section 1A of chapter 25, or electricity, upon such terms and conditions as are legal and reasonable; provided, however, that if such corporation is engaged in such town solely in the transmission of gas such order shall not be made where it appears that compliance therewith would result in permanent financial loss to the corporation. A gas company may meet any obligation to serve by providing a customer with non-emitting renewable thermal energy, including but not limited to networked geothermal infrastructure or an electric heat pump.

Alternative Proposal by EEA Agencies: “Pursuant to a Decommissioning Plan approved by the Department, a gas company may terminate natural gas service to a customer where such Plan provides that the heating function provided to such customer by natural gas is replaced by a non-gas pipeline alternative that provides substantially similar service to such customer, as determined by the Department. Not later than 180 days after the effective date of this act, the Department shall promulgate regulations governing the terms (including notice requirements and provisions protecting such customer from service interruption) under which a gas company may terminate natural gas service pursuant to this section.”

Supported by: AGO; LEAN; NCLC; CLF; PowerOptions; Jonathan Buonocore

Supporting Statements:

AGO – The AGO supports the proposal by the EEA agencies.

CLF - Redefining the LDCs' obligation to serve can provide an opportunity for LDCs to identify opportunities for their participation in efforts to achieve net-zero greenhouse gas emissions. This is a potentially vital tool in Massachusetts' transition to a clean energy future and should be considered as a viable change sooner rather than later.

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

USW - This is well beyond the scope of this working group and has implications extending well beyond Chapter 164.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil) – The LDCs oppose this proposed revision. Redefining a local distribution company's obligation to continue to serve an existing customer is outside the scope of the stakeholder working group's statutory mandate as set forth in the Drive Act. Furthermore, by presuming that natural gas service can/will be replaced with substitute heat or energy service assumes that the non-pipe alternative criteria is met and determined the NPA to be affordable and feasible. Additionally, the replacement of leak-prone pipe should continue to be based on the risk scores pursuant to each LDC's DIMP. While the LDCs are supportive of consideration of non-pipe alternatives, substitute heat or energy service (e.g. networked geothermal or electrification) requires not only customer adoption, but a location of GSEP eligible pipe that would allow for a section of the LDC's natural gas distribution system to be retired without duplicative pipe being required to continue the operation of the LDC's remaining system. The LDCs generally support the inclusion of "non-pipe alternatives" assuming the non-pipe alternative criteria is met and determined the NPA to be affordable and feasible by the local distribution company and the NPA has been reviewed and approved by the Department in the context of the GSEP, which encompasses substitute heat or energy services. Generally, any additions to the Department's standard of review should be left to the broad oversight of the Department and not prescribed by legislation.

Roll Call Vote on alternative proposal by EEA Agencies: 6 yes, 5 yes with additional language regarding consideration of impact on low-income customers, 7 no, and 1 abstain. **Yes** - AGO, DOER, DPU, MassDEP, Senator Barrett, CLF. **Yes with additional language** - LEAN, NCLC, PowerOptions, HEET, Buonocore. **No** – Wakefield Municipal, USW, Berkshire, Eversource, Liberty, National Grid, Unitil. **Abstain** – Representative Roy.

- If section 145 is amended to require (1) consideration of a non-gas pipe alternative, and (2) a determination by the LDC that such alternative is "infeasible or not cost-effective," what costs are included in such cost-effectiveness analysis?

Proposed by: HEET

Proposal Statement: A non-gas pipe alternative is considered not feasible or not cost-effective in a similar manner to the way the installation of a gas pipe is evaluated. The non-gas pipe alternatives of advanced leak repair and renewable thermal infrastructure would be considered feasible and cost effective if the costs of the installation plus operations and maintenance were considered likely to be paid back over the measure's lifetime while maintaining customer bill affordability, and while factoring in any likely growth of local energy use along that street segment over that time period. Since renewable thermal infrastructure installation is new to gas utilities, for the first decade of these installations, a little financial leeway should be given, through the application of a cost-curve reduction¹³ assumption. The other non-gas pipe alternative is retiring the gas main and

¹³ Wright's Cumulative Average Model (<https://maaw.info/LearningCurveSummary.htm>) is a simple method of calculating the cost curve. $Y = aX^b$ where:

- Y = the cumulative average time (or cost) per unit.

transitioning the connected buildings from gas to electricity. This alternative does not result in any on-going revenue stream for the gas utility and thus has a harder time meeting any financial viability test. How to do this would be perhaps best left to the Department to enact, but one potential option is to utilize the avoided costs of future operations and maintenance funds, along with Mass Save funds.

Supported by: PowerOptions; Jonathan Buonocore (with clarification)

Supporting Statements:

Jonathan Buonocore (with clarification) – There should be some thought and deliberation about definitions of the scope of a cost-benefit assessment. Similar to above, should only direct financial considerations be included, or should this also include health, climate, safety, and other considerations?

Opposed by: USW; LDCs (Berkshire, Eversource, Liberty, National Grid, Unital)

Statements in Opposition:

USW - This would require a holistic analysis, including not just consumer replacement and maintenance costs and costs to the LDCs in acquiring, training, constructing, operating, and maintain alternative infrastructure but also just transition costs. It should also include costs associated with the failure of a non-pipe alternative—e.g., heat pumps failing to work during periods of extreme cold. And it would need to consider the cost of just transition of the LDC’s workforce and economic impacts on both the communities whether pipeline was housed and communities where gas workers live.

LDCs (Berkshire, Eversource, Liberty, National Grid, Unital) - As discussed above, the LDCs do not support a framework under which the LDCs must show a non-pipe alternative is infeasible or not “cost effective” before they can replace or retire pipe. The question posed by this proposal is telling because it highlights the fact that it is unclear what costs should be included in such an analysis and suggests that this may not be a practical framework at this time. For example, networked geothermal is still in the pilot stage in the Commonwealth, and the true costs and useful life of the technology may not be fully understood. In addition, the cost-effectiveness of new and evolving non-pipe alternatives would be subject to multiple assumptions concerning uncertain factors such as the pace of renewable/energy storage development, the total cost of large-scale intermittent renewable generating sources, the cost of electric system upgrades necessary to enable electrification, how long gas generation will be on the margin, workforce transition costs, etc.). As the number of assumptions increase, the conclusions that may be drawn from the analysis are less reliable.

- Require DPU to establish planning docket to address depreciation of gas utility infrastructure

Proposed by: LEAN and NCLC (joint proposal)

Proposal Statement: The DPU should be directed to establish a planning docket to address depreciation of gas utility infrastructure. In addition to the cost recovery available through GSEP, gas utilities have also sought approval from the DPU to further accelerate this recovery via accelerated depreciation. Addressing all cost recovery questions related to gas infrastructure through a planning docket would provide an opportunity to examine all costs and impacts on rates, and to take steps to keep residential rates affordable.

Supported by: HEET (with clarification); Jonathan Buonocore

Supporting Statements:

-
- X = the cumulative number of units produced.
 - a = time (or cost) required to produce the first unit.
 - b = slope of the function when plotted on log-log paper.

HEET (with clarification): This is similar to the suggestion under the definition of eligible infrastructure replacement to “minimize stranded assets.” If the Department accelerates depreciation of gas assets, it should also create a phased plan to decommission them as they are paid off, in a way that maintains safety and reliability. Otherwise, it is possible the customers will have to rush to pay for these assets by 2050, while the assets continue to be used long past that point, producing emissions in the Commonwealth and revenue for the local gas utility.

Opposed by: LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)

Statements in Opposition:

LDCs (Berkshire, Eversource, Liberty, National Grid, Unitil)– The LDCs oppose this proposed revision. The addition of “depreciation of gas utility infrastructure” is outside the scope of the stakeholder working group’s statutory mandate as set forth in the Drive Act. Furthermore, this effort would be duplicative of the Department’s directive in D.P.U. 20-80 concerning the deprecation of gas utility infrastructure.

