



City of Cambridge

Fossil Fuel Free Demonstration Program Application

August 18, 2023

Staff Contacts:

Nikhil Nadkarni

Energy Project Planner

nnadkarni@cambridgema.gov

(617) 349 6434

Susanne Rasmussen

Director of Environment and Transportation Planning

srasmussen@cambridgema.gov

(617) 349 4607

Community Development Department

344 Broadway, Cambridge, MA 02139



City of Cambridge

Executive Department

YI-AN HUANG
City Manager

August 18, 2023

Elizabeth Mahony
Commissioner, Massachusetts Department of Energy Resources
100 Cambridge St., 9th Floor
Boston, MA 02114

Dear Commissioner Mahony,

On behalf of the City of Cambridge, I am pleased to submit our application to the Municipal Fossil Fuel Free Building Demonstration Program. The opportunity to participate in this demonstration allows us to make crucial progress towards our climate goals. We look forward to continued collaboration with the Department of Energy Resources to successfully implement the Fossil Fuel Free Demonstration Program in Cambridge.

Cambridge has long been committed to taking action on climate change and reducing our greenhouse gas emissions. Cambridge's Net Zero Action Plan, adopted first in 2015 and updated in 2021, lays out a series of specific policies and programs to reduce emissions from buildings and reach net zero in or before 2050. A key action in the Plan is to adopt a net zero code for new buildings as soon as the Commonwealth enables us to do so. Therefor we filed a Home Rule Petition in April 2022 requesting this authority and adopted the Specialized Stretch Code in January 2023, establishing a stringent standard for highly efficient building design and electrification readiness. Requiring new buildings to be fossil fuel free is critical to achieving our climate goals, and the Demonstration Program will allow us to decisively transition away from fossil fuels in our new buildings and major renovations.

To help develop a well thought out ordinance and implementation plan for Fossil Fuel Free requirements in Cambridge, City staff have undertaken a public process over the past few months that encompassed extensive outreach, broad community engagement, and a detailed technical review. We created a webpage for Fossil Fuel Free, ran a social media campaign, created a survey, and distributed over 800 flyers. Over 9000 residents received information in a city newsletter, and we shared information at four webinars. To ensure equitable outreach, we also sent information to over 50 community organizations and 900 local businesses, and reached out specifically to the Chinese-, Bangla-, Haitian Creole-, and Amharic-speaking communities with translated materials. We also worked with a technical consultant in an expedited timeframe to analyze different building types and end uses that are common in Cambridge and how they could be built with all-electric solutions. The consultant team examined how Fossil Fuel Free would build upon the Specialized Stretch Code and other code requirements.



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YI-AN HUANG
City Manager

As a result, the application we are submitting has been informed by extensive engagement and technical analysis to ensure the successful implementation of Fossil Fuel Free requirements in Cambridge. We look forward to your review and to collaborating with the Department of Energy Resources on the implementation of the Fossil Fuel Free Demonstration Program as we work towards our shared climate goals.

Sincerely,

Yi-An Huang
City Manager

A. Home Rule Petition

Cambridge's Home Rule Petition was filed in the Legislature on April 6, 2022. Please see *Appendix A* for a copy of the petition.

B. Proposed Fossil Fuel-Free Ordinance

On August 7, 2023, the Cambridge City Council voted to adopt Cambridge's Fossil Fuel-Free Demonstration Ordinance. Please find the full text of the adopted ordinance in *Appendix B*.

The proposed Cambridge ordinance includes a limited number of changes to the model rule to fit local circumstances. These changes are specific and limited in nature, designed to focus solely on equipment that may be difficult to electrify. Also, Cambridge adopted the Specialized Stretch Code, effective July 2023, providing a strong foundation for the implementation of fossil fuel free requirements. Equipment or projects that are exempted from fossil fuel free requirements or may be granted a waiver would still be required to comply with the requirements of the Specialized Stretch Code.

The following section explains the rationale for each change from the model rule by section.

