



City of Newton, Massachusetts Climate and Sustainability Team



MEMORANDUM

Date: March 23, 2023

To: Councilor Deborah Crossley, Chair, Zoning & Planning Committee, Members of the Zoning & Planning Committee

From: The Climate & Sustainability Team

RE: Embodied Carbon

CC: Members of the Embodied Carbon Working Group, Zachery LeMel, Chief of Long Range Planning, Jennifer Caira, Deputy Director

Last Spring the City Climate & Sustainability Team and the Embodied Carbon Working Group gave an “Embodied Carbon 101” presentation to the Zoning and Planning Committee, as an introduction to the topic with plans to return with draft ordinance language requiring large special permit projects to analyze the embodied carbon of their project. Almost a year later, after discussions with community stakeholders, we are returning with draft language.

Embodied carbon is the sum of greenhouse gas emissions associated with raw material extraction, manufacturing, and transportation for materials production and the emissions associated with the construction, maintenance, renovation, and end-of-life of buildings. Embodied carbon is estimated to account for over 11% of total global greenhouse gas (GHG) emissions. As buildings become more efficient in their operations, embodied carbon becomes an even larger portion of building emissions: in high-performance buildings, 50% of the building’s emissions in the first 10 years are estimated to be from embodied carbon.

Newton’s Zoning Ordinance currently includes sustainable development requirements for new construction and substantial reconstruction >20,000 sq ft. (section 5.13). Three of the requirements, one of which is embodied carbon (section 5.13.4.D), are currently listed as reserved.

Our proposed ordinance language to fill in this reserved section is attached. In short, the requirement is for projects between 20,000 and 50,000 square feet to conduct a limited analysis of the structural materials for the project, and for projects over 50,000 to conduct a whole-building life cycle assessment of both the structural and enclosure materials. Project teams would commit to conducting such analysis as part of their special permit application, and provide the completed analysis as part of the building permit document submissions. The City’s role would be to confirm that the analysis had been submitted and signed by a Registered Design Professional.

There are a number of embodied carbon analysis tools and software programs available, many of which are already in use by architects and sustainability consultants. Reporting requirements are thought to have minimal costs, under 0.25% of the total project cost.

Embodied Carbon FAQs

What is embodied carbon?

- Embodied carbon is the sum of carbon dioxide and other greenhouse gas emissions associated with raw material extraction, manufacturing, and transportation for materials production and the emissions associated with the construction, maintenance, renovation, and end-of-life of buildings and infrastructure. Greenhouse gas emissions are calculated relative to the impact of one molecule of carbon dioxide and reported as carbon dioxide equivalent (CO₂e) with units of mass. In Life Cycle Assessment reports and Environmental Product Declarations (EPDs), embodied carbon is equivalent to Global Warming Potential (GWP).

To which buildings would the proposed standards apply?

- The proposed standards would apply to projects subject to the Sustainability Requirements of the Zoning Ordinance: any proposed development in any zoning district that includes the construction or substantial reconstruction of one or more buildings totaling 20,000 sf or more of gross floor area.

What is the cost of the analysis requirements in the proposed ordinance language?

- There are two levels of analysis stipulated in the proposed ordinance language. For buildings between 20,000 and 50,000 square feet, the analysis is required to estimate the embodied carbon of the structural elements of the building that is already in design. Such analysis would likely be conducted by structural engineers already contracted for the project. In conversations with some Newton-area professionals, this is a cost add of \$1,500 to \$5,000. This represents under 0.1% of the construction value of a typical project of this size.
- For projects over 50,000 square feet, the analysis is also to include a Life Cycle Assessment of the structural and envelope (enclosure) systems of the building. This assessment is based on a credit in the LEED Rating System. Costs for this level of analysis and additional design might range between \$8,000 and \$25,000, representing a cost from under 0.1% to as much as 0.25% of the construction cost.

What is the difference between an embodied carbon assessment and a life-cycle assessment?

- Embodied carbon assessment is a more limited analysis than a life-cycle assessment. An embodied carbon assessment estimates only the global warming potential over the life of a project. A life-cycle assessment also includes other environmental impacts such as acidification and smog formation potential.

What is the cost/time difference between an embodied carbon assessment and a life-cycle assessment?

- The embodied carbon of most structural and envelope materials is well understood and the data are widely available, so in many cases simplified tools may be used to estimate embodied carbon. The data for other environmental impacts evaluated in a life-cycle

assessment are not as widely available and more specialized LCA tools must be used to estimate these impacts.

