



SE 2050 EMBODIED CARBON ACTION PLAN (ECAP)

SEPTEMBER 2022

GLOTMAN•SIMPSON | 2022 EMBODIED CARBON ACTION PLAN EXECUTIVE SUMMARY

Glotman Simpson joined the SE 2050 movement because of the pressing need to reduce embodied carbon in the building sector.

We are excited to be part of the solution. Through SE 2050, we better understand the aspects of our work that most contribute to carbon emissions and subsequently, the measures we can take to reduce them. During the first year of our commitment, we placed an emphasis on educating our firm about the value of sustainability and embodied carbon reduction strategies. In our business operations and in our technical work, sustainability is now front of mind.

In this Embodied Carbon Action Plan (ECAP), we reflect on what we've accomplished and look onwards to what we can achieve in the year ahead.



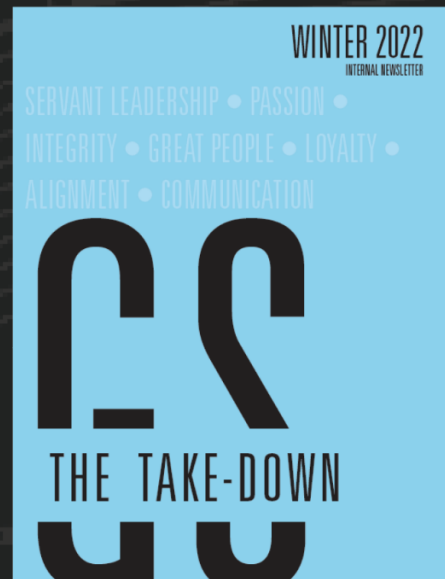
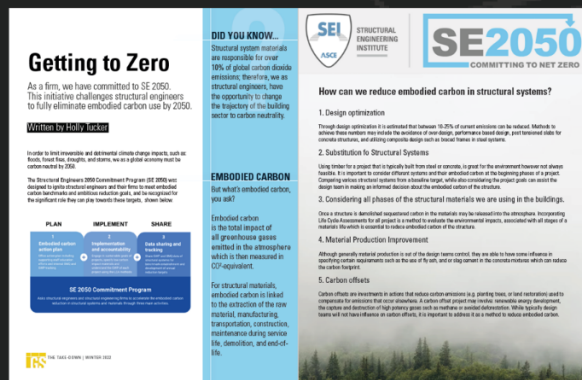
ACCOMPLISHMENTS AND LESSONS LEARNED IN OUR FIRST YEAR

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Why we joined SE 2050

THE NEED TO PHASE OUT CARBON EMISSIONS IS CLEAR AND MORE PRESSING THAN EVER.

The built environment is responsible for approximately 40 percent of global CO2 emissions, most of which is emitted through and from buildings. We have a major opportunity to change this through smart, efficient, and carbon-informed design decisions. Our participation in the SE 2050 movement ensures we are a part of the solution towards a more sustainable future and towards responsibly serving our communities.



Firm behaviour change/precedent change directly related to sustainable goals written in your firm's ECAP

The quarterly GS internal newsletter now dedicates a section to sustainability, including new sustainable design changes the firm is taking, setting standards for running LCA's and relevant sustainable policy updates. The internal sustainability committee is developing a standardized guide to run LCA's and will present via webinar to the rest of the firm later this year. Sustainability will be a topic of presentation at the internal GS technical retreat this year. Furthermore we are creating an embodied carbon summary sheet on all of our projects, to help establish a benchmark and inform clients and architects on the embodied carbon performance of the structure.

