

# Cold Climate Electrification Policy Review for Burlington

Completed July 2020

# Cold Climate Electrification Policy Review

## Background and Summary of Project

Burlington, VT has been working on its building electrification efforts since 2016. In 2020, BEI worked with Burlington's municipal utility, Burlington Electric Department (BED), to help the City assess the opportunities for electrification in new buildings.

As part of this work, BEI developed this review of existing policies to scale up building electrification technologies in other cities or regions with cold climates. The goal of this project was to help identify policy opportunities that may be applicable in the Burlington context. Each policy example includes a description of the policy and key partners, the number of heating degree days (HDD) for the city or region where the policy was enacted, and how the policy addresses technical or economic challenges associated with building electrification in cold climates.



# Cold Climate Electrification Policy Review

*Summary of the policies included in this review:*

Jurisdiction	Type of Policy
<b>Brookline, MA</b>	Fossil fuel restriction for new construction and major renovations
<b>Ithaca, NY</b>	Promotion of electrification through Energy Code
<b>Montreal, Canada</b> <b>New York, NY</b> <b>Oslo, Norway</b> <b>Stockholm, Sweden</b>	Date-certain phase out of fossil fuels in both new and existing buildings
<b>Maine</b>	Heat pump installation goal
<b>St. Paul, MN</b>	Example all-electric project

# Brookline, Massachusetts

**HDD = 5,513**  
(Heating Degree Days)

- **Type of Policy:** Fossil fuel restriction for new construction and major renovations
- **Policy Description:** Prohibition on natural gas connections to new construction and all major renovations through the town's General By-Laws.
- **Compliance Timeline:** Passed town law in November 2019, but rejected by the Massachusetts Attorney General on legal grounds in July 2020.\*
- **Coverage:** Would have included all new construction and major renovations, defined as work on 50% of existing building floor area.
  - Exemptions included for backup generation, outdoor heating and cooling, commercial cooking, labs and medical offices, and application for other exemptions.
- **Key Partners:** Mothers Out Front, Mass Climate Action Network

*\*Note: The Massachusetts Attorney General expressed support for the goals of the Brookline by-law but rejected the law for the following reasons: i) preemption by the State Building Code; ii) preemption by elements of the State Gas Code; iii) preemption by the State Department of Public Utilities and its regulation of the sale and distribution of gas.*

# Ithaca, New York

HDD = 6,982

- **Type of Policy:** Prescriptive and/or performance requirements in Energy Code
- **Policy Description:** Updates to the state Energy Code with the following options:
  - **Prescriptive path:** Includes point system for electrification, efficient design, renewable energy.
  - **Performance path:** Requires 40% greenhouse gas emissions reduction compared to State Energy Code to promote electrification; required compliance with LEED (minimum 17 energy points), HERS Rating, National Green Building Standard, Passive House, or Carbon Calculation Method.
- **Compliance Timeline:** Introduced in August 2019; effective immediately, but awaiting Town Board and City Council approval as of July 2020.
- **Coverage:** All new construction and major renovations, defined as work on 75% of existing building floor area.
- **Key Partners:** 13-member advisory committee representing economic development, design, real estate, energy, planning, and social equity

- **Type of Policy:** Statewide heat pump installation goal
- **Policy Description:** Law established goal of 100,000 heat pumps installed by 2025.
  - Program funded by Efficiency Maine Trust incentives through utility revenues and Low-Income Home Energy Assistance Program (LIHEAP).
  - Rebate incentives range from \$500 - \$1,500, based on number of units and efficiency.
- **Compliance Timeline:** Announced in June 2019, goal accomplished by end of 2025.
- **Coverage:** Residential buildings (60% of the state's households rely on fuel oil as primary energy source for heat) and small businesses.
- **Key Partners:** The program will be implemented with the following partners:
  - *Efficiency Maine* to provide incentives for heat pump installations.
  - *Maine Housing* to assist with targeting installations in low-income housing.
  - *Kennebec Valley Community College* to offer training in installation and design of heat pump systems.

