Potential Role for GENs in the Massachusetts Natural Gas Transition

Geothermal Energy Networks: Transforming Our Thermal Energy System

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Overview

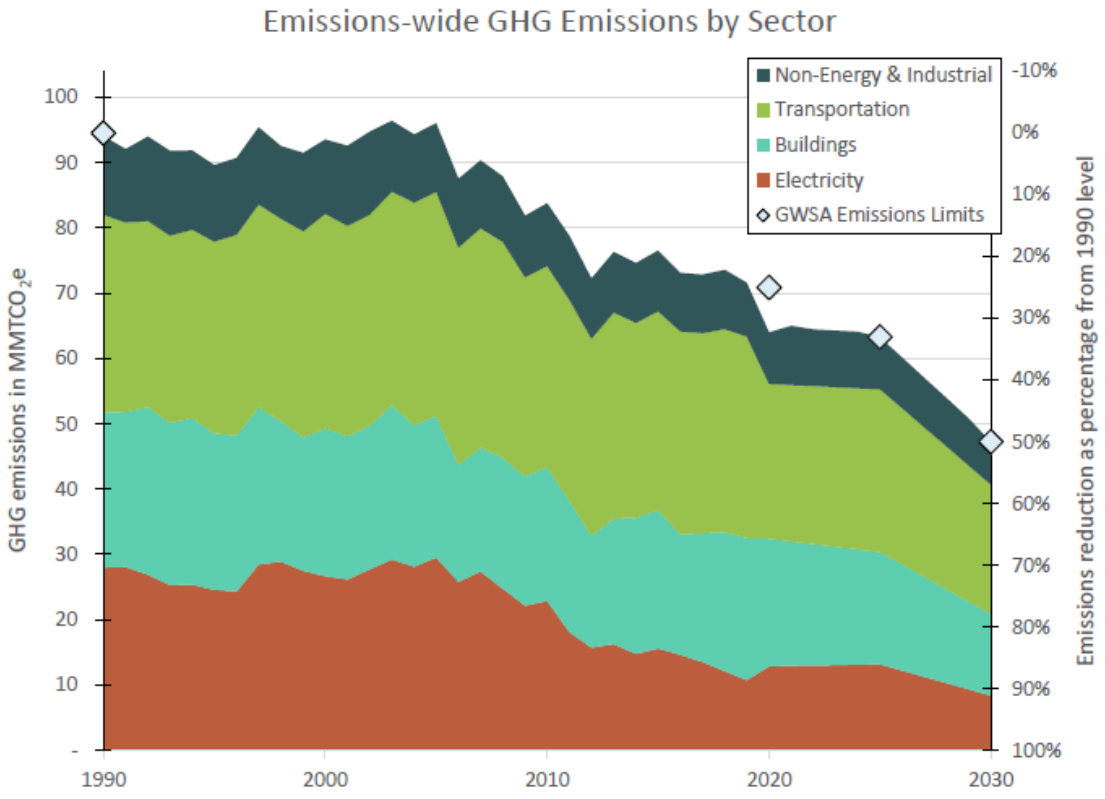
- Clean energy targets in Massachusetts
- Statutory framework
- Regulatory framework
- Current GEN demonstration projects in Massachusetts

Clean Energy Targets in Massachusetts

- Commonwealth set a target of net zero greenhouse gas (GHG) emissions by 2050 in the Global Warming Solutions Act of 2008
- Established sector-specific emissions reduction targets for 2025 and 2030 in the Clean Energy and Climate Plan (June 2022)

Clean Energy Targets in Massachusetts

[Source: 2022 CECP]



Source: public domain

Table ES.2. Historical GHG Emissions and 2025/2030 GHG Emissions Sublimits for Residential and Commercial Building Heat

Buildings (Residential & Commercial) Sector GHG Emissions (MMTCO2e)	1990	2010	2015	2020	2025	2030
Residential	15.3	13.7	13.6	12.2	10.8	7.8
Commercial (without Industrial)	8.4	6.7	7.6	7.3	6.4	4.7
Total Gross Emissions ($MMTCO_2e$)	23.8	20.4	21.2	19.5	17.2	12.5
Total Percent Reduction from 1990		14%	11%	18%	28%	47%

Statutory Framework

- Gas companies are authorized to propose pilot projects for development of utility-scale renewable thermal energy (2021 Climate Bill)
- Gas system enhancement plan (GSEP) projects may include “replacing natural gas infrastructure with utility-scale non-emitting renewable thermal energy infrastructure.” (2022 Climate Bill)

Statutory Framework

- 2024 Climate Bill
  - Section 47: Amends definition of “gas company” to provide that “[a] gas company may make, sell or distribute utility-scale non-emitting thermal energy, including networked geothermal and deep geothermal energy.”
  - Section 77: Addresses “obligation to serve” by allowing consideration of adequate substitutes for gas services
  - Section 81: Modifies eligible infrastructure investment in GSEP to include “retirement”

Regulatory Framework

- D.P.U. "Future of Gas" proceeding
  - Order 20-80-B (December 6, 2023)
  - Electrification is primary pathway to achieve GHG emissions reduction targets
    - Air-source and ground-source heat pumps (which includes geothermal energy networks)
  - Requires consideration of non-gas pipeline alternatives (NPAs) before investing in additional natural gas distribution infrastructure
  - Requires each LDC to file a Climate Compliance Plan (CCP) by April 1, 2025

Regulatory Framework

- D.P.U. “Future of Gas” proceeding
  - Each local gas distribution company (LDC) is required to file a targeted electrification project by March 1, 2026
    - Must work with applicable electric distribution company (EDC)
    - National Grid filed Targeted Electrification Demonstration proposal (communities of Winthrop and Leominster) in December 2024 (D.P.U. 24-194)

Regulatory Framework

- Policy considerations for demonstration projects (2021 Climate Bill)
  - Substitute sources must have a reasonable likelihood of facilitating substantial reductions in GHG emissions
  - Pilot cannot include blending of other fuels with fossil-based natural gas
  - DPU must use third-party evaluation

Regulatory Framework

- Policy considerations (continued)
  - DPU must consider reasonableness of size, scope and scale of project and related budget
    - Do the benefits justify the proposed cost to both participating customers and non-participating customers?
  - Calculation of benefits must include calculations of the social value of GHG emissions reductions

Current Demonstration Projects

- Eversource (D.P.U. 19-120)
  - Framingham Phase I
  - Framingham Phase II (?)
- National Grid (D.P.U. 21-24)
  - $15.6M for up to 4 networked geothermal pilot projects
  - Lowell
  - Franklin Field Apartments (Boston Housing Authority)

Questions?

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https://ocw.mit.edu/

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