

Embodied Carbon Action Plan

HOPE FURRER ASSOCIATES, INC.



HOPE FURRER
ASSOCIATES

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Our Company



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As HFA enters its fourth year of commitment to the SE2050 goal of net zero, we continue to expand our application and understanding of embodied carbon reduction methods.

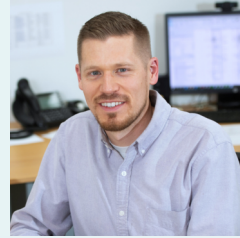
We strive to increase our education and advocacy year over year.



*Hope Furrer
Principal*



*Melissa Harmon
Principal*



*Tyler Graybill
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*Christopher Gerding
Project Engineer*



*Sherri Meisel
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Embodied Carbon Champion*



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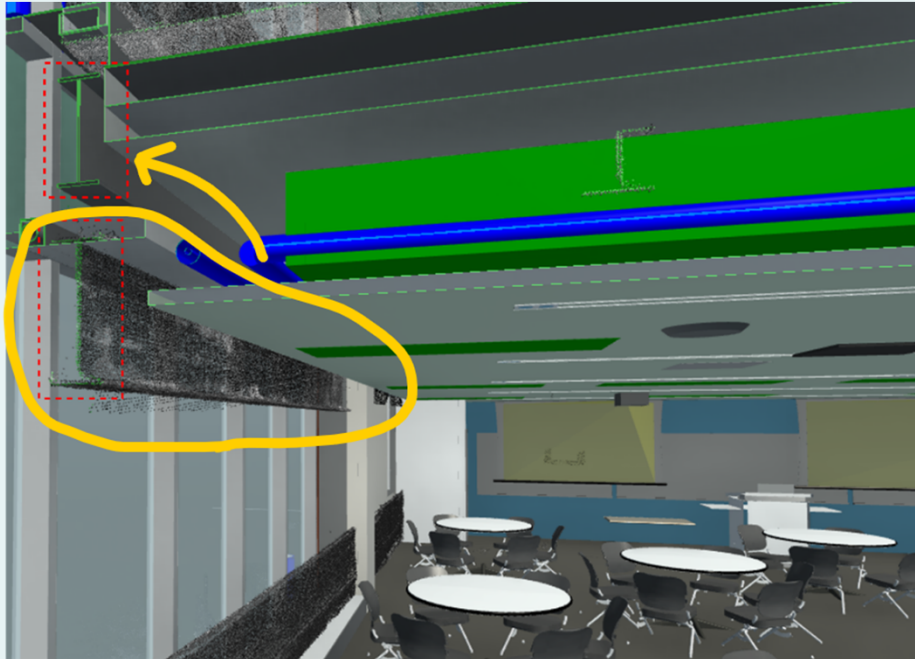
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STRUCTURAL
ENGINEERING
INSTITUTE



1 Introduction



Sustainable Goals

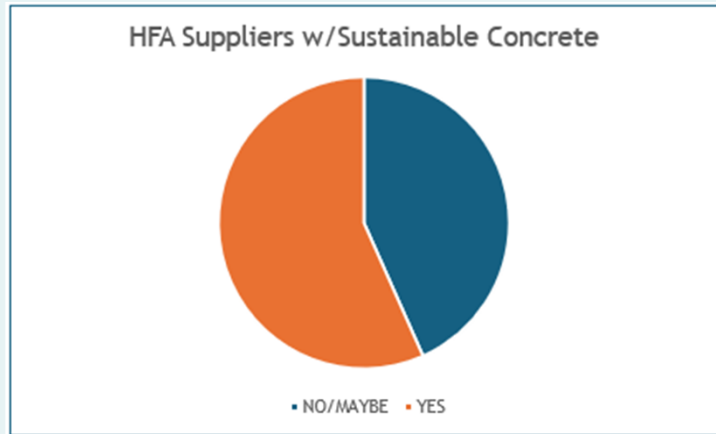
As Hope Furrer Associates enters our fourth year of commitment to SE2050, we continue to support the vision that all structural engineers shall understand, reduce, and ultimately eliminate embodied carbon in our projects by 2050, as stated in our initial Commitment Announcement.

We continue to make progress modifying our internal tools, processes, and details to reduce carbon emissions, and we are learning from our colleagues who have shared their case studies and best practices in SE2050 meetings.