15.30.10 - Definitions: Major Renovations. Cambridge's ordinance simplifies the alteration threshold of "Major Renovation" to reflect local building stock. No changes to the thresholds for additions or change of use are proposed. Whereas the 225 CMR 24.02 definition includes "Level 3 Alterations as defined in the International Existing Building Code (IEBC 2021) (which exceed 50% of the existing conditioned floor area) exceeding 1,000 square feet for low rise residential, or exceeding 20,000 square feet for all other building uses," Cambridge's ordinance makes the following changes to the alteration threshold in 225 CMR 24.02, definition of Major Renovation:

Section (c): Level 3 Alterations as defined in the International Existing Building Code (IEBC 2021) in which the work area exceeds 50% of the building area and exceeds 1,000 square feet for residential buildings,

Section (d): Level 3 Alterations as defined in the International Existing Building Code (IEBC 2021) in which the work area exceeds 50% of the building area or alterations that exceed 20,000 square feet for non-residential building uses.

[The change of use thresholds are unchanged, and those sections are re-labeled Sections (e) and (f).]

The goal of these changes is to ensure that Level 3 Alterations in residential buildings larger than low-rise residential buildings would still be appropriately covered by the fossil fuel free requirements.

Cambridge's building stock includes many midsize multifamily buildings that exceed three stories but are still small enough such that a 50% or greater alteration would not exceed 20,000 square feet. By proposing a simpler 50% threshold for all residential buildings, Cambridge seeks to ensure that all major renovations in all residential buildings are fairly covered by fossil fuel free. The ordinance includes a definition of residential building to account for the many mixed-use properties in Cambridge; this definition mirrors other greenhouse gas emission reduction regulations in Cambridge.

15.30.40(b)(i)(5): This section provides an exemption for *emergency and standby power systems*. In feedback received through our public engagement process, we heard about the critical need for emergency backup systems. Indeed, Cambridge's work on climate resiliency emphasizes the need for resilient energy systems through backup systems. Since all-electric backup options are limited for larger facilities and critical loads, we are exempting the use of fossil fuels for emergency and standby power systems. The ordinance narrowly defines the criteria for such systems from the NFPA.

15.30.40(b)(i)(6): *Equipment in critical use medical and research facilities* is provided an exemption. We expect that this would apply to only a small number of facilities in which critical life safety systems and data systems, as defined by state code, depend on fossil fuel-based systems and are not well served by all-electric technologies.

15.30.40(b)(i)(7): *Cooking equipment in restaurants* is provided a time-limited exemption. This exemption is available until 2035, and it applies only to restaurants, and not to other types of kitchens such as employee cafeterias or dormitories. The exemption is specific to cooking equipment and does not allow a building to use fossil fuels for a restaurant's HVAC, hot water, or other non-cooking end uses. In addition, notwithstanding this exemption, per the Specialized Stretch Code, the restaurant electrical panel must be sized for full electrification. This exemption is based on a technical review that determined that there are cuisines and cooking processes for which the all-electric technologies do not yet exist, are not available in the US, or do not yet perform at the level needed to replace gas. We anticipate that all-electric technologies will evolve to fully serve a wide range of cooking needs by 2035.

15.30.40(b)(i)(8): *Heating and hot water provided through a district energy system* are provided an exemption from fossil fuel free, and their electrification pathway will continue to be defined by the Specialized Stretch Code. This exemption only allows a building to receive thermal energy supplied through the district network and would not allow the building to be built with onsite fossil fuel equipment (e.g., gas stoves). Cambridge is home to multiple institutional and commercial district energy systems, several of which are working towards decarbonization. Low- and zero-carbon district energy systems are identified in our Net Zero Action Plan as an important solution for heating decarbonization. We also understand that DOER is developing specifications for how the Specialized Stretch Code applies to buildings using district energy. Thus, we feel that it is appropriate that the Fossil Fuel Free Ordinance not prevent the use of district energy, and instead allow these buildings to comply with the requirements of the Specialized Stretch Code.

15.30.40(b)(i)(9): We clarify that *onsite vehicle fueling* connections are not subject to the fossil fuel free requirements, as they do not relate to energy used in the building. This clarification is expected to be relevant to fleet fueling facilities.

