



CITY OF CAMBRIDGE

Community Development Department

To: Planning Board

From: Community Development Department (CDD) Staff

Date: June 24, 2021

Re: **Article 22.000 Emissions Accounting Zoning Petition**

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 Articles: Article 22.000 Sustainable Design and Development

Amendment Summary: The proposed amendments would require applicants of most Green Building Projects to provide an accounting of the emissions generated by construction to the Community Development Department (CDD) before receiving an occupancy permit. This requirement would not apply to any residential buildings that include affordable units. The submission would include information about expected embodied carbon, annual emissions, lifetime expected emissions, and total emissions. The Zoning Petition identifies specific types of emissions that shall and shall not be included in each of these calculations. The amendments would also require applicants to present a payment schedule for how to zero out the total emissions of the building, using a social cost of carbon formula approved by CDD, with the outstanding balance acting as a lien on the property in case it is sold, and a specified list of acceptable offsets.

Planning Board Action: Recommendation to City Council

Memo Contents: Summary of the proposed zoning; background information on current planning for Net Zero buildings in Cambridge; and comments on proposed amendment.

Summary of Petition Effects

The Petition would add a section entitled “Emissions Accounting” (Section 22.24.4) to the “Green Building Requirements” currently in Section 22.20 of the Zoning Ordinance.

The Green Building Requirements apply to development of 25,000 square feet or more that requires a Planning Board Special Permit or is subject to the Building and Site Plan Requirements in Section 19.50 of the Zoning Ordinance – which includes new construction, additions, and some rehabilitation of buildings that are undertaken to accommodate a change of use. The proposed Emissions Accounting section would not apply to any residential buildings that include affordable units.

The Emissions Accounting requirements would be applied “as a condition of receiving an occupancy permit,” and would involve a calculation of emissions (presumably, greenhouse gas emissions, though the Petition does not specify or define “emissions”) from the construction process (embodied carbon) and from annual building operations, as well as a “lifetime emissions” calculation. It would then require a “payment schedule for how to zero out the Total Emissions of the building” over a period of up to 10 years.

The Petition does not precisely explain how the “payment” would be satisfied, but it lists potential “offsets” including green jobs development programs, energy efficiency upgrades to existing buildings, payment into “the City of Cambridge Renewable Energy and Greenhouse Gas Reduction Revolving Fund”, installation of solar photovoltaic systems, and direct supply contracts for 100% renewable electricity.

Background – Planning for a Net Zero Cambridge

Net Zero Action Plan

The Cambridge Getting to Net Zero Action Plan was adopted by the City Council in July, 2015 following a stakeholder-driven process to formulate a comprehensive plan to phase out GHG emissions from buildings throughout the Cambridge community. The Plan included a set of actions for existing buildings, new buildings, low carbon energy supply, and enabling actions to set Cambridge buildings on the pathway to zero GHG emissions by mid-century. Actions for new buildings included strengthening the Article 22 Green Building Requirements, and amendments were passed to the zoning ordinance in 2019 which require most new buildings to achieve LEED Gold certifiability as well as submission of a narrative for how the building will convert to net zero emissions in the future.

Per the principles of the Net Zero Action Plan, the full Plan is currently undergoing a comprehensive 5-year Review with an expanded stakeholder group, including members of the original Net Zero Task Force. The Review is considering the impact of the Net Zero Action Plan to date and current science, technology, and policy context for GHG emissions reductions from buildings to lead to a recommended set of updates to the Plan. Two updated actions relevant to this zoning petition are the recommendations to seek to adopt the state-level net zero stretch energy code for newly constructed buildings which is anticipated to be available in 2022, and to add language to Article 22 to require the measurement and increasingly greater reductions of embodied carbon from building construction over time.

Building Energy Use Disclosure Ordinance

The Cambridge Building Energy Use Disclosure Ordinance (BEUDO), adopted in 2014, currently requires commercial properties over 25,000 square feet and residential properties over 50 units to annually report and disclose their energy and water usage. Per the Ordinance, beginning in 2018 CDD conducted a review of the effect of the Ordinance on the energy performance of covered buildings and concluded that the energy performance had not improved significantly. In response to this, CDD is working with affected property owners and operators to develop proposed amendments to the BEUDO which would require covered buildings to progressively reduce their operational GHG emissions over time. These performance requirements would also apply to newly constructed buildings as they go into operation.