- In addition, for projects under 50,000 square feet, the proposed ordinance language only requires the design team to evaluate the structural materials, which are limited in number and for which data are widely available. For projects over 50,000 square feet, the proposed ordinance language requires evaluation of both structural and envelope materials, and also requires that the developer compare design alternatives. Costs for the more encompassing life-cycle assessment are about 3 to 20 times the cost of a simple embodied carbon assessment of the structural materials measured as a percentage of the cost of construction. As indicated above, all costs associated with this ordinance requirement would be less than 0.25% of the construction value.

Who performs the embodied carbon assessment and the life-cycle assessment? Are these individuals or companies readily available?

- The project designers typically provide embodied carbon and/or life-cycle assessments. Professionals who would conduct these assessments are likely already contracted for projects of these sizes and most are well-versed in the topic. Some projects in Newton subject to the 5.13 Sustainability Requirements currently going through the special permit process have already committed to doing embodied carbon analyses.

Does the City have staff who can evaluate the embodied carbon assessments?

- City staff will review the reports submitted by the project team, similar to many other submittals required through the special permitting process.

How available are lower-carbon concrete mixes? How do we know they are structurally safe?

- Lower-carbon concrete mixes are readily available and already in wide use for specialty applications. The structural properties of the lower-carbon concrete usually equal or exceed the properties of conventional concrete. More detail can be found on the Carbon Leadership Forum and SE 2050 website.

What level of analysis can be reasonably expected of a project team at the special permit stage? At the building permit stage?

- Embodied carbon assessments can be conducted at any stage of project development. The closer the design is to completion, the more precise the computations become. That is why we are asking for an initial commitment for what type of analysis will be undertaken at the special permit stage, to start the conversation early, but not requiring the work of doing the analysis until the building permit stage – after the special permit has been approved.

Do we have sample embodied carbon assessments?

- The Carbon Leadership Forum and [SE 2050](#) websites include case studies. We hope to develop some local case studies as current projects are completed.

What resources do developers who do not know about embodied carbon have to learn more about this topic/how to meet the proposed requirements?

- The [Carbon Leadership Forum](#) and [SE 2050](#) websites both offer a wealth of information about embodied carbon and how to calculate it, including descriptions of available tools.

What is Newton doing about embodied carbon in its own building projects?

- The City has conducted embodied carbon analyses on its recent new construction projects, and will continue to do so for projects moving forward.

What are other cities and towns doing related to embodied carbon?

- Boston's efforts to address embodied carbon are part of the City's Zero Net Carbon Building Zoning Initiative, which is now in draft form out for public comment. The City has established a Technical Advisory Group that has presented a report and suggested avenues for how to address embodied carbon, including requiring life-cycle analyses for large projects.
- Cambridge is looking to first require reporting, then 20% reductions, and eventually 50% reductions as outlined in the City's Net Zero Action Plan.
- Brookline passed a resolution last year for the Town to use low-carbon concrete products (reduction of 10% emissions) in Town projects, including sidewalks.

Why are we focused on large new construction rather than smaller residential buildings, which make up the majority of the building stock in Newton?

- We have the ability to address embodied carbon in large projects through the special permit process; we do not have the same sort of oversight in by-right projects.

Sec. 5.13. Sustainable Development Design

5.13.1. Intent and Purpose

The intent of this section is to reduce the use of energy, water, and other natural resources in Newton's building stock and minimize adverse environmental impacts from buildings and development in both construction and long-term operation by:

- A. Increasing the use of renewable energy sources for electricity, transportation, heat/cooling, and hot water;
- B. Increasing the use of efficient electricity technology for transportation and buildings;
- C. Increasing the number of buildings built to Passive House, net zero, or similar standards;
- D. Minimizing the environmental impacts of construction materials and methods, including waste reduction;
- D.E. Encouraging sustainable material selection and the responsible reuse of existing structures.

5.13.2. Definitions

- A. **Green Commissioning.** The process of verifying and documenting that a building and all of its systems and assemblies are installed, tested, operated, and maintained to meet specified levels of environmentally sustainable performance in accordance with the provisions of Section 5.13 of this Zoning Ordinance.
- B. **Green Commissioning Agent.** An entity or person with documented experience on at least 2 building projects with a scope of work similar to the proposed project extending from early design phase through at least 10 months of occupancy.
- C. **Green Building Professional.** A professional who holds a credential from a Green Building Rating Program indicating advanced knowledge and experience in environmentally sustainable development in general as well as specific Green Building Rating Systems or otherwise possesses comparable experience in environmentally sustainable development. In instances where a Green Building Rating Program that does not offer such a credential is being applied to meet the provisions of Section 5.13, the designated Green Building Professional must have demonstrated experience as a project architect or engineer, or as a consultant providing third-party review, on at least 3 projects that have been certified using the applicable Green Building Rating Program.
- D. **Green Building Project.** Any development project that meets the provisions of Section 5.13.4.
- E. **Green Building Rating Program.** A collection of activities and services directed by an organization to promote environmentally sustainable development and to recognize projects that achieve defined environmentally sustainable development objectives, including the establishment and oversight of one or more Green Building Rating Systems.
- F. **Green Building Rating System.** A specific set of design standards for environmentally sustainable performance established under the auspices of a Green Building Rating Program against which a project or building design may be evaluated.

