


The D.P.U. Future of Gas Final Order

What Remains to be Done?

Timeline

COVID
AGO Petition



**THE COMMONWEALTH OF MASSACHUSETTS**
OFFICE OF THE ATTORNEY GENERAL
ONE ASHLETON PLACE
BOSTON, MASSACHUSETTS 02108

MARKA HEALEY
ATTORNEY GENERAL

(617) 727-2200
(617) 725-6100 TTY
www.mass.gov/ago

May 6, 2022

Mark D. Martin, Secretary
Department of Public Utilities
One South Station, 5th Floor
Boston, MA 02111

Re: Investigation by the Department of Public Utilities into the role of local gas distribution companies in the Commonwealth achieving its target 2050 climate goals, D.P.U. 20-40

Dear Secretary Martin:

By Hearing Officer Moneradden, dated March 24, 2022, in the above referenced docket, the Department of Public Utilities ("Department") invited shareholder comment on the local gas distribution companies ("LDCs") March 18, 2022 filings. The Office of the Attorney General appreciates the opportunity to offer comments and recommendations for the Department's consideration. In addition, enclosed is a Certificate of Service.

The AGO provides the following:

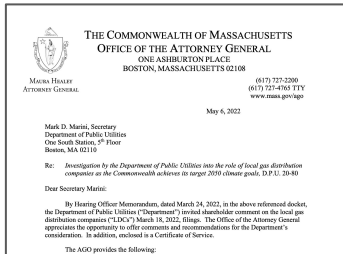
Timeline

COVID
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Reasons

- 2050 net zero mandate
- Buildings = 30% of MA emissions
- \$40 billion to be spent on new gas pipes (GSEP)

Align our investments with our goal



The Way We Are Headed

*A mass exodus of gas customers has the potential to shock rates...
as well as posing a potential general safety risk...*

- 20-80 Final Order



Timeline

Problems?

- Gas system contains 4X the energy
- Electric grid impact?

COVID
AGO Petition
20-80 Docket



THE COMMONWEALTH OF MASSACHUSETTS
 DEPARTMENT OF PUBLIC UTILITIES

This is an important notice. Please have it translated. Este é um aviso importante. Outros idiomas disponíveis. Este é um aviso importante. Si usted necesita traducirlo, póngase en contacto con el Servicio de Información al Consumidor en el lenguaje de su elección. 此乃重要通知。如有需要，請即聯絡本局。 此乃重要通知。如果您需要將其翻譯成其他語言，請即聯絡本局。

NOTICE OF FILING AND PUBLIC HEARING

D.P.U. 20-80 March 23, 2022

Investigation by the Department of Public Utilities on its own Motion into the role of gas local distribution companies as the Commonwealth achieves its target 2050 climate goals.

On October 29, 2020, the Department of Public Utilities ("Department") voted to open an investigation into potential policies that will enable the Commonwealth to reach its goal of net-zero greenhouse gas emissions by 2050 and the role of Massachusetts gas local distribution companies ("LDCs") in achieving that goal. Investigation by the Department of Public Utilities on its own Motion into the role of gas local distribution companies as the Commonwealth achieves its target 2050 climate goals. D.P.U. 20-80. Vote and Order

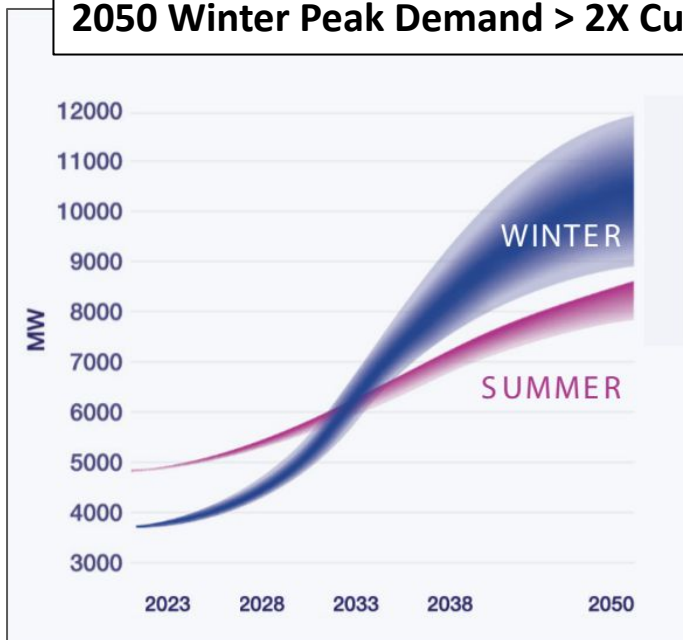
Dear Secretary Mattie:

By Hearing Officer Memorandum, of the Department of Public Utilities ("Department") dated March 14, 2022, the Department of Public Utilities ("LDCs") has been asked to consider the opportunity to offer comments and recommendations for the Department's consideration. In addition, enclosed is a Certificate of Service.