15.30.40(b)(i)(10): A *manufacturing process load* may be eligible for a waiver if it cannot be physically or reasonably converted to an all-electric process. It is difficult to predict the specific manufacturing processes that a new building or major renovation may be establishing, and thus an individualized review is an appropriate path forward for what is likely to be an infrequent waiver case.

15.30.40(b)(i)(11): A waiver may be provided to any *building equipment for which sufficient utility service* is not available at the time of building occupancy. Applying for this waiver requires a letter signed by a design professional and a letter from the utility confirming the lack of sufficient capacity in the local distribution system. Furthermore, the building owner must commit to converting their equipment to all-

electric within three years of receiving sufficient electric capacity from the utility. Grid planning discussions with Eversource have identified areas of the city that are currently capacity constrained, and thus a narrowly defined waiver process requiring thorough documentation would be appropriate to address temporary constraints in local grid capacity. Buildings will, of course, still be required to meet the Specialized Stretch Code requirements for electrification readiness. This waiver process thus does not penalize a building project for insufficient electricity supply to meet its needs and instead requires them to prepare themselves for full electrification when the utility can provide the necessary service.

15.30.40(b)(i)(12): *Historic buildings* may also apply for a waiver. The criteria they must meet to qualify as historic are adapted directly from the Specialized Stretch Code. We are also requiring that, to apply for a waiver, the applicant must provide a report from an expert or appropriate historic commission that documents why complying with fossil fuel free would threaten the historic nature of the building. We believe that these stringent requirements set a high bar, thereby applicable to only a small number of historic building renovations.

15.30.40(c) includes a clarification that the installation of fossil fuel equipment or appliances is not allowed in the *permitted work area of a major renovation*. This would encompass any part of the building in which work is being done, including the installation of equipment. Other areas of the building that are not under renovation are not affected by these requirements at that time.

15.30.40(d) establishes that the Commissioner of Inspectional Services may promulgate regulations, as discussed in the section below.

C. Implementation Plan

Timeline and Effective Dates of the Ordinance's Provisions and Requirements

The Cambridge City Council voted to ordain the Fossil Fuel Free ordinance on August 7, 2023. The Ordinance will go into effect January 1, 2024, or three months after its approval by the Department of Energy Resources (DOER), whichever occurs later. On January 1, 2027, permit applications that seek to utilize propane or gas for domestic water heating will no longer be approved. On January 1, 2035, the all-electric pathway will also apply to cooking equipment in restaurants.

Planned Collaboration with Department on Data Collection, Reporting, Outreach and Training

The City of Cambridge is dedicated to realizing the success of the demonstration program in Cambridge as we work towards our building decarbonization goals. Consequently, the City commits to close collaboration with DOER on data collection, reporting, outreach, and training. This includes annual reporting of the permit and energy data required by DOER, as outlined in 225 CMR 24.07(2). Additional information on data organization and reporting is in the next section.

With regards to outreach and education, Cambridge conducted extensive community engagement as part of the process of developing and adopting the fossil fuel free ordinance. This included print materials, a digital campaign, multilingual informational materials, and outreach through community partner organizations. Cambridge also hosted two webinars in collaboration with Mass Save focused on residential and commercial buildings with the purpose of educating builders, building owners, and residents on the implications of the new Specialized Stretch Code and the Fossil Fuel Free proposed

ordinance. Similar outreach and educational events could be hosted to explain the implementation of the Fossil Fuel Free ordinance, and we look forward to working with DOER on this.

Cambridge Process for Storing Building Permit Data and Certificates of Occupancy

The City of Cambridge Inspectional Services Department stores building permits in the Viewpoint database system. Building permits are tracked by a unique identifier and are tied to a building parcel, identified by its map-lot number. Much of the data is made available on the City's Open Data platform as well, where it can be downloaded in CSV format. New construction projects are permitted as [New Construction Building Permits](#), and renovation and addition permits are classified as [Addition/Alteration Permits](#). Certificates of Occupancy are also issued by Inspectional Services and stored in the Viewpoint database, linked to the preceding building permit and map-lot parcel number.

Process Loads

City staff used the [Cambridge Property Database](#) to identify likely commercial and industrial process loads in Cambridge buildings. We then considered the impact of the proposed ordinance on these building use types when developing exemptions and waiver processes.