We are advocating the re-use of existing structures when possible, which often includes finding unique solutions to problems presented when differences between existing drawings and field conditions appear. Recently we reused an existing steel beam to support new concrete on metal deck.



2 Education



Year 3 Review

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

- ✓ April 2025: Distributed our Embodied Carbon Action Plan to all staff
- ✓ August 2025: Held Webinar Presentations for all technical staff summarizing the benefits of high strength steel in reducing embodied carbon.
- ✓ October 2025: Held Webinar Presentation for all technical staff reviewing the most recent AIA 2030 progress report
- ✓ February 2026: Discussed findings from engagement with local concrete suppliers

Lessons Learned

- We explored the role that high-strength materials can take in reducing embodied carbon.
- We learned that Embodied Carbon does not take as much of a forward role in the AIA 2030 effort as we believed. However, we noted several clients we can collaborate with on effective EC modeling.
- There are more suppliers with sustainability listed on their websites, and EPDs are widely available compared with previous years. We do not often receive these as a structural submittal. We question accountability – what incentive/consequences should be employed to ensure targets are reached?

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 fourth year as a firm committed to the SE2050 movement, we plan to add sustainability language to our design standard, grow our understanding of local industry EPD metrics, and engage in local sustainability conversations. This is consistent with an SE2050 goal for structural engineers to become leaders in this field.



April 2026: Provide a narrative of how the Embodied Carbon Champion will engage carbon reduction at each office.



June 2026: Create technical memo consolidating embodied carbon material data and share with employees.



August 2026: Create/Stream (1) webinar focused on how to navigate and use the Building Transparency EC3 tool



October 2026: Engage with a CLF Regional Hub – Pittsburgh, Philadelphia, D.C.

3 Reporting

Hope Furrer Associates entered four projects into the SE2050 database for Year 03. We selected a variety of building use to evaluate impact on global warming potential. We look forward to growing our project volume in the database in Year 04.

Project	Footprint Area / Stories	Use	Phase	System	GWP Intensity (kgCO2e/m2)
NEW Gilman Music Hall	27,192 SF / 2 stories	Public Assembly	Construction Documents	Composite Steel with Braced Frames	263.2
NEW GMU RAC Addition	45,969 SF / 2 stories	Education	Design Development	Composite Steel with Braced Frames and Masonry Shear Walls	215.9
NEW Coppin State Housing	21,216 SF / 6 stories	Multi-Family Residential	Construction	Long-span Deck with CFMF Walls on Steel Podium with Concrete Shear Walls	184
NEW PSU ADL	44,567 SF / 2 stories w/ partial basement	Lab	Construction Documents	Composite Steel with Masonry Shear Walls	197



YEAR 2 AVERAGE: 211 kgCO2e/m2
+4kgCO2e/m2

YEAR 3 AVERAGE: 215 kgCO2e/m2

YEAR 2 TARGET: 211 kgCO2e/m2
-4kgCO2e/m2

YEAR 3 TARGET: 207 kgCO2e/m2



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Reporting Methodology

EMBODIED CARBON MATERIAL MODELING

HFA adopted our own procedures along with the ECOM Tool developed and maintained by the SE2050 Committee for Embodied Carbon calculations by our office in Year 03.

In Year 04, our internal documentation has evolved to further break down materials by usage, as required for database entry. HFA uses open-source backup information that SE2050 makes available publicly. The changes will facilitate more accurate reporting of the sustainable specifications as utilized on our projects for comparison with structures all over the country.



HFA's Revit Templates include material names that conform to ECOM designations, and include all types of structural elements meeting standard specifications.



Material quantities are exported from Revit into an internal HFA spreadsheet for data entry. The spreadsheet converts units into those used by ECOM, and we will input the results into the ECOM Tool for EC calculations.



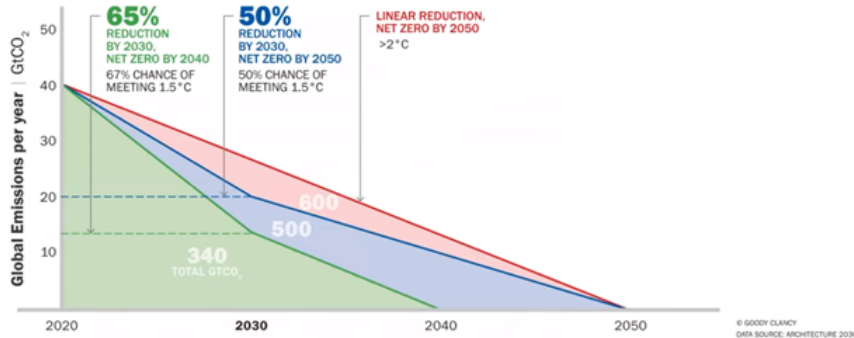
We continue to learn from about our baseline project GWP Intensity. As we add more projects to the database our understanding of industry trends and our own building portfolio evolve.