Sustainability-focused seminars/knowledge sharing hosted by GS since joining SE 2050

- 843 N Spring Street (Rachelle Habchi - SEAOSC Technical Summit: Sustainability in Structural Engineering, Mar 2022)
- The Road to Net-Zero: Eliminating Embodied Carbon in Design by 2050 (Harrison Glotman - AIBC Conference 2022, May 2022)
- M5, Vancouver and Terraine, San Jose: Lessons Learned from Conception to Construction (Harrison Glotman, Chris Smith - CTBUH Steel-Timber Hybrid Conference 2022, May 2022)
- Decarbonation Toolbox (Rachelle Habchi, AIA LA, July 2022)

Specification change, internally or on a project related to sustainability since joining SE 2050

GS has worked with multiple sustainability consultants to change our specifications on specific projects focused on sustainability. The concrete specifications have been revised to include language specifying selection of low GWP & cement content mixes, requiring product-specific Type III EPD's conforming to ISO 21930 and limiting GWP criteria for major structural mix designs. The steel rebar specifications have been revised to require manufacturing at EAF plants, providing product-specific Type III EPD's in accordance with ISO 21930, specifying minimum recycled content and limiting GWP criteria to align with a 30% reduction against industry-average rebar.

Percentage increase on performing LCAs since joining SE 2050

GS started running internal LCAs as a direct result of joining SE 2050.

SE 2050 SUMMARY

GLOTMAN • SIMPSON CONSULTING ENGINEERS



Image from: 843 N Spring Street (Rachelle Habchi - SEAOSC Technical Summit: Sustainability in Structural Engineering, Mar 2022)



Image from: M5, Vancouver and Terraine, San Jose: Lessons Learned from Conception to Construction (Harrison Glotman, Chris Smith - CTBUH Steel-Timber Hybrid Conference 2022, May 2022)

Using our ECAP to re-establish firm goals, mission, vision

The creation of the ECAP has allowed GS to reinforce our commitment to the environment and innovation. We are excited to be a part of the solution. The drive to sustainability adds an additional element and constraint to the building puzzle - we all became engineers to be creative and solve meaningful problems and we are determined to be a purposeful part of the global push to net zero.

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ACCOMPLISHMENTS AND LESSONS LEARNED IN OUR FIRST YEAR

We have achieved our primary objective of educating our firm about embodied carbon reductions during our first year as SE 2050 signatory firm. Our progress can be noted below:

EDUCATION

SE 2050 Requirement	GS Actions
Distribute a firm-wide announcement of our firm’s pledge to join the SE 2050 Commitment.	Internally announced our pledge to join the SE 2050 commitment via an official email announcement from our Chief Operating Officer
Nominate an Embodied Carbon Reduction Champion for our firm.	Harrison Glotman has been nominated as our firm’s Embodied Carbon Reduction Champion
Develop a firm-wide education program for embodied carbon reduction and our commitment to SE 2050.	Formed a Sustainability Committee composed of technical and non-technical staff.
	Have made “Sustainability” articles a recurring feature in The Take-Down, quarterly internal newsletter.
	Uploaded our SE 2050 resources in the GS Wiki, our intranet
Set a date within the first year to present an “Embodied Carbon 101” webinar	This will be part of the sustainability presentation for the company-wide technical retreat in October 2022
Shared the SE 2050 library of resources with technical staff. (Elective)	Included the link in our quarterly newsletter
Shared embodied carbon reduction strategies with your firm as outlined in Top 10 Carbon Reducing Actions for Structural Engineers document produced by SE 2050.(Elective)	Featured these in our quarterly internal newsletter
Presented the document, “How to calculate embodied carbon” to all technical staff. (Elective)	This will be part of the sustainability presentation for the company-wide technical retreat in October 2022
Initiated an embodied carbon interest group within your firm and provided a narrative of their goals. (Elective)	GS initiated an internal GS Sustainability Committee with the goal of measuring embodied carbon, collaborating on embodied carbon reduction strategies

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ACCOMPLISHMENTS AND LESSONS LEARNED IN OUR FIRST YEAR

REPORTING

SE 2050 Requirement	GS Actions
Provide a narrative on how our firm plans to measure, track, and report embodied carbon data.	We are creating a cover sheet on all of our drawings that show the embodied carbon data. This will be automatically generated for every job at different stages of the project.
Create an internal training for embodied carbon measurement.	This will be part of the sustainability presentation for the company-wide technical retreat in October 2022
Submitted a minimum of two (2) projects per U.S. structural office for the firm to the SE 2050 Database.	Submitted