Our review identified all manufacturing buildings, warehouses, laundromats, dry cleaners, and restaurants in Cambridge. Most of the warehouses in Cambridge were found to store automobiles for landscaping, moving, or rental car services. The proposed ordinance includes a clarifying exemption for onsite fueling pumps, so vehicle storage facilities with these process loads should not be adversely affected.

A significant number of manufacturing buildings and warehouses are also operated by food processing establishments. We anticipate that the waiver process for process loads that cannot be readily electrified will provide a pathway for these businesses to continue their food processing operations; building systems related to heating and hot water would still be required to be electrified.

Only thirteen buildings in Cambridge were found to house laundromats or dry cleaner establishments. A review by our technical consultants also identified that these facilities do not use fossil fuels for dry cleaning processes (instead using chemical treatment), so the ordinance's impact on these processes should be minimal.

Finally, we observed that restaurants are among the businesses with a high rate of turnover. Although restaurant buildings frequently change ownership, a high-level review of the Addition/Alteration Permits revealed that they are very rarely renovated in ways that would qualify as a major renovation and thereby trigger the fossil fuel free requirements. In addition, the ordinance includes an exemption for cooking equipment until 2035, with the provision that the kitchen panel is sized for future electrification, thereby allowing this industry the time needed for appropriate all-electric technologies to become commercially available in the US.

Exemptions

Cambridge's Fossil Fuel Free Ordinance includes exemptions for domestic hot water heating for multifamily buildings above 12,000 square feet, emergency and standby power systems, equipment in critical use facilities for medical care and intensive research, cooking equipment in restaurants, heating or hot water supplied by district energy systems or central utility plants, and onsite vehicle fueling

connections. The exemption for cooking equipment in restaurants applies only to buildings that apply for permits before January 1, 2035, and with the provision that the building is prepared for full electrification later.

Waivers

Waivers may be granted by the Commissioner of Inspectional Services for specific circumstances outlined in the ordinance. Applicants seeking waivers must prove their project's eligibility by supplying the Commissioner with sufficient documentation at the time of application for a building permit. Circumstances eligible for waivers include process loads, equipment for which sufficient utility electric service cannot be provided, and historic buildings. The Commissioner of Inspectional Services is granted the authority to issue regulations that specify the documentation and application procedure required for seeking each type of waiver.

Applicants for process load waivers must demonstrate that the process cannot be reasonably electrified. Applicants who claim that they cannot procure sufficient utility service for their building systems or equipment must provide a utility letter and a letter signed by a design professional verifying the limitation. Furthermore, they must commit to converting the system within three years of sufficient electrical service procurement.

Finally, historic building projects can seek waivers only if they are listed in the National Register of Historic Places, designated historic under a state or local law, or certified as a contributing resource within a National Register-listed, state-designated, or locally designated historic district. If a building meets one of these requirements, they may apply for a waiver by submitting a report to the Commissioner of Inspectional Services that demonstrates that compliance with the all-electric pathway would threaten, degrade, or destroy the historic form, fabric, or function of the building. This report must be signed by a registered design professional, a representative of the State Historic Preservation Office, or another historic preservation authority.

D. Housing Production Eligibility

Cambridge satisfies the 10% housing affordability threshold set under Chapter 40B of the General Laws as of December 21, 2020, with a current subsidized housing rate of 12.9% based on [Department of Housing and Community Development data](#).

Appendix A

HOUSE DOCKET, NO. 4996 FILED ON: 4/6/2022

E. HOUSE No. 4705

The Commonwealth of Massachusetts

PRESENTED BY:

Mike Connolly

To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts in General Court assembled:

The undersigned legislators and/or citizens respectfully petition for the adoption of the accompanying bill:

An Act authorizing the city of Cambridge to establish a net zero emissions standard for newly constructed buildings.