# Oslo, Norway

HDD = 7,379

- **Type of Policy:** Date-certain phase out of fossil fuels in existing buildings
- **Policy Description:** Commitment to fuel oil phase-out in all buildings by 2020; net zero carbon requirement for new construction and major renovations by 2030; net zero carbon for all buildings by 2050.
- **Compliance Timeline:** Climate and Energy Strategy for Oslo adopted by City Council in 2016, committing City to fuel oil phase-out in all buildings by 2020; net zero for new construction and major renovations by 2030, and for all buildings by 2050.
- **Coverage:** All buildings; to date, no exemptions have been developed.
- **Key Partners:** Climate 40 Cities (C40) – the city has signed onto the organization's New Zero Carbon Buildings Declaration

# Montreal, Canada

HDD = 7,753

- **Type of Policy:** Date-certain phase out of fossil fuels in both new and existing buildings
- **Policy Description:** Heating fuel oil ban in all commercial buildings by 2025 and all residential buildings by 2030; potential gas ban in all buildings by 2050.
- **Compliance Timeline:** Announced May 2019, mayor will introduce bill in 2021 to phase out fuel oil by 2030 and potentially gas by 2050. City government will phase out fuel oil in all municipal buildings in 2020.
- **Coverage:** All buildings, exemptions not fully developed. Note:
  - Roughly 65% of buildings use electric resistance heating, with inexpensive electricity from Hydro-Québec.
  - Roughly 10% of residential buildings and 35% of commercial buildings rely on natural gas or fuel oil.
- **Key Partners:** Policy still in development; David Suzuki Foundation, a large Canadian environmental organization has spoken in favor of proposed law.



# New York City, New York

HDD = 4,757

- **Type of Policy:** Date-certain phase out of heavy heating oil in new and existing buildings
- **Policy Description:** Phase out of No. 6 fuel oil by 2015 and No. 4 oil by 2030 or at time of boiler replacement. All new boilers must use gas, No. 2 oil, biodiesel, or district steam.
- **Compliance Timeline:** City Council law passed in 2010 and regulations enacted by NYC Dept. of Environmental Protection in 2011. Phase-out of No. 6 oil was completed in 2015 and the No. 4 oil phase-out will be complete by 2030.
  - **100% No. 6 fuel oil phase out achieved in 2015** (~5,000 buildings); 75% converted to the cleanest fuels.
  - **The City established NYC Clean Heat in 2011**, a technical assistance program to help with conversions, which evolved into the NYC Accelerator in 2015 to assist owners with a broader set of energy upgrades.
- **Coverage:** All buildings with boilers over a certain size threshold; waivers allowed for temporary compliance deferrals.
- **Key Partners:** Environmental Defense Fund; environmental justice and air quality partners

# Stockholm, Sweden

HDD = 7,064

- **Type of Policy:** Date-certain phase out of fossil fuels in new and existing buildings
- **Policy Description:** Committed to fossil fuel phase-out by 2040, with a plan to:
  - Improve efficiency of district heating and connect additional buildings to system.
  - Transition district heating to less carbon-intensive inputs such as biofuels.
  - Replace natural gas and fuel oil furnaces to efficient electric technologies in buildings without access to district heating system.
- **Compliance Timeline:** Passed by City Council in 2016, the City committed to be fossil fuel free by 2040; no interim targets set.
- **Coverage:** All buildings; approximately 80% of buildings currently rely on district heating
- **Key Partners:** National government of Sweden is responsible for setting laws for non-building policies including shipping, aviation, and transportation.

# St. Paul, Minnesota

HDD = 7,253

- **Type of Policy:** Example all-electric project
- **Policy Description:** City partnership with private developer on 122-acre site to explore all-electric new construction master-planned community
- **Compliance Timeline:** Site purchased in 2019, the project's first phase has a 2025 completion date
- **Coverage:** Covers all buildings on site; no commercial buildings aside from retail space
- **Key Partners:** Project developer, The Ryan Companies

# Cold Climate Electrification Policy Review

## Summary of Policies Reviewed:

#	Jurisdiction	HDDs*	Policy Summary
1	Brookline, MA	5,513	Restriction on gas infrastructure in new construction; requires approval from Attorney General.
2	Ithaca, NY	6,982	Green Building Policy requires Easy Path or Whole Building Path for energy performance in new construction. Easy Path rewards for heat pump installations.
3	Maine	7,501	Maine Climate Council recommends building codes to reach net zero carbon by 2030 and phasing out gas appliances in new construction.
4	Montreal, Canada	7,753	Mayor announced plan to introduce bill to phase out heating oil-burning heating systems by 2030 and gas-burning heating systems by 2050.
5	New York, NY	4,757	Phase out of most carbon- and pollution-intensive heating fuel oil from new and existing buildings.
6	Oslo, Norway	7,379	Committed to net zero carbon new construction by 2030 and fossil fuel city by 2050.
7	Stockholm, Sweden	7,064	Committed to phasing out fossil fuels by 2040, requiring all buildings to be served by heat pumps and/or district heating by then.
8	St. Paul, MN	7,253	Exploring all-electric new construction for a new, 3,800 unit residential development.