EMBODIED CARBON REDUCTION STRATEGIES

SE 2050 Requirement	GS Actions
Set an EC reduction goal for the coming year and an implementation narrative.	For our first year, GS set a goal to notify clients of building elements that excessively contribute to embodied carbon when applicable and working with them to develop alternative schemes (e.g. transfer slab, excessively long spans)
Any other appropriate actions regarding embodied carbon reduction strategies (Elective)	GS made it a point to participate in more associations and conference focused on sustainability such as CLF, sustainability seminars and embodied carbon policy development

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ACCOMPLISHMENTS AND LESSONS LEARNED IN OUR FIRST YEAR

ADVOCACY

SE 2050 Requirement	GS Actions
Provide a narrative on how our firm plans to measure, track, and report embodied carbon data.	GS dedicated a page on our company website to sustainability and our narrative on measuring, tracking, and reporting embodied carbon data
Describe the value of SE 2050 to clients.	We have demonstrated our commitment to embodied carbon reduction by presenting at various conferences throughout North America, including: <ul style="list-style-type: none">843 N Spring Street (RH - SEAOSC Technical Summit: Sustainability in Structural Engineering, Mar 2022)The Road to Net-Zero: Eliminating Embodied Carbon in Design by 2050 (HG - AIBC Conference 2022, May 2022)M5, Vancouver and Terraine, San Jose: Lessons Learned from Conception to Construciton (HG, CS - CTBUH Steel-Timber Hybrid Conference 2022, May 2022)Decarbonation Toolbox (RH, AIA LA, July 2022)
Declare your firm as a member of the SE 2050 on boilerplate proposal language	Added standard messaging in our proposals denoting our SE 2050 Commitment:

Proven commitment to sustainability including having several LEED certified professionals on staff and joining SE 2050 (a movement to eliminate embodied carbon in structural design by 2050). For Glotman•Simpson, success means finding solutions that will make the structure, and the project, more efficient and economical, as well as environmentally sustainable.

LEGEND



IN PROGRESS



COMPLETED

PLANS FOR OUR SECOND YEAR (2022-2023 ACTION PLAN)

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PLANS FOR OUR SECOND YEAR (2022-2023 ACTION PLAN)

EDUCATION

GS is committed to ensuring all our engineers have a fundamental understanding of measuring and tracking embodied carbon as this becomes an integral part of the design process.

At a company-wide level, we are working towards consistently accounting for the global warming potential of the individual elements we design. When making design decisions, we are actively communicating the embodied carbon impact to architects and clients.

GS hosts a technical retreat every 3 years and this upcoming year we have a sustainability group working on updating our material specifications, providing internal guides for drafters and engineers on how to calculate embodied carbon, and generating reports to present to clients in a cohesive manner.



Examples of how we plan to educate our employees

Elective #1: Distribute ECAP within firm upon publishing

Elective #2: GS will conduct an internal embodied carbon information forum that will lead employees through material selection, embodied carbon tracking, available softwares and the appropriateness of each software given the specific design stage

Elective #3: Provide (2) workshops and recorded webinars for drafters and engineers to incorporate embodied carbon project tracker in typical drafting & design workflow

Elective #4: At least one GS representative will attend the monthly CLF webinars

Elective #5: A minimum of (2) GS employees are active participants in CLF-LA and CLF-Vancouver

Elective #6: GS sustainability committee will present an internal standardised LCA procedure to ensure firm-wide accuracy and uniformity.

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PLANS FOR OUR SECOND YEAR (2022-2023 ACTION PLAN)

KNOWLEDGE SHARING NARRATIVE

Our sustainability committee has established a standardised embodied carbon tracker based on material quantity takeoffs in Revit, which will be included on the title page of our construction documents. We are currently working on making this part of our typical design flow. The intent is to provide accurate Global Warming Potential (GWP) estimates which automatically update based on the updated Revit model. These are intended to help the client and design team make informed decisions to reduce the structural GWP of the project.