PETITION OF:

NAME:	DISTRICT/ADDRESS:	DATE ADDED:
<i>Mike Connolly</i>	<i>26th Middlesex</i>	<i>4/6/2022</i>
<i>Patricia D. Jehlen</i>	<i>Second Middlesex</i>	<i>4/13/2022</i>

1 of 1

HOUSE DOCKET, NO. 4996 FILED ON: 4/6/2022

F. HOUSE No. 4705

By Mr. Connolly of Cambridge, a petition (accompanied by bill, House, No. 4705) of Mike Connolly and Patricia D. Jehlen (with the approval of the city council) that the city of Cambridge be authorized to establish a net zero standard for newly constructed buildings. Telecommunications, Utilities and Energy. [Local Approval Received.]

The Commonwealth of Massachusetts

In the One Hundred and Ninety-Second General Court
(2021-2022)

An Act authorizing the city of Cambridge to establish a net zero emissions standard for newly constructed buildings.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

- 1 SECTION 1. Notwithstanding any general or special law or rule or regulation to the
2 contrary, the City of Cambridge is authorized to establish a net zero standard for
 newly
3 constructed buildings, starting in January of 2022. Such a standard may impose
 limitations on the
4 combustion of fossil fuels in such buildings, as well as limit the installation of
 equipment that 5 combusts fossil fuels, in order to ensure reductions in building
 emissions congruent with state 6 and city climate change goals.
- 7 SECTION 2. This act shall take effect upon its passage.

Appendix B

Fossil Fuel Free Ordinance

ORDINANCE NO. 2023-3 - FINAL PUBLICATION

CITY OF CAMBRIDGE

In the Year Two Thousand and Twenty-Three

AN ORDINANCE

In amendment to the Ordinance entitled “Cambridge Municipal Code”

That the Municipal Code of the City of Cambridge be amended to add a new Chapter 15.30 entitled “Fossil Fuel-Free Demonstration” as follows:

Chapter 15.30 FOSSIL FUEL-FREE DEMONSTRATION

§ 15.30.10 Definitions

Fossil Fuel-Free Demonstration - Codified by the entirety of 225 CMR 24.00, the Fossil Fuel-Free Demonstration

Major Renovation - Defined as any of the following:

(a) Low-rise residential additions over 1,000 square feet and additions that exceed 100% of the conditioned floor area of the existing dwelling unit,

(b) Additions over 20,000 square feet and additions that exceed 100% of the conditioned floor areas of the existing building for all building use types except low-rise residential,

(c) Level 3 Alterations as defined in the International Existing Building Code (IEBC 2021) in which the work area exceeds 50% of the building area and exceeds 1,000 square feet for residential buildings,

(d) Level 3 Alterations as defined in the International Existing Building Code (IEBC 2021) in which the work area exceeds 50% of the building area or alterations that exceed 20,000 square feet for non-residential building uses,

(e) Change of use of over 1,000 square feet per International Energy Conservation Code (IECC 2021) Sections R505,

(f) Change of use of over 20,000 square feet or change of use of 100% of the conditioned floor areas of the existing building for all building use types except low-rise residential, International Energy Conservation Code (IECC 2021) Sections C505.

Residential building - Defined as a building containing one or more dwelling units, and whose use is primarily (greater than 75% of the conditioned floor area) residential.

Specialized Energy Code - Codified by the entirety of 225 CMR 22 and 23 including Appendices RC and CC, the Specialized Energy Code adds residential and commercial appendices to the Massachusetts Stretch Energy Code, based on amendments to the respective net-zero appendices of the International Energy Conservation Code (IECC) to incorporate the energy efficiency of the Stretch energy code and

further reduce the climate impacts of buildings built to this code, with the goal of achieving net-zero greenhouse gas emissions from the buildings sector no later than 2050.

§ 15.30.20 Purpose

The purpose of 15.30, also referred to as the Fossil Fuel-Free Demonstration is to restrict and prohibit new building construction and major renovation projects that are not fossil fuel-free.

§ 15.30.30 Applicability

This restriction applies to residential and non-residential buildings that qualify as new construction or major renovation, as defined in 225 CMR 24.00. This restriction shall not apply to research laboratories for scientific or medical research, hospitals and medical offices regulated by the department of public health as a health care facility as defined in 225 CMR 24.00.

