



GLOTMAN | SIMPSON
60TH ANNIVERSARY

EMBODIED CARBON ACTION PLAN

2024

Founded on the west coast,
Glottman-Simpson has fully
 embraced the innovative side of
 sustainable building design.



GLOTMAN | SIMPSON
 60TH ANNIVERSARY

2024 SUSTAINABILITY COMMITTEE

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To the SE 2050 team and signatory firms,

2024 has been another exceptional year in our pursuit of lower-carbon buildings. Our dedicated team has continued our efforts and initiatives, ensuring we remain at the forefront of this field. Our goal is to promote and encourage sustainability not only in our buildings, but across the industry. To further solidify our commitment in this area, we also joined as a signatory firm of the Climate Smart Buildings Alliance's (CSBA) Responsible Buildings Pact. This year, we formalized the Sustainability Committee within our Engineering Standards Group and have created exciting internal initiatives and tools to inform our designs. We also recognize the significance of advocacy and education beyond our office walls. As a proud signatory of the SE2050 movement, we show no signs of slowing our blog posts, presentations, case studies, or discussions with clients, contractors, and product suppliers.

Within the firm, there is a sense of optimism and excitement for the future of sustainable structural engineering. We have great plans for 2025 that we look forward to sharing throughout the year and in next year's ECAP, continuing the snowballing efforts toward the end goal of net zero by 2050.



RORY ROBERTS
 Director of Sustainability

PROGRESS OVER THE YEARS

2021

2021 marked Glotman Simpson's commitment to the SE2050 movement, reinforcing our commitment to lowering embodied emissions in buildings.



2022



We summarized our milestones in the firm's first full ECAP year. We also started using Tally to track embodied carbon in select projects.

Early 2023

We launched OnTrack - an educational blog series of research topics and case studies, providing insights into our firm's dedication to building decarbonization.



Highlighted Blogs:

- [Our Journey to Net Zero](#)
- [Footing Elements](#)
- [Sustainability and Code Evolution](#)

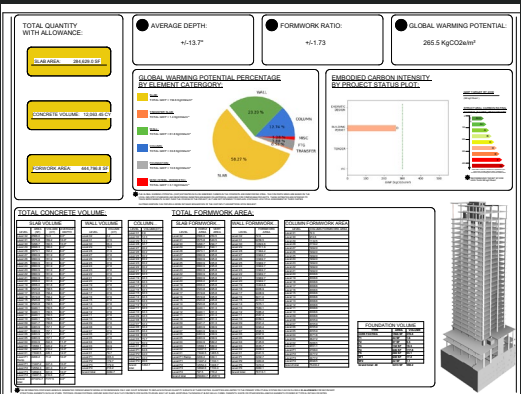
Late 2023

We calculated company-wide embodied carbon benchmark as **350kgCO₂e/m²**. We updated all of our internal structural design tools to report embodied carbon.

WHERE WE ARE:

2024

We formalized the Sustainability Committee as part of the Engineering Standards Group within the firm. We also updated our general notes to include sustainability metrics by default. We developed a coversheet on all of our drawings and a plug-in that calculates and reports embodied carbon on all of our projects



2025

We are planning to release our internal Life Cycle Assessment (LCA) tool and update our US general notes/specifications to include sustainability metrics by default. We will also recalculate GS' company-wide embodied carbon benchmark.

2030

Compared to our 2023 benchmark, we aim to achieve a 30% reduction in embodied carbon across all our projects.

2050

Along with all other signatory firms, we plan to achieve the globally stated goal of net zero carbon by 2050.

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Glotman•Simpson has provided structural engineering consulting services for 60+ years.

With over 5,000 projects completed to date in the areas of residential, commercial, industrial and institutional buildings.

For **60 years**, Glotman•Simpson has engineered some of North America's most iconic structures. We believe that exceeding client expectations begins and ends with superior service. Our commitment to **creative** thinking and sustainable structural **design** is representative of our dedication to creating value for our clients, and future generations.

Our firm currently retains a staff of 100 including 50 engineers, who are part of the creative engineering behind some of the most iconic structures in Vancouver, across Canada and throughout North America.

2024 IN REVIEW

At **Glotman•Simpson**, sustainability is a mission that drives every facet of our work, with **embodied carbon reduction** in building design at the forefront of our priorities. Through our Sustainability Committee, we have cultivated a **dedicated** group of individuals **passionate** about fostering a culture of innovation, education, and advocacy, through data-driven application of initiatives to make a positive impact on the **built environment**.