APPENDIX

LEAN's Summary Comments

INTRODUCTION

In addressing the request for specific language revisions and additions to the current GSEP statute, it is useful to set out the broad themes and rationales that underlie our recommendations. Our recommendations reflect the broader context within which GSEP revisions need to be considered: the future of natural gas distribution in light of greenhouse gas (GHG) reduction requirements.

1. Affordability and Equity

a. As customer costs for heating with natural gas or most alternatives increase, Total Energy Burden (percentage of household income devoted to home energy costs) will increase and increase most for those at the lowest incomes.

i. As gas sales shrink, costs per remaining customer will increase.

ii. Most alternatives to heating by natural gas are more costly to customers. The only proven alternative, on-site electric air source heat pumps, require significant customer investment and are usually more costly for customers to fuel and maintain.

b. LMI focus -- Low-income (LI) customers are, by definition, the most economically vulnerable:

In Massachusetts, the average energy burden for all households is about three percent, but the average energy burden for low-income populations is about ten percent, and in certain neighborhoods, the energy burden is as high as 31 percent.⁵ Moreover, low-income households in Massachusetts spend at least 3.5 times more of their income on energy than non-low-income households.⁶ Researchers have identified a household with an energy burden of six percent or more as having a high energy burden.⁷

⁵ Kimberly Clark, Metropolitan Area Planning Council, Reducing Energy Burden: Resources for Low-Income Residents (January 28, 2022, 4:03 PM), <https://www.mapc.org/planning101/reducing-energy-burden-resources-for-low-incomeresidents>.

⁶ U.S. Department of Energy, Office of State and Community Energy Programs, Low-Income Energy Affordability Data Tool, <https://www.energy.gov/scep/slsc/lead-tool> (last visited December 1, 2023).

⁷ American Council for an Energy-Efficient Economy, Understanding Energy Affordability, <https://www.aceee.org/sites/default/files/energy-affordability.pdf> (last visited December 1, 2023).

(Energy Burden with a Focus on Energy Affordability for Residential Ratepayers, DPU 24-15 NOI at 3 (Jan. 4, 2024).)

Current LI rate discounts are vital, and LI ASHP conversions are available at no cost from MassSave, but discounts are unlikely to bridge the entire energy burden gap universally. Non-low-income moderate income (MI) customers currently receive no discount.

c. There are low- and moderate-income communities that have also been disproportionately disadvantaged, without compensation, by the negative consequences of publicly-overseen energy infrastructure siting. There are several definitions of such Environmental Justice (EJ) communities, with varying levels of precision in identifying the disadvantaged populations.

2. Law and options re stranded investment

a. DPU precedent, in simple terms, is that a utility investment prudently made but no longer "used and useful" (sometimes referred to as "stranded investment") remains entitled to recovery (amortization) but not a return. This means that decommissioning pipe will not significantly reduce LDC revenue requirements, which then must be paid by a shrinking number of customers. This increase in customer bills is likely to be considerably larger than the "transition charges" resulting from the 1997-1998 electricity restructuring. Stranded investment is thus a particular concern for low-income households.

i. Shrinking gas LDC customer count and revenue, coupled with little change in net rate base, will result in increased gas bills for those remaining.

ii. Those gas customers who convert from gas to electric ASHP heat will, at current rates, also see increased bills for heating.

b. There is thus conflict between the policy goals of affordability and equity on one hand with utility financial integrity on another. Therefore an additional cost recovery mechanism is needed to meet both statutory goals, as well as the statutory policy goals of environmental protection. Options for addressing this funding gap include ratepayers, taxpayers, and other outside funding. As set out in the next point below, since well-justified GHG reduction public policy is a main driver of increased costs, public policy needs to cover a major share of them.

3. Cost-effectiveness and feasibility: comparing options, short-term v long-term consumer impacts, choosing among non-gas pipeline alternatives (*i.e.*, all reasonable alternatives)

a. GSEP and the future of natural gas distribution are surrounded by often-conflicting policy objectives: LDC financial integrity (including cost recovery for repair and replacement of pipeline infrastructure including embedded costs, potential stranded assets, and opportunity costs and benefits), affordability and equity (customer bill impacts), GHG reduction requirements, safety, public health, and reliability. *See* St. 2022, c. 179, sec. 68.

b. From the viewpoint of low-income households, affordability and equity policies need to consider *short-term* financial impacts.

c. Aspects of public policy can be seen as unfunded mandates that increase household bills without compensation or mitigation, a particular concern for low-income households already struggling with current bills.

i. Customer economics -- at current prices, conversion from gas to electric ASHPs (for example) is often not an economic alternative for customers; renewable thermal is a promising unknown. Complicating this is that the future relationship of gas and electricity prices is likely to change. Yet public policy demands proceeding with efforts to reduce GHGs while maintaining the aforementioned additional policy objectives. Therefore public policy should bear a share of the affordability and equity risks and costs involved, especially for low-income households.

ii. Public policy cost-effectiveness analysis, as distinguished from cost-effectiveness from the customer or LDC financial point of view, requires (a) assessment of public/societal benefits, such as avoided Social Costs of Carbon/Methane (SCC), (b) establishment of costs and bill impacts, and (c) identification of funding source(s) to bridge affordability gaps. MassSave energy efficiency Total Resource Cost cost-effectiveness analysis provides some guidance -- *e.g.*, (a) including the value of SCC needs to be resolved (proposals pending at MassSave), (b) consensus on gas alternatives and their probable costs and bill impacts needs to be at least tentatively achieved, and (c) with most difficulty, non-ratepayer funding needs to be identified and secured to bridge the gap to affordability.

iii. Uncertainties -- Decisions are needed despite the context of uncertainties, *e.g.*, of networked thermal economics, future gas and electricity prices.

E.g.,” RNG currently does not meet the Department’s least-cost supply planning standards,” “we are not convinced that sufficient RNG stocks will be available,” “we will not authorize a mechanism that would socialize the higher commodity cost of RNG,” “RNG and hydrogen blending are new, unproven, and uncertain technologies,” the Department welcomes networked geothermal ... as promising decarbonization strategies ... the Department is uncertain about the viability of hybrid heating and hydrogen technologies,” “The Department ... eagerly awaits successful valuation data concerning their [geothermal heat districts and alternative thermal technologies] costs, feasibility, and potential scalability.” (The Role of gas local distribution companies re: 2050 climate goals, DPU 08-50-B, at 68, 81, 79, 85-86 (Dec. 6, 2023).)

Nevertheless a democratic public consensus over decisions is necessary, perhaps achievable through DPU pre-approval review after DPU-approved pilot R&D projects.

c. Traditional LDC cost-effectiveness/prudence review considers, *inter alia*, financial integrity and bill impacts (affordability and equity), as well as potential stranded assets, opportunity costs and benefits, safety and reliability, to which must be added public policy objectives such as GHG reduction requirements and public health. The DPU has dealt with such issues for more than a century, so there is extensive regulatory precedent, *e.g.*, line extension policy. However, as has been pointed out, there is not enough known with certainty about costs and other concerns with respect to potential alternatives, And, as explained above, the major likely bill impacts of traditional regulatory review will require non-regulatory financial solutions.

i. Part of the needed analysis is prioritization of alternatives, *e.g.*, Advanced Leak Repair (sleeving or internal coating) v. external patch (repair) v. replacement v. decommissioning v. other alternatives. Analytical factors include imminent safety and long-term customer total cost (including customer alternatives). Thus a process is needed to determine when it is prudent to replace a pipe -- a long-term investment unlikely to be useful for its entire physical life -- with significant alternative investment, or rather than opt for one of the shorter-term alternatives or longer-term less costly alternatives from the customer perspective..

ii. Electrification via in-home ASHPs is currently the only alternative with proven feasibility but it is not economic for consumers.

d. Where possible, the needed analysis would be most efficiently accomplished as part of an iterative Gas-Electric Integrated Planning process, with periodic updating. This could include development of phased blueprints (*e.g.*, by street segments) and should include consideration of customer economics. One result should be dated target plans to reach emissions targets. To this possible end “the Department directs each LDC to work with the applicable electric distribution company to study the feasibility of piloting a targeted electrification project in its service territory.” (DPU 08-50-B at 88)

4. Support for displaced gas workers is an important additional policy objective.

5. Determination of when GSEP accelerated cost recovery will be terminated and how cost recovery will be treated otherwise.

a. Consideration might be given to recovery for alternatives (including carefully conducted and evaluated R&D such as pilots) and replacement, perhaps only after pre-approval following full public analysis.

b. In the future, where non-gas alternative pilots (such as renewable thermal) prove feasibility, favorable customer economics, safety, and environmental benefits, consideration might be given to incentives along the lines of the MassSave energy efficiency model.

c. As explained above, financial solutions for LDCs should be coupled with affordability solutions to offset additional consumer costs of non-cost-effective measures (from the consumer point of view) and added utility costs (such as any incentives).

