



SE 2050

Embodied Carbon Action Plan (ECAP)



TABLE OF CONTENTS

3	INTRODUCTION
5	MEET THE COMMITTEE
6	EDUCATION
7	REPORTING IN 2025
8	REDUCTION STRATEGIES
10	ADVOCACY
11	KNOWLEDGE SHARING
12	CONTACT US



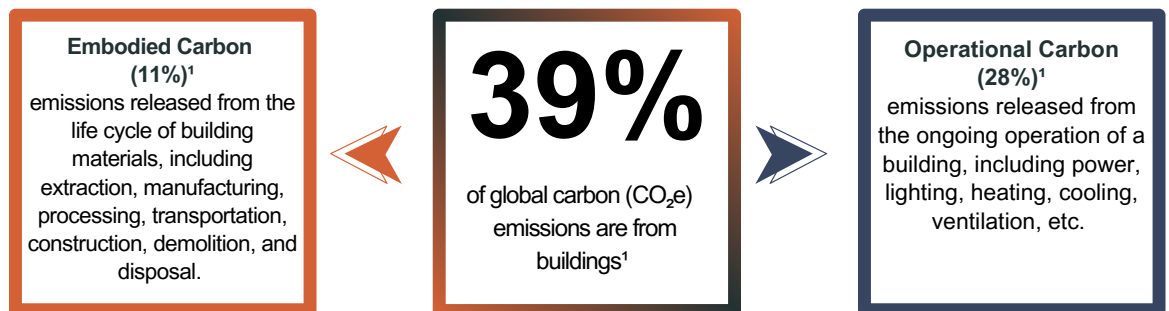
INTRODUCTION

At Structural Focus, we are proud to be a signatory firm of the SE 2050 Commitment, a critical milestone for our industry's journey towards achieving net-zero embodied carbon structures by 2050.

We are actively integrating sustainability into our projects by:

- **Educating** ourselves and others
- **Reporting** project data
- **Implementing** reduction strategies
- **Advocating** for change

Buildings have a huge environmental impact, currently accounting for 39% of global carbon (CO₂e) emissions.¹ These carbon emissions can be broken into two types:



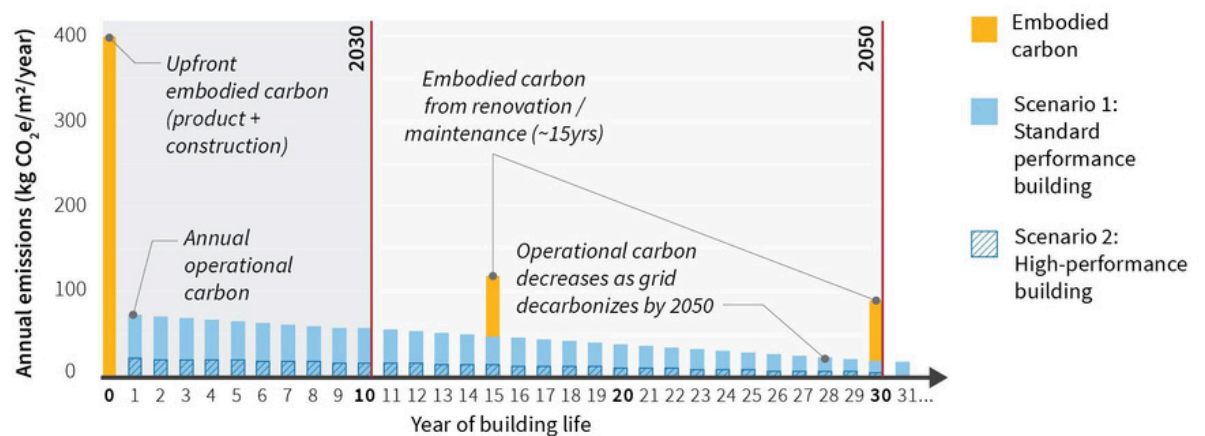
As structural engineers, we carry a responsibility for the design choices we make, as they directly impact global embodied carbon emissions.

¹ World Green Building Council (2019), "Bringing Embodied Carbon Upfront "





ANNUAL EMBODIED & OPERATIONAL CARBON EMISSIONS—A TYPICAL BUILDING OVER TIME.²



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Between now and 2050, as the power grid becomes more renewable and buildings become more energy efficient, operational carbon will reduce, and embodied carbon will become a larger portion of a building's total carbon footprint and demands attention now.

² Carbon Leadership Forum (2020). "Embodied Carbon 101"





MEET THE COMMITTEE

Get to know the faces behind our commitment to sustainability!

Introducing our Sustainability Committee, an internal team dedicated to integrating sustainable practices into every aspect of our work.

Through expertise and collaboration, they will guide us in achieving the SE 2050 Commitment and building a more sustainable future.



GABRIELA PASCUALY, P.E.

