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Massachusetts Department of Energy Resources

Elizabeth Mahony, Commissioner

NASEO Annual Meeting
Clean Heat Policies and Thermal Energy Networks: Tools for Efficiency and Emission Reduction
October 1, 2024

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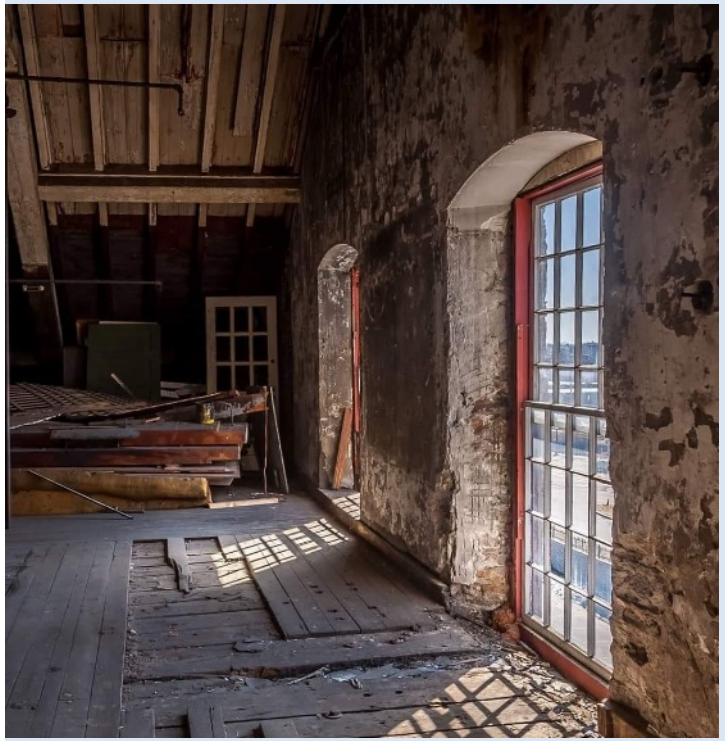
Getting Buildings to Net Zero

- Massachusetts' 3 building energy codes:
  - Base Code
  - Stretch Code
  - Specialized Opt-in Code
- Focus on efficiency + space heating = crushed heating loads
- Leads to resilient electric grid, comfortable buildings, lower energy use / bills
- MA codes estimated to save 500,000 tons GHG emissions & $21 B in cost savings
- 2-year independent analyses of standards specific to MA informed codes
- Fossil Fuel Free Demonstration Program in 10 cities/towns
- Building codes, FFF Pilot will enable Massachusetts to cost effectively meet emissions reduction targets



Stone Mill in Lawrence, MA
Adaptive reuse development project – all-electric affordable housing

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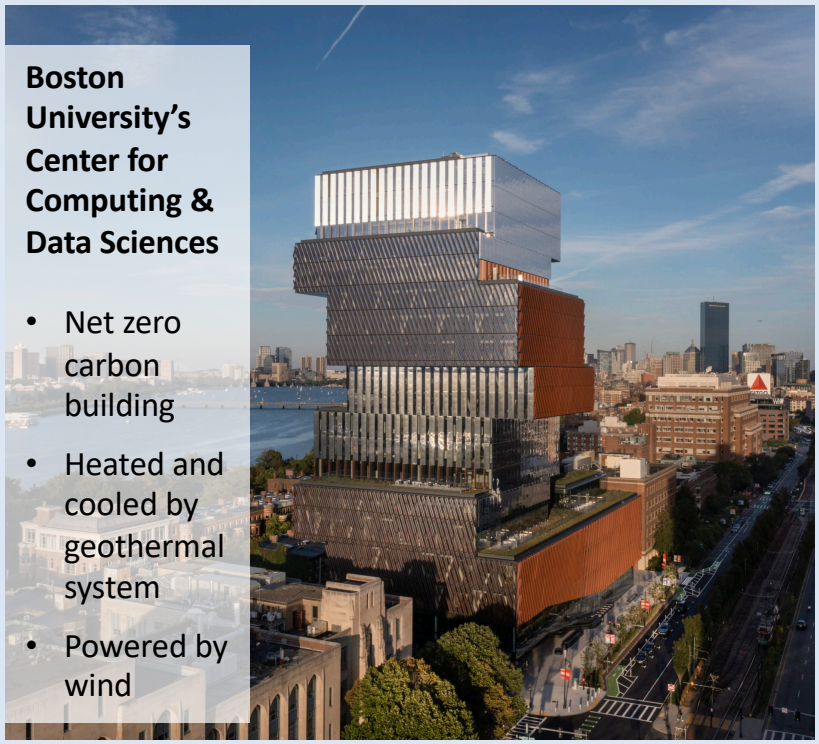

