



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.