



---

# CITY OF CAMBRIDGE

Community Development Department

---

To: Planning Board

From: Community Development Department (CDD) Staff

Date: August 13, 2020

Re: **Fossil Fuel Zoning Petition (Amendments to Article 22.000 of the Zoning Ordinance)**

**IRAM FAROOQ**  
Assistant City Manager for  
Community Development

**SANDRA CLARKE**  
Deputy Director  
Chief of Administration

**KHALIL MOGASSABI**  
Deputy Director  
Chief of Planning

## Overview

Petitioner: City Council

Zoning Section: Section 22.25 of Article 22.000 (Green Building Requirements)

Amendment Summary: Add a new Paragraph 22.25.2(d) to read as follows: "A plan shall be submitted to Community Development and Inspectional Services Departments that uses alternative and renewable energy sources and an analysis of the feasibility and cost of installing such a system compared with a fossil fueled energy system for city and public review."

Planning Board Action: Recommendation to City Council

Memo Contents: Background information on Article 22.000 and Cambridge's Net Zero Action Plan; information on recent changes to green building requirements; summary of green building requirement review; and comments on proposed amendment.

## Background on Green Building Requirements

In 2010, the City Council first adopted Green Building Requirements ([Section 22.20 of the Zoning Ordinance](#)) based on the recommendations of a task force formed to study zoning standards that would encourage sustainable development practices. These requirements apply to construction projects of 25,000 square feet or more, and the performance standards were originally based on the LEED rating program, requiring projects of 50,000 square feet or more to be designed to a "Silver" rating level and projects of 25,000-50,000 square feet to be designed to a "Certifiable" level.

In 2019, the City Council adopted a set of changes to Section 22.20 that were based largely on the recommendations of the City's Net Zero Action Plan (see below). Those changes affected the Green Building Requirements in the following ways:

- Increased the minimum citywide standards to LEED Gold for projects of 50,000 square feet or more, and LEED Silver for projects of 25,000-50,000 square feet;
- Included Enterprise Green Communities and Passive House as optional rating systems that may be used in place of LEED;

---

344 Broadway  
Cambridge, MA 02139  
Voice: 617 349-4600  
Fax: 617 349-4669  
TTY: 617 349-4621  
[www.cambridgema.gov](http://www.cambridgema.gov)

---

- Required an enhanced commissioning process for all projects subject to Green Building Requirements;
- Required a Net Zero Narrative to be submitted at the initial stage of review which describes the projected energy use and greenhouse gas emissions of the project, measures to improve energy performance and promote renewable energy, incentive programs that are being used to reduce energy demand, and pathways to transition the building to net zero emissions in the future; and
- Made other text changes intended to clarify and streamline parts of the review process that may have caused confusion in the past, including more specific information about the inclusion of Energy Simulation Tools (also known as “energy models”).

### **Net Zero Action Plan**

Buildings generate over 80% of Cambridge’s total greenhouse gas emissions, which demonstrates the importance of promoting green building practices. While new buildings are responsible for a relatively small portion of Cambridge’s total greenhouse gas emissions, their high visibility and long lifespan make them an important example of green building practices in Cambridge.

The Cambridge [Net Zero Action Plan](#) (NZAP) was adopted by the City Council in 2015. The NZAP lays out a set of actions to phase out greenhouse gas emissions from new and existing buildings throughout the City by mid-century. NZAP actions are focused on energy efficiency in existing buildings, net zero new construction, and low carbon energy supply. The NZAP includes phased targets for newly constructed buildings to achieve net zero emissions, beginning with municipal buildings in 2020, small residential buildings (1-3 units) in 2022, commercial, multifamily, and institutional buildings in 2025, and laboratories in 2030. Leading up to these targets, the NZAP laid out a step-by-step approach to reduce emissions from newly constructed buildings subject to the Article 22 Green Building Requirements, beginning with the amendments adopted in 2019.

The NZAP approach to new building performance is focused on energy efficiency and overall greenhouse gas emission reductions, versus prescribing specific energy supply options. To achieve net zero greenhouse gas emissions, buildings must achieve 100% renewable energy supply or, potentially, offset on-site combustion emissions via a local carbon fund. Current approaches are intended to reduce greenhouse gas emissions to the maximum extent possible through efficient design, and to design and develop buildings to be adaptable to achieve net zero greenhouse gas emissions in the future.

The NZAP includes actions intended to facilitate the development of low-carbon energy supply options for new and existing buildings in Cambridge, including on and off-site solar, efficient all-electric thermal systems, and low-carbon district energy systems. The [2018 Low Carbon Energy Supply Strategy](#) specifically recommended that the City seek to enable the development of low-carbon district energy systems to efficiently serve the energy needs and increase the energy resilience of dense institutional and commercial districts of Cambridge, where many buildings are subject to Green Building Requirements.

To encourage the use of low-carbon district energy, a recent CDD study recommended that the City require developers to carry out feasibility studies of low-carbon district energy for large new developments. The feasibility studies should:

- Include a cost-benefit analysis of a low-carbon district energy option compared to a baseline project;
- Be based on a levelized-cost-of-energy (LCOE) method or similar; and
- Take into consideration and monetize additional benefits gained from a low-carbon district energy approach, including additional space available in basements and roof-tops.

