ASCE / SEI SE 2050 Commitment

Embodied carbon action plan 2022

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Maffei Structural Engineering

www.maffei-structure.com

(415) 329-6100

Introduction

Maffei Structural Engineering joined the SE 2050 Commitment this year, and we present here our embodied carbon action plan for our first year of participation. We summarize below our goals and our planned and completed activities, following the outline provided in the SE 2050 Program Requirements Guidance Document, version 2021.1.

Initial steps

Commitment letter We submitted our SE 2050 commitment letter on 24 June 2022.

Internal announcement Rob Ward sent a company-wide email announcing our pledge to join the SE 2050 Commitment on 27 June 2022.

Embodied carbon reduction champions

We've chosen Rob Ward, SE, LEED AP, Senior Structural Engineer, and Sarah Chen, LEED Green Associate, Structural Designer, as our embodied carbon reduction champions.

Values and vision

Maffei Structural Engineering takes pride in finding creative and successful solutions to challenging structural engineering projects. The challenges typically come from multiple constraints, and the best designs tend to be "win-win-win" across a diversity of constraints and objectives. As a firm, we welcome sustainability and carbon reduction as objectives in our projects.

Environmental sustainability is one of the core values of our firm, and we are eager to support the SE 2050 initiative. SE 2050's commitments for the reduction of atmospheric carbon are synergistic with the other dimensions of environmental sustainability, including clean air and water, protection of wilderness and species, and the health of the land and its vulnerable populations.

Working together with a focus on sustainable design and carbon reduction, we can help make our planet a better place for the generations to come.

- Joe Maffei, SE, PhD, LEED AP
Founding Principal

Rob has over 15 years of experience in providing structural engineering for solar projects and has a long-standing interest in building more sustainably.

Sarah recently earned a master's degree in Structural Engineering from UC Berkeley, where she also completed her undergraduate studies in Civil Engineering and Sustainable Design. She has experience with life-cycle assessment and integrative processes.

Rob and Sarah have a strong interest in finding, vetting, and promoting materials and methods that reduce greenhouse gas emissions. They are excited to have the opportunity to dive deeper into the issues around the embodied carbon emissions of buildings and to lead Maffei's efforts toward mitigating them.

Education

Our goals this year include the following:

- That all technical staff at Maffei understand the framework and methods for building emissions life-cycle assessment and embodied carbon measurement.
- That a minimum of 5 technical staff are trained to calculate embodied carbon, using the EC3 tool and other sources of certified EPDs.

To meet these goals, we are working on the following **education electives**:

- We will distribute this document to everyone at Maffei.
- As a company, we will watch the "Embodied Carbon 101: Basic Literacy" webinar available on the Boston Society of Architecture website. We will then have a brief discussion about how these principles may apply to our work at Maffei. For further education, we will encourage everyone to watch at least one more webinar from this website or another and share their findings with the rest of the company.
- We will have an employee attend an external education program related to embodied carbon on a quarterly basis.
- We will have 2 firm-wide presentations this year on the topic of embodied carbon.
- We are making the following documents easily accessible to everyone at Maffei:
    - The SE 2050 library of resources
    - The SE 2050 webpage, "Top 10 Carbon Reducing actions for Structural Engineers"
    - "How to Calculate Embodied Carbon" by The Institution of Structural Engineers
- We will nominate an employee to participate in the San Francisco Bay Area CLF Community Hub.

Additionally:

- We've set up a company-wide chat space for informally sharing information and ideas related to embodied carbon.
- We've set up an in-house library for reference materials, templates, and other tools.

Knowledge sharing

We will look for opportunities to advocate for the adoption of embodied carbon targets in building codes, following Marin County's example for concrete. We will share our discoveries of available methods and materials to reduce embodied carbon with our architecture and engineering clients and colleagues.

We have the following **advocacy electives**:

- We will discuss the SE 2050 Challenge with our clients and collaborators who are not familiar with it.
- We will develop boilerplate language for use in our proposals, noting our participation in the SE 2050 Commitment.
- We will mention our commitment to SE 2050 on our company website.

Embodied carbon reduction strategy

We are focusing this year on becoming familiar with the embodied carbon accounting process, on training our staff, and on determining how we can best produce project-specific data for the SE 2050 database.

For our first steps toward embodied carbon reduction, we plan to work on the following **reduction electives:**

- We will update our specification templates to incorporate embodied carbon performance objectives, and to require the submission of EPDs for review.
- We will incorporate biogenic materials on at least one project.
- We will develop a project-specific embodied carbon reduction plan.

Reporting

For our first year, we will use the EC3 tool to measure cradle-to-gate (A1-A3) embodied carbon for at least 2 projects, calculating structural material quantities by hand. We will begin measuring embodied carbon in the SD phase, updating our calculations through the DD and CD phases.

We have the following **reporting electives**:

- We will submit embodied carbon data for 2 U.S. projects to the SE 2050 database.
- For a project we plan to submit to the database, we will ask the architect or owner if the project has a carbon budget or if there are established project sustainability goals. We would like to at least start the conversation around embodied carbon on a project.