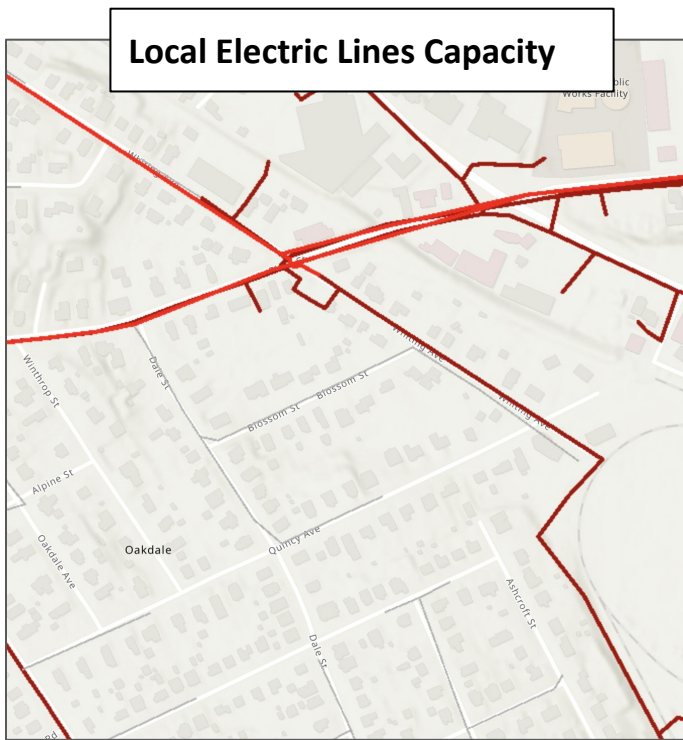
The AGO provides the following:

Winter Electric Peak

2050 Winter Peak Demand > 2X Current Summer Peak



Wide Scale Electric Upgrades Needed



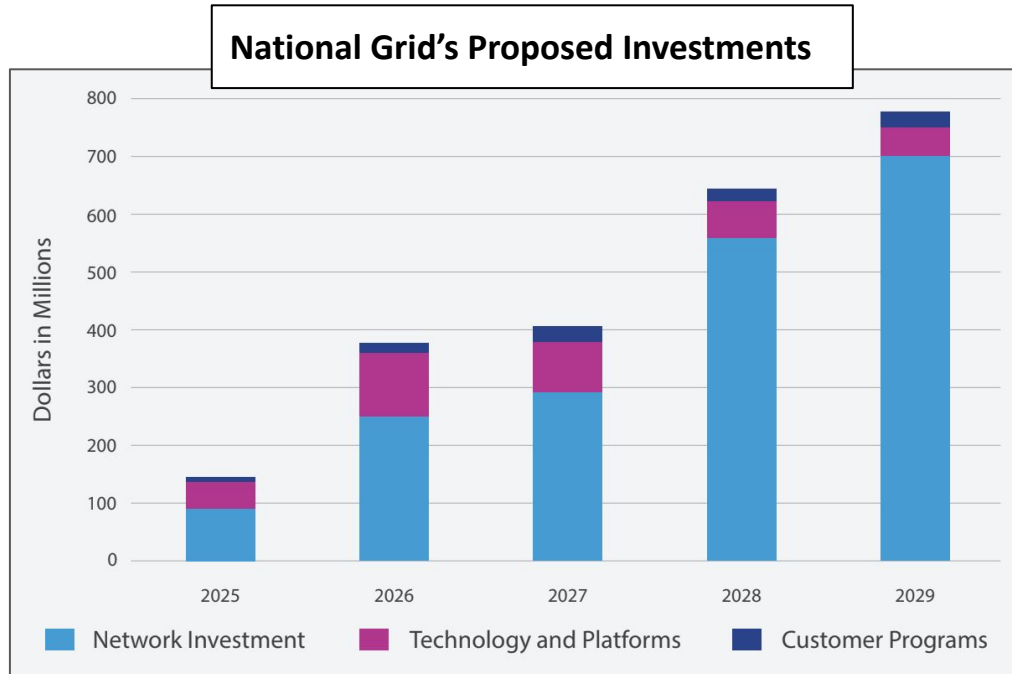
Constrained Substations

Table 44: Metro Boston Substations with Projected Deficiencies and Communities Impacted

