

Embodied Carbon Action Plan

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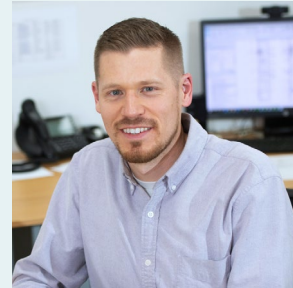
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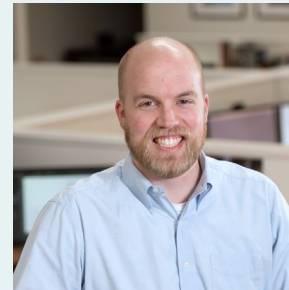
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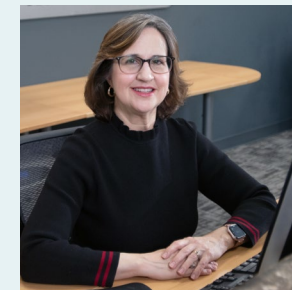
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In our first year of SE2050 commitment, each of us learned that we have a key role in reducing carbon emissions.

We continue to learn and develop our knowledge as we enter Year Two.



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Summary

1 Introduction



Sustainable Goals

As Hope Furrer Associates enters our second year of commitment to SE2050, we continue to support the vision that all structural engineers shall understand, reduce, and ultimately eliminate embodied carbon in our projects by 2050, as stated in our initial Commitment Announcement.



2 Education



Year 1 Review

Last year, we detailed the following program aimed at basic education for our engineers and designers.

- 11/09/22: Shared the SE2050 library of resources with technical staff by sending links and downloading files to our network.
- Jan-Apr 2023: Presented several webinars to all technical staff, including a few from the “Embodied Carbon 101” series
- 04/15/23: Distributed our Embodied Carbon Action Plan to all technical staff
- Apr-Oct 2023: Approximately one-half of staff members tested various LCA tools and generated data for our four first projects entered into the database.

Lessons Learned

- As a company, we became familiar with the terms and many acronyms associated with embodied carbon.
- Beacon add-in for Revit quickly became our first choice as an LCA reporting tool. However, we have found that it is only supported up to Revit 2022. As our projects transition to Revit 2023 and beyond, we will need to become more comfortable with the other LCA tools available.
- Within Revit, the material assignments are specific to each element, and manipulation of materials as a group is time consuming. This needs to be considered early-on in modeling.
- The ability to make changes during design while meeting the schedule and staying within the project’s budget continues to be a major challenge. We need to continue to track and learn from others in order to make impactful recommendations without affecting schedule or budget.



Education Program

EMBODIED CARBON REDUCTION FOR STRUCTURAL ENGINEERS

All employees are continually learning more – this includes determining how to revamp specifications to reduce embodied carbon in concrete, how to consider ideal layouts to reduce waste, how to design in new materials, or how to work on better ways to specify structural elements. The objective for education is implementation.

For our second year as a firm committed to the SE2050 movement, we plan to build our library of details and specifications, to standardize our methods of tracking embodied carbon, and to communicate goals to builders and owners.

This is consistent with an SE2050 goal for structural engineers to become leaders in this field.



Assign an employee to review two or more Case Studies from the SE 2050 Database to summarize and present to the firm. A minimum of two presentations will occur per year, one created from each office.



Create an internal Technical Memorandum “SE2050 Tracking” for use by all technical staff members.



Create a task group dedicated to creating new or editing our current typical details to be more in line with lowering embodied carbon.



4/1/2024 Distribute our Embodied Carbon Action Plan 2024 to all technical staff.

3 Reporting

Hope Furrer Associates entered four projects into the SE2050 database for Year 01. We selected representative projects in various stages, for purpose of establishing some baseline data as we look forward to Year 02.

Project	Area / Stories	Use	Phase	System	GWP Intensity (kgCO2e/m2)
NEW Confidential Project A	219,313 SF / 7 stories	Office	Design Development	Composite Steel	223.85
NEW Confidential Project B	400,000 SF / 10 stories	Office	Design Development	Composite Steel	245.02
NEW Towson University College of Health Professions	254,184 SF / 7 stories	Education	Construction	Reinforced Concrete	346.17
RENOVATION Salisbury University Blackwell Hall	95,700 SF / 3 stories	Office	Concept	Other	35.65



Reporting Methodology

EMBODIED CARBON MATERIAL MODELING

HFA will continue to utilize the Revit Add-in Tool, “Beacon” for LCA reporting. In Year 01, we learned that the accuracy of materials in our model is important in performing an LCA. We generated an internal technical memorandum to aid engineers and drafters in consistent material assignments for modeling and tracking.