Boston University's Center for Computing & Data Sciences

- Net zero carbon building
- Heated and cooled by geothermal system
- Powered by wind

Winthrop Center in Boston

- World's largest Passive House certified office building
- 812,000 square feet of Global Class A office space

Passive House

- Cost-optimized approach to reduce emissions from multi-family buildings
- Decades-long track record of crushing space heating / cooling loads
- Envelope investments reduce air infiltration, optimize ventilation
- Passive House planning in MA:
  - 50 units in 2018
  - 20,661+ units currently
    - 272 projects pursuing certification through Mass Save
- For 6+ unit multi-family buildings, Mass Save Passive House incentives are $3,000 per unit plus up to $20,000 in energy modeling support
- Mass Save provides incentives of up to $40,000 for 4-unit buildings in support of all-electric new construction

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Clean Heat Standard

Clean Heat Standard

- The CHS would require **annual emission reductions** from the thermal sector while ensuring ongoing progress toward **full electrification of buildings**

Annual GHG emissions reductions

Full electrification of buildings

- From 2026 to 2030, the **full electrification standard** would require full electrification of an increasing number of residences each year
- After 2030, the standard would remain at 100,000 per year
- A certain portion of the electrifications would support equity

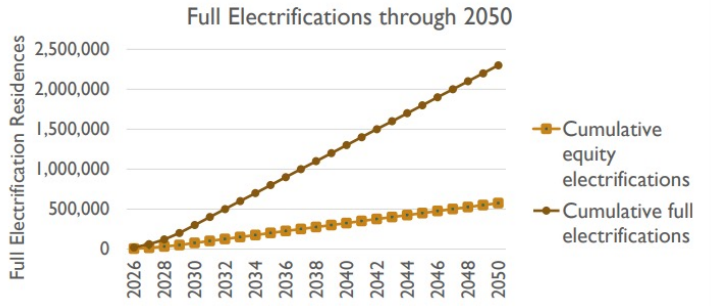
Annual full electrification standard in number of residences

2026	2027	2028	2029	2030	2035	2040	2050
20,000	40,000	60,000	80,000	100,000	100,000	100,000	100,000

Full electrification of buildings

Equity Carve Out

At least **25%** of **full electrifications** must serve customers who are eligible for low-income discount electricity rates



Annual number of full electrifications that must serve low-income customers

2026	2026	2028	2029	2030	2035	2040	2050
5,000	10,000	15,000	20,000	25,000	25,000	25,000	25,000

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Networked Geothermal

Framingham

The main circulating pump inside the geothermal pump house

Borehole drilling begins in August 2023

photos courtesy of Eversource

Lowell

A crew member drills 600 feet below the Wilder Street Parking Lot on UMass Lowell's South Campus

Borehole drilling technology will be used to study the properties of the bedrock

photos courtesy of National Grid, UMass Lowell

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Joint Energy Planning

2022 Climate Law
Grid Modernization Advisory Council (GMAC) established

GMAC convenes for the first time in March

Biweekly GMAC meetings to review draft ESMPs

9/01/2023: EDCs submit ESMPs to GMAC

11/20/2023: GMAC provides feedback on ESMPs to EDCs (80 days to review)

Quarterly GMAC meetings

1/29/2024
- EDCs finalize ESMPs and file with the DPU
- EDCs respond to GMAC comments

8/29/2024: DPU Order approving the ESMPs as strategic plans

GMAC meeting cadence to be determined

ESMP Phase I (7/1/25 – 6/30/2030)

Bi-Annual Reporting: EDCs submit 2 reports per year to DPU and Massachusetts Joint Committee on Telecommunications, Utilities and Energy on deployment of approved investments in accordance with any performance metrics included in the approved ESMP plans.