\*Heating Degree Days calculated using [degreedays.net](https://degreedays.net); all are three-year averages; Maine HDDs used average of Portland, Lewiston, and Bangor, Maine.

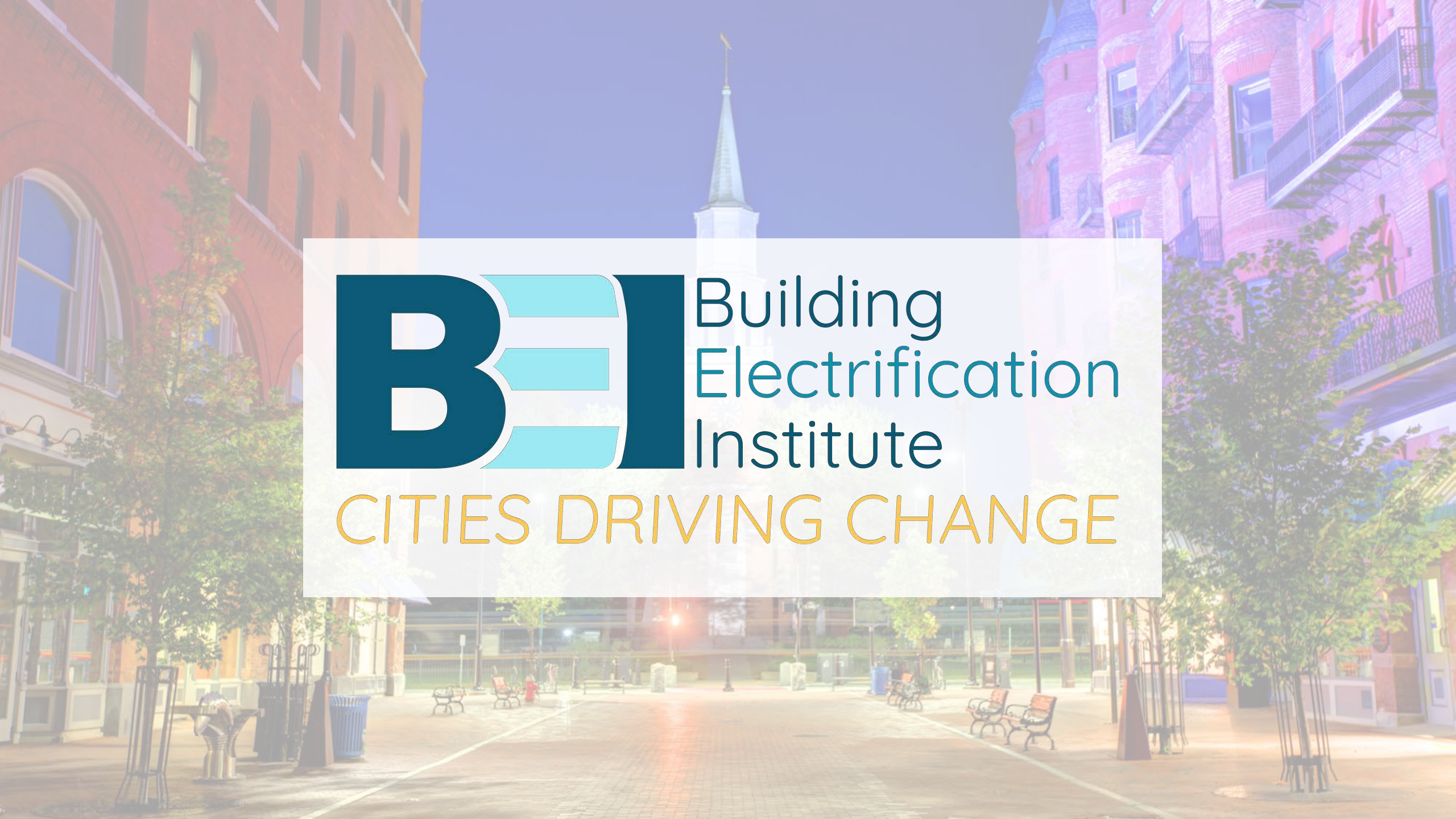
# Cold Climate Electrification Policy Review