- G. **Embodied Carbon.** The sum of greenhouse gas emissions associated with the building materials throughout multiple stages of the materials' lifecycle. Greenhouse gas emissions are calculated relative to the impact of one molecule of carbon dioxide and reported as carbon dioxide equivalent (CO₂e) with units of mass. In Life Cycle Assessment reports and Environmental Product Declarations (EPDs), embodied carbon is equivalent to Global Warming Potential (GWP).
- H. **Whole Building Life- Cycle Assessment.** A method for estimating the potential environmental impacts of a whole building throughout its life cycle.
- F.I. **Environmental Product Declaration (EPD).** A standardized report of the environmental impacts of a product, process, or service based on a life-cycle assessment.

5.13.3. *Application of the Sustainable Development Requirements*

- A. These sustainable development requirements apply to any proposed development in any zoning district that includes the construction or substantial reconstruction of one or more buildings totaling 20,000 sf or more of gross floor area that also requires issuance of a special permit under any provision of this Zoning Ordinance.
- B. No Segmentation. The zoning provisions of this Section apply to projects at one site or two or more adjoining sites in common ownership or under common control within a period of five years from the first date of application for any special permit for construction on the lot or lots, or for the 12 months immediately preceding the date of application for any special permit. An applicant for development may not segment or divide or subdivide or establish surrogate or subsidiary entities to avoid the requirements of Section 5.13. Where the City Council determines that this provision has been violated, a special permit will be denied. However, nothing in Section 5.13 prohibits the phased development of a property.

5.13.4. *Sustainable Development Requirements*

- A. A green building project must be designed to meet the standards of one of the authorized green building rating systems identified in Section 5.13.5 according to the requirements listed below.
 1. **LEED Green Building Rating Program.** A green building project being designed according to the LEED Green Building Rating Program must be designed to achieve a minimum 'Silver' level standard. Projects of greater than 50,000 sf of gross floor area must be designed to meet a minimum 'Gold' level standard. Certification by the LEED Green Building Rating Program is not required.
 2. **Passive House Green Building Rating Program.** A green building project being designed according to the Passive House Green Building Rating program must be designed to achieve certification. Certification by the Passive House Green Building Rating Program is required.
 3. **Enterprise Green Communities Green Building Rating System.** A green building project being designed according to the Enterprise Green Communities Green Building Rating program must be designed to achieve the minimum criteria for certification. Certification by the Enterprise Green Communities Green Building Rating Program is not required.

B. Electric Vehicle Charging Stations. A green building project must provide that a minimum of 10% of parking spaces have access to electric vehicle charging stations up to a maximum of 40 spaces. An additional 10% of parking spaces must be electric vehicle charging station ready, meaning that electrical systems and conduit are prepared to expand the number of charging stations as demand increases. This Section 5.13.4.B only applies to new or rebuilt parking facilities; those projects using existing parking lots are exempt.

C. Solar Panels. [reserved]

D. Embodied Carbon A green building project must provide an analysis that estimates the embodied carbon of a project. The type of analysis is determined based on gross square footage of the green building project.~~[reserved]~~

1. For projects under 50,000 sf, only structural materials must be evaluated using Life Cycle Analysis tools or Environmental Product Declarations.

2. For projects over 50,000 sf, the design team must use a Whole Building Life-Cycle Assessment tool to estimate the embodied carbon of both structural and enclosure materials, and the CO₂e per square foot of the project compared to an average CO₂e intensity (kg CO₂e/unit floor area) for projects of comparable use, and provide justification for the building materials and systems chosen. This requirement may be met by using one of the following methods:

a. LEED Credit for Whole Building Life-Cycle Assessment

b. Green Building Initiative's (GBI) Green Globes for New Construction (NC) Credit for Whole Building Life-Cycle Assessment

c. International Living Future Institute's (ILFI) Zero Carbon Standard.

d. Another method approved by the Planning Director.

3. Projects where at least 50% of the floor area comprises re-use of a pre-existing structure are not subject to these provisions.