Background – Green Building Requirements

The Green Building Requirements were first adopted in 2011. They are intended to supplement other design and development standards that apply to larger-scale development by establishing threshold standards for sustainable design. These standards rely on design rating systems (LEED, primarily) that address a range of environmental concerns and are widely used in urban design and development.

The Green Building Requirements were amended in 2019 as recommended by the City’s Net Zero Action Plan. Currently, a development project that is subject to the requirements must meet two main criteria: First, by meeting minimum standards using the LEED (Gold level), Passive House, or Enterprise Green Communities rating systems; second, by engaging a “Green Commissioning Authority” to verify and document compliance through construction, installation, operation, and maintenance. The Green Building Requirements were amended again in 2020, pursuant to a City Council zoning petition, to require a technical and financial feasibility assessment of energy systems that would not consume carbon-based fuels on-site for comparison with the energy systems proposed for the project.

Compliance is reviewed at the special permit, building permit, and certificate of occupancy stage. At each stage, the proposal must be certified by a credentialed “Green Building Professional” on the project team.

Comments on Petition

Planning Considerations

As described above, the Petition overlaps with a number of areas of the existing Net Zero Action Plan and updates proposed through the 5-Year Review. Action 2.1 of the Net Zero Action Plan aimed to address GHG emissions from new buildings through a phased approach to requiring net zero emissions from newly constructed buildings, beginning in 2020 for municipal buildings, 2022 for small residential, 2025 for multifamily, commercial, and institutional buildings, and 2030 for laboratories. This timeline could be accelerated through adoption of the state’s net zero stretch code.

The Petition proposes to address the GHG emissions from building materials and construction processes. The practice of quantifying lifecycle emissions from building construction and operations is relatively new and a developing field, and there are a number of technical issues raised by the proposed zoning amendment that could make administration very challenging or impossible at this time. There is

embodied carbon in buildings that is not related to operations but is related to the structural elements, including concrete and steel. To perform a whole building embodied carbon calculation, data is required on every material that is utilized, from concrete and steel to wood, finishes, insulation, mechanicals, wiring, and glass. Builders rely on product manufacturers to provide information on the content and sustainability of their products. Many manufacturers do not provide this information and there is no system to verify the data when it is available.

Zoning Considerations

The Petition is a conceptual departure from the current Green Building Requirements in a few ways. These issues may also raise concerns about whether the proposed requirements are within the purview of zoning or are legally permissible.

The Green Building Requirements are intended to encourage sustainable development by setting design standards, which are applied and reviewed early in the development process. Ongoing review ensures that the design standards continue to be met as a project is developed. The design standards that are applied through the Green Building Requirements incorporate performance-based metrics related to energy efficiency and water usage, but apply them as part of a holistic design review process that does not supplant building and energy codes.

The requirements proposed in the Petition would not directly regulate land use or set standards for building or site development, but would impose new requirements at the end of the development process, which makes it impossible to determine the extent to which a proposal complies with the requirements during the design process or before development begins, and in turn makes review and enforcement very difficult. It is also unclear whether “as a condition of receiving an occupancy permit” means that the proposed requirements would be applied and certified before or after issuance of a certificate of occupancy. This also raises the question of whether the imposition of such requirements would be legally permissible.

Finally, the Petition suggests a “payment schedule” but it is unclear what form such payments would take – the Petition seems to suggest that investing in environmental measures “approved by CDD” would be the process to “zero out” the calculated emissions. The ability to require payments through zoning is very limited, and there may be further complications if investments in non-City initiatives are required. Aside from whether such types of requirements are within the legal purview of zoning, the process of certifying compliance would be unlike any other zoning requirement. It could be extremely difficult to ensure that the required payments are calculated, transferred, and used in full accordance with the intent of the Petition. The Petition states that “The outstanding balance shall act as a lien on the property in case it is sold,” which seems intended to address the issue of ongoing enforcement but may also raise other legal concerns.