6. Prudence of new construction absent safety concerns requires assessment..

7. Assertions that some of the above considerations are "beyond the scope" of GSEP raise issues that are up to the General Court to decide. In any event, whatever the original purpose of GSEP, public policy objectives -- not to mention economic conditions -- have undergone substantial change since its adoption. We make these recommendations to the General Court as inextricably entwined with the updating of GSEP policy.

HEET's Summary Comments

January 16, 2024

The Department has recently issued its order on the Future of Gas (DPU 20-80). The summary of this document was titled “Beyond Gas.” With this order, the decision has been made. The state will move beyond gas. The question now is not *if*, but *how*.

Luckily the gas utilities are accustomed to changes, having moved from “manufactured” gas to “natural” gas and then to “produced” gas¹. With each of these transitions, major changes in infrastructure and/or appliances were required. Each time the gas utilities and workers have risen to the challenge, always moving toward a product that is safer, more affordable and lower emitting.²

Following the Department’s order, it is time to transition again. How we do so will impact the costs, speed, equity, safety and ease of this transition.

Enacted well, this transition can be a model for other states as they also move beyond gas to a safer, more affordable, non-combusting, renewable thermal system that works for all.

The Current Dilemma

As part of the Gas System Enhancement Plan (GSEP), Massachusetts gas utilities are spending over a total of \$800 million per year installing new gas mains to replace old gas mains. These pipes have a lifespan of well over 50 years and are paid back over that time period by customers.

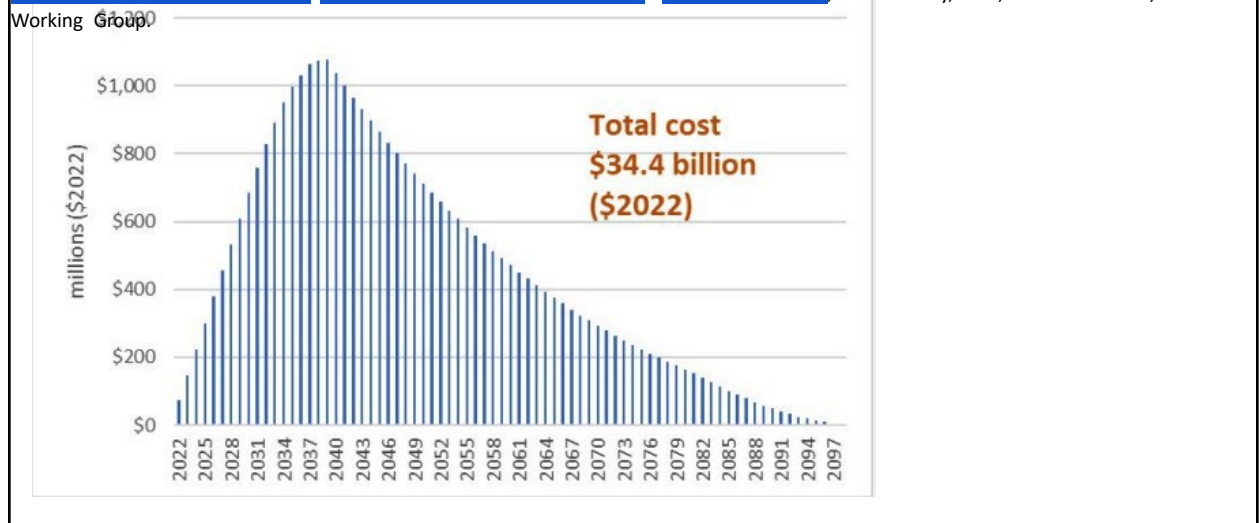
Dorie Seavey’s presentation to the GSEP Working Group demonstrated that from now until the end of the GSEP program (currently projected to be 2039), an additional \$34 billion³ worth of new gas infrastructure will be installed. If paid for by customers in the normal way, these pipes would not be fully paid for until 2097.

¹ Manufactured or “town” gas was made from gasification of coal, followed by natural gas, then fracked or produced gas.

² Please see the 1952 *New York Times* article at the end of this letter about the transition from manufactured to natural gas.

³ Including return on equity and operations and maintenance.

GSEP's cumulative costs as derived from the "Future of Gas" Independent Consultant Reports, Dorie Seavey, PhD, 20 October 2023, GSEP



I. Rising Energy Burden

Compounding the difficulty of the need for investment is that heat pumps are now outselling gas furnaces across the country, partly because they deliver cooling as well as heating.⁴ In Massachusetts, heat pumps are also highly incentivized, since the state's Clean Energy Climate Plan has a goal of transitioning 1 million homes to them by 2030. It is thus not surprising that heat pump sales have tripled in Massachusetts each year for the last few years.⁵

As this trend continues of customers retrofitting their buildings to move from gas to heat pumps, fewer and fewer customers will remain on the gas system. However, that gas system will still have the same number of miles of pipe, with the same fixed maintenance costs. These maintenance costs will be shouldered by fewer and fewer gas customers, making the customers overall gas bills increase.

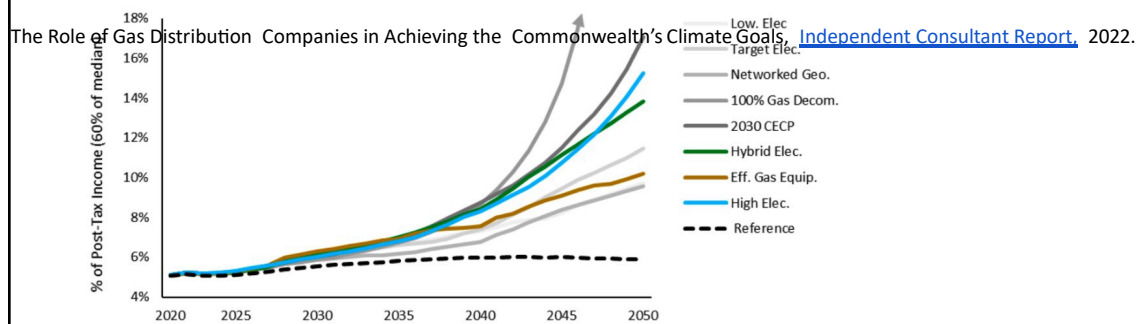
The higher gas bills will inspire more customers to move to heat pumps, creating a feedback loop. In the end, the only ones left on the gas system are likely to be those who cannot buy a new heating system: low-income residents and renters. This is not the sort of just transition we want for the Commonwealth.

Additionally, with a smaller and lower income customer base, the gas utilities will cut back where they can, potentially keeping fewer workers on staff—this could mean that the safety of the system will suffer.

⁴ [Heat pump sales in US surged past gas furnaces in 2022](#), Canary Media, 2022.