Substation Name or Location	Communities Supplied	2030 % of Substation Capacity	Project Solution
Brighton	Brookline, City of Boston	96	Bulk Distribution Transformer Additions
Longwood Medical Area (LMA)	Brookline, City of Boston	98	Allston/Fenway/Brookline Substation
Hyde Park	Milton, City of Boston	104	Future Hyde Park – Dorchester Area Supply Initiatives
Everett ¹⁵²	City of Somerville, Charlestown	99	Somerville 115/14kV Substation #402 Expansion and Charlestown/East Boston Substation
Chelsea ¹⁵³	East Boston, City of Chelsea	110	New East Eagle Street 115/14kV Substation # 131
East Cambridge	City of Cambridge – East	109	New Cambridge 115/14kV Substation #8025
Putnam	City of Cambridge – South	96	New Cambridge 115/14kV Substation #8025

7 <https://eversource.maps.arcgis.com/apps/webappviewer/index.html?id=7b13d31f908243e49406f198b359aa71>

7-fold Increase in Investments?



Timeline

- Pathways
 - ~~Business as usual~~
 - ~~RNG, hydrogen~~
 - ~~Heat pumps with gas backup~~
 - Strategic electrification
 - Networked geothermal

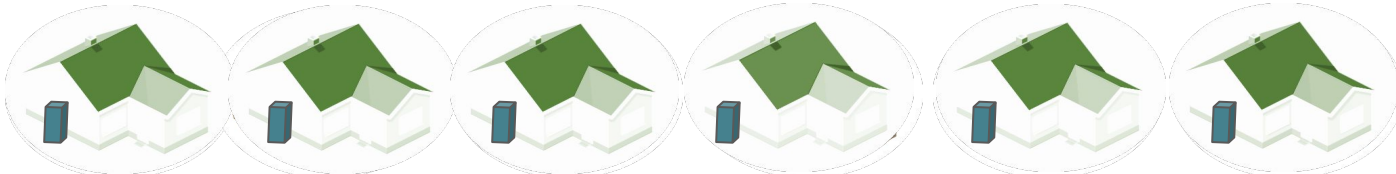
COVID
AGO Petition
20-80 Docket
Modeling of possible pathways



The collage includes three documents:

- Left Document:** A letter from Mark D. Martin, Secretary of Public Utilities, dated March 16, 2022. It is addressed to the AGO and discusses the investigation into the role of gas local distribution companies in achieving the Commonwealth's climate goals.
- Middle Document:** A "NOTICE OF FILING AND PUBLIC HEARING" from the Department of Public Utilities, dated March 16, 2022. It announces a public hearing on the role of gas local distribution companies in achieving the Commonwealth's climate goals.
- Right Document:** A cover page for the "The Role of Gas Distribution Companies in Achieving the Commonwealth's Climate Goals" report, dated March 16, 2022. It features a cityscape image and the title of the report.

Strategic Electrification



Networked Geothermal



Underground thermal energy networks are becoming crucial to the US's energy future

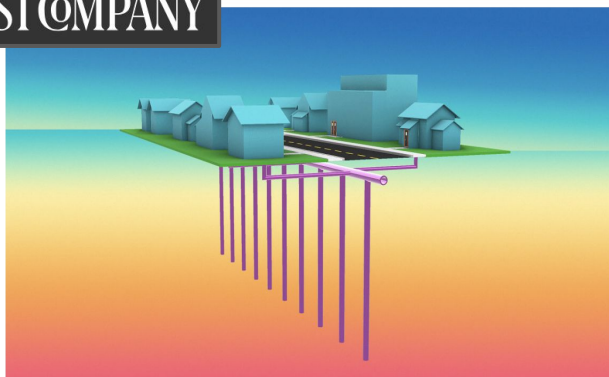
Their advantages extend beyond reducing carbon emissions.

By June Kim

October 4, 2023

MIT
Technology
Review

FAST@COMPANY



[Rendering: Anara Magavi/HEET]