GS is creating an LCA report template for projects with sustainability goals to provide to the client, which will be customizable based on the specific project. The goal is to highlight to the client the design decisions that can be made to improve the embodied carbon of the project (i.e. concrete mixes, PT vs. cast-in-place etc...). The report will provide both economic and sustainability metrics to help them make the most informed decision.

Additionally, GS regularly posts on social media about our current mass timber and adaptive reuse projects, as well as sustainability-related conferences and seminars that our engineers have taken part in. In this coming year, for every project posted, GS will make an effort to include the GWP associated with the specific project. This last year, GS has taken part in the SEAOSC white paper on PLC, participated in the SEAOSC Sustainability Technical Summit, CTBUH Steel-Timber Conference, the International Mass Timber Conference, and is active in CLF-LA and CLF-Vancouver. Through these experiences, we have learned about relevant sustainably-focused projects, mass timber design and how recent and upcoming legislation will affect our work in the coming years.



A sneak preview of our new LCA Report Template working draft.

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REDUCTION STRATEGY

For the first year of the SE 2050 program, we came to really appreciate the widely-circulated consensus in the sustainability community that you cannot manage what you cannot measure. And so, GS focused on developing internal GWP measuring tools, investing in life cycle assessment softwares and researching emerging technologies of structural materials which allow for reducing carbon.

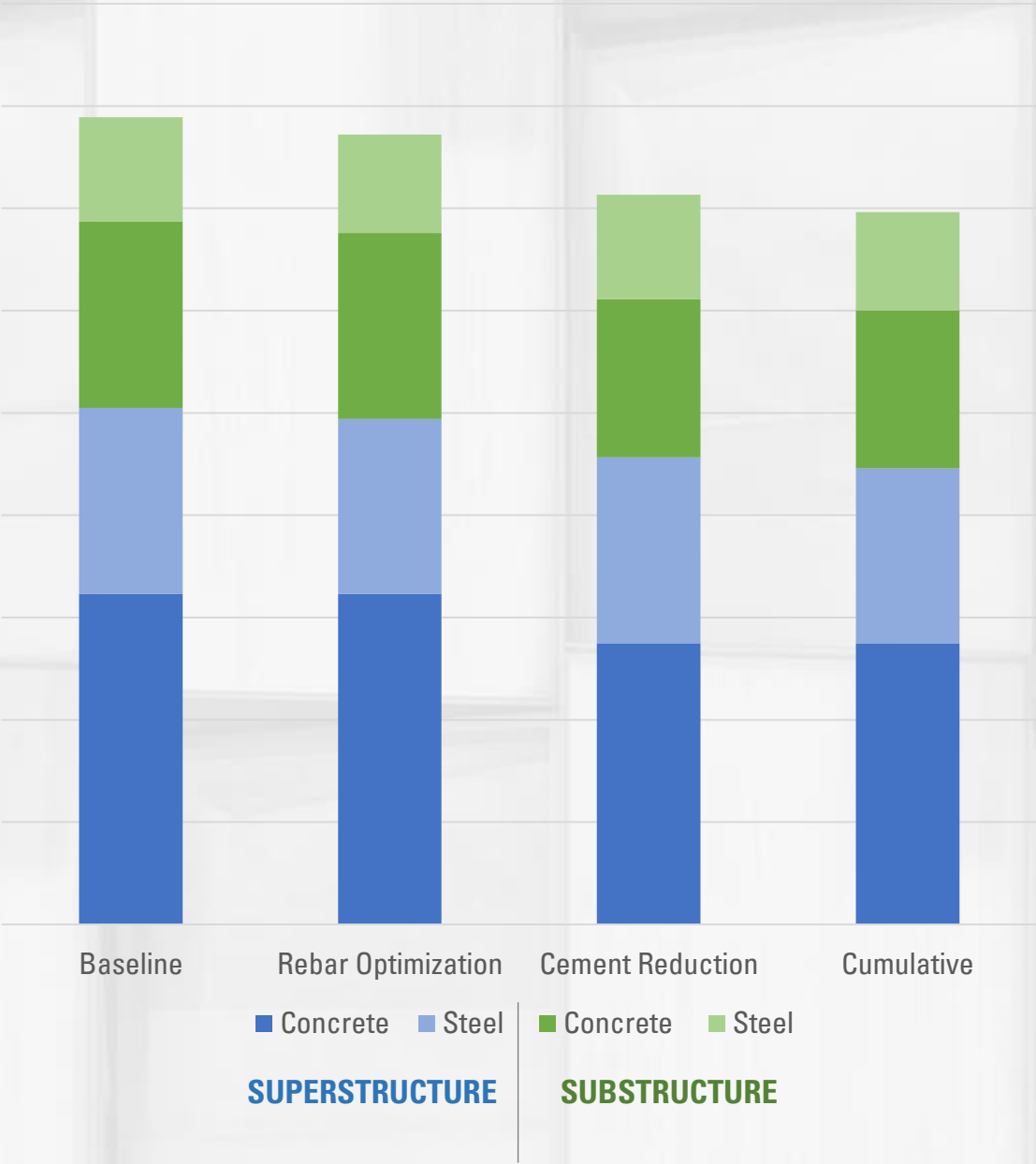
Elective #1: GS will communicate the embodied carbon impacts of different design options to clients with creative data visualisation through our customizable LCA summary reports. The reports will provide clients with local GWP and cost comparisons for different structural materials (e.g. concrete, reinforcing, structural steel and timber) that are project specific.

