Fast + Epp

Embodied Carbon Action Plan

This action plan is our firm-wide strategy for excelling in the best practices of sustainable design and providing industry leadership in the reduction of embodied carbon. This document will guide us to remain focused on the evolution, adaptation, and improvement of our embodied carbon reduction strategies. We will learn, develop and apply the latest knowledge to our projects, leading to the least carbon intensive 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. Education

Professional Development Program
Fast+Epp is introducing a new internal professional development for all staff. This introductory-level series is designed to educate staff on the fundamentals of sustainability, ensuring a foundational understanding across the company. Our goal is to equip our staff with the necessary language and foundational knowledge to effectively discuss sustainability and engage in meaningful conversations about our tools and services. For F+E staff wishing to learn more about embodied carbon and associated reductions strategies than our introductory materials provide, we have created educational materials to provide a more advanced understanding of the conceptual foundations for our reduction strategies.

Internal Embodied Carbon Estimation
Fast+Epp has integrated sustainable design practices into the overall project delivery. Embodied carbon calculations are performed during the project design to better inform design decisions. Through this system, project staff are exposed to sustainable design strategies and how to communicate those factors to the greater design team.

Research
Our internal specialists meet regularly and maintain an internal resource library for the firm to reference. By participating in external organizations such as the AIA Committee on the Environment (COTE) and Carbon Leadership Forum (CLF), we are able to stay up to date on the latest sustainable design developments within the regions that we operate.

Public Support for Carbon Reduction Initiatives
We feature information on our website stating our involvement in SE2050, explaining how it fits into our overarching sustainability goals as a firm.

2. Reporting Plan

Carbon Calculation Process
Our internal tool has been developed so that project teams can calculate embodied carbon quantities for the majority of our projects. These calculated values are recorded in our own internal database and have been transcribed to comply with SE2050 standards. Over 14 projects have been submitted to participate in the SE2050 database. The Fast+Epp internal tool is available for all of our North American offices and applicable to both American and Canadian projects.

The Fast+Epp internal tool allows for the calculation of the embodied carbon using industry average EPDs, unless a manufacturer-specific EPD is available. This process is typically executed at the end of the design development phase and a second calculation is executed at the end of the contract document phase. This is done in order to create potential options to reduce carbon emissions. Within each project, a member from the sustainable design technical group is assigned as a Sustainable Design Lead (SDL). A Sustainable Design Lead's primary role is to assist the project manager with embodied carbon calculations and to advise on potential strategies that may benefit the project from a global warming potential (GWP) perspective.

EPD Selection
Our current Excel spreadsheet method for calculating structural embodied carbon uses CLF baseline values or industry average EPDs for most materials. For concrete, we have modified the typical industry average EPDs to match the maximum GWP we allow in our specifications. These values are continuously updated as new industry average values are published per region.

3. Reduction Strategy

Reduction Targets
Fast+Epp is driven to accurately measure the structural embodied carbon in our designs and contributing to the industry's ultimate goal of achieving net zero embodied carbon buildings by 2050. Within the next year, Fast+Epp is dedicated to using the embodied carbon calculation system in place and continuing to add to the internal database to create a relevant baseline. Within the next five years, Fast+Epp expects to create an internal baseline that new projects will be compared to. This will help drive the embodied carbon down where possible and create strategies to reduce embodied carbon more effectively.

Sustainable Design Specifications
Our general notes and specifications are continuously updated to support the usage of materials with low embodied carbon and other sustainable practices such as wood products from responsibly managed forests, steel with high recycled content, and concrete with high percentage of supplementary cementitious materials (SCM).

Material Reuse
We often look for opportunities to reuse existing materials in our work, where it may fit well into a project context. Reinforced with embodied carbon reduction mentality, we will continue seeking and prioritizing new applications for existing structural elements. Where new materials must be fabricated, we will seek to incorporate recycled materials to reduce the carbon footprint of the production process.

4. Advocacy

Life Cycle Analysis (LCA)
We will continue to inform clients of our sustainability services and promote our advocacy of SE2050. Fast+Epp will continue to assist 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.

Internal Sustainable Design Group
Our internal Sustainable Design Technical Development Group consists 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. Members of the technical group will continue to work with our internal project teams and educate the engineers on the benefits of carbon reduction.

Carbon Efficient Design
We are committed to implementing design strategies that lead to low carbon buildings. It is a core tenant of our identity to design highly efficient structures. Our carbon efficient design guide will support engineers in designing with embodied carbon reduction in mind. In addition, our sustainable design specialists will participate in internal critical design review sessions and provide feedback on sustainable design principles.

Embodied Carbon Tool Development
In recognition of the fact that the further a structural design progresses, the harder it is to make major changes to reduce carbon, we want to identify carbon reduction strategies early on. To help accomplish this, we have developed a web-based application to estimate the embodied carbon of early project designs based on estimated material quantities. The application is available to the public and is often shared with our clients and partners to help advance awareness of the embodied carbon impacts different structural concepts would have.

External Resources

Our website offers publicly accessible tools designed for a wide range of users. The Timber Bay Tool enables users to create and schematically model a repetitive bay in 3D while generating preliminary design estimates. It can calculate member sizes and volume outputs for typical structural grids. Additionally, our sustainability team has integrated a feature that provides an embodied carbon estimation using industry-average values.

We also offer a Schematic Carbon Calculator, which allows users to assess the embodied carbon of structural elements during the early design stages. This EC Tool is a web-based application designed for embodied carbon calculation of structural elements in early design stages. Calculations account for product life cycle stage (A1-A3) only. This tool facilitates comparative analysis by generating diagrams that compare up to three different design schemes.

Industry Events
We will continue to attend CLF regional hub meetings and AIA Committee of the Environment (COTE) and participate in decarbonization subcommittees. These communities facilitate topics related to sustainability to learn best practices and continuously adapt our carbon reduction strategies.

5. Lessons Learned

Updated Reporting Methods
As we complete more detailed structural embodied carbon assessments for projects with varying requirements and complexities, we have encountered the need to collect and aggregate that information in a clearer and more comprehensive manner. Standardizing our data collection and storage methods will allow us to draw conclusions based on real patterns across our projects. Our database spreadsheet contains more areas of information in line with the SE2050 database. This provides a higher level of information across all recorded projects.

Clear Actionable Strategies
Although we strive to integrate sustainable design best practices into our projects by default, adoption has been uneven depending on structural material, as some of our engineers do not have an in-depth understanding of sustainable design principles. We will continue to provide education for our engineers to promote sustainable design principles. We will also develop a menu of carbon reduction strategies engineers can select from as they progress through the design process.