E. Electrification of heating/cooling and residential cooking, domestic water heating, and laundry [reserved]

5.13.5. Authorized Green Building Rating Programs

~~A. Any of the following green building rating programs may be used to meet the requirements of this Section 5.13.~~

~~1. The Leadership in Energy and Environmental Design ("LEED") Green Building Rating Program developed and overseen by the United States Green Building Council;~~

~~2. The Passive House Green Building Rating Program developed and overseen by either Passive House Institute US, Inc. or the Passive House Institute; or~~

~~3. The Enterprise Green Communities Green Building Rating Program developed and overseen by Enterprise Community Partners, Inc.~~

B.A. Applicability of Rating Systems.

1. If a green building rating program offers different green building rating systems, a green building project must use the system that is most directly applicable to the project or building type, as ~~determined~~ approved by the Planning Director.

2. The green building rating system must address the design and construction of buildings, not building operations or neighborhood development.

3. A green building project must use the most current version of the applicable green building rating system at the time of the special permit application.
4. The green building rating system, including the applicable version, must be specified at the time of special permit application.

5.13.6. *Sustainable Development Review Procedures*

A. **Special Permit Submittal Requirements.** The following must be submitted with the special permit application:

1. **Rating System Checklist.** A document enumerating the criteria set forth in the applicable green building rating system and indicating which technical and design requirements will be met in the green building project design and the resulting rating level of the green building project.
2. **Rating System Narrative.** A written description of the technical and design elements of the green building project that will be utilized to achieve compliance with the applicable green building rating system.
3. **Energy Sustainability Narrative.** A written description of the energy efficiency, renewable energy, and other technical and design elements of the green building project that serve to minimize energy use, make use of renewable energy sources, and otherwise demonstrate how close the project is to achieving net zero energy use status. This narrative should include the following, referencing how the requirements listed in Section 5.13.4 are achieved:
 - A. ~~Descriptions of building envelope performance, anticipated energy loads, mechanical systems, and site planning strategies;~~~~mechanical systems and~~
 - B. Description of on-site and off-site renewable energy systems;
 - C. Description of ~~.-The narrative must also describe~~ how the building could be made to achieve net zero status in the future~~;~~
 - D. Specified commitment to electric vehicle charging infrastructure; and
 - E. Specified procedure that will be used to analyze embodied carbon.
4. **Credentials.** A document demonstrating the credentials of the green building project's designated green building professional, which must include a credential from the green building rating program indicating advanced knowledge in the specific green building rating system being applied to the green building project.
5. **Affidavit.** An affidavit signed by the green building professional stating that he/she/they has~~es~~ reviewed all relevant documents and that to the best of their knowledge, the documents provided indicate that the green building project is being designed to achieve the requirements of this Section 5.13.

B. **Building Permit Submittal Requirements.** When applying for a building permit for a Green Building Project, the documentation listed in Section 5.13.6.A above, updated from any previous version to reflect the current Green Building Project design, and the additional documentation listed below must be submitted to the Department of Planning and Development.

1. Credentials of the Green Building Project's Green Commissioning Agent.
2. For a Green Building Project using the Passive House Green Building Rating Program, the following set of documents is required:

a. Credentials of the Passive House rater/ verifier who will perform testing and verification and letter of intent stating he/ she has been hired to complete the on-site verification process;

b. Credentials of the Certified Passive House Consultant who has provided design, planning, or consulting services;

3. Embodied carbon analysis as required by section 5.13.4.D and affidavit signed by a Registered Design Professional confirming the embodied carbon analysis follows the requirements committed to in the special permit submittal documents and required herein.

C. **Certificate of Occupancy Submittal Requirements.** When applying for a temporary certificate of occupancy for a Green Building Project, the documentation listed in Sections 5.13.6.A and 5.13.6.B above, updated from any previous version to reflect the current Green Building Project design, must be submitted to the Department of Planning and Development. The additional documentation listed below must be submitted prior to issuance of a final certificate of occupancy.

1. An affidavit signed by the Green Commissioning Agent, certifying that the pre-construction commissioning process requirements of the applicable Green Building Rating Program have been met and that the post-construction commissioning process requirements of this Section were included in the scope of work and will be met, including a schedule of when each commissioning requirement was or will be met.

2. For Green Building Projects using the Passive House Green Building Rating Program, the final testing and verification report completed by the Passive House rater/verifier.

3. Credentials of the Green Building Project's accredited Green Building Professional and an affidavit signed by that professional stating that he/shethey has reviewed all relevant documents and that to the best of his/hertheir knowledge, the documents provided indicate that the Green Building Project was built to achieve the requirements of Section 5.12.