Elective #2: GS will complete an embodied carbon comparison study during the project concept phase.

Elective #3: GS will calculate the firm’s average benchmark for embodied carbon.

Elective #4: GS will update our concrete specifications to incorporate embodied carbon performance and include embodied carbon in the concrete mix submittal review requirements.

Potential GWP Reduction Scenarios



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REPORTING PLAN

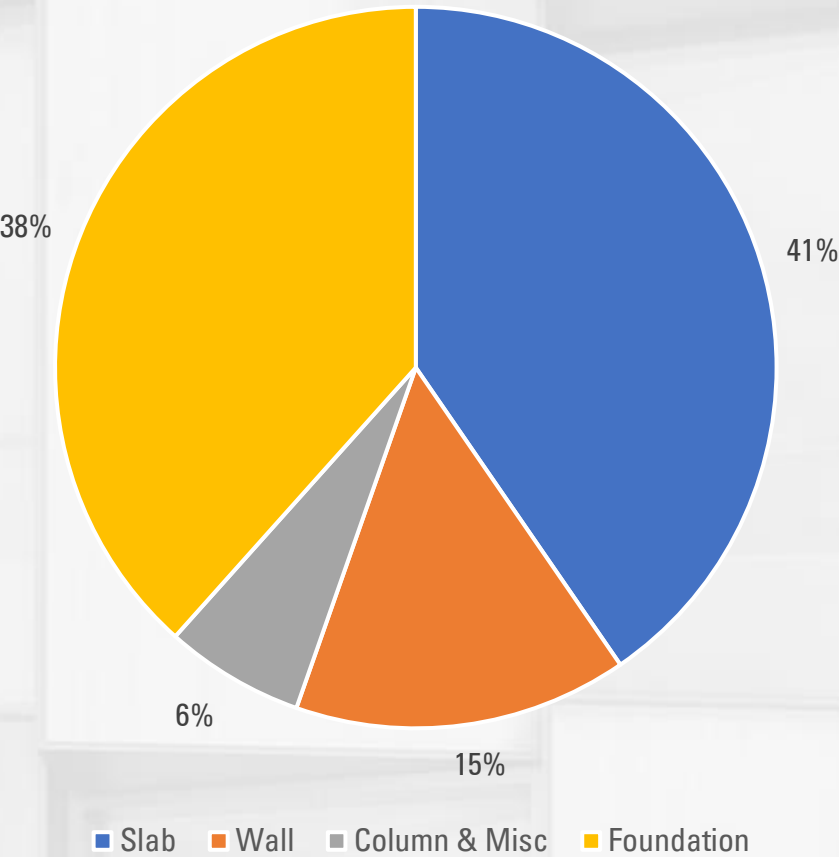
GS regularly uses both Tally for WBLCA and Embodied Carbon in Construction Calculator (EC3) for modules A1-A3 to calculate embodied carbon of structural materials. GS will measure embodied carbon data for our projects through our aforementioned project specific embodied carbon tracker which uses Tally and Revit output to publish total GWP and elemental GWP onto the title page of our construction documents. This tracker automatically updates based on the updated Revit model and informs the client and design team of the latest embodied carbon status. For preliminary projects with perhaps no established Revit model, GS uses the SE 2050 Embodied Carbon Estimator (ECOM). We’ve also been involved in providing user feedback for the Carbon Avoided: Retrofit Estimator (CARE).