Material templates will be created for use within Revit.



Projects utilizing versions of Revit up to Revit 22 will continue to be reported with Beacon between the Design Development and Construction phases. EC3 will be utilized for projects at the Concept phase.



In the interest of learning from our “Baseline Projects”, we will attempt to select projects with similar systems, composite steel and concrete to report within the coming year.



Two projects from each office, (four total) will be reported to the Database within the coming year.

4 Reduction



Year 1 Review

Last year, we learned of successful strategies for reduction.

- We collaborated with concrete suppliers to reduce embodied carbon in mix designs.
- We updated our concrete specifications to include what we learned.
- Two of our employees toured a CLT manufacturing facility to gain a better understanding of how CLT and Mass Timber can be used efficiently in our designs.
- We investigated how using higher strength steel in our designs impacted the overall weight of steel for the entire building.

Lessons Learned

- Since it was our first year, we focused more on education and establishment of a baseline than on reduction. We need to review and analyze what we have learned in order to determine an effective strategy.
- Our best opportunity for changing the embodied carbon impact in concrete is by development of specifications that are a requirement prior to selection of the contractor.
- Owners and developers need to be on-board with specification requirements, so that fewer exceptions are granted during the bid process.



5 Advocacy



Year 1 Review

Last year, we:

- Shared our commitment to SE2050 on our website in the “News” section.
- Shared a presentation on “How to create and ECAP” with SEI Maryland Chapter members

Lessons Learned

- We are a small consulting company and so we do not often have complete control over proposal language. However, there are other things we can do to increase our public promotion of SE2050. We will focus on items more within our control for our year 2 commitment.
- Creating and sharing a presentation was a great strategy that engaged other structural colleagues within our region. We were able to show ourselves as leaders in the field and inspire others to involve their companies. We will continue to look for opportunities for future presentations.



How did Year 01 Go?



6 Summary

Lessons Learned IN OUR INAUGURAL YEAR OF SE2050



Our Year 01 Elective Topics	Description	Completed?	Lessons Learned
Education	Created and distributed our first ECAP and shared resources with all technical staff	YES	Creating the ECAP was a group effort. Items with full buy in and that were assigned to a specific person have the most chance of being successfully completed.
Education	Presented 3 introductory webinars about EC for Structural Engineers to all technical staff.	YES	The webinars were presented in early stages of EC tracking. Well received, but we would like to have a similar quantity of webinars spaced throughout the year for more continuous exposure of the topics.
Reporting	Submit a minimum of (2) projects per office (total of 4) to the SE2050 Database	YES	Creating LCA and updating database are easy, and we want to involve more personnel in the process for next year.
Reduction	Collaborate with a concrete supplier to reduce embodied carbon in a mix design.	Indirectly	We have projects with EPDs but concrete suppliers either are or are not implementing the changes on their own, depending on their capabilities. Concentrating on specifications and owner coordination may be more effective for us.
Advocacy	Describe SE2050 value to clients: Share our commitment on website and marketing materials, including boilerplate proposal language.	Partially	We include the announcement of our commitment on our website, but do not have ability (in general) to add this to proposals. There are things we can do, however, and will increase SE2050 exposure in marketing.
Advocacy	Share a presentation on "How to create an ECAP" with SEI Maryland Chapter members	YES	There is lots of interest from other structural engineers, but many are hesitant to take the first steps. Webinar well received.

Year 2 Electives

Topic	Description	Status
Education	Provide a narrative of how the Embodied Carbon Champion will engage carbon reduction at each office. (required)	Completed
Education	Create (2) Webinar Presentations, (1) from each office, which summarize the findings of Case Studies from the SE 2050 Database and share with all employees. (required)	Scheduled for June and October of 2024
Education	Create an HFA Tech Memo on Embodied Carbon Tracking for use by all employees.	In progress.
Education	Create a task group dedicated to creating new or editing our current typical details to be more in line with lowering embodied carbon.	Scheduled to be completed by December of 2024
Reporting	Submit a minimum of (2) projects per US office (total of 4) to the SE2050 Database (required)	Scheduled to be submitted by June of 2024
Reporting	Analyze & document the data from Year 01 Projects to determine what pieces of information are most important and communicate the findings to all employees.	Scheduled to be completed by December of 2024
Reduction	Short term - Develop & implement a workflow that makes it easier to make early design decisions based on embodied carbon.	Scheduled to be completed by December of 2024
Reduction	Long term - Continue to collaborate with concrete suppliers to reduce embodied carbon in a mix designs.	In progress
Advocacy	Add the SE 2050 logo to our signature files. (required)	Completed
Advocacy	Add language noting our continued participation and commitment to SE 2050 to our website. (required)	Completed