⁵ <https://www.mass.gov/info-details/massachusetts-climate-report-card-buildings-decarbonization>

Figure 38. Non-migrating customer energy burden for low-income customers (% of annual income spent on gas and electricity). A low-income customer is defined as a customer with a household income that does not exceed 60% of the state median income level.



II. Stranded Assets

Since the Commonwealth has a net zero emissions mandate beginning in 2050 and gas is a fossil fuel, these new gas pipes being installed today are thus unlikely to be “used and useful” through their lifespan, but instead are likely to become stranded assets that will have to be paid for by the Commonwealth and its taxpayers.⁶ We must end this installation of future stranded assets as quickly as possible.

III. Safety

The question is what to do about safety. Safety is the reason that GSEP was started. The most dangerous type of leak-prone pipes are small-diameter cast iron mains. This type of pipe is brittle enough to crack “catastrophically” during a frost heave, allowing the gas to then migrate underground into nearby buildings. Small-diameter cast iron pipe has thus wisely been prioritized to be replaced as part of GSEP. Since the program started, over 40% of all small-diameter cast iron mains in Massachusetts have been replaced.⁷ Thus our gas system is now much safer than before the program.

However, unfortunately, that increased safety has not been demonstrated yet in the data. According to the Pipeline Hazardous Materials Safety Administration’s (PHMSA) database, in the 11 years before GSEP started, there were 3 deaths and 24 injuries caused by hazardous events with gas. In the 8 years of PHMSA data since, there have been 2 deaths and 27 injuries.⁸ The majority of those injuries, as well as one of the deaths, happened during the Merrimack Valley gas disaster.

⁶ [Who Will Pay for Legacy Utility Costs?](#) Lucas W. Davis and Catherine Hausman.

⁷ [Pipeline Hazardous Materials Safety Administration database](#) shows the mileage of small diameter cast iron mains in MA have decreased from over 3,800 in 2010 to less than 2,250 in 2022.

⁸ [Pipeline Hazardous Materials Safety Administration database](#)

This disaster was caused by a mistake made during a GSEP gas pipe replacement. The incident underlines the fact that, although the gas utilities and workers perform an exemplary job of keeping the gas system and customers safe, gas is explosive and inherently dangerous.

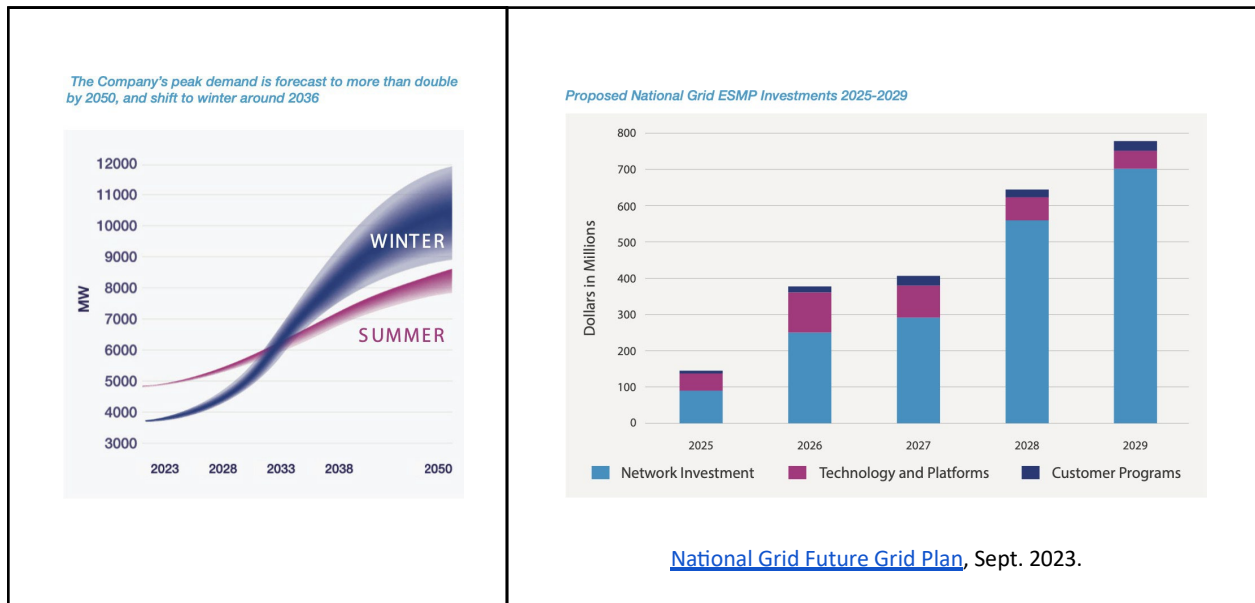
All of us, and especially gas workers, will be safer the faster we transition our gas system to a non-explosive method of piping heat to residents.

IV. Electric Grid Impacts

The best strategy to reduce our emissions is to move all of our energy needs to electricity and then create that electricity with renewables. To provide all that energy (as well as the energy for transportation), the electric grid will have to be upgraded. Since the gas system at peak can contain four times the energy of the electric grid, the electric grid's upgrades will need to be extensive.

As already stated, air source heat pumps are currently the most popular way to retrofit a building's heating system from gas to electric. These systems are reliable and very efficient, but on very cold days their efficiency decreases as they need to work harder to pull heat from cold air. On a cold February morning, having a majority of our buildings on air source heat pumps would create a very high electric grid peak.

Currently our electric use peaks in the summer, on hot days when customers turn on their air conditioning. However, by 2036, as more buildings move to electric heat, the assumption is that the electric peak load will move to the winter and, in the end, will dwarf the current summer electric peak use.



V. Electric Grid Upgrade Costs

The higher these potential electric peaks, the more the grid will need to be upgraded, as well as the more renewable energy and storage will be needed to meet that need. The Electric Sector Modernization Plans (ESMP) are currently in progress. National Grid's ESMP report predicts needing to increase its investments in its electric grid seven-fold within the next five years. If we assume that National Grid's prediction is conservative, and that the actual need is only half of the prediction, the needed upgrade would still require a considerable investment.

Peak electricity is the most expensive electricity we use—costing on average ten times or more that of an off-peak kilowatt hour. Additionally, the higher our future electric peaks are, the longer it will take and the more expensive it will be to:

- Upgrade the system to meet that peak
- Source all the renewables needed to produce clean electricity
- Source all the battery storage to supply that load in a non-intermittent way (when the sun is not shining and the wind is not blowing)

No one currently knows the total cost of this electric grid modernization work, or the total cost of the peak electricity during these future winter peaks. We do know, of course, that all of this will be paid for in the end by customers. If we aren't smart about how we transition and electric bills increase significantly, that would have a negative effect on customers' desire and ability to transition.

VI. Workforce

If the gas system is not transitioned but instead stranded, the gas workforce will be left without jobs, even while we search for the trained workforce to upgrade the electric grid and to perform all the building retrofits.

VII. Summary

Today we have a clear goal. We know we are about to transition from one system to another. However, we are not yet acting or investing as if we know our direction.

Instead we are investing significantly and actively in the gas *and* electric system at the same time, without thinking through how to synergize the work to reduce the cost and increase the speed. It is as though we are taking out a mortgage to replace the foundation on our horse's stable, even after we've ordered an electric car.

Suggested Solutions

VIII. Ramping Down GSEP

As part of the GSEP Working Group, the AGO suggests ramping down the accelerated cost recovery funds allocated to GSEP over time and stopping the program entirely by 2030. This suggestion would help maintain the affordability of gas customer bills (since the customers would not be paying for as many gas pipe replacements) and would commensurately reduce the investment in new assets that are likely to be stranded.