1. We continued **GS On Track**, an educational compilation of research topics, providing insights into our firm's dedication to building decarbonization and furthering the SE 2050 movement. This series serves as a platform for sharing updates on sustainability design trends, policy changes, observations from our design work, and introductions to the innovative automation tools and BIM plug-ins we've developed.
2. We expanded the use of **STEVIE**. Our Sustainable Tech Tool for Embodied Carbon Visualization of Integrated Efficiency, better known as STEVIE, is a BIM-integrated tool designed to automate the tracking of embodied carbon throughout a project's lifespan, ultimately creating diagrams to provide a clear visualization of the carbon intensity of different structural elements. We have educated our staff on the use of STEVIE which has empowered them to use it when discussing carbon reductions with clients.
3. We formalized our **Sustainability Committee** as part of the Engineering Standards Group within the firm, solidifying it as a key influence on internal education and development.
4. We launched the beta version of our **Embodied Carbon Reduction Plan** service. This service focuses on early design intervention to propose alternative strategies that will provide significant carbon savings.
5. We launched updated **General Notes** with sustainability criteria as standard in our Canadian projects. We intend to expand this to our US projects in 2025.
6. We've expanded our use of in-house design tools with a built-in **GWP Calculator App**, allowing designers to actively assess the embodied carbon impact of the ongoing design. Our design tools now allow for comparisons between lower carbon alternatives in real time.
7. We have a series of **internal initiatives** to ensure our staff is apprised of all of the firm's sustainability-related work at all times, namely our embodied carbon reduction strategies. From introducing a sustainability section in our Policies and Procedure handbook to regularly penning articles in our quarterly newsletter, The Take-Down, our company is on the same page.

Needless to say, **Glotman•Simpson** remains strongly committed to the **SE 2050** movement.

EDUCATION

Our journey towards sustainable practices begins with knowledge, and we firmly believe that knowledge should be shared.

Our journey towards sustainable practices starts with knowledge, and we firmly believe in sharing this knowledge openly. This belief has inspired the continuation of our "OnTrack" blog series, a comprehensive educational resource covering various research topics. Through this series, we offer insights into our firm's unwavering commitment to decarbonization and advancing the SE 2050 movement. Serving as a platform for dialogue, the series shares updates on sustainability design trends, interpretations of policy changes, observations from our design projects, and showcases the innovative automation tools and BIM plug-ins we've developed. Internally, our Sustainability Committee convenes monthly, collaborating closely with our Automation Team to develop internal tools for tracking and reducing embodied carbon. Moreover, the Sustainability Committee actively engages with suppliers and vendors of sustainable building materials, ensuring our entire team remains well-informed about the latest technologies for reducing embodied carbon.

WITHIN OUR COMPANY

CHANGE STARTS FROM WITHIN. In 2024, engagement within the firm remained strong. Sustainability-focused webinars attracted high attendance and participation across the company, while the sustainability committee continued advancing its work, developing updated tools and guidance to help our engineers integrate sustainability into their designs effectively..

KEEPING UP WITH BUILDING MATERIALS

WE TAKE PROACTIVE STEPS TO FOSTER PARTNERSHIPS WITH SUPPLIERS AND VENDORS SPECIALIZING IN SUSTAINABLE BUILDING MATERIALS. Through these engagements, we ensure that our entire team remains updated of the latest advancements and innovations in technologies aimed at reducing embodied carbon in our projects. By staying connected with industry leaders and staying informed about emerging trends, we empower our team to make informed decisions that align with our commitment to sustainability.

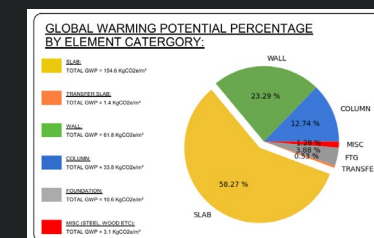
2024 ELECTIVES

1. **Engineer Engagement** The Sustainability Committee welcomes staff from all offices to join and participate. We actively share resources, presentations, and insights to ensure equal access to educational opportunities for everyone.