It should be noted that the NZAP is currently undergoing a comprehensive 5-Year Review informed by a stakeholder Task Force to evaluate the impact of the Plan to date, consider the current scientific, technological, economic and policy context around greenhouse gas emissions reductions from buildings, and recommend potential adjustments to the Plan going forward. One specific aspect of this review process will be analyzing the technical and economic feasibility of prohibiting new buildings from using on-site fossil fuel infrastructure, the legality of which would need to be considered by the City's Law Department. The 5-Year Review was delayed by the COVID-19 pandemic and is now expected to be completed in FY21.

### **Net Zero Narrative Requirement**

One of the significant changes made to the Green Building Requirements in 2019 was the addition of a Net Zero Narrative requirement. This narrative must first be submitted to CDD when the applicant applies for a special permit from the Planning Board (if such a special permit is required), as detailed in Section 22.25.1 of the Zoning Ordinance. It is used for advisory review to inform City staff and the Planning Board on how the Net Zero Action Plan has influenced the design of the project. It is also useful for starting a dialogue that helps all parties better understand what building improvements are possible and what the major barriers are to achieving net zero greenhouse gas emissions.

CDD provides a [Net Zero Narrative Template](#) to help applicants understand what information needs to be provided. Per zoning, applicants are required to include the following information:

- Anticipated building envelope performance, including roof, foundation, walls and window assemblies, and window-to-wall ratio;
- Anticipated energy loads, baseline energy simulation tool assumptions, and proposed energy targets, expressed in terms of site energy use intensity ("EUI"), source EUI, and total greenhouse gas emissions;
- A description of ways in which building energy performance has been integrated into aspects of the Green Building Project's planning, design, and engineering, including building use(s), orientation, massing, envelope systems, building mechanical systems, on-site and off-site renewable energy systems, and district- wide energy systems;
- A description of the technical framework by which the Green Building Project can be transitioned to net zero emissions in the future (acknowledging that such a transition might not be economically feasible at first), including future net zero emissions options for building envelope, HVAC systems, domestic hot water, interior lighting, and on- and off-site renewable energy sources; and
- A description of programs provided by local utility companies, government agencies, and other organizations that provide technical assistance, rebates, grants, and incentives that can assist in

achieving higher levels of building performance, summarizing which entities have been contacted and which programs could be utilized in the Green Building Project.

Like the other required Green Building submissions, an updated Net Zero Narrative must be provided to CDD prior to applying for a building Permit (Section 22.25.2) and certificate of occupancy (Section 22.25.3), so that CDD can verify that the project continues to comply with Section 22.00.

### **Proposed Zoning**

The proposed zoning amendment would add a reporting requirement that is separate from the Net Zero Narrative focusing on “alternative and renewable energy sources” and would require “an analysis of the feasibility and cost of installing such a system compared with a fossil fueled energy system.” Such a submission would be required at the building permit stage of review, after a special permit has been granted, and would be provided to the Inspectional Services Department (ISD) as well as to CDD and for “public review.”

### **Considerations**

In current zoning, the Net Zero Narrative focuses on building energy performance, not specifically on where that energy comes from, though it requires that the developer describe a possible “pathway” by which a building could be converted to achieve net zero greenhouse gas emissions in the future. The petition proposes to add a requirement to analyze the feasibility of using alternative and renewable energy sources instead of fossil fuels. Like the Net Zero Narrative, the report would be advisory and would not require that applicants install a non-fossil fuel-based system or achieve net zero greenhouse gas emissions.

One consideration for the Planning Board is whether the current petition will enhance the existing Green Building Requirements and lead to more development that uses non-fossil fuel energy sources, thus helping the City meet its Net Zero goals. Planning and zoning are concerned with land use and urban development, and generally not with building energy sources. CDD and ISD staff may not have the technical expertise to make findings based on the information provided, nor the ability to influence desired outcomes. As a result, the plan could increase cost for applicants without a significant benefit to the City.

Another consideration is that the petition would require applicants to submit a plan to CDD and ISD before applying for a building permit. At the building permit phase, staff’s role is to conduct administrative review of project plans and specifications and determine whether applicable requirements and standards are being met. Although submitted documents are public record, there is no “public review” process for a building permit. Public review would take place during a special permit process or other pre-building permit review process under Article 19.000 of the Zoning Ordinance. If the Board agrees that this type of information should be reviewed, it may be more appropriate at the special permit stage, along with the Net Zero Narrative requirements in Paragraph 22.25.1(c). This would allow energy sources to be considered from the beginning of the review process and would better align the application process with other requirements.

A final suggested consideration is whether the term “alternative and renewable energy sources” should be clarified. The term “alternative and renewable” could be interpreted in many ways and does not necessarily imply non-greenhouse gas emitting sources. As a result, the analyses provided could address a wide range of energy sources that may or may not be relevant to meeting the City’s greenhouse gas emissions goals.