5.13.7. Exceptions

A special permit may be granted to allow for exceptions to this Section 5.13 if an applicant can demonstrate that the same or better environmental outcomes can be achieved through a different approach or project design. An exception may also be granted where literal compliance is impracticable due to the nature of the use or that such exceptions would be in the public interest.

EMBODIED CARBON DRAFT LANGUAGE

PRESENTATION TO ZONING & PLANNING COMMITTEE

March 27, 2023

Climate & Sustainability Team

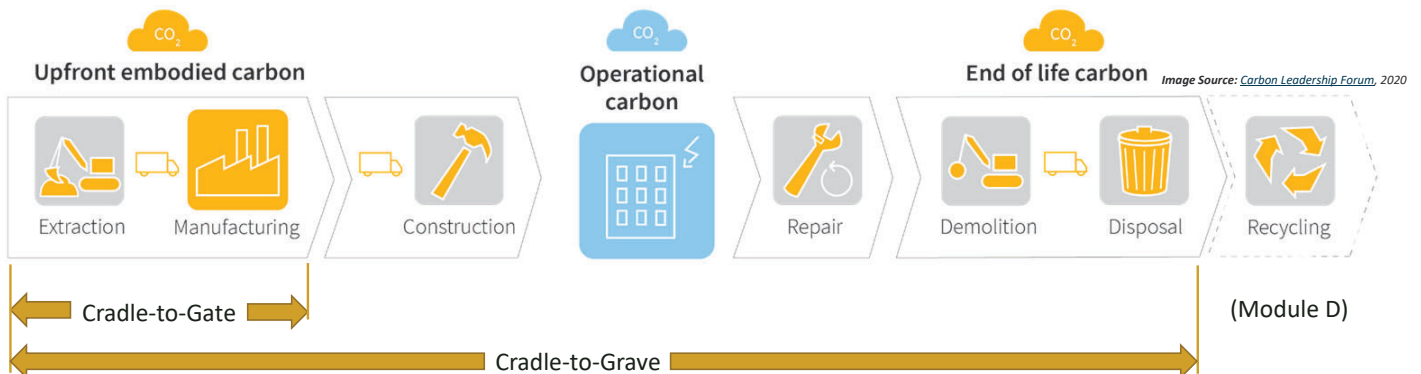
Embodied Carbon Working Group



What is embodied carbon in the built environment?

Embodied carbon refers to the greenhouse gas (GHG) emissions associated with the manufacturing, transportation, installation, maintenance, and disposal of building materials.

Upfront embodied carbon focuses on the GHG emissions released before a building is constructed. These can also be thought of as supply chain emissions.



Embodied carbon is significant and urgent

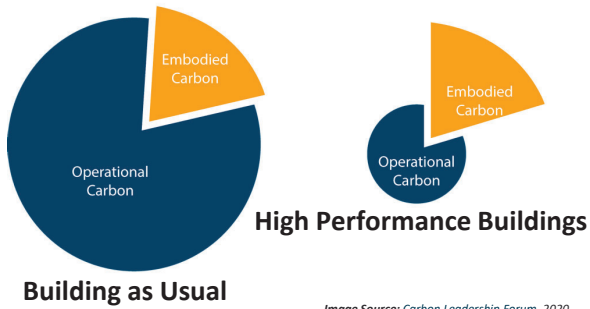
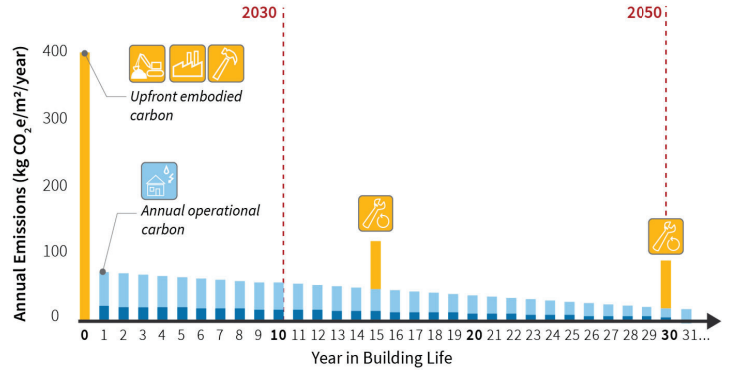


Image Source: Carbon Leadership Forum, 2020



We are already reducing operational carbon. Embodied carbon contributes a higher proportion of life-cycle emissions in more energy-efficient buildings.

