



Embodied Carbon Action Plan

2022

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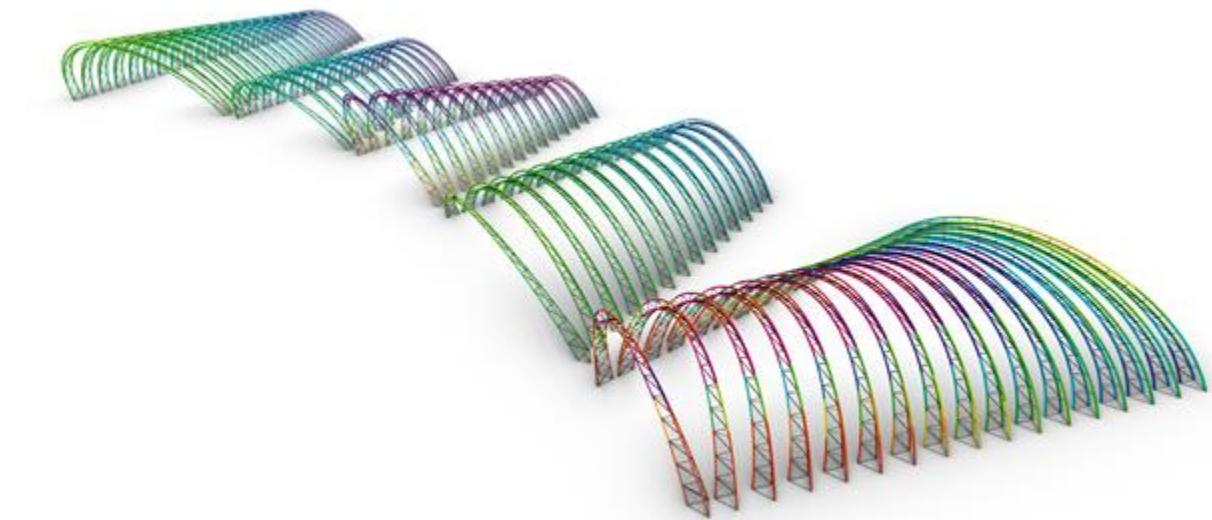


KF Aerospace Spiral Stair, photo: Shawn Talbot

1. Lessons Learned

StructureCraft is an Engineer-Build firm with a portfolio covering efficiently designed and built mass timber and hybrid steel-timber structures across North America and Asia. We understand our roles as stewards and the impact our work has on the world and the built environment.

The following Embodied Carbon Action Plan (ECAP) outlines our strategy to provide education and resources on embodied carbon to our internal staff, to track the embodied carbon of our current and past projects, to reduce the embodied carbon on future projects through efficient structural design, sourcing, and procurement, and to present options for lower carbon designs to clients. As a continuation of our first ECAP, submitted in 2021, this Embodied Carbon Action Plan summarizes the initiatives we are pursuing in the upcoming year and reflects on the previous year.



DC Southwest Library, photo: James Steinkamp

2. Education

As part of the goal to encourage sustainable design using the latest tools and resources, the StructureCraft sustainability group has created and distributed resources and guidelines within the company and attended workshops and demonstrations throughout the year.

SE 2050 Requirement	Actions
Distribute firm-wide announcement of your firms pledge to join the SE 2050 Commitment.	Joining SE 2050 was distributed through an email and was followed by a presentation in a weekly engineering meeting. The company will distribute this presentation to all new engineering members and distribute an updated yearly announcement.
Initiate an embodied carbon interest group within your firm and outline their goals.	StructureCraft has created a sustainability group which meets quarterly. The primary goal of the group is to ensure progress towards achieving the commitment and company's sustainability goals. As the group has grown throughout the year, the group has enabled us to structure and grow our internal resources around embodied carbon.
Minimum (1) employee attends a presentation or demo of an LCA-based tool used to calculate embodied carbon.	The members of our sustainability group have attended demonstrations of tallyCAT by Building Transparency and the UpStream Forest Carbon & LCA Tool by ZGF.
Distribute ECAP within your firm upon publishing.	On the company internal intranet page for sustainability, a list of videos on the topics of LCA assessments, sustainable forestry, and carbon neutral construction is now available. On the same page, the SE 2050 library of resources is linked and explained in more detail.