Year	Percent of the gas company's most recent calendar year total firm revenues
October 1, 2024	2.8%
October 1, 2025	2.5%
October 1, 2026	2.0%
October 1, 2027	1.5%
October 1, 2028	1.0%
October 1, 2029	0.5%
October 1, 2030	0.0%

The AGO's suggested ramping down of accelerated cost recovery for GSEP

IX. However, there are problems with this proposed solution.

By 2030:

- The utilities will have installed, at current cost per mile, ~900 more miles of new gas pipe and spent approximately \$5 billion more in capital expenditures (~\$10 billion total, if return on equity, as well as operations and maintenance are factored in).
- The electric utilities will have assumed that the gas system is entirely going away and will be seven years into the needed electric grid upgrades, raising electric bills commensurately for customers. Higher electric bills will make electrification less attractive.

Additionally, after 2030, with GSEP over, there will still be at least 1,100 miles of the dangerous small-diameter cast iron pipe remaining in the state. These pipes will need to be addressed in one way or another.

X. Right-sizing

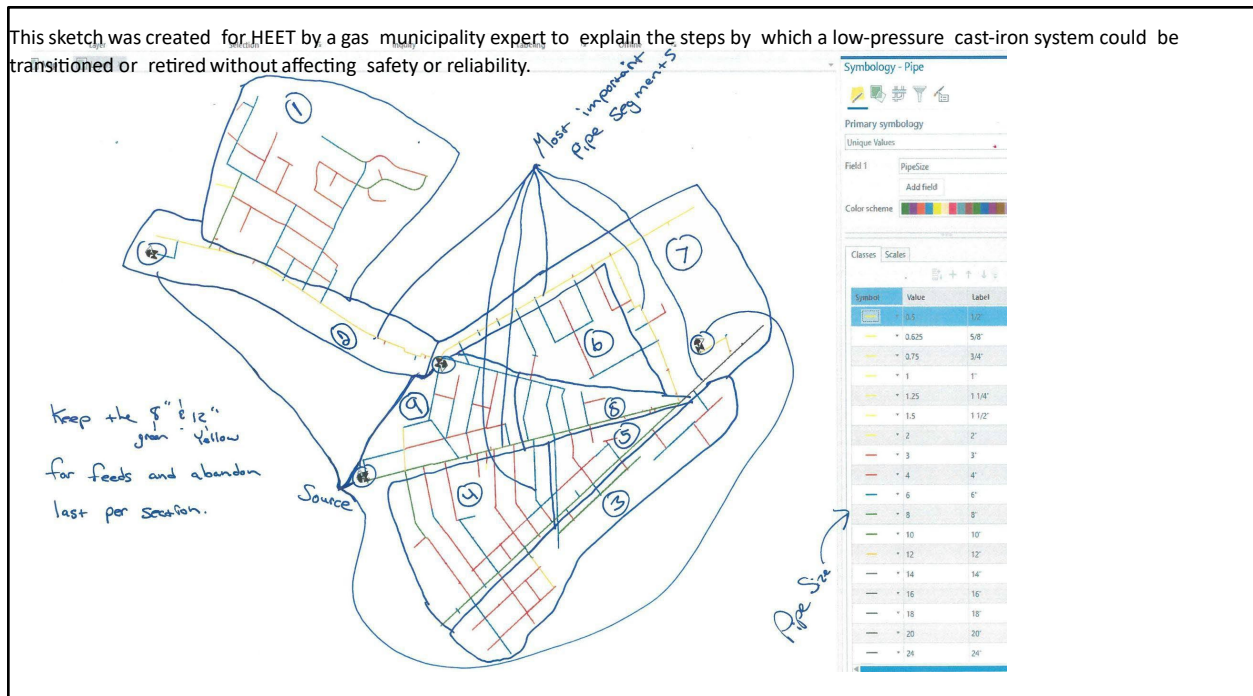
HEET supports the AGO's desire to quickly stop the investment in new gas mains but suggests that we go further in revamping GSEP.

Stopping investing in new gas pipes is only part of the answer. As the gas customer base continues to decrease, the gas system needs to be "right-sized" to maintain a reasonable ratio of customers to infrastructure. Right-sizing this ratio will help keep energy bills affordable and stop the downward spiral toward stranded assets.

This right-sizing can be performed through a combination of the following three **non-gas pipe alternatives (NGPAs)**:

- **Advanced leak repair** where appropriate,⁹ to reduce or eliminate emissions for a decade or more until a pipe can be retired or transitioned.
- **Retiring gas pipes** where appropriate, while moving the connected customers to electric appliances such as air source heat pumps.
- **Transitioning street-segments to water-based thermal systems.**

Both retirement and/or transition of a gas system can be performed (while maintaining safety and reliability) by starting at the distal ends of the gas system in each neighborhood and maintaining two gas feeder pipes into the area until all other gas pipes are removed.



⁹ Advanced leak repair is already allowed as part of the GSEP statute. It is a set of techniques that is less expensive than replacement. These techniques include "sleeving" or "pigging" large diameter pipes to significantly reduce or stop gas leaks for a decade or longer. These larger diameter pipes are not prone to "catastrophic" breaks during frost heaves.

If the gas utilities are allowed to install utility-scale non-combusting renewable infrastructure, then every mile of such infrastructure installed will mean:

- One less mile of new gas pipes installed, one less mile of unsafe pipes remaining in the ground, and fewer future stranded assets.
- One more mile of customers transitioned permanently off of combustion to a highly efficient method of clean electric heating and cooling, a method that reduces the needed local electric grid upgrades and that lowers the overall peak electric load, thus helping to reduce future electric bills.

XI. Transitioning to Non-combusting Thermal Infrastructure

One method of non-combusting thermal infrastructure is a water-based thermal system, such as networked geothermal. Because the water in the pipes can be heated or cooled days *before* the extreme temperature arrives, it can act as a thermal battery, shaving electric peaks. Networked geothermal can also store temperature in the bedrock for weeks or months.¹⁰

Water-based thermal systems can deliver heating, or heating and cooling. These systems can be:

- A. District energy systems,¹¹ which use a central plant to deliver heated or chilled water through pipes across a district. The temperature of the water can be provided through clean electricity. The technology is well proven and financially viable. District energy systems exist primarily in urban areas such as college and hospital campuses, military bases, and business districts, providing heating (and/or cooling) to hundreds of buildings. In Boston and Cambridge, there is, for instance, a district steam system¹² run by Vicinity that is currently being transitioned to a six-stage air source heat pump and wind energy. The system heats over 65 million square feet.
- B. Thermal energy networks,¹³ which contain water at an ambient temperature (generally between 40 and 90 degrees Fahrenheit). Heat pumps in each building take the heating and cooling needed from the water. **Thermal energy networks (which include networked geothermal) are the most efficient thermal systems known**¹⁴ and do not require central plants; instead they maintain the temperature in the system through local heat sources and sinks, such as office buildings, ice rinks, greenhouses, boreholes and bodies of water. Thermal systems can significantly lower the electric peaks through their efficiency.¹⁵ Since they don't need a central plant but instead have distributed resources, they can:
 - Grow organically, interconnecting additional street segments and distributed sources and sinks as needed.

¹⁰[Design Considerations for Borehole Thermal Energy Storage \(BTES\): A Review with Emphasis on Convective Heat Transfer](#), H. Skarphagen, Volume 2019 | Article ID 4961781 |

¹¹ <https://www.energy.gov/eere/amo/articles/combined-heat-and-power-technology-fact-sheet-series-district-energy>

¹² It is important to note that a steam district system is significantly less efficient than lower temperature systems.

¹³ [Underground thermal energy networks are becoming crucial to the US's Energy Future](#), MIT Technology Review, 2023.

¹⁴ See attached Xcel Energy Colorado Mesa University case study.

¹⁵ [Inefficient Building Electrification Will Require Massive Buildout of Renewable Energy and Seasonal Energy Storage](#), Sci Rep 12, 11931 (2022), J. Buonocore et al.

