



# 2024

## Embodied Carbon Action Plan

# Introduction

This document contains WHM’s short and long-term action plans in pursuing sustainability and in educating our team members and partners to purposefully incorporate more sustainable design practices. WHM supports SEI’s vision that “all structural engineers shall understand, reduce, and ultimately eliminate embodied carbon in their projects by 2050.”

As structural engineers, we play a crucial role in the development of greener built environments. Incorporating sustainable strategies at a structural level contributes to a lighter ecological footprint overall and allows us to affect change at a base level. We understand that, as members of the engineering community, it is our duty to build safe, sustainable, and efficient structures for our community. We have witnessed the benefits of constructing Net Zero and Passive House buildings, as well as the consequences of neglecting to address environmental issues, and thus, we commit to contributing to more efficient and sustainable designs.

WHM has already been implementing carbon reduction strategies during the design development stage of certain projects, such as systematic exploration of design possibilities and material selection to maximize structural efficiency. As we join the SE 2050 Commitment Program, we will endeavor to further develop more detailed and project-specific strategies that will help reduce environmental impact for a more sustainable future.

## Summary of SE 2050 Deliverables

- **Education Plans**
- **Knowledge Sharing Narrative**
- **Reporting Plans**
- **Embodied Carbon Reduction Strategies**
- **Advocacy Plans**
- **Lessons Learned**

# Sustainability Team

WHM's Sustainability Team was formed in the summer of 2023. Calling themselves The De-Carbonators, this team of inspired and passionate engineers will intensify WHM's sustainability efforts by leading the charge and facilitating the sharing of knowledge and resources with the team and our external partners.



Jordan Ju



Emma Zhang, P.Eng., MEL



Graham Taylor  
Embodied Carbon Champion



Jules Yap



Jason Hsin

*Inspired team that is passionate about sustainable design and efficient structures*



# Education Plan

Creativity and innovation are at the heart of WHM’s corporate values. The company has always promoted those values by providing its team members opportunities for growth in knowledge and experience through mentoring and regular professional development programs. As part of the SE 2050 commitment, WHM will provide resources and learning opportunities to raise awareness and teach about embodied carbon.

Committed Tasks	Status	Implementation
Distribute an Internal Announcement announcing your firm’s pledge to join SE 2050 along with embodied carbon resources.	Complete	A Sharepoint folder is created where WHM team can access information and resources about embodied carbon and sustainability strategies.
Select and nominate an internal embodied carbon champion.	Complete	Graham Taylor has been appointed as WHM’s Embodied Carbon Champion.
<b>Elective</b> Provide a narrative of how the Embodied Carbon Reduction Champion will engage embodied carbon reduction at each office.	Ongoing	WHM continues to commit to self-education, research, resource gathering, and knowledge sharing within the company. The Embodied Carbon Champion will help facilitate company-wide education programs and get the sustainability momentum going.

<p><b><u>Elective</u></b>          Incorporate embodied carbon education in your onboarding process for all new employees.</p>	<p>Started</p>	<p>WHM will integrate webinar content with Continuing Education (CE) plans. WHM has planned webinar content for the next quarter.</p>
<p><b><u>Elective</u></b>          Present at least (1) webinar focused on embodied carbon and make a recording available to employees.</p>	<p>Started</p>	<p>WHM is planning to set up webinars as part of the onboarding process for new employees, along with reading employee handbooks and setting up personal information in the system.</p>
<p><b><u>Elective</u></b>          Train all of your firm's structural engineers on the core concepts and skills required to measure, reduce, and report embodied carbon. (Ref. SE 2050 Resources)</p>	<p>Ongoing</p>	<p>WHM will include carbon reduction as part of core values. We will integrate webinar content with CE plans, and invite industry professionals or the De-Carbonators to present during Lunch and Learn. Additionally, the Sharepoint folder will be made available to the rest of the WHM team to access and use as a resource.</p>
<p><b><u>Elective</u></b>          Initiate an embodied carbon interest group within your firm and outline their goals. This group may more broadly address sustainability, but they must include embodied carbon.</p>	<p>Started</p>	<p>A shared portal containing carbon-related data and sustainability resources has been created for the WHM team. Interested groups may also be engaged to address alternative design challenges of specific projects to improve sustainability.</p>
<p><b><u>Elective</u></b>          Create an Embodied Carbon digital resource wiki and/or forum on your firm's internal website for staff to create, share, and discuss Embodied Carbon educational resources.</p>	<p>Ongoing</p>	<p>Aside from a Sharepoint folder mentioned, WHM will also open a Team Chat or internal forum where the team can discuss research findings/case studies internally.</p>
<p><b><u>Elective</u></b>          Provide narrative outlining plans for minimum (2) firm-wide presentations per year on the topic of embodied carbon</p>	<p>Ongoing</p>	<p>De-Carbonators have coordinated with Lunch and Learn coordinator/Professional Committee to engage with industry professionals on embodied carbon to deliver at least 2 presentations per year.</p>



## Knowledge Sharing Narrative

Part of our knowledge-sharing strategy is to develop an Education Influence System (EIS) which will engage our clients, industry partners, and the rest of our community for deeper conversations about carbon reduction strategies and how to implement them.

Spearheaded by the De-Carbonators, WHM will facilitate research on various construction materials and distribute and discuss findings through round-table meetings, shared portals and online channels.