§ 15.30.40 Fossil Fuel-Free Demonstration

The Fossil Fuel-Free Demonstration, as codified by the entirety of 225 CMR 24.00, is herein incorporated by reference into the City of Cambridge Code of Ordinances, Chapter 15 with an effective date of January 1, 2024 or three months after approval by the Department of Energy Resources (DOER), whichever is later.

With adoption of the Fossil Fuel-Free Demonstration, and upon approval by DOER, the following amendments to the Specialized Energy Code are adopted. These changes are enforceable by the Commissioner of Inspectional Services and will go into effect for any project seeking a Building Permit on or after the effective date.

a. Low-rise Residential Code (225 CMR 22 Appendix RC)

- i. Sections RC102 and RC101 “Zero Energy Pathway” and “Mixed Fuel Pathway” shall not be permitted for use for new construction.

b. Commercial and All Other (225 CMR 23 Appendix CC)

- i. Sections CC103 and CC105 “Zero Energy Pathway” and “Mixed-Fuel Pathway” shall not be permitted for new construction, with the following exceptions:

1. Research laboratories for scientific or medical research,
2. Hospitals regulated by the department of public health as a health care facility,
3. Medical offices regulated by the department of public health as a health care facility.
4. Multi-family buildings over 12,000 square feet with permit application filed prior to January 1, 2027 may utilize gas or propane for domestic water heating as the only combustion equipment.
5. Emergency and standby power systems, as defined as level 1 and level 2 systems in the NFPA 110 (2022) Section 4.4.
6. Equipment in critical use facilities for medical care and intensive research that meet the definitions of Critical Operations Data Systems and Critical Operations Power Systems as defined by the Massachusetts Electrical Code.
7. Commercial cooking equipment used in a restaurant in a building that has applied for a building permit prior to January 1, 2035, provided that the electrical panel has sufficient capacity for the later installation of fully electric food preparation equipment.

8. Heating or domestic hot water that are supplied to a building through a district energy system or central utility plant.

9. Onsite vehicle fueling connections.

10. A waiver may be granted by the Commissioner of Inspectional Services for the use of fossil fuels for manufacturing process loads if the process load cannot physically or reasonably be converted to an all-electric process, as demonstrated by the applicant.

11. A waiver may be granted by the Commissioner of Inspectional Services for any equipment for which sufficient utility electric service cannot be provided by the time of building occupancy, provided that the applicant shall furnish a letter signed by a design professional and a utility letter describing service limitations. The building owner shall commit to converting said equipment to all-electric within three (3) years of when sufficient electric capacity can be made available by the utility.

12. A waiver may be granted by the Commissioner of Inspectional Services for the following:

Historic buildings, defined in Chapter 2 of the IECC 2021 as any building or structure that is one or more of the following:

- a) Listed, or certified as eligible for listing, by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.
- b) Designated as historic under an applicable state or local law.
- c) Certified as a contributing resource within a National Register-listed, state-designated or locally designated historic district.

Provided that a report has been submitted to the Commissioner of Inspectional Services and signed by a registered design professional, a representative of the State Historic Preservation Office, or the historic preservation authority having jurisdiction, demonstrating that compliance with that provision would threaten, degrade, or destroy the historic form, fabric, or function of the building.

c. Equipment or appliances used for space heating, service water heating, cooking, clothes drying, and/or lighting that can utilize coal, oil, natural gas, other fuel hydrocarbons, including synthetic equivalents, or other fossil fuels may not be installed in the permitted work area as part of any residential or non-residential Major Renovation, with the exception of b.i.1-12 above. All Major Renovations associated with b.i.1-12 must follow applicable stretch code requirements.

d. The Commissioner of Inspectional Services shall have the authority to promulgate regulations for the implementation of the provisions of this Ordinance.

In City Council August 7, 2023.

Ordained as amended by a yeas and nays vote:-

Yeas 7; Nays 1; Absent 0; Present 1

Attest:- Diane P. LeBlanc, City Clerk

A true copy;

ATTEST:-

A handwritten signature in dark ink, appearing to read "Diane P. LeBlanc", is written over a horizontal line. The signature is fluid and cursive.

Diane P. LeBlanc
City Clerk