3. Reporting

Working closely together with Architects & Owners, the sourcing of wood is a common topic and often given as a project requirement. As a design-build company, StructureCraft assists both the Architect and Owner in determining sustainable pathways. During the first year of our commitment, new reporting tools have been developed to find and promote the most sustainable solutions for our clients.

SE 2050 Requirement	Actions
Submit a minimum of (2) projects per U.S. office with structural engineering services to the SE 2050 Database	During the year, two projects have been submitted to the SE 2050 Database. This data is used internally to benchmark and improve future projects.
Ask the Architect or Owner if the project has a carbon budget or if there are established project sustainability goals at the project kickoff meeting.	On a current project, StructureCraft worked closely with the Owner to develop a carbon analysis for the mass timber project using supplier-specific EPDs from locally sourced timber to more accurately compute the embodied carbon of the structure and compare to a baseline concrete flat plate option for the building.
Propose other actions that promote the reporting of embodied carbon data and describe their value.	The StructureCraft software team has developed an internal tool for real-time massing and carbon reporting during the early design studies of mass timber projects. The tool has informed our early design studies and was used in our communications with developers and architects to find the best carbon neutral solutions.



4. Embodied Carbon Reduction Strategies

As engineer of record on structures which often already contain significant timber elements as well as concrete/steel, StructureCraft's focus in pushing forward sustainable construction techniques must go beyond simply recommending mass timber as a lower carbon construction material. Our focus is thus two-fold: reducing total material consumption by designing the entire structure efficiently, regardless of material choice; and lowering the carbon content of the materials we do specify via regional sourcing, and specification of low-carbon materials where possible. Specific actions toward that focus are listed below.

SE 2050 Requirement	Actions
Communicate the embodied carbon impacts of different design options to clients with creative data visualization. Include these visualizations in your Elective Documentation.	For our ongoing projects, an embodied carbon report template was designed and used for our reports and presentations with clients. Please see section 6 for reference.
Participate in a LEED, ILFI Zero Carbon, or similar project design charrette and speak to potential design considerations impacting embodied carbon.	On an east coast project, StructureCraft participated in several meetings with the Owner, Architect and Sustainability Consultants to discuss options for both LEED and ILFI Zero Carbon certifications. Specifically, StructureCraft presented the potential timber sourcing options in North American and Europe with FSC and PEFC to educate the team on what is possible and how these certifications will affect the team's ability to achieve either LEED or ILFI Zero Carbon.
Submit a Circular Economy Narrative describing how the project supports the circular economy. This can be done by incorporating re-use or design for deconstruction into at least one project.	For a project on the east coast, StructureCraft designed a structure so that it can be disassembled after 3 years and reassembled in a different location – a design requirement by the Owner. StructureCraft worked with local subcontractors during the installation and will engage them again in the future to continue this local workforce partnership.



5. Advocacy

StructureCraft presents each year at a conference where sustainability is a topic. This year Lucas Epp presented at the Greenbuild International Conference in San Francisco. Together with this submission our marketing department plans to promote our continuing SE 2050 commitment.

With the listed actions, we hope that we will show our clients the value the SE2050 Challenge brings to the overall building industry.

SE 2050 Requirement	Actions
Describe the value of SE 2050 to clients. How can your design teams collaborate to reduce embodied carbon?	Our involvement in SE2050 helps our engineers become more aware of options to design efficiently and sustainably with the earth's limited resources and focus on using natural and renewable materials. This in turn helps owners and designers become aware of their responsibility to wisely steward natural resources, and provides options for them to do so. Our design teams create early massing design studies to benchmark carbon for design options. Our engineers include manufacturers early in the design process. This allows them to evaluate the feasibility of different transportation modes and supplier capacities in the early project design. Further, we promote sourcing material from regional forests where possible.
Share your commitment to SE 2050 on your company website	Along with the submission of our ECAP 2022, the company is releasing its commitment to the SE 2050 program on the website.
Encourage industry and policy change by promoting and using low-carbon and carbon sequestering materials.	As a mass timber engineering, manufacturing, and installation company, StructureCraft is promoting the use of timber across different building and infrastructure typologies. We challenge the industry limits for mass timber and seek to bring the material into more versatile construction typologies such as large span roofs, stadiums, and bridges. We believe that by doing so we are encouraging responsible use of materials, and being good stewards of the earth's natural resources.