2. **Resource Sharing** We presented multiple webinars on embodied carbon and made our recordings available to all staff. Webinars were either developed internally, sourced externally with permission, or accessed from publicly available. Some examples include:



Arcelor Mittal
(Supplier Presentation)
August 28, 2024



STEVIE
(Internal)
September 12, 2024



Canada General Notes Updates
(Internal)
December 11, 2024

3. **Staff Onboarding** We have updated our onboarding process to include a dedicated module on Embodied Carbon, using resources such as the Embodied Carbon Video Training Series provided by the Carbon Leadership Forum (CLF). This ensures that all staff—technical and non-technical—develop a baseline understanding of embodied carbon from the start. By integrating this training, we reinforce our firm's commitment to reducing embodied carbon and embedding sustainability into our culture from day one.

4. **Embodied Carbon Interest Group** Our Sustainability Committee prioritizes embodied carbon reduction in all aspects of its work. Every meeting, initiative, and research effort considers embodied carbon reduction and its integration into our projects and practices.

5. **Internal Resource Hub** We have an intranet that has all of our existing resources for all of our staff. We've also reorganized the way the Sustainability Committee communicates and shares information - we now have a streamlined process within our Engineering Standards Committee Hub.

6. **CLF Regional Hub** Our team actively participates in CLF Regional Hub activities, including attending presentations and working sessions and sharing insights with the firm. We have also contributed to the broader conversation by sharing a case study with the CLF BC chapter, fostering knowledge exchange within the industry.

REPORTING

2024 ELECTIVES

We utilize technology to report on key data, influence industry standards, and drive continuous improvements in engineering and sustainability practices.

Our commitment to automation extends beyond enhancing internal efficiency; it's about establishing a new industry standard. This vision is embodied in our suite of tools—particularly STEVIE—that deliver essential embodied carbon reduction data with just a click. Our comprehensive approach to innovation, combined with our goal of sharing these tools with the wider design community, underscores our dedication to improving not only our own practices but also supporting the industry's broader decarbonization goals. By leveraging cutting-edge tools, technology, and promoting educational collaboration, we strive to inspire a shift toward sustainable practices, making a significant contribution to the global reduction of embodied carbon in the construction and design sectors.

DESIGN SPREADSHEETS

OUR IN-HOUSE DESIGN TOOLS INCLUDE A GWP CALCULATOR. Designers can use it in real time to assess the embodied carbon impact of their ongoing designs. This transforms the tool into a powerful resource, enabling comparisons between lower-carbon alternatives and different options for clients. Ultimately, it empowers our designers to suggest low-carbon design solutions and clearly communicate their environmental impact.

STEVIE: FOR EMBODIED CARBON VISUALIZATION

STEVIE, OR THE SUSTAINABLE TECH TOOL FOR EMBODIED CARBON VISUALIZATION OF INTEGRATED EFFICIENCY, IS A BIM-INTEGRATED TOOL DESIGNED TO AUTOMATE THE TRACKING OF EMBODIED CARBON THROUGHOUT A PROJECT'S LIFESPAN. Using the project's Revit model, STEVIE runs a life cycle assessment (LCA) with up-to-date material quantities and construction document graphics showing the project's GWP intensity and contributions from various elements. This process is repeated at key milestones, with an embodied carbon tracker and charts to visualize the carbon intensity of different structural elements, enabling targeted reduction strategies.

1. **Data Reporting** We have submitted project data to the SE 2050 Database and continually collect data throughout the year for ongoing uploads.

OF PROJECTS SUBMITTED
IN 2024:

3

SE2050 BENCHMARK VALUE -
RESIDENTIAL:

404kgCO₂e/m²

GS SUBMISSIONS
AVERAGE IN 2024:

275kgCO₂e/m²

2. **Responsible Buildings Pact** In addition to SE2050, our firm is active in the Climate Smart Buildings Alliance (CSBA) Responsible Building Pact (RBP). This voluntary agreement promotes the consistent use of lower carbon materials when appropriate, helping to bring more low-carbon options online and accelerate the shift toward sustainable building practices. Through the Pact, we aim to de-risk sustainable actions, foster shared accountability for material decisions, and raise professional standards across the industry. Our Director of Sustainability is also part of the steering committee for the Pact.

OF SUBMITTED PILOT
PROJECTS THROUGH RBP:

5

LOW CARBON CONCRETE VOLUME
RECOMMENDED THROUGH PILOT PROJECTS:

67%

3. **Embodied Carbon Project Comparison** Aligned with the company-wide measuring standard, we will have robust project data for comparison. This will be a focus for the upcoming year, with a report in the 2025 ECAP.