- It is not necessary to know the maximum size of the district before it is built.

This technology is also well proven and can function in urban *and* suburban areas since the ambient temperature of the water in the pipes is close to the temperature of the ground and thus does not lose much temperature if it is piped further. Again, this is a proven, financially viable technology and is used by many large college campuses (for instance, currently UMass Amherst,¹⁶ Smith College,¹⁷ Brown¹⁸ and Oberlin¹⁹ are in the midst of installations).

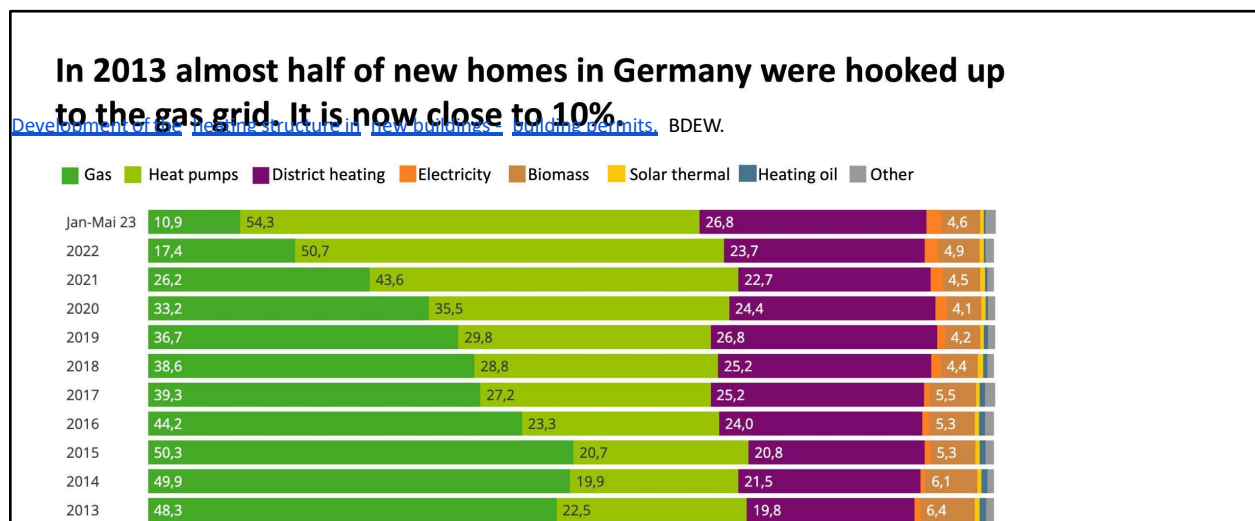
In both cases, the “gas” utility’s role would be similar to what it is now: to install, own and operate the system, in the right of way in the street, using their current financing methods, with their current customers, to deliver the needed temperature through pipes to all customers on the system.

XII. Gas/Thermal Merged Ratepayer Base

So long as the gas and thermal customers are in a single merged ratepayer base, and unneeded gas pipes are retired, the ratio of infrastructure to customers can be maintained, avoiding a rising energy burden and slow slide into stranded assets.

XIII. Can Thermal Systems Be Scaled Up?

New York and Colorado have both already passed legislation mandating that their gas utilities install systems like this. New York is currently figuring out how to regulate these systems. Meanwhile, Germany is far ahead of the US, having moved almost 40% of its new customers off of gas in just 10 years.



¹⁶ <https://www.umass.edu/news/article/umass-amhersts-carbon-zero-project-ramps-geothermal-test-well-drilling-two-locations>

¹⁷ <https://smithgeoenergy.info/>

¹⁸ <https://www.brown.edu/news/2023-11-02/geothermal>

¹⁹ <https://www.oberlin.edu/news/ambitious-geothermal-project-make-oberlin-national-leader-clean-energy>

XIV. Integrated, Street-segment-based, Phased Plan

If you were about to do a major renovation on your home, the first thing you'd want is a blueprint of the building, including information on where the electrical wiring and pipes are. With that blueprint, you could create a specific and phased plan to help ensure that the work happened as smoothly as possible and for the least cost. Moving more than 1.6 million gas customers in the Commonwealth off of gas is a much larger and more complex project than any home.

In order to figure out which solution to use where, we need a plan. In order to create that plan, gas and electric utilities need to share their blueprints with each other to create a unified map of the state's gas and electric system capacities and constraints down to the street-segment level. To this map, can be added the local energy needs, building stock and geology. With this information, it will be possible to apply an algorithm that creates an integrated, street-segment-based, phased plan to transition the system with the greatest speed and equity and for the lowest cost.

Town Name	Town Code	WONUM	DESCRIPTION	Prioritization Factor	Cost Estimate	GSEP Footage
Acton	ACT	1508518	24-65 CONANT ST, ACT, COUNTRY CLUB & FAIRWAY RD	13.0	\$717,126.00	2,110
Arlington	ARL	1127516	174-219 SUMMER ST, ARL, SUMMER ST PL & BRATTLE ST	20.3	\$967,907.25	1,475
Arlington	ARL	1207318	2-24 ORCHARD PL, ARL	4.4	\$309,436.10	470
Arlington	ARL	1471419	53-131 RHINECLIFF ST, ARL	26.8	\$1,338,416.07	2,375
Arlington	ARL	1310396	53-75 DOROTHY RD, ARL	29.4	\$264,023.49	345
Arlington	ARL	1429163	62-179 FRANKLIN ST, ARL	44.7	\$2,531,481.97	3,575
Arlington	ARL	1198194	925-1115 MASSACHUSETTS AVE, ARL	29.5	\$982,259.19	2,900
Bedford	BED	1511469	281-314 GREAT RD, BED, PRIVATE COMMERCIAL COMPLX	15.0	\$1,222,738.96	2,815
Belmont	BEL	1128007	521-563 TRAPELO RD, BEL, & 6-37 MORAIN ST	21.0	\$1,503,228.28	1,235

[DG Hosting Capacity - External Map Viewer](#) EMA showing electric grid capacity.

Overlaying this map of street-segment capacity constraint information with all leak-prone gas infrastructure in the state by street-segment (as shown above in the GSEP reports) would help identify how to transition for the least cost.

Technical details from the map viewer pop-up:

- Operating Voltage: 4.16
- Circuit Name: 311-13
- Bulk Circuit Name: 311-1404
- Distribution: STA, 311 Mattapan
- Substation Name: STA, 311 Mattapan
- Distribution Voltage(kV): 13.8/4.16
- Distribution Substation Rating (MVA): 146.00
- Bulk Substation Name: STA, 496 Hyde Park
- Location: Boston, MA

Suggested Actions

XV. Legislating in a Time of Uncertainty

The time for action is now. Every year that goes by means around 270 more miles of new gas pipes are installed at roughly the cost of a billion dollars. Meanwhile, the electric grid upgrades planning is starting now and the physical work will begin by 2025. Every year, more money will be sunk into two sets of systems without a plan.

Unfortunately, although we know air source heat pumps, district energy systems and thermal energy networks work effectively and are financially viable, we don't know what system works best where. Nor do we have the local expertise and equipment to scale at the speed needed. We need time to plan and iterate on different models to begin to reach scale.

Although this lack of knowledge creates uncertainty, there are ways to move forward now so as to learn as quickly as possible, while minimizing the waste of time and money, and while maintaining affordability for all.