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

4 Reduction

The Next Decade is Critical



Source: Goody Clancy, Architecture 2030



MEMORANDUM

To: Internal File
From: Melissa A. Harmon, PE, LEED AP BD+C
Hope Furrer Associates, Inc.
Date: March 17, 2025
RE: SE2050 – Embodied Carbon Reduction Workflow

Archived Versions:

Title	Date	Summary of Revisions
None	---	---

This memo is in response to our SE2050 goal to: Develop & implement a workflow that makes it easier to make early design decisions based on embodied carbon (EC).

Below are items that should be considered in each design phase:

Year 3 Review

Last year, we completed the following program for Embodied Carbon emission reduction:

- ✓ Short Term Goal: 4 kgCO₂/m², approximately 2%.
 - Actual gain +4 kgCO₂/m²
- ✓ Long Term Goal: 10% reduction by Year 07 (2030), or approximately 190 kgCO₂/m² average.
- ✓ Implement Carbon Emissions Reduction Workflow

Lessons Learned

- While our total GWP intensity is below the SE2050 database average, we did not meet our GWP intensity reduction goal for Year 3. But we learned that our initial HFA baseline GWP intensity may not be as reliable as we thought given our small sample size. As we and other engineers add projects to the database, a more accurate picture of our reduction goals will emerge.
- Following our Carbon Emissions Reduction Workflow has generated valuable discussions with clients about the SE2050 commitment and embodied carbon reduction.



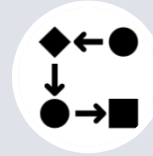
Reduction & Advocacy

REDUCING EMBODIED CARBON
AND SHARING STRATEGIES

HFA plans to build upon the progress and successes of past years, and to develop new strategies as we move forward.



Strive for an average of 208 kgCO₂e/m² for our projects reported in Year 04, keeping us on track to reach 190 kgCO₂e/m² by 2030.



Update our specifications and design standard to incorporate embodied carbon performance, and compare design options with embodied carbon as a performance metric.



Have firm leadership participate in LEED project meetings and SE2050 quarterly signatory calls.



Describe the value of SE2050 to Clients, using our website, LinkedIn, and other social media to publicly declare HFA as a member of the SE2050 Commitment



Volunteer as a Guest Lecturer for students, presenting projects that have a reduced carbon footprint.

5 Advocacy



Amy Saar Barabas • 1st
Principal at Hope Furrer Associates, Inc.
2w •

Last week I had the opportunity to speak as a guest lecturer before the AE 222 students within the Penn State Architectural Engineering program. Part of this course focuses on introducing various types of structural building materials and systems. My presentation focused on the EDI building, a building that the students are very familiar with, and I was happy to talk about hybrid steel and CLT, and to mention a few pointers on methods to reduce embodied carbon. [Penn State College of Engineering Penn State Department of Architectural Engineering Xiaohui \(Sophia\) Wang](#)



You and 27 others

1 comment • 2 reposts

Year 3 Review

Last year, we completed the following program for Embodied Carbon emission reduction:

- ✓ We maintain the SE2050 logo on our signature files on all staff emails.
- ✓ We maintain our commitment to SE2050 on our website [<https://hfurrer.com/about/>].
- ✓ We continue to guest lecture to Penn State students within the Architectural Engineering program about various projects and touch on Reducing our Carbon Footprint.

Lessons Learned

- Reaching out to students is an excellent way to encourage reducing carbon in design. Providing them with a real-world example of biogenic carbon in CLT, and how wood, concrete, and steel work together to achieve project goals.

OUR COMMITMENT

Hope Furrer Associates, Inc. is committed to providing structural engineering services with sensitivity to the architectural design objective. The firm pursues complete client satisfaction through strong design talent and an understanding of the client's needs. By utilizing a personalized approach to each building type, we provide high-quality services which are designed to meet the requirements of a diversified client base.