4. **Structural Material Quantities** We are including all structural material quantities in our submissions to the SE2050 database. We are submitting IFT or IFC projects for this purpose.

5. **Company-Wide Measuring Standard** A top priority for the upcoming year is ensuring the proper use of measuring and reporting embodied carbon data. Both our Sustainability Committee and company leaders are fully committed to this initiative.

EMBODIED CARBON REDUCTION STRATEGIES

We are committed to integrating embodied carbon reduction into our design practices and service offerings through in-house tools, GWP calculators, education, and industry collaboration.

As embodied carbon policies continue to develop across North America, the construction and engineering sectors are facing a significant challenge to adapt their methods to meet new policy and permitting requirements. For our firm, the core of this transformation lies in integrating a comprehensive embodied carbon reduction plan into both our design practices and service offerings. Through in-house technology tools, integrated GWP calculators, ongoing education seminars, and continuous collaboration within the design community, we are committed to consistently reducing embodied carbon in our design

EMBODIED CARBON REDUCTION PLAN SERVICES (ECRP)

EARLY STAGE COLLABORATION FOR OPTIMAL RESULTS. As structural engineers, we can have a much larger impact on embodied carbon if we start discussions at the earliest stages of design. Our ECRP service follows the hierarchy principles of build less, build clever, build efficiently. We start by collaborating with the client and consultant team in the early stages of project massing to discuss efficient programming stacks and structural strategies that will lead to lower material quantities long before layouts are formalized – we are not yet bound by specific outlines that can lock in inefficient structural strategies such as transfers or excessive spans. We then develop a sustainability basis-of-design that serves as a guiding framework for making low-carbon design decisions throughout the remainder of the project. This includes tracking embodied carbon at regular intervals and providing carbon budgets to material suppliers to ensure conformance to the project goals.

2024 ELECTIVES

- 1. Company Goals** Our five-year goal is to be on track for a 30% reduction by 2030 against our 2023 benchmark of 350kgCO₂e/m². In the short-term, that means understanding our benchmarks and reassessing our project intensities in the coming year.
- 2. Early Stage Workflow** We have integrated STEVIE into the workflow at SD to enable early design decisions on embodied carbon, which is crucial because these early choices—such as material selection and structural design—have the greatest impact on the overall carbon footprint. By addressing embodied carbon at this stage, we can explore low-carbon alternatives, optimize design strategies, and improve energy efficiency before the design becomes fixed. Additionally, we are developing a more accessible tool with a simplified LCA process for use before creating a Revit model, ensuring that sustainable decisions are made as early as possible in the project.
- 3. Specifications Update** We have updated our specifications to include embodied carbon performance criteria and incorporated it into our submittal review requirements. This update has been completed for our Canadian General Notes and for projects in Santa Monica to align with CALGREEN requirements. We plan to update our USA-wide general notes in the coming year.
- 4. LEED and ILFI Zero Carbon Participation** We enjoy working on a diverse range of projects and constantly challenge ourselves to meet the specific sustainability standards required, whether it's LEED certification, a target for embodied carbon reduction, or other project-specific goals.
- 5. Sustainably Harvested Biogenic Materials** We work on a variety of wood-frame and mass timber projects and specify sustainable harvesting practices in our general notes to ensure the materials used are responsibly sourced.

KNOWLEDGE SHARING NARRATIVE

We communicate our embodied carbon reduction efforts externally by sharing our successes, lessons learned, and strategies with the design community and the public.

At the core of our firm is a strong belief in the power of knowledge sharing and building community to inspire and drive sustainable change. Our impact reaches beyond our projects, influencing the communities and industries we serve. Whether through digital platforms, client presentations, or collaborative efforts, our aim is to spark and sustain a shared vision for a lower-carbon future.

ONLINE PLATFORMS

CHAMPIONING SE 2050 IN ONLINE. We actively support the SE 2050 movement by sharing embodied carbon reduction messaging on our online platforms. Through consistent updates on our website and social media, we emphasize the importance of SE 2050 and offer educational resources to increase awareness and promote understanding within our digital community.