10 climate tech innovations that give us hope for 2024

There's a battery underneath your feet, and utilities want to use it

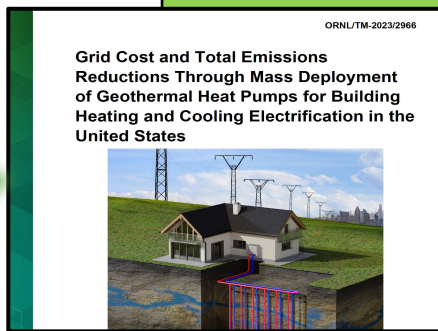
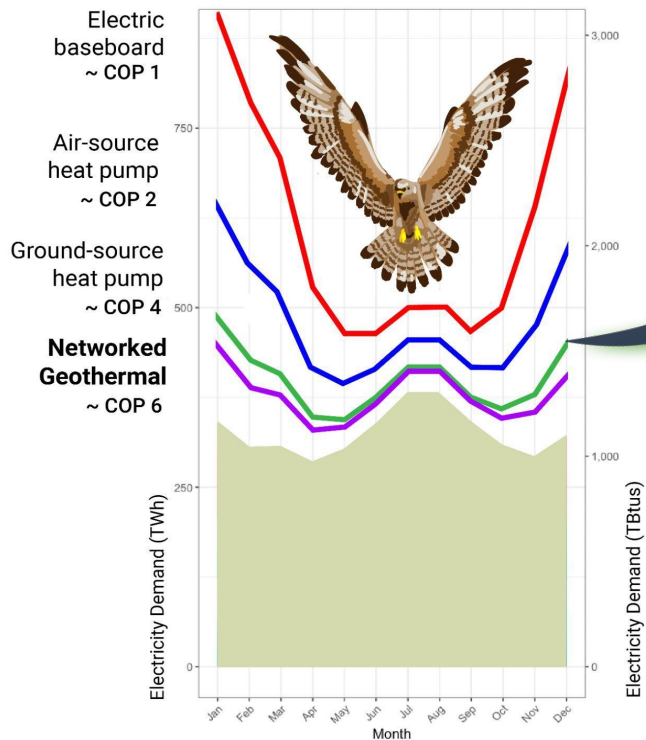
Sabri Ben-Achour

Nov 27, 2023

MARKETPLACE*

heet

Heating & Cooling Efficiency Matters to the Grid: Future U.S. Building Electric Use



- 12% cheaper wholesale electricity
- 7.34 GIGATONS CO₂e SAVED
- 33% fewer miles of transmission
- 47% cheaper grid decarbonization
- \$19 Billion/year fuel cost savings
- **Cumulative US savings > \$1 Trillion**

Heating & Cooling Efficiency Matters to the Grid: Future U.S. Building Electric Use

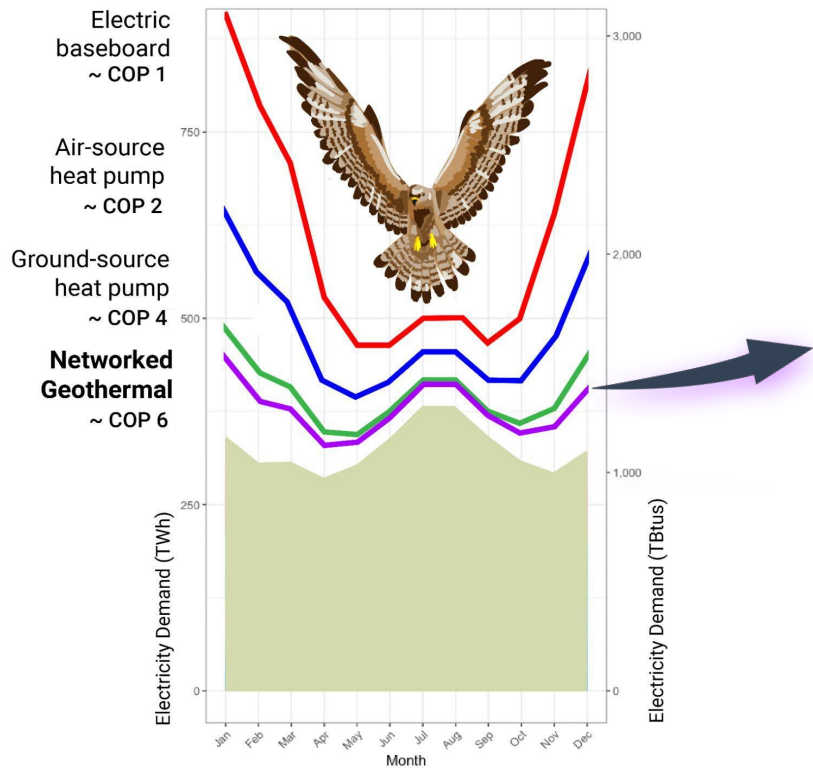


Table 1 CMU networked geothermal efficiency vs a standard system

	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



Networked Geothermal - Massachusetts Leads



The country's first gas utility-run networked geothermal heating and cooling system breaks ground in

Ma

June 13



Geothermal Pilot Project to Reduce Carbon Emissions on Campus and Surrounding Area

Boston Housing Authority, National Grid team up on geothermal project in Dorchester

The project could be a test case for other sites in Boston, and elsewhere in the state

By [Jon Chesto](#) Globe Staff, Updated January 25, 2024, 11:01 a.m.