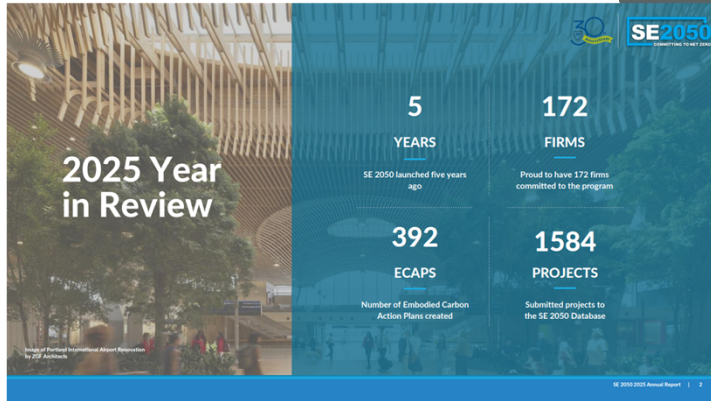
As Hope Furrer Associates enters our second year of commitment to SE2050, we continue to support the vision that all structural engineers shall understand, reduce, and ultimately eliminate embodied carbon in our projects by 2050, as stated in our initial Commitment Announcement.



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How did Year 03 Go?



6 Summary Lessons Learned



Our Year 03 Elective Topics	Description	Status	Lessons Learned
Education	- EC Champion narrative - High Strength Steel Webinar - AIA 2030 Report Review - Concrete Supplier Engagement	☒ ☒ ☒ ☒	The number of clients and suppliers participating in embodied carbon reduction is growing and HFA has created and collected a number of resources to help us understand where the industry is, and where it is headed.
Reporting	- Submit a minimum of (2) projects per office (total of 4) to the SE2050 Database. - Include all structural material quantities in our SE2050 Database submissions.	☒ ☒	Every project added to the database increases our understanding of how project size, building use, and structural system impact embodied carbon quantities.
Reduction	- Short term reduction goal: 4 kgCO₂/m², ~ 2%. Long term reduction goal: 10% by 2030 - Begin implementation of our Carbon Emissions Reduction Workflow, which was developed in Year 02 as a reduction elective.	☒ ☒	Our progress with GWP reduction is tied to industry standards, and we continue to learn what is possible on a year to year basis.
Advocacy	- Describe SE2050 Value to Clients - Publicly Declare HFA as a member of the SE2050 Commitment - Guest Lecture at PSU	☒ ☒ ☒	Communicating our commitment to SE2050 has generated the occasional question from a client or design team member. We may be ready to take a more directed step towards advocacy.

Year 04 Electives



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Topic	Description	Status
Education	Provide a narrative of how the Embodied Carbon Champion will engage carbon reduction at each office. (required)	☆☆☆
Education	Create (1) webinar focused on embodied carbon to be presented live to all employees and make an externally created recording available to all employees. (required)	★☆☆
Education	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.	★★☆
Education	Engage with a CLF Regional Hub.	★★☆
Reporting	Submit a minimum of (2) projects per US office (total of 4) to the SE2050 Database (required)	★☆☆
Reporting	Include all structural material quantities in our SE2050 Database submissions.	★★☆
Reduction	Short term – Clearly stated reduction target to meet by 2027: We are targeting a 4 kgCO2/m2 reduction in Year 04. (required) Long term – Clearly stated reduction target to meet by 2030 or later: 10% reduction by Year 07 (2030), approximately 190 kgCO2/m2 average. (required)	★★☆
Reduction	Update Specifications to incorporate embodied carbon performance. Include embodied carbon in your submittal review requirements.	★★☆
Reduction	Participate in a LEED, ILFI Zero Carbon, or similar project design charrette and speak to potential design considerations impacting embodied carbon.	☆☆☆
Reduction	Integrate embodied carbon mitigation strategies in general notes.	☆☆☆
Advocacy	Describe the value of SE2050 to Clients. Attach any associated marketing materials. (required)	★★☆
Advocacy	Publicly declare HFA as a member of the SE2050 Commitment using our website, LinkedIn, or other social media. (required)	★★★
Advocacy	Continue to volunteer as a Guest Lecturer for the Architectural Engineering program at Penn State, presenting projects that have a reduced carbon footprint.	☆☆☆
Advocacy	Have a firm leader participate in one or more SE 2050 Quarterly Signatory Call	★★☆

KEY:

- ★★☆☆ Scheduled
- ★★★☆☆ Partially complete
- ★★★★ Completed