CLIENTS

TARGETED PRESENTATIONS, TAILORED FOR OUR CLIENTELE. We engage with our clients through targeted presentations, demonstrating the feasibility and potential embodied carbon reductions that can be achieved through early design decisions. Whether it's reusing materials like existing steel beams or optimizing structural layouts and systems, we consistently advocate for embodied carbon reductions in line with SE 2050's core principles. By sharing these insights, we enable our clients to make informed choices that help reduce embodied carbon in their projects.

COMMUNITY

SHAPING THE COMMUNITIES WE SERVE WITH SUSTAINABILITY-DRIVEN COLLABORATIONS. Beyond our client relationships, our firm is deeply engaged in local communities, particularly in Vancouver and Los Angeles. In Vancouver, we actively collaborate with the CLF Vancouver chapter, contributing to community-driven initiatives that promote sustainable practices. We are also proud supporters of the Carbon Leadership Forum (CLF) BC Chapter. Our sponsorship of the 2024 Embodied Carbon Awards and participation in CLF events demonstrate our commitment to industry collaboration. We look forward to continuing our involvement with CLF and other industry leaders as we work toward meaningful change in the built environment.

2024 ELECTIVES

1. **Showcasing SE 2050 Value** As part of our commitment to spreading the word about SE2050, we ensure that both existing and potential clients are aware of our involvement in the initiative. We emphasize our pledge in all our proposals, with the hope that by seeing it regularly, clients will be reminded of the importance of embodied carbon reduction and encouraged to give it greater consideration for their projects.
2. **2050 Pledge Declaration** We are proud to be members of the SE2050 initiative and actively share our commitment through various external channels, including our presentations, online presence (social media and website), as well as our proposals.
3. **Community Collaboration and Presentations** We are proud supporters of the Carbon Leadership Forum (CLF) BC Chapter. Our sponsorship of the 2024 Embodied Carbon Awards and participation in CLF events reflect our commitment to industry collaboration. We look forward to continuing our engagement with CLF and other industry leaders as we push for meaningful change in the built environment.
4. **Government Engagement** Several members of our team engaged with local, state, and federal governments to emphasize the importance of low embodied carbon procurement and construction policies. They participated in City of Vancouver presentations on the VBBL guidelines and provided feedback on their implementation.

CASE STUDY - 4TH & MACDONALD

CHALLENGE

Achieving substantial embodied carbon reductions can be difficult in wood frame construction projects like 4th & MacDonald, where the baseline embodied carbon is already lower than a concrete or steel equivalent, leaving limited room for further impactful reductions.

PROJECT OVERVIEW

BUILDING TYPE	Market Rental Mixed-Use
LOCATION	Vancouver, BC
GROSS FLOOR AREA	99,000 SF
BUILDING HEIGHT	6 storeys
CONSTRUCTION PERIOD	January 2024 - December 2025

PROJECT TEAM

OWNER	Third Space Properties
ARCHITECT	Yamamoto Architecture
STRUCTURAL ENGINEER	Glotman Simpson
GENERAL CONTRACTOR	Axiom Builders
MECHANICAL & ELECTRICAL ENGINEER	Rocky Point Engineering and Nemetz
LCA CONSULTANT	Priopta



The 4th & MacDonald mixed-use wood frame project demonstrates further cost savings and carbon reductions through optimized structural design, as detailed in a case study by the Carbon Leadership Forum's British Columbia chapter (CLF BC).

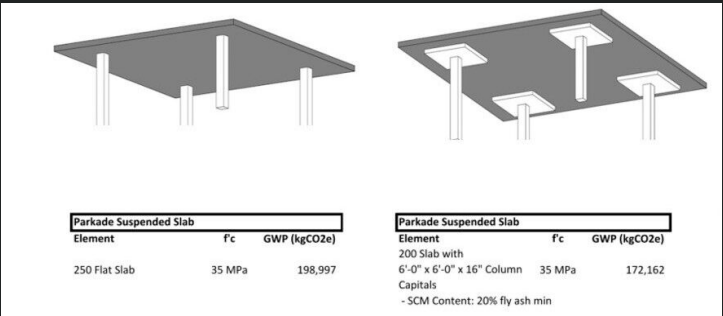
This case study is based on content from the Carbon Leadership Forum British Columbia (CLF BC): "4th & MacDonald: Cost Savings and Carbon Reductions through Optimized Structural Design."