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Timeline

COVID

AGO Petition

20-80 Docket

Modeling of possible pathways

Analysis Results

Governor Healey

Final Order

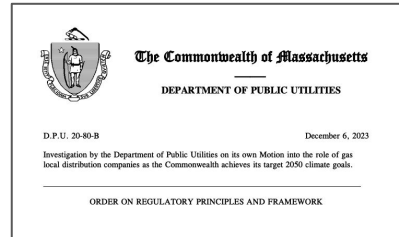
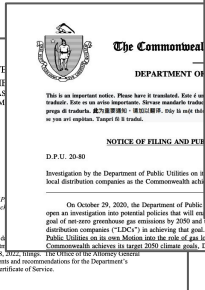
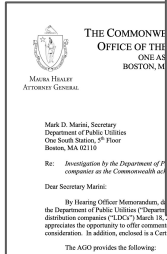
2020

2021

2022

2023

2024



Final Order, “Beyond Gas” - Decisions

Don't make the problem worse

- No longer incentivize new gas customers (revenue decoupling)
- No exit fees for leaving the gas system
- Customers cannot be charged for gas ads or marketing



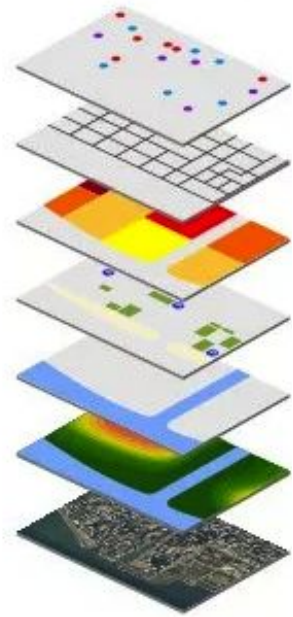
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- Joint electric & gas utilities planning
- Climate compliance plans every 5 years



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- Incentives for reducing emissions with affordable rates
- Examine potential for stranded assets
- Consider accelerated infrastructure payback (depreciation)
- Any costs associated with RNG & hydrogen must be paid by utility shareholders, not general customers



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Installations

- Gas utilities must propose networked geothermal & electrification “pilots”

Final Order, “Beyond Gas”

Requests of the Legislature

- Doesn't want more gas system extensions (Douglas). Recommends that the legislature repeal Section 3 of the Gas Leaks Act

Massachusetts is phasing out natural gas. Why is it expanding in Douglas?

By [Sabrina Shankman](#) Globe Staff, Updated July 26, 2023, 5:43 a.m.

The Boston Globe



Final Order, “Beyond Gas”

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- Comprehensive workforce strategy



Final Order, “Beyond Gas”

Requests of the Legislature

- Doesn’t want more gas system extensions (Douglas). Recommends that the legislature repeal Section 3 of the Gas Leaks Act
- Comprehensive workforce strategy
- Consider the GSEP* Working Group recommendations

*Gas System Enhancement Program



The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

NOTICE OF PUBLIC MEETING

GAS SYSTEM ENHANCEMENT PLAN WORKING GROUP

In July 2022, the Massachusetts State Legislature passed An Act Driving Clean Energy and Offshore Wind, St. 2002, c. 179 (“Act”), which requires the Department of Public Utilities (“Department”) to convene a stakeholder working group to develop recommendations and legislative changes to align gas system enhancement plans (“GSEPs”) with statewide emission limits as well as encourage development of geothermal systems. The Act designated certain members of the working group, e.g., the Chairs of the Joint Committee on Telecommunications, Utilities, and Energy, the Chair of the Department, the Attorney General of Massachusetts, and stated that eight members would be appointed by the Secretary of the Executive Office of Environmental Affairs. As a multi-member committee established to serve a public purpose, the members are subject to open meeting law.

The Future of Clean Heat

√ 20-80

√ GSEP Group

Create a Transition Plan

- Enact plan & report annually on the results

√ 20-80

√ GSEP Group



Allow the Transition

- Thermal infrastructure = non-combusting & utility-scaled
- Can sell thermal & install thermal infrastructure
- Must consider thermal & electrification first
- Obligation to serve met with thermal

✓ GSEP Group

Aging gas pipes



New water pipes



Incentivize the Transition

- Performance-based incentives
 - Less gas infrastructure
 - More thermal infrastructure