X: 9/30/25	X: 9/30/26	X: 9/30/27	X: 9/30/28	X: 9/30/29
X: 3/31/26	X: 3/31/27	X: 3/31/28	X: 3/31/29	X: 3/31/30

LEGEND
- GMAC activity
- Statutory requirements: Phase 1
- Statutory requirements: Phase 2
- Reporting requirements

2/12/29: EDCs submit second draft ESMP to GMAC

6/18/29: GMAC provides feedback on ESMPs to EDCs (125 days to review)

9/11/29: EDCs file second ESMP with DPU

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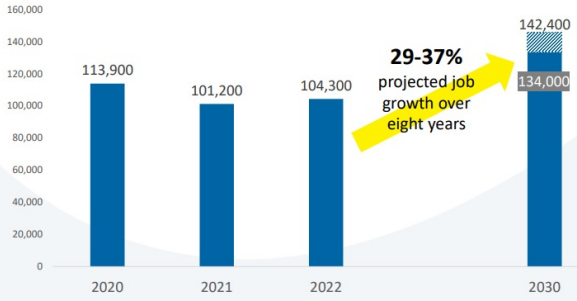
Clean Energy Work Force

- Massachusetts Needs to Add 38,000 workers by 2030
- 2025-2027 Three-Year Plan will create ~70,000 workers
  - Focus on workforce and supplier diversity
  - 15% of dollar volume of direct contracts to diverse suppliers
  - Build pipeline of diverse suppliers

Our Clean Energy Workforce Today & Tomorrow

38,000+ additional clean energy workers are needed to meet the state's decarbonization goals by 2030

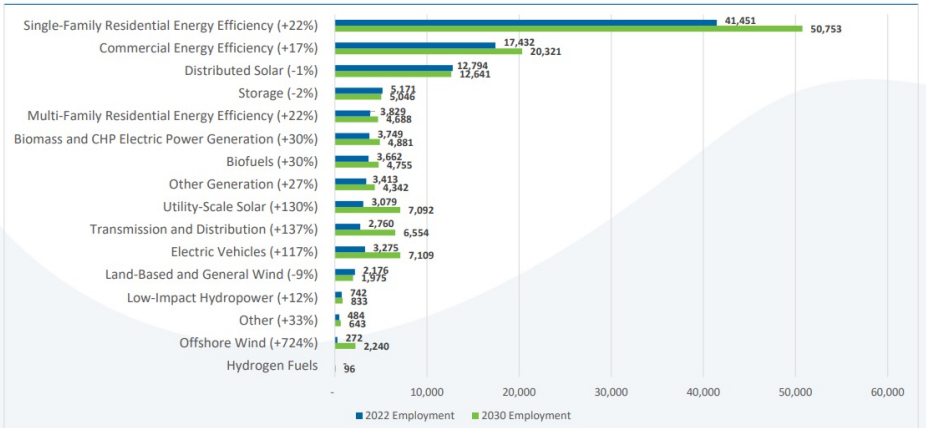


88% of clean energy employers already report difficulty finding workers in this historically-tight labor market (2.6% unemployment; 64.6% Labor force participation rate)

82% of the jobs created by 2030 will be middle to high-wage jobs with a median wage of over $36 per hour.

Given the competitive labor market, **a just transition** that provides economic opportunity and advancement to historically marginalized populations is critical to meeting the demand for clean energy workers by 2030.

Growth by Clean Energy Sub-Technology



Powering the Future: A Massachusetts Clean Energy Workforce Needs Assessment

Massachusetts Clean Energy Center