6. Embodied Carbon Report

StructureCraft has designed a carbon reporting template for visual reporting and communication with clients. The report is focussing on early design considerations for LCA stages (A1-A5) and covers the listed structural elements:

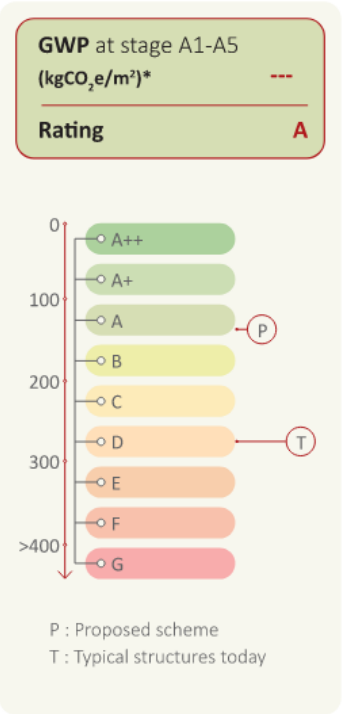
- Substructure: Foundations, Slabs on Grade, Basement Walls, Pile Caps
- Superstructure: Columns, Beams, Floor Plates, Stairs, Walls, Bracing Elements

The company is committed to analyse the design efficiency of our buildings against international performance targets provided by SCORS, RIBA, LETI and further.

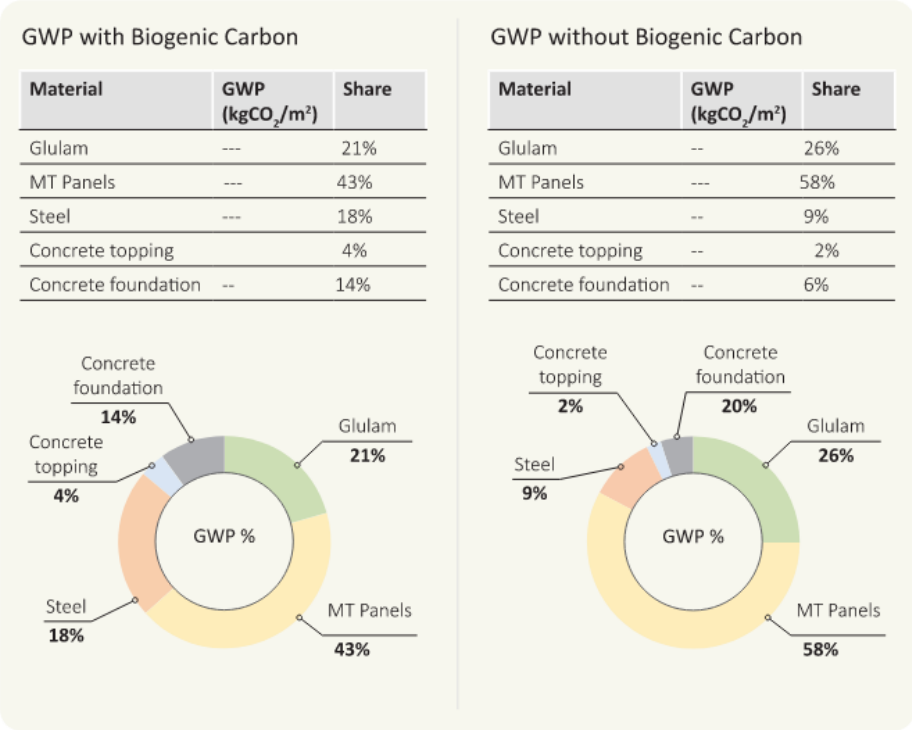
Total embodied carbon rate



SCORS rating



Result Breakdown by Materials



Result Breakdown by Life Cycle Stages