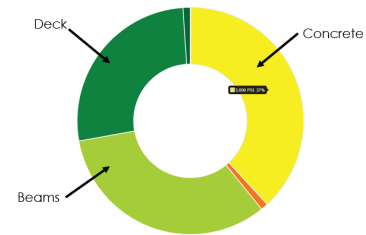
Embodied carbon is expended early in a building's lifecycle, adding carbon to the atmosphere as we're working to reduce emissions to meet 2050 goals.

Note: some content courtesy of Rebecca Esau of RMI

EMBODIED CARBON ESTIMATION TOOLS



SE 2050 – ECOM



REDUCING EMBODIED CARBON IN STRUCTURAL DESIGN

Design vs. Procurement Strategies

Design strategies relate to the form of the building:

- Renovation vs. New Construction
- Form: how tall, how deep into the ground, how many irregularities such as column offsets
- Bay Size: widely spaced columns increase structural framing sizes significantly
- Choice of Materials (e.g. steel vs. concrete vs. timber framing)
- Designers can use embodied carbon tools to optimize these options

Procurement strategies relate to how the materials are specified after design:

- Cement limits for concrete
- Embodied carbon limits for materials
- Certified wood

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LOCAL POLICY

- **Town of Brookline:** Town must use low carbon concrete (10% less than average) for town-owned projects and encourage developers to do the same.
- **City of Cambridge:** On path to require measurement and reduction of embodied carbon through Zoning Ordinance.
- **City of Boston:** Including embodied carbon as part of proposed Zero Net Carbon Building Zoning Initiative. Draft proposal includes both measurement and reduction.
- Municipalities share goal of coordinating efforts.

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NEWTON BACKGROUND

Climate Action Plan, 2019

- “Neither this Climate Action Plan nor the NCCE Plan directly addresses embodied energy. Embodied energy will need to be addressed in the future, as accounting methodologies and mitigation strategies continue to be developed.”

Sustainable Development Design, 2019

- Section 5.13 of the Zoning Ordinance adopted
- 5.13.4.D: Embodied Carbon [reserved]

Formation of Working Group, Fall 2021

- Mark Webster
 - Structural Engineer, SGH
- Russel Feldman
 - Architect, President of AIA Massachusetts
- Beverly Craig
 - Project Manager, MassCEC

Presentations with ZAP, EDC, Chamber Real Estate Group, Planning Board, Spring-Summer 2022

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DRAFT ORDINANCE LANGUAGE: 5.13.4 SUSTAINABLE DEVELOPMENT REQUIREMENTS

D. Embodied Carbon A green building project must provide an analysis that estimates the embodied carbon of a project. The type of analysis is determined based on gross square footage of the green building project:

1. For projects under 50,000 sf, only structural materials must be evaluated using Life Cycle Analysis tools or Environmental Product Declarations.
2. For projects over 50,000 sf, the design team must use a Whole Building Life-Cycle Assessment tool to estimate the embodied carbon of both structural and enclosure materials, and the CO₂e per square foot of the project compared to an average CO₂e intensity (kg CO₂e/unit floor area) for projects of comparable use, and provide justification for the building materials and systems chosen. This requirement may be met by using one of the following methods:
 1. LEED Credit for Whole Building Life-Cycle Assessment
 2. Green Building Initiative’s (GBI) Green Globes for New Construction (NC) Credit for Whole Building Life-Cycle Assessment
 3. International Living Future Institute’s (ILFI) Zero Carbon Standard.
 4. Another method approved by the Planning Director.
3. Projects where at least 50% of the floor area comprises re-use of a pre-existing structure are not subject to these provisions.

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DRAFT ORDINANCE LANGUAGE: EMBODIED CARBON DOCUMENT SUBMISSION

- As part of the **special permit submission**: Specified procedure that will be used to analyze embodied carbon as part of the sustainability narrative.
- As part of the **building permit submission**: Embodied carbon analysis as required by section 5.13.4.D and affidavit signed by a Registered Design Professional confirming the embodied carbon analysis follows the requirements committed to in the special permit submittal documents.

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DETAILS AND NEXT STEPS

- Full draft language provided with meeting materials
- FAQ document available
- For discussion and, with council interest, schedule a public hearing

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To: Zoning and Planning Committee
Cc: Mayor Fuller, Jonathan Yeo, Barney Heath, Josh Morse, Jen Caira, Jonah Temple, John Sisson, John Lojek, Anthony Ciccariello, Andrew Lee
From: Ann Berwick
Re: Ten Communities Program, Proposed Electrification Ordinance, and the Specialized Code
Date: March 22, 2023

This memo is intended to explain (1) some of the details of the Ten Communities Program; and (2) the relationship among the Ten Communities Program, the proposed Electrification Ordinance (attached), and the Specialized Code (i.e., the more stringent, opt-in version of the Stretch Code).