Gabriela is our Embodied Carbon Champion. She earned her M.S. in Structural Engineering at UC San Diego. She has worked with construction materials such as concrete, steel, wood, and masonry. Projects include historic renovation, seismic retrofits, tenant improvements, and new construction of office, retail, studio, multi-family, and educational facilities.

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SARA MEANS, S.E., LEED AP

Sara is a Legacy LEED Accredited Professional.

She obtained her B.S. and M.S. in Structural Engineering from UC San Diego. She has extensive experience working on evaluations and retrofits of existing buildings, historic preservation, structural analysis, computer modeling, and new building design.

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LOGAN MCDEVITT, P.E.

Logan is a LEED Green Associate. He earned his M.S. in Structural Engineering and Mechanics of Materials from UC Berkeley. His Bachelor's degree in civil engineering included a minor in Environmental Systems and Society. Logan's involvement in Engineers Without Borders gave him an opportunity to work on projects providing clean and reliable water in California and as far away as Uganda.

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EDUCATION

By fostering a culture of continuous learning, we equip our team with the knowledge and skills needed to reduce our projects' embodied carbon footprint.



DESIGN POLICES

We actively track the latest sustainable design news, policy, webinars, and events, encouraging staff attendance. All gathered knowledge is made readily accessible in our internal sustainability digital library.



BEST PRACTICES

Our Sustainability Committee holds monthly meetings to discuss the latest advancements and best practices in sustainable design.



EMPLOYEE INTEGRATION

Embodied carbon education and reduction strategies are now part of new employee training and included in the newly released internal engineering handbook.



AWARENESS TRAINING

To promote sustainable awareness firmwide, we provide seminars to our staff. Topics include:

- Understanding Embodied Carbon Policies (May 2024)
- Sustainability in our Internal Engineering Handbook (March 2025)
- How to Perform an LCA using Commercially Available Software (Scheduled for September 2025)

LESSON LEARNED # 1

Involvement in industry associations that promote sustainability creates a culture of continuous improvement, encouraging staff to seek out new information and adopt more sustainable practices over time.



REPORTING IN 2025

Compiling and reporting our structural embodied carbon data will help keep us accountable within our firm and the industry, leading to more efficient reduction strategies and overall lower embodied carbon on our projects.

OUR GOAL	ACHIEVEMENT PLAN
Submit at least 5 projects to the SE 2050 database.	<p>We plan to continuously increase the number of submitted projects in future years.</p> <p>We recognize that submitting as many projects as possible to the database contributes to the assessment of industry trends and establishment of achievable reductions.</p>
Expand on an internal tool to compare the cradle-to-gate emissions for each of our tracked projects.	<p>We began building this tool last year to help us identify the largest contributors of embodied carbon within our projects and allow us to implement reduction strategies in current and future projects.</p> <p>We aim to enhance the accessibility and efficiency of the tool this year.</p>
Explore the embodied carbon implications of a new building vs. a retrofit of an existing building.	<p>We all know that keeping an existing building is inherently more sustainable than building a new one.</p> <p>We want to demonstrate that our submitted projects for existing buildings produce GWP output that is much lower than that of a new building in a similar environment.</p>





REDUCTION STRATEGIES

Since joining SE 2050, Structural Focus has implemented embodied carbon reduction strategies on various projects. We are now doing the following with our practice:



- ☒ **Designing** with efficiency in mind. Efficient structural design means fewer materials, a lower embodied carbon footprint, and a lower cost.
- ☒ **Revising** guidelines to list all approved supplemental cementitious materials.
- ☒ **Utilizing** higher strength steel to reduce the total quantity of the material on projects.
- ☒ **Revising** the structural general notes in our design drawings to request that EPDs be submitted when available.
- ☒ **Removing** limits on water-to-cement ratios in concrete mixes (applied on a project by project basis).
- ☒ **Removing** modulus of elasticity limits on concrete mixes where appropriate (applied on a project by project basis).
- ☒ **Limiting** GWP for concrete mixes (applied on a project by project basis).
- ☒ **Educating** our staff on the use of Type IL cement and encouraging its use whenever appropriate.
- ☒ **Specifying** low-strength concrete when appropriate and compatible with the most efficient structural design.
- ☒ **Referring** to internal plots showing the GWP of various structural materials to aid in material selection.

These reduction strategies have helped us bring awareness to sustainability both internally and with clients. Measuring the effectiveness of these reduction strategies goes hand in hand with our tracking of embodied carbon.

LESSON LEARNED #2

The accuracy of LCA results depend heavily on the specific product used at the time of construction. Obtaining product-specific EPDs ensures an accurate LCA.



As we continue becoming more sustainable in our practice, we have a growing list of strategies we will be implementing in the future:



DESIGN

Design with deconstruction in mind.



TEAM WORK

Work with the project team to set carbon budgets for projects.



INCORPORATE

Incorporate the use of biogenic materials.



PERFORM

Perform LCAs on the majority of our projects.