- **Stop the installation of and investment in new gas pipes as quickly as possible.** Enact the AGO's suggestion of a ramp-down of the funds spent on new gas infrastructure.
- **Mandate non-gas pipe alternatives (NGPA) wherever financially and technically viable.** NGPAs, in terms of GSEP, should include the options of advanced leak repair, water-based thermal systems, or retiring gas pipe (while moving customers to air source heat pumps).
- **Create a merged gas/thermal ratepayer base to maintain the ratio of customers to infrastructure** in order to avoid rising energy burden and the slide into stranded assets. Of course as part of this gas utilities should be able to sell and install thermal infrastructure and to meet their obligation to serve through whichever system (gas or thermal) is closer.
- **Slow down and lengthen GSEP to allow for learning.** The overall annual mileage of GSEP infrastructure installed each year can be decreased, while the program is lengthened. This will allow the truly unsafe small-diameter cast iron pipes to continue to be replaced, while giving enough time for trials with NGPAs. With an integrated energy plan, the Department would have the information needed to determine the future duration and speed of GSEP.
- **Create an integrated, street-segment-based, phased plan.** Gas and electric utilities need to share their system capacities and constraints to begin to create an integrated, street-segment-based, phased plan to transition the system with the greatest speed and equity and for the lowest cost.

- **Iterate on the phased plan through regular reassessments with the greatest possible transparency of information.** As it becomes more clear which non-gas pipe alternatives work best while maintaining affordability, the allowable or preferred NGPAs can be readjusted. Since regulation is a faster method to do this than legislation, the Department should be directed to perform this iteration and reassessment. Transparency of information will increase the trust of all stakeholders, while allowing more people to help provide potential answers.
- **Require a greater percentage of NGPAs annually to reach 100% of GSEP.** The least expensive way to affect a market is to give it certainty. Clarifying to the gas utilities that NGPAs is the way forward through a gradual required ramp-up in NGPAs will allow them to figure out how to get the work done, sourcing the expertise, materials and equipment. This required ramp-up will help maintain the workforce we need to accomplish the mammoth job in front of us.
- **Motivate action through a combination of accelerated cost recovery, pre-approval of funds, and/or incentives.** Most people and companies will not perform work without some money up front and without a guarantee of getting paid the rest of the funds. Asking the utilities to perform a year's worth of expensive work without any of the funds up front, and to perform that work without a pre-approval of getting paid back, is an effective way to stop that work. Thus HEET *strongly* encourages a mixture of accelerated cost recovery, pre-approval of expenditures, and/or performance-based ratemaking to help increase the speed of the gas utilities' transition.

As at other points in the history of our infrastructure transitions, there are many unknowns in front of us. The one thing we know for sure is that we are wasting money and time now by installing long-lived combustion infrastructure, while knowing that combustion is going away.

Let's multi-solve the problems in front of us. It's time to create a plan to right-size the gas system by transitioning it to a safer, more affordable water-based system, decommissioning pipes where necessary. With data transparency, a merged gas/thermal ratepayer base and the right incentives, we can iterate forward to meet the Commonwealth's net zero emissions mandate for the least cost and at the greatest speed.

This is a time to build the future and the legacy we want. Respectfully,



Audrey Schulman
Co-founder and Co-executive Director, HEET

Note: Some of the comments from NEGWA/USW seem to suggest a misunderstanding about the scope of the GSEP Working Group. The group was not tasked with performing studies. Instead, each member was selected for their expertise in various fields. The idea was that by working together, these experts will be able to make recommendations that will help align the GSEP statute with the Commonwealth's net zero emission mandates. The legislature and Department could then choose which of the working group's recommendations to enact, and how to do so in conjunction with state and federal law.

XVI. Xcel Energy Report on Colorado Mesa University Geothermal Network System

Xcel Energy evaluated the efficiency of Colorado Mesa University's 15-year-old networked geothermal system. They calculated the average annual system efficiency (please see Table 1, comparing the Coefficient of Performance). The demonstrated efficiency is almost six times more than that of a gas boiler and approximately twice that of an air source system. During the winter, the season efficiency is even higher, demonstrating partly the thermal storage in the system's water and in the nearby bedrock of the boreholes. The report follows.

GAS MAN COMETH, AND SO EARLY TOO

At 7 A. M. He Starts Changing
Brooklyn Appliances for
Natural Type of Fuel

Since March 6 the breakfast routines of thousands of Brooklyn families have been interrupted by the early visits of traveling journeymen new to the local scene. They are among the 3,000 mechanics converting nearly 1,000,000 appliances of Brooklyn Union Gas Company customers from manufactured to natural gas.

The conversion men, each of whom specializes in one type of appliance, make their first calls between 7 and 9 A. M. The basic adjustment they make on each appliance is to drill the burner holes to three times their present size so that the slower-burning natural gas can provide the same amount of heat and the same height of flame as does the manufactured type.

Although the dismantling and reassembling of their ranges, refrigerators and heaters is a singular experience, most Brooklynites are accepting it with city dwellers' usual calm. One of the veteran conversion men on the job, Al Robbins of Fort Worth, Tex., recalled with a laugh the days when casual acceptance was not the normal attitude.

A Trick of the Trade

In nearly thirty years of following the extension of natural gas lines over the country, Mr. Robbins often met the housewife who didn't like the performance of the fuel after the conversion was completed. The workman's standard procedure in such a case was to return to the cellar, spend ten minutes harmlessly banging on pipes, and then report that manufactured gas was flowing again. The customer, he reported, was always satisfied.

The conversion of the Brooklyn-

Queens area services is being done by Conversions and Surveys, Inc. More than one third of the men employed on the project, which is to be completed on Sept. 4, are permanent members of the company's staff who travel where the pipelines take them. The remainder were hired and trained here.

The trade has changed considerably since 1927 when Mr. Robbins was one of 120 men—each carrying \$5 worth of tools—who converted the gas appliances of the whole of Los Angeles. The men who are calling on the 925,000 customers of Brooklyn Union take with them equipment valued at \$80. Every two or three days the crew completes the conversion of one of the fifty-eight districts into which the territory has been divided. Traveling with them are four mobile machine shops equipped to handle any problem that might otherwise delay the conversion.

One Hazard of the Job

A job that entails spending most of one's time in other persons' homes is not without hazards, as Jack Smith of Washington, who has worked in thirteen states since joining the conversion company in 1946, learned one night in Augusta, Ga.

Mr. Smith and his crew were working late in a house that had been closed up for some time. A rookie policeman spotted the lights inside the usually darkened building, assumed burglars were within, and entered with pistol in hand. The conversion men spent a nervous twenty minutes with their hands on their heads until reinforcements arrived and assured the suspicious patrolman their presence was legitimate.

Typical of the many young men who have joined the work during the post-war boom of the natural gas industry is Frank Hart, of Oslo, Minn. Attracted by the high wages and opportunity for travel, Mr. Hart joined Conversions and Surveys in 1947 in Waukegan, Ill. He acquired a wife the same week he took the job, but solved his problem by investing in a trailer. He is now one of eighty employes of the company who have put their homes on wheels to follow their trade.



**INSTALLING A COMMUNITY GROUND SOURCE
HEAT PUMP SYSTEM AT COLORADO MESA
UNIVERSITY**



- **SUMMARY**

Colorado Mesa University (CMU) is in Grand Junction, Colorado, serves approximately 11,000 students, and spans 141 acres. This campus consists of 37 buildings including admissions, dormitories, athletics, academics, and student centers.

Beginning in 2008, CMU began deploying a geothermal loop system to reduce the need for conventional cooling and natural gas heating and reduce overall campus water use. The system was designed to utilize water-source heat pumps to serve interior spaces with a closed geothermal loop that utilizes the thermal stability of the ground as a heat sink. The networked loop consists of five loop fields with 471 bore holes drilled to depths ranging from 375 to 600 feet. These loop fields can be utilized as a thermal energy source to mitigate on-peak demand by filling the bore holes with loop water during off-peak periods and discharging the bore holes during on-peak periods. In 2023 Xcel Energy commissioned Michael's Energy to analyze the performance of CMU's geothermal system.