√ 20-80

√ GSEP Group

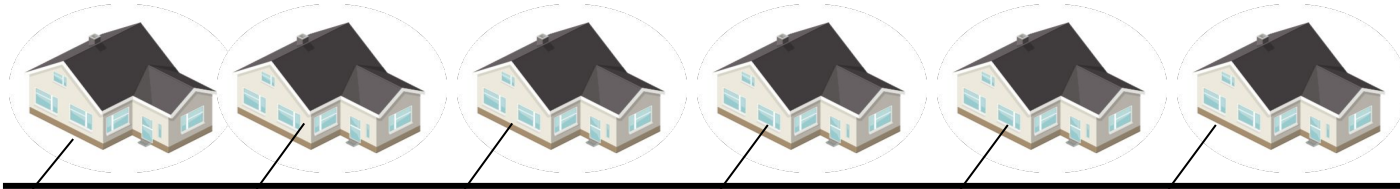
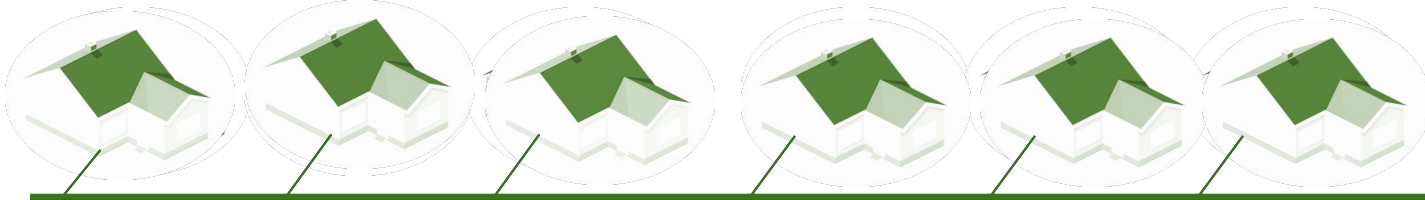
Aging gas pipes



New water pipes



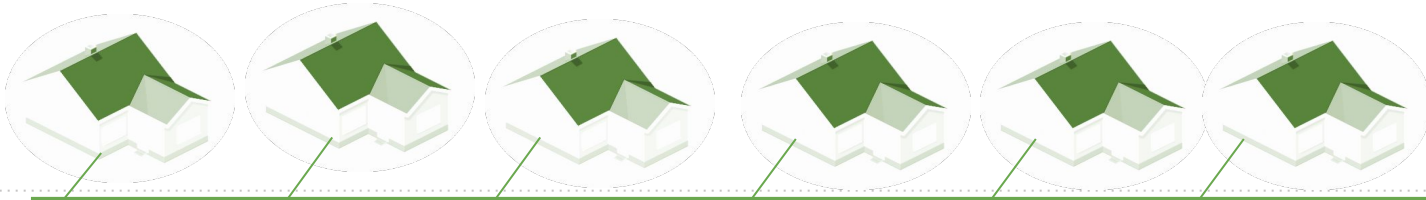
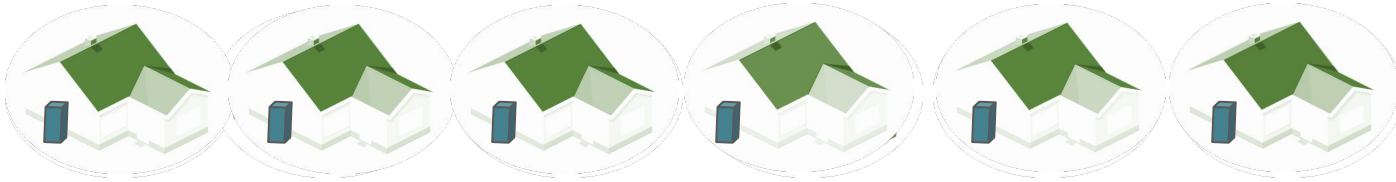
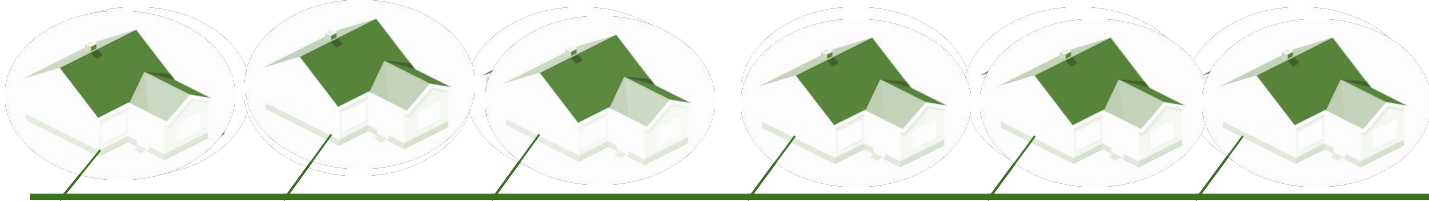
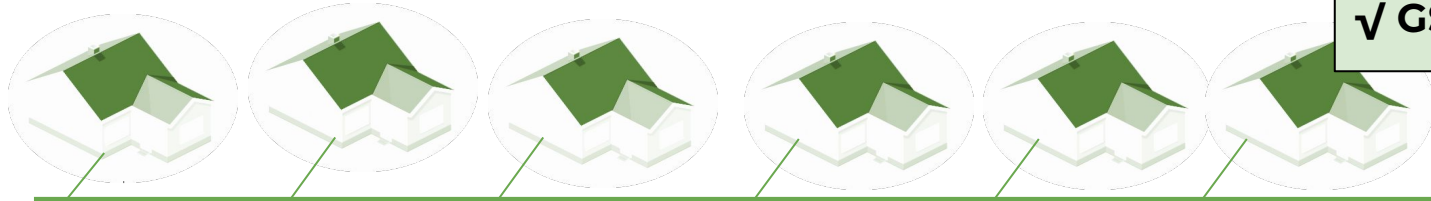
Gas & Thermal Merged Ratepayer Base



Strategic Electrification

√ 20-80

√ GSEP Group



No Gas Expansion Unless in Public Interest

√ 20-80

Utilities must first issue a competitive bid for non-combusting options.