Elective #1: GS will submit 3 projects to SE 2050 database

Elective #2: GS will report a greater percentage of projects than we did last year

Elective #3: For at least one of the projects submitted to the SE 2050 database, GS will commit to asking the Architect or Owner if the project has established sustainability goals at the project kickoff meeting.

Global Warming Potential Percentage by Element:

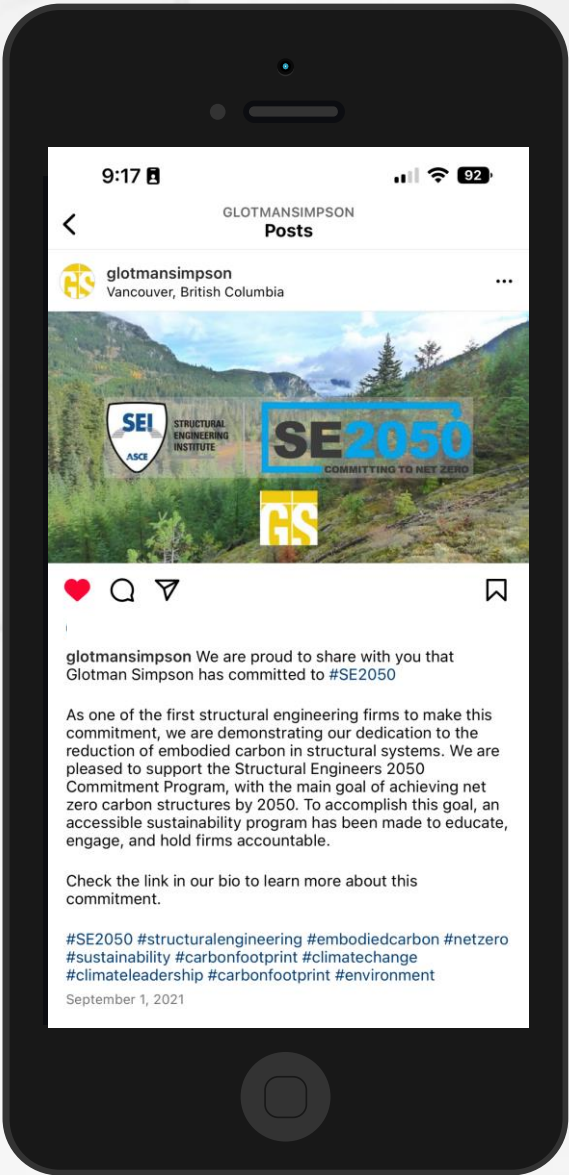


An example of our internal GWP calculator broken down by element

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PLANS FOR OUR SECOND YEAR (2022-2023 ACTION PLAN)

ADVOCACY

As a firm, we will continue our internal initiatives and external efforts for the movement to reduce embodied carbon—we are strong advocates for SE 2050.



Elective #1: GS will describe the value of SE 2050 to clients as a permanent segment of the LCA report template.

Elective #2: GS will post on our social media channels about our involvement and commitment to SE 2050.

Elective #3: GS will share our commitment to SE 2050 on our company website as a section of our permanent sustainability page

Elective #4: Members of our sustainability committee are active participants in advocating for and proposing local Los Angeles embodied carbon policy

A post announcing our involvement in SE 2050 on social media. We will continue to post about our progress on our ECAP.