

Embodied Carbon Action Plan

This action plan is our firm-wide strategy for exceling in the best practices of sustainable design and providing industry leadership in the reduction of embodied carbon. This document is intended to ensure we remain focused on evolution, adaptation, and improvement of embodied carbon reduction strategies. Our goal is to learn, develop and apply the latest knowledge to our projects, leading to the most embodied carbon efficient structures possible.

Our Pledge

Carbon emissions caused by human activities significantly contribute to the rapid change of our planet's climate. We recognize the urgency to address this issue and the large impact we can have by reducing the impact of the construction industry.

At Fast+Epp we are dedicated to learning, implementing, and sharing the best design practices to reduce the carbon emissions associated with buildings. We commit to measure and reduce the structural embodied carbon in our designs and contribute to the industry's ultimate goal of achieving net zero embodied carbon buildings by 2050.



1. Motivations

Climate change

Carbon emissions caused by human activities significantly contribute to the rapid change of our planet's climate. We recognize the urgency of addressing climate change and are dedicated to developing and implementing sustainable practices to reduce carbon emissions and minimize our impact on the environment.

Carbon emissions and structures

About 10% of the world's carbon emissions come directly from the construction of buildings. At least half of these emissions comes from a building's structural elements. Current projections call for the number of buildings on our planet to be doubled by 2060. As structural engineers, we are faced with an unprecedented challenge as well as an incredible opportunity to contribute to the reduction of carbon emission caused by buildings.

2. Intentions

Reduce carbon emissions

It is our design mentality to reduce the world's carbon emissions by creating carbon-efficient structures. We are driven to achieve this objective by implementing best design practices allowing for low-carbon materials and structural systems.

Enhance holistic design

At Fast+Epp, our solutions emerge from harmonizing all aspects of the design. Our firm-wide strategies go beyond creating safe, functional, and economical buildings. We strive to design architecturally exposed structures minimizing finishes and to utilize more sustainable materials and structural systems with low carbon footprint.

Empower engineers

We want structural engineers to understand their role in climate change mitigation and to make informed sustainable choices throughout the design process.

Inspire industry

Leading by example, we are devoted to inspiring other businesses and professionals in the construction industry to adopt principles of low carbon construction in their practices.

3. Education

Carbon efficient design guide

Drawing on our experience and available industry wide knowledge, we will create an internal guide outlining carbon characteristics of main structural materials, good practices of sustainable design in structural engineering, and methods for embodied carbon calculation.

Research

Embodied carbon is an emerging science with data and technologies being constantly updated. Our internal specialists will stay up to date with new information released around the globe.

Embodied carbon 101

We should be climate change literate, and we should understand how embodied carbon affects climate change. Our internal educational presentations will highlight the embodied carbon impacts of our design decisions and introduce sustainability aspects of structural materials and structural systems.

Resource library

To make sure needed information on embodied carbon can be easily accessed, we will maintain a library of electronic publications and references to on-line resources. This library will be a part of F+E web-based knowledge tool, Watson.

4. Implementation

Internal sustainable design group

Our internal Sustainable Design Technical Development Group will consist of embodied carbon specialists who are responsible for being up-to-date with the latest knowledge, keeping the rest of our firm informed, setting up access to resources, developing useful tools, managing the embodied carbon database and guiding application of sustainable design principles to our projects.

Carbon efficient design

We are committed to implementing design strategies that lead to low carbon buildings. It is within our identity to design structures with minimum amount of materials used. Our carbon efficient design guide will support engineers in designing with embodied carbon reduction in mind. In addition, our sustainability specialists will participate at internal design crit' sessions and provide feedback on sustainable design principles.

Embodied carbon calculation

Calculation of embodied carbon that goes into structural elements will allow us to evaluate and improve our embodied carbon reduction strategies. We will create an effective and practical calculation methodology assisting engineers in performing embodied carbon estimates efficiently. We are committed to providing material take offs and embodied carbon data on our projects as part of our base services.

Embodied carbon database

We will develop and maintain a project-based collection of structural material quantities and related embodied carbon impacts. This database will help us to establish trends across a range of building types and structural systems. We will study these trends to identify the best structural practices for embodied carbon reduction and will apply them to our future projects.

Sustainability smart specifications

Our specifications will promote the usage of materials with the lowest carbon footprint possible. We will encourage wood products from responsibly managed forests, steel with high recycled content, and concrete with high percentage of supplementary cementitious materials (SCM). We will employ performance-based strategies in our specification where possible.

Material reuse

On our projects we always look for opportunities to reuse existing materials. Reinforced with embodied carbon reduction mentality, we will continue seeking and prioritizing new applications for existing structural elements.

Design for disassembly

A powerful way to reduce consumption of resources in construction is to design buildings with future dismantlement in mind. All buildings have limited life spans, but often structural elements can outlive the building as a whole. Designing for disassembly allows for future recovery of materials and minimizes waste. This concept is only starting to gain traction now, but we are up for a challenge to explore this design avenue.

Live Cycle Analysis (LCA)

We will help our clients to make informed sustainable choices throughout the design process by providing LCA services. Results of our LCA studies will provide insight into material and system environmental impacts, confirm compliance of buildings' environmental performance with respect to local regulations, and assist in achieving green building rating points.

5. Advocacy

Knowledge sharing

We want to share our knowledge across the industry to accelerate broader actions towards embodied carbon reduction. This is achieved by collaborating with other design professionals, participating in local and global carbon reduction groups, delivering presentations at conferences, and hosting educational events.

Advising clients

Owners' decisions play a critical role in reducing embodied carbon in the building industry. We feel a responsibility to discuss embodied carbon reduction with our clients at very early stages of the design process. Working with clients we will keep exploring the implementation of low-carbon design strategies and material choices into projects allowing them to make informed choices.

Policymaking

Development of carbon reduction regulations, including policies and building code requirements, is a necessary step in transforming the construction industry. We understand the challenge of complexity and urgency the policymakers are faced with. We will volunteer our knowledge and time to the policymaking process by participating in carbon reduction task groups and advisory committees organized by governmental bodies.

Carbon calculation

Developed by our own in-house parametric design team, our Timber Bay Tool provides member sizes and material volume outputs of any mass timber grid the user wants to explore. The tool is freely available on-line and can be found on the Fast + Epp [website](#). We will continue to further develop this tool by adding more capabilities, including calculation of embodied carbon quantities, as well as options for additional structural materials.