Massachusetts is phasing out natural gas. Why is it expanding in Douglas?

By [Sabrina Shankman](#) Globe Staff, Updated July 26, 2023, 5:43 a.m.

The Boston Globe



No Unsafe or Expensive Fuel Blending

No substitute fuels unless

- Non-emitting in life cycle
- Not a safety hazard
- Reliable & affordable

Save RNG & hydrogen for industrial processes (difficult to decarbonize). Not in our homes

√ 20-80

√ GSEP Group



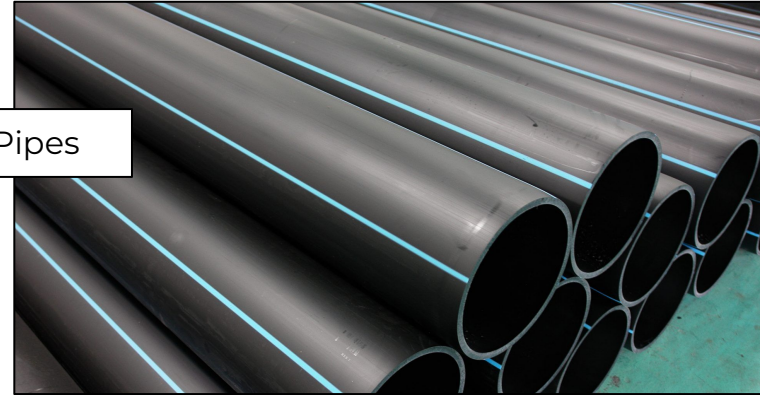
Gas Workers

√ 20-80

- Retrain workers so they can retain wages & benefits



Gas Pipes



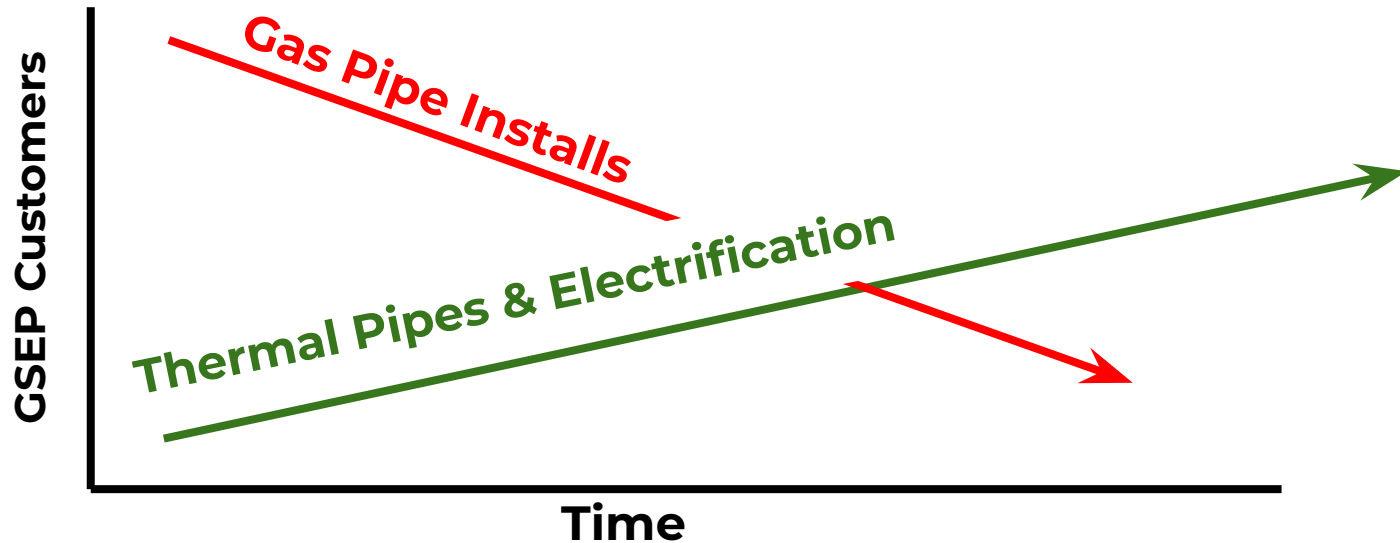
Water Pipes

“RPS for GSEP” Proposed Amendment

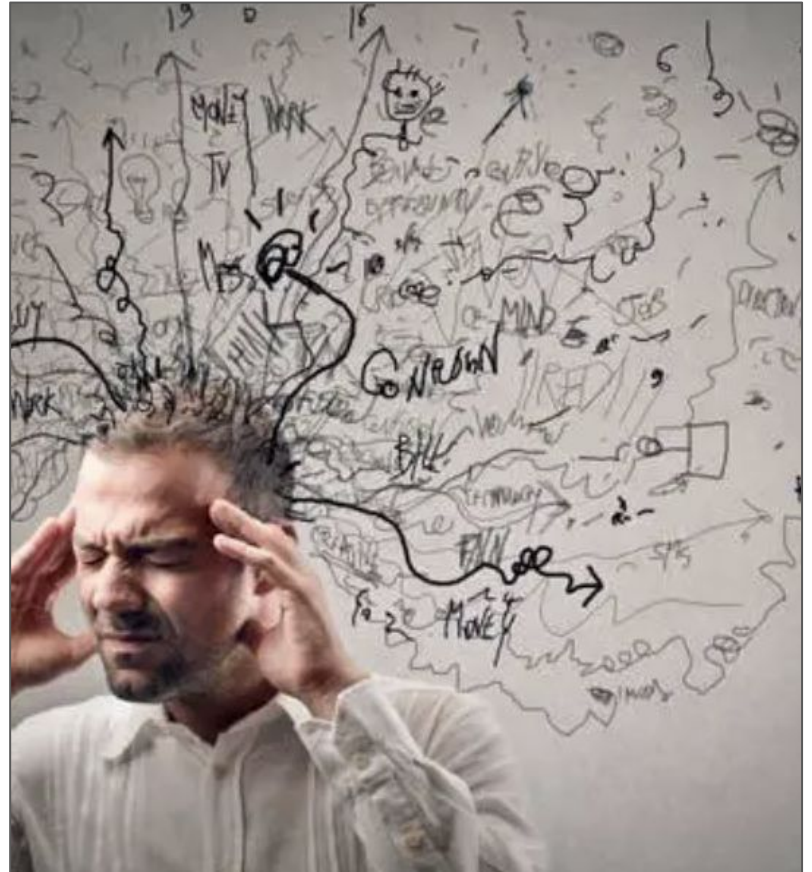
With **gas pipe replacement (GSEP) funds**

- Requires annual increase in customers transitioned to non-emitting up to 100%
- Affordability must be maintained
- Under DPU control

√ GSEP Group



Questions?



The Most Efficient Heating System



If all buildings could electrify with GSHPs, costs would be less than business-as-usual projections.

\$1,337B

\$319B

-\$19B



Electricity Consumption Savings (%)

-5 17.5 30