Parts of this memo will look familiar because the memo is an update to an earlier memo that addressed only the Ten Communities Program and the Specialized Code, not the proposed Electrification Ordinance.

Ten Communities Program and the Proposed Electrification Ordinance

As you know, a number of cities and towns filed Home Rule Petitions with the Legislature over the last few years, seeking authority to require all new construction and substantial renovations to be all or mostly electric. Rather than acting on the Petitions, the Legislature passed a statute that provides the requested authority to the first ten communities that filed such Petitions. Newton is one of the first ten. (Boston is also one of the ten.)

The Department of Energy Resources (DOER) has now published its [proposed regulations](#) and [model rule](#) on the Ten Communities Program. Communities that intend to participate must submit a letter of intent to do so to DOER not later than September 1, 2023.

The regulations require that the communities submit application materials in order to qualify for participation. Among other things, the applications materials must include:

- a copy of the proposed Ordinance (“proposed” in that it is *proposed* to DOER, but has been *passed* by the City Council), with an explanation of any differences from the Model Rule;
- an implementation plan;
- description of any exemptions or waiver process;
- documentation sufficient to demonstrate compliance with one of the three housing production eligibility thresholds set forth in 24.05(1)(c).

Notwithstanding being one of the first ten, Newton has to address the following issues in order to qualify to participate:

- **The City must meet the affordable housing requirements** specified in the applicable legislation. The City’s Planning Department is optimistic that we will be able to do so ahead of September 1, most likely by meeting the 10% housing affordability requirement under Chapter 40B of the Massachusetts General Laws.
- **If a Community determines that adoption of a local ordinance that differs from the Model Rule is necessary, the Community must describe the differences and the rationale for the differences.** Newton’s Home Rule Petition and DOER’s Model Rule are indeed different.
 - The most significant difference is that Newton’s Home Rule Petition covered only residential buildings and small non-residential buildings (i.e., less than 20,000 square feet, any portion of which is used for commercial, retail, office, professional, educational, or other non-residential purpose). By contrast, the Model Rule includes commercial buildings over 20,000 square feet. **It will certainly be impermissible to exclude large commercial buildings.**
 - Additionally, Newton’s Home Rule Petition included a waiver provision. As a result of discussions with the Inspectional Services Division, we concluded that the waiver provision would be virtually impossible to implement, and eliminated it.

There are two other respects in which Newton’s Home Rule Petition differs from DOER’s Model Rule, but I think those are less problematic.

The first of these is that DOER’s regulations do allow communities to propose exemptions, but they do not specify what exemptions may be acceptable. Newton’s Home Rule Petition provides for a variety of exemptions, including freestanding outdoor heating and cooking appliances that are not connected to the building’s natural gas or propane infrastructure, and back-up power. Newton’s Home Rule Petition also exempts certain centralized domestic hot water systems in larger buildings.

I don’t know for sure, but I doubt Newton’s proposed exemptions will be a barrier to our participation in the Program. I have asked DOER to tell us whether they anticipate that Newton’s proposed Electrification Ordinance will be approvable, and also their view of whether commercial cooking might be an additional approvable exemption.

The other difference between Newton’s Home Rule Petition and the Model Rule is that, pursuant to the applicable State legislation, the Model Rule requires that communities include exemptions from fossil fuel-free requirements for both laboratories and medical facilities. In that regard, the Newton Home Rule Petition exempts only Newton Wellesley Hospital. Since the laboratories/medical facilities provisions are requirements of State legislation, the ordinance that Newton adopts will have to adopt these provisions.

Ten Communities Program and the Specialized Code

DOER “recommends” (DOER doesn’t have statutory authority to impose this as a requirement) that the communities that want to participate in the Ten Communities Program adopt *both* the Specialized Code and the Model Rule (or an ordinance that substantially reflects the requirements of the Model Rule). Newton has already adopted the Specialized Code.

DOER’s recommendation in this respect makes sense for a number of reasons, including that the Specialized Code and the Model Rule need to be integrated because the Specialized Code specifies certain compliance pathways that allow the use of fossil fuels, in contrast to the Model Rule. One way to think about this is that the Model Rule provides a variant of the Specialized Code for communities that participate in the Ten Communities Program.