# Reduction Strategies

One of the key factors to reducing embodied carbon in our future building projects is to promote sustainable options with external consultants and to increase in-house design efficiency. We will work with clients and architects to incorporate more sustainable materials, such as mass timber, low carbon concrete, and suggest other strategies, whenever possible. We will continue to improve our structural designs to optimize material use. We will also engage contractors to collect data to build our database for embodied carbon resources to further optimize our design approach moving forward.

Committed Tasks	Status	Implementation
<p><u>Elective</u> Develop and implement a workflow that makes it easier to make early design decisions based on embodied carbon.</p>	Started	A workflow will be formalized in a reference document that addresses embodied carbon reduction strategies during the different stages of the project.
<p><u>Elective</u> Communicate the embodied carbon impacts of different design options to clients with creative and effective data visualization.</p>	Started	We continue to utilize software, such as Revit, AutoCAD, and Excel to visualize impact of sustainable design decisions.
<p><u>Elective</u> Compare different design options with embodied carbon as a performance metric during the project concept phase.</p>	Ongoing	We have used and will continue to use SE 2050's ECOM (Embodied Carbon Estimator) in our pursuit of institutional projects.
<p><u>Elective</u> Incorporate sustainably harvested biogenic materials in at least one project.</p>	Ongoing	We are currently working on several wood-frame and mass timber buildings, such as a commercial building on 101 West 6 <sup>th</sup> , West Kelowna City Hall, and SFU Residence Phase 3.

# Reporting Plan

WHM will utilize existing software, such as Revit and embodied carbon calculators, to measure, track, and report embodied carbon. For projects requiring life-cycle analysis or embodied carbon calculations for third parties, such as LEED, CAGBC's Zero Carbon Building Standard and/or the City of Vancouver, we will refer to OneClick Life Cycle Assessment tool.

Committed Tasks	Status	Implementation
<b><u>Elective</u></b> Submit a minimum of (2) projects per U.S. office with structural engineering services to the SE 2050 Database.	Complete	WHM will continue to provide project data for the upcoming years.
<b><u>Elective</u></b> Describe how different project teams or managers are measuring and reporting embodied carbon.	Ongoing	WHM has started to measure and report embodied carbon by leveraging software and engaging with contractors/developers of the project team.
<b><u>Elective</u></b> Compare the embodied carbon emissions from multiple projects across your firm. Analyze and document what data or pieces of information are most important and communicate the findings to your firm.	Ongoing	The 2023 project data spreadsheet has allowed comparisons of embodied carbon emissions from selected concrete and wood projects. These findings will be shared with the whole WHM team.
<b><u>Elective</u></b> Propose other actions that promote the reporting of embodied carbon data and describe their value.	Not Yet Started	We will provide case studies to peers to show the significance of tracking.



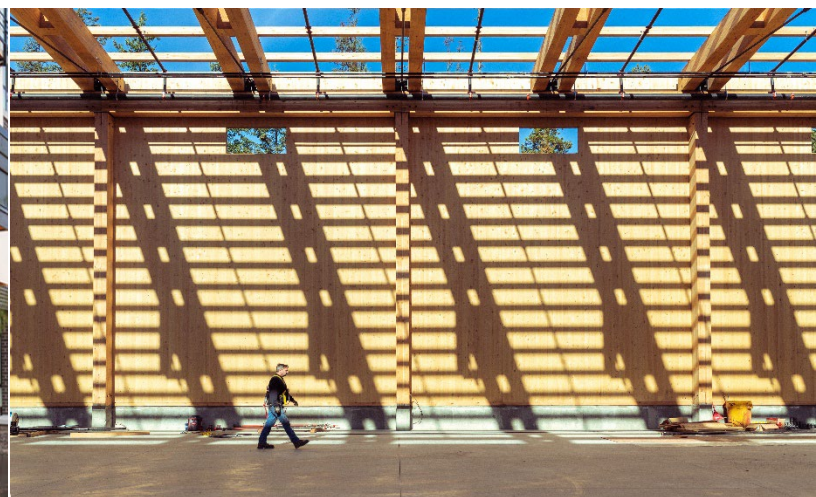
# Advocacy Plans

While efficient and sustainable structural designs are paramount, our efforts alone will not be enough to reduce embodied carbon in our structures. We will need the help and support of other consultants, our partners, the government, and the rest of the community to accelerate the shift to more sustainable practices.

Committed Tasks	Status	Implementation
<u>Elective</u> Describe the value of SE 2050 to clients and partners.	Started	We have issued an external announcement to our clients about our SE 2050 commitment. We will also integrate this in our email signatures.
<u>Elective</u> Publicly declare WHM as a member of the SE 2050 Commitment.	Complete	WHM's SE 2050 Commitment has been stated on our website and included in our marketing materials.



We anticipate the road to embodied carbon reduction will be long and filled with many challenges, but the opportunity to make a difference is greater, and we are looking forward to the progress our collective efforts will achieve.





## Lessons Learned

A year of committing to SE 2050 has taught us plenty of lessons on embodied carbon – its definition, calculation methods, reduction strategies, and life cycle analysis. We also learned how we can influence the industry in making more sustainable design choices through knowledge sharing and advocacy.

While we can influence our clients to opt for more sustainable design in their projects, we are also aware of the limitations of our scope and how far we can push the envelope. However, we are optimistic that our combined industry efforts, along with community support and government directive, we will be able to create more impact and reach our sustainability goals.

We will continue our firm-wide education and knowledge-sharing initiatives throughout the year. Last year, we promoted the use of mass timber through podcasts, social media, and client presentations. We will increase mass timber promotion this year and initiate more client dialogues to encourage adoption of this sustainable material.