On-site CO_{2e} Emissions Reduction (%)

0 50 100

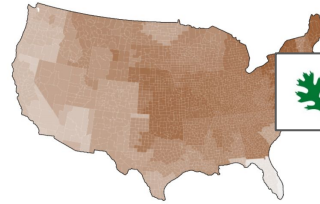
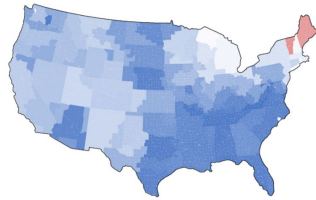


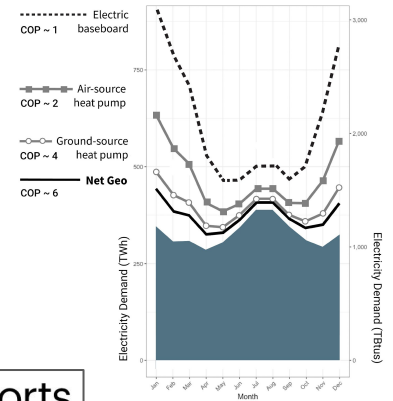
Figure ES-1. Geospatial representation of the percentage changes in (left) building annual electricity consumption and (right) carbon emissions (from on-site combustion in buildings) resulting from deploying GSHPs into 68% of existing and new residential and commercial buildings in the United States, coupled with weatherization in single-family homes.

Table 1 CMU networked geothermal efficiency vs a standard system

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Future US Electric Peaks (as we electrify heating)



Networked geothermal systems reduce electric peak demands compared to pathways with larger reliance on ASHPs because these technologies are not sensitive to outside temperature.

- 20-80 Independent Consultant Report

scientific reports



Source: J. Scharif, P. M. M. M., E. Allen, J. "The Future Costs, Implications of Geothermal Heating, Energy Use and Electrical Energy Storage for Heating Decarbonisation" (2021) 10(1) 100-110