

Embodied Carbon Update

ZAP Meeting 10.11.2022



Embodied Carbon: 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.

Our Goal: to fill in the reserved section 5.13.4.D, the Sustainable Development Design requirement, currently written as Embodied Carbon: [reserved].

Applicable only to large (>20,000 sq ft) new construction.

The Process



- **Fall 2021/Winter 2022:**
 - Working group formed
 - Explored options for reducing embodied carbon in large new construction
- **Spring 2022:**
 - Embodied Carbon 101 to ZAP
 - Consulted with Law Department
 - Connected with neighboring municipalities exploring similar requirements
- **Summer 2022:**
 - Shared plans with Chamber of Commerce Real Estate Committee, Economic Development Commission Sustainability Working Group, and the Planning Board; got feedback
- **Fall 2022:**
 - Drafting language with Law Department'
 - Presenting language to ZAP?



Proposed Requirements

- **For buildings 20,000-50,000 sq ft:** evaluate the embodied carbon of the structural materials.
- **For buildings over 50,000 sq ft:** 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 size, and provide justification for the building materials and systems chosen.
- Projects where at least 50% of the floor area comprises re-use of a pre-existing structure are not subject to these provisions.

3

FAQs



- **What is the cost of embodied carbon analysis?**
 - **For structural materials (<50,000 sq ft):** Likely \$1,500 to \$5,000. This represents under 0.1% of the construction value of a typical project of this size.
 - **For a Life Cycle Assessment (>50,000 sq ft):** Likely between \$15,000 and \$25,000, representing a cost from under 0.1% to as much as 0.25% of the construction cost.
- **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.
- **More FAQs can be found [here](#).**

4