Read the full case study at CLF BC's website: <https://clfbritishcolumbia.com/4th-macdonald-cost-savings-and-carbon-reductions-through-optimized-structural-design-1119/>

SOLUTIONS

The life cycle assessment revealed that concrete structures accounted for over 90% of the building stucture's embodied carbon despite accounting for less than 50% of the floor area. We focused on the optimization of the following components:

- Spread Footings** By incorporating additional steel reinforcement (stirrups), the footing depth was reduced by nearly 40%, resulting in an estimated carbon reduction of approximately 12,000 kgCO₂e and cost savings around \$30,000
- Parkade Slabs** Transitioning from a standard 10-inch flat slab to an 8-inch slab with 6'x6'x16" DP column capitals led to an estimated carbon reduction exceeding 26,000 kgCO₂e. This modification was cost-neutral, with initial estimates suggesting a potential \$5,000 savings.



- Level 2 Transfer Slab** The original plan to replace an 18-inch monolithic slab with a 10-inch slab complemented by 28-inch transfer beams was projected to reduce carbon emissions by approximately 66,000 kgCO₂e. However, due to zoning constraints related to building height, this strategy was adjusted to a 2-inch slab reduction, achieving an 18,000 kgCO₂e reduction and saving about \$30,000.

While the overall percent reduction of embodied carbon at 4th & MacDonald of 9% is not drastic, it is not insignificant as a finite reduction in carbon, especially in the context of wood frame construction that typically has lower embodied carbon to start with.

By focusing on optimizing structural components and carefully assessing material use, the project team successfully balanced environmental responsibility with economic feasibility.

2024 LESSONS & 2025 GOALS

In 2024, we uncovered key lessons that will strengthen how we approach embodied carbon moving forward.

As part of our ongoing commitment to reducing embodied carbon across our projects, 2024 served as a pivotal year of experimentation, collaboration, and insight. Through hands-on application, internal initiatives, and strategic partnerships, we identified several opportunities to enhance our approach—from refining the tools we use to elevating early-stage design conversations. The following key learnings capture the most impactful observations and outcomes from this year, and will serve as a foundation for strengthening our embodied carbon strategy moving forward.

1. **Traction** is improved with more frequent and digestible posts for our blogs as this keeps our audience consistently engaged and returning for more content.
2. Using **Tally** is not feasible for most of our projects, as it requires significant training and time. A simpler, more focused tool aligned with GS' modeling and building standards will improve project participation in embodied carbon tracking.
3. **Internal education** is key to improving conversations with developers, architects, and contractors. Building a centralized library of information will help us deliver consistent messaging and guidance.
4. Studies conducted in **partnership** with others yield more actionable findings, as they reflect a broader range of inputs.
5. **Early design decisions** made under our embodied carbon reduction plan led to more significant carbon savings than later-stage optimizations. Expanding these early discussions will enable us to drive more meaningful reductions.

In 2025, we're making bold strides in sustainability as we reach the halfway mark between 2000 and 2050.

As we approach the midpoint between 2000 and the critical 2050 decarbonization target, 2025 marks a turning point for sustainability at GS. With momentum building from our past progress, this year will see the launch of new tools, expanded internal resources, and deeper integration of embodied carbon thinking across our practice. From monthly check-ins to major reporting milestones and targeted studies, our 2025 goals are designed to equip our team with actionable insights and drive measurable change across our projects.

1. Publish **monthly** On Track articles throughout 2025 to share updates, insights, and milestones on our embodied carbon journey.
2. Launch our in-house **LCA tool**, purpose-built to align with GS's Revit standards and provide rapid feedback to engineers and sustainability consultants during both schematic and detailed design phases. We will run the majority of IFC projects in 2025 through this tool to update GS's embodied carbon baseline
3. Continue releasing our SE2050 ECAP and RBP reporting data reinforcing **transparency** and commitment to industry-wide collaboration.
4. Expand our **general notes** to ensure all U.S. projects reflect embodied carbon considerations consistently.
5. Develop in-house embodied carbon **guides** (including flowchart and infographics) for engineers to use as quick-reference tools during design and coordination.
6. Continue a range of sustainability-focused **studies**, both internally and in partnership with external collaborators, to explore new strategies and validate emerging approaches.
7. Add a more robust embodied carbon section to the employee handbook and general **onboarding** process, including CLF intro video modules for engineers and a lite-version tailored for non-engineers.



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