Draft Newton Electrification Ordinance and Amendments to the Specialized Energy Code

Purpose

The City of Newton adopts this Ordinance in order to enable the City to participate in the Fossil Fuel-Free Demonstration Project, 225 CMR 24.00. The purpose of the Fossil Fuel-Free Demonstration Project is to restrict and prohibit new building construction and Major Renovation Projects that are not fossil fuel-free in ten communities in Massachusetts. The Ordinance will protect the health and welfare of the City's inhabitants and the environment by reducing greenhouse gases, which cause climate change, and by reducing other air pollutants.

The Ordinance requires new construction and Major Renovation Projects to use electricity instead of fossil fuels for heating and cooling systems and cooking and clothes drying appliances; and, for hot water, to use either electricity or thermal solar.

Definitions

"Department" means The Massachusetts Department of Energy Resources, as established by MGL chapter 25A.

"Commissioner" means the Commissioner of Inspectional Services of the City of Newton, as established by Section 5-16 of the Ordinances of the City.

"Fossil Fuel-Free Demonstration Project" means the project codified by the entirety of 225 CMR 24.00, enabling ten communities designated by the Department to require new construction and Major Renovation Projects to be fossil-fuel free, notwithstanding MGL chapter 40A; MGL chapter 142, section 13; MGL chapter 164; or any other general or special law to the contrary.

"Hospitals or Medical Offices" means a facility licensed or approved by the Department of Public Health to provide health care, including clinics licensed as health care facilities and facilities that provide substance use disorder treatment

services, including outpatient withdrawal management, opioid treatment programs, office-based opioid treatment programs, acute treatment services (inpatient detoxification), and clinical stabilization services.

“Major Renovation Project” means a level 3 alteration as defined in 225 CMR 22.00 and 23.00.

“Research Laboratories for Scientific or Medical Research” means a building in which a laboratory procedure or research activity occurs, and where the building has an average ventilation at full occupancy greater than 0.5 cfm/sf. Such buildings shall provide the ventilation design documentation described in 225 CMR 23.00, Section C103.2, at the time of building permitting.

“Specialized Energy Code” means the building code in 225 CMR 22.00 and 23.00; including Appendices RC and CC, which add residential and commercial appendices to the Massachusetts Stretch Energy Code.

Applicability

The fossil fuel restriction applies to residential and commercial buildings located in the City that qualify as new construction or Major Renovation Projects, except as listed in the Section herein entitled “Exceptions.”

Exceptions

The requirements of this Ordinance do not apply to any of the following:

- A. Research Laboratories for Scientific or Medical Research;
- B. Hospitals or Medical Offices;
- C. Freestanding outdoor cooking appliances that are not connected to the building’s natural gas or propane infrastructure;
- D. Freestanding outdoor heating appliances that are not connected to the building’s natural gas or propane infrastructure;
- E. Emergency generators;
- F. Appliances to produce potable or domestic hot water from centralized hot water systems in commercial buildings with a gross floor area of at least 10,000 square feet, provided that the architect, engineer, or general contractor on the project certifies by affidavit that no commercially

available electric hot water heater exists that could meet the required hot water demand for less than 150% of installation costs, compared to a conventional fossil fuel hot water system.

Application Requirements

When applying for a building permit for new building construction or a Major Renovation Project the applicant must submit documents with the application that identify the heating and cooling and hot water systems and cooking and clothes drying appliances that will be installed and used in the building.

Compliance

The Commissioner shall not issue any building permit for the construction of a new building or Major Renovation Project unless the applicant submits the documentation set forth in the Section herein entitled “Application Requirements.” The Commissioner shall not issue a certificate of occupancy for any building subject to this Ordinance prior to inspection and confirmation that the heating and cooling and hot water systems and cooking and clothes drying appliances installed in the building comply with the applicant’s documents submitted pursuant to the Section herein entitled “Application Requirements.”

Effective Date

This Ordinance shall apply to all building permits, special permits, and comprehensive permits issued **XXX** days after the approval by the Department of participation by the City in the Fossil Fuel Demonstration Project.

Amendments to the Specialized Energy Code

With adoption of the Fossil Fuel-Free Demonstration Project by the City, and upon approval by the Department, the following amendments to the Specialized Energy Code are adopted. These changes are enforceable by the Commissioner and will go into effect for any project seeking a permit after the effective date of this Ordinance.

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

1. Sections RC102 and RC101 “Zero Energy Pathway” and “Mixed Fuel Pathway” shall not be permitted for use for new construction or Major Renovations.

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 or Major Renovations, with the following exceptions:

1. Research Laboratories for Scientific or Medical Research;
2. Hospitals or Medical Offices;
3. Buildings heated with Clean Biomass Heating Systems as defined in 225 CMR 23, as the only combustion equipment;
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;