ADVOCACY

Embodied carbon reduction requires a collective effort. Through collaboration with diverse stakeholders (building owners, architects, contractors, suppliers, and government agencies), we can advocate for and implement industry-wide changes to achieve carbon reduction goals.

We are active in many industry organizations related to embodied carbon and sustainability including:

- **(CLF)** Carbon Leadership Forum
- **(SEAOSC)** Structural Engineers Association of Southern California Sustainable Design & Resilience Committee
- **(AIA LA COTE)** American Institute of Architects Los Angeles Chapter Committee on the Environment
- **(ULI)** Urban Land Institute

We advocate for building reuse and promote the preservation of existing structures through retrofits and adaptive reuse over demolition and replacement. This minimizes new embodied carbon by extending building lifespans.



LESSON LEARNED #3

Embodied carbon reduction policies elevate sustainability from an option to an obligation, creating a level playing field and fostering cross-disciplinary collaboration across the industry.

KNOWLEDGE SHARING

The sharing and receiving of knowledge benefits everyone. We are continually learning from others and sharing our knowledge.

EDUCATING CLIENTS

During the conceptual and schematic design stages of new projects, we prioritize educating clients about embodied carbon and the SE 2050 Commitment, and work with them to establish project-specific embodied carbon reduction goals.

SUSTAINABILITY EVENTS

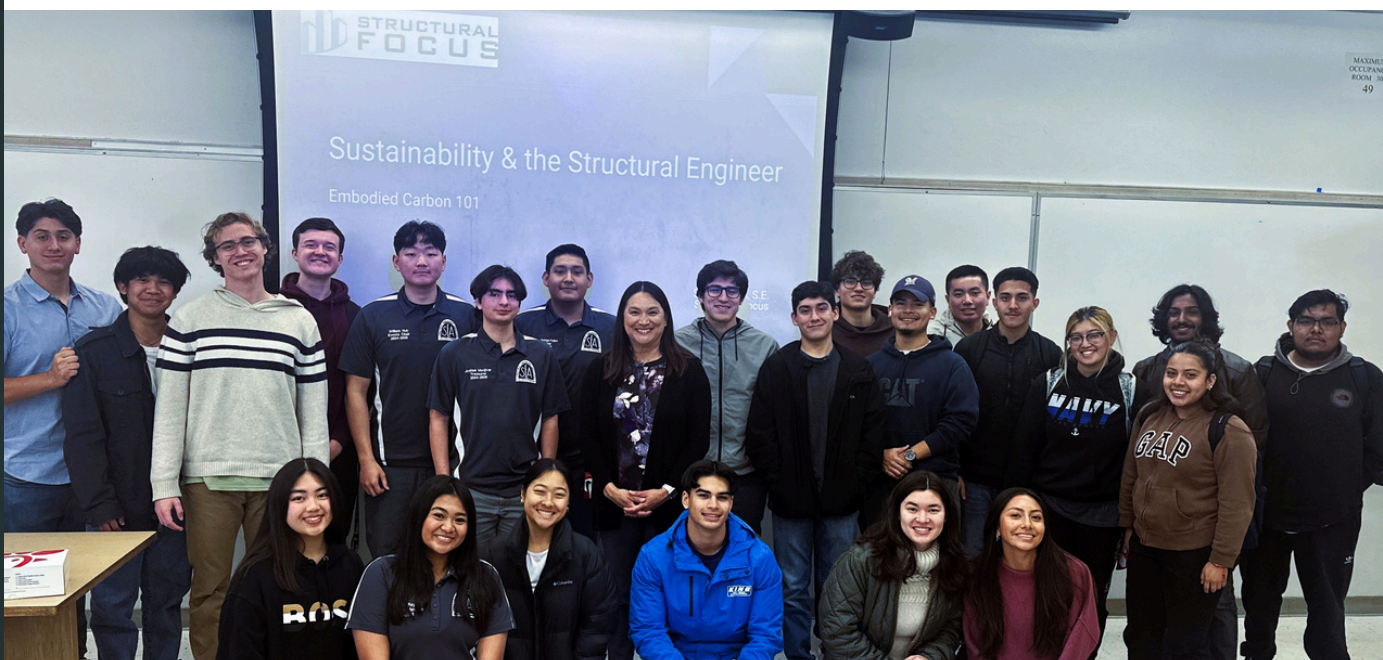
We attend conferences and symposiums to learn about industry efforts and challenges from different perspectives. We also promote the importance of reducing embodied carbon through our structural engineering expertise.

COMPANY COMMITMENT

Our commitment to SE 2050 is proudly displayed on the Structural Focus website, making it readily accessible to all stakeholders. We plan to regularly post on LinkedIn regarding SE 2050 and our sustainability efforts

STUDENT EDUCATION

We've educated student groups on sustainability, focusing on how structural engineers can reduce carbon emissions through sustainable design and building reuse. We plan to expand our university outreach in the coming year.



Sara Means presenting on Sustainability at Cal Poly Pomona



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