## Benefits and Drawbacks of Policy Approaches:

Type of Policy	Jurisdiction	Benefits of Policy Approach	Potential Drawbacks of Approach
<b>Fossil fuel restriction for new construction and major renovations</b>	Brookline	<ul style="list-style-type: none"> <li>Reduces building costs</li> <li>Limits/prevents new gas infrastructure build-out</li> <li>Electrification of existing buildings can occur as buildings are rehabilitated</li> </ul>	<ul style="list-style-type: none"> <li>Law provides exemptions from requirement</li> <li>Long time horizon for buildings to be rehabilitated</li> <li>State preemption issues</li> </ul>
<b>Promotion of electrification through Energy Code</b>	Ithaca	<ul style="list-style-type: none"> <li>Easy Path reduces building costs</li> <li>Provides owners and developers flexibility to choose their best compliance pathway</li> <li>Electrification of existing buildings can occur as buildings are rehabilitated</li> </ul>	<ul style="list-style-type: none"> <li>Allows for compliance options that include fossil fuels</li> <li>Long time horizon for buildings to be rehabilitated</li> </ul>
<b>Date-certain phase out of fossil fuels in both new and existing buildings</b>	Montreal; New York; Oslo; Stockholm	<ul style="list-style-type: none"> <li>Known time horizon allows building owners to pursue required changes at the most strategic time</li> <li>Will cover 100% of buildings by end date</li> </ul>	<ul style="list-style-type: none"> <li>Robust enforcement capacity needed to ensure requirements are met</li> <li>Delay in installation could lead to market confusion or capacity constraints</li> </ul>
<b>Heat pump installation goal</b>	Maine	<ul style="list-style-type: none"> <li>Helps develop market in lead up to a potential requirements</li> <li>Opportunity to build workforce capacity</li> <li>Potential to prioritize low-income communities</li> </ul>	<ul style="list-style-type: none"> <li>Significant funding needed to incentivize heat pump installation goal</li> <li>Will eventually need to be paired with a requirement to reach all buildings</li> </ul>
<b>Example all-electric project</b>	St. Paul	<ul style="list-style-type: none"> <li>Provides example to market that all-electric construction is feasible</li> <li>Will provide detailed cost information on installation and operations</li> </ul>	<ul style="list-style-type: none"> <li>Long project development timeline</li> <li>One project may not change the broader heat installation pump market</li> </ul>

# References and Web Resources

- **Brookline, Massachusetts**
  - Town of Brookline Massachusetts, [Warrant Article 21: Prohibition on New Fossil Fuel Infrastructure in Major Construction](#) (text to amendment to General By-Laws). Updated August 2020.
- **Ithaca, New York**
  - Town of Ithaca, [Ithaca Green Building Policy](#)
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  - Efficiency Maine, [Heat Pump Incentives](#) (program webpage).
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  - Global News, "[City of Montreal to ban oil heat by 2030 in bid to fight climate change.](#)" May 2019.
  - CTV News, "[Montreal to phase out oil heating in next decade.](#)" May 2019.
- **New York City, New York**
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  - The City of New York, [NYC Clean Heat](#) (program website).
  - The City of New York, [NYC Accelerator](#) (program website).
- **Oslo, Norway**
  - C40 Cities, "[Oslo and Heidelberg Commit to make New Buildings 'Net Zero Carbon' by 2030.](#)" September 2019.
  - City of Oslo, [Climate and Energy Strategy for Oslo](#). September 2016.
- **Stockholm, Sweden**
  - City of Stockholm, [Strategy for a fossil-fuel free Stockholm by 2040](#). December 2016.
- **St. Paul, Minnesota**
  - Saint Paul City Council, [Ford Site Zoning and Public Realm Master Plan](#). Last amended May 2020.
  - City of St. Paul, [St. Paul Ford Site – Energy Study Report](#). November 2015.



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