Today, this system serves 1.2 million sq. ft. of building area across 16 facilities with a diversity of cooling and heating needs. The system is comprised of (7) 50-HP central loop pumps, 91 individual building pumps, 5 conventional cooling towers, 2 hydronic boilers, 21 water-to-water heat pumps, 962 water-to-air heat pumps, and a

sophisticated control system. This equipment is sized to meet a design cooling load of 3,113 tons and a design heating load of 2,728 tons.

It is important to note that the geothermal system wasn't designed to meet 100% of the load, 100% of the time. CMU strategically interconnected conventional assets that already existed as buildings were added to the network. These assets are intended to increase overall system efficiency. These sources include water-to-water heat pumps for domestic hot water needs and pool preheating, a heat exchanger that enables the facilities team to reject heat via irrigation water, and five conventional cooling towers to reduce loop temperatures. In the winter months when loop temperatures decline to less than 57°F, the hydronic boilers inject heat into the loop. There were no instances of boiler operation throughout the 2022/2023 heating season. Additional gas usage can be attributed to dormitory domestic hot water (DHW) heating because the water-to-water heat pumps aren't able to raise the temperature of the water high enough to meet designed supply temperatures (140 F). However, newer heat pump technology can potentially solve this problem.

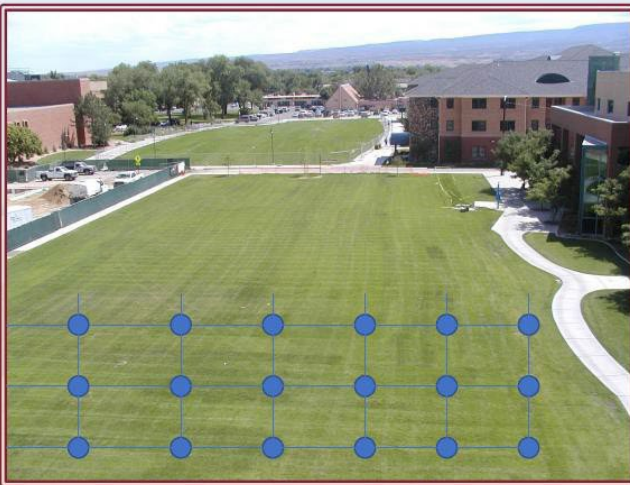
A key advantage of a network geothermal system is the system's ability to share heating and cooling loads. This load sharing can happen from room to room, floor to floor, and building to building. A water-to-air heat pump in heating mode removes heat from the building loop, cooling down the loop water. Another heat pump on the same loop in cooling mode expends less energy supplying space cooling than it would have otherwise. The same is true in reverse, where heat pumps in cooling mode reject excess heat into the building loop to be consumed by heat pumps in heating mode.

When comparing historical central campus loop temperatures versus outside air temperatures, it is apparent that this load sharing occurs when outdoor air temperatures are between 25°F and 55°F. This wide load-sharing operating band greatly increases the overall efficiency of the system as the need for heat pump compressor operation is greatly reduced.

When compared to a conventional cooling and heating system consisting of water-cooled chillers and natural gas hot water boilers, this system has a demand reduction of ~650 kW (13%), an energy savings of ~1.3 GWh (10%), a natural gas savings of ~58,000 Dth (55%), and a water savings of ~10 million gallons, annually. Water savings were provided by the Grey Edge Group and were not part of this analysis. Seasonal coefficient of performance (COP) values are displayed in Table 1, below. Note that a typical boiler operates with a COP of 0.8, a typical chilled water system at 3.4, and electric resistance heating at 1.0. A larger number indicates increased system efficiency and lower energy consumption per unit heating or cooling.

Table 1 CMU networked geothermal efficiency vs a standard system

	Networked Geo COP	Conventional COP
Spring	7.0	1.9
Summer	3.6	3.4
Fall	5.8	2.0
Winter	8.9	1.2
Overall	5.7	1.9



Drill field east and south of Dominguez Hall

Pipes connecting bore holes

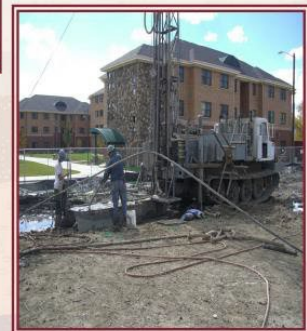


8" dia. Pipes between Central Loop And H.H



Top: The drill field in front of Grand Mesa Hall

Right: A drill rig





18" diameter HDPE Central Loop

- **METHODOLOGY**

Due to the large number of input assets that make up the Colorado Mesa University (CMU) Geothermal network, monitoring the system in empirical fashion would have proven cost and time prohibitive. Statistical regression analysis was used to discern power requirements and equipment performance in lieu of establishing automation system trend logs or taking onsite power measurements. The results are not an investment-grade analysis but provide a realistic understanding of overall and seasonal system performance, when compared to conventional cooling and heating equipment.

- **DEFINITIONS**

HX	Heat exchanger	WSHP	Water source heat pump
AHU	Air handling unit	kW	Kilowatt
CFM	Cubic feet per minute	GPM	Gallons per minute
HP	Horsepower	COP	Coefficient of Performance
EER	Energy Efficiency Ratio		

DATA GATHERING

- Historical hourly data from April 2022 to April 2023 was collected for weather, central loop temperature, and available loop assets.
- Loop assets include central loop water pumps, building pumps, bore field pumps, cooling towers, cooling tower pumps, irrigation heat exchanger (HX) pumps, water-to-water heat pumps, and water-to-air heat pumps.

- Additional data was collected on known asset values and building settings, such as heating capacity, cooling capacity, heating design temperature, and cooling design temperature.

- **ASSUMPTIONS**

- Conventional cooling and heating equipment power and efficiencies were estimated based on ASHRAE 90.1 documentation.
- Assumptions include chillers (0.61 kW/ton), primary pumps (0.018 kW/ton), secondary pumps (0.026 kW/ton), cooling towers (0.059 kW/ton), condenser pumps (0.057 kW/ton), and AHU fan kW (812 kW).
- AHU fan kW was derived using the following methodology and conversion factors: 400 CFM/ton, 0.75 HP/1000 CFM, Supply Fan HP ($0.3 \times \text{Max loop load}$), Return Fan HP ($0.12 \times \text{Max Loop Load}$).
- The water source heat pump (WSHP) efficiency disaggregation was built based on conversations with campus staff and is as follows: 60% - 13 Energy Efficiency Ratio (EER), 10% - 13.5 EER, 10% - 15 EER, 10% - 16 EER, 10% - 18 EER.

- **EMPIRICAL DATA**

- Empirical data, consisting of average loop temperature and outside air temperature, was utilized to determine the load sharing temperature range. This is the temperate range where different buildings connected to the central loop are sharing energy between themselves, and little additional source and sink energy is required from the bore fields or conventional equipment.
- Data revealed a load sharing range when outside air temperatures are between 25°F and 55°F.

- **CALCULATION METHODOLOGY**

- Loop cooling loads were derived from the relationship between outside air temperature, system balance point, and the design cooling temperature.
- Loop heating loads were derived from the relationship between outside air temperature, system balance point, and the design heating temperature.

- Input asset power (kW) was calculated using regression analysis for the equipment that didn't have historical trend data configured. These assets are outlined below.
 - Heat pump cooling kW was calculated through regression analysis. This regression was built based on a load curve from a WSHP.
 - Heat pump heating coefficient of performance (COP) was calculated through regression analysis. This regression was built based on a load curve from a WSHP.
 - Cooling tower kW was determined through use of a second order polynomial regression, to model fan power between 85°F and the cooling design temperature.
 - Loop and building pump kW were determined through use of a third order polynomial regression, to model pump power based on a dual temperature loop load profile, assumed flowrate (GPM), assumed pump head, and pump horsepower.
- COP was calculated as a function of total loop load and input power.
- Total input power was determined by summing all input assets.
- Seasonal and overall system COP was evaluated for the geothermal system compared to a conventional water-cooled chiller system.

