



EMBODIED CARBON Action Plan

2021

Submitted August 6, 2021

Keast & Hood's Commitment

Keast & Hood joined the SE2050 commitment in February of 2021 because climate change is one of the defining issues of our time, with repercussions on the environment, society, and the global economy.

The construction industry alone was responsible for more than a third of global carbon emissions contributing to climate change in 2019. As engineers, we have a responsibility to consider the impact of our work and fight this urgent threat. Engineers must rise to this challenge together – this monumental task demands collaboration, cooperation, and innovation across our industry.

We fully support the challenge of the SE2050 program to reduce embodied carbon in our structures to net zero by 2050. The resources and sharing of knowledge between firms in the program will allow the profession to more-quickly understand the carbon impact of our designs and take proactive steps towards reduction.

the role of engineers as advocates for change. While quantifying and reducing carbon is a large part of the program, to truly accelerate change we must educate clients, owners, and policy makers on sources of embodied carbon and strategies to incentivize reduction.

Upon joining this program, Keast & Hood formed a Sustainability Committee in early 2021. The primary focus of this committee has been the development of the firm's Embodied Carbon Reduction Plan, but the Committee will also focus on topics such as adaptive reuse advocacy and the reduction of internal office waste. The Sustainability Committee will coordinate and track the firm's initiatives in the Embodied Carbon Action Plan, and adjust the plan each year as we work towards net-zero carbon by 2050.

The SE2050 program also highlights

Respectfully Submitted, Keast & Hood Sustainability Committee

Denise Richards, PE, Principal Brian Wentz, PE, Director of Hist. Pres. Amelia Popovic, Director of Marketing Melissa Palmer, Controller Arieto Seraphin, PE, Engineer Courtney DiCampli, PE, Engineer Leah Bradley, PE, Engineer Nathaniel Piekos, Designer

Education

Internal & External Information Transfer

Reporting

Measuring, Tracking & Sharing Embodied Carbon Data



Embodied Carbon Reduction Strategies

Goals to Reduce Embodied Carbon in Projects



Sharing Knowledge & Value of SE 2050 Program

Keast & Hood Education

Requirements



Distribute firm-wide announcement of your firm's pledge to join the SE 2050 Commitment.

Keast & Hood joined the SE 2050 Commitment in February 2021, and an announcement was made to the staff in early March. The Embodied Carbon Action Plan will be shared with the staff following submission.



Provide a brief narrative describing how your firm is promoting a firm-wide education program for embodied carbon reduction and the firm's commitment to SE2050.

Keast & Hood will host bi-monthly internal education sessions on topics related to sustainability and embodied carbon reduction. During the first year of the program, we will be presenting educational webinars and sharing the resources on the SE2050 website. We also plan to add a sustainability section to our internal mentoring program for new staff members.



Nominate an Embodied Carbon Reduction Champion for your firm. Include a brief profile in your ECAP.

Structural Engineer, Courtney DiCampli, PE will serve as the Embodied Carbon Reduction Champion. Courtney joined Keast & Hood in 2019 and graduated from the University of Delaware with a Master of Civil Engineering, Structural Engineering Concentration in 2016. She currently serves as a Board Member for the Delaware Valley Association of Structural Engineers.

 \checkmark

Set a date within the first year to present an "Embodied Carbon 101" Webinar to your firm. Include this resource in your orientation/on-boarding programs.

The "Embodied Carbon 101" webinar will be presented to all staff in the August/September timeframe. This webinar will be added to the onboarding program for all staff.

Electives



Share the SE 2050 library of resources with technical staff.

We will share the library of resources with the staff in the second bimonthly internal education session this fall.



Present the document "How to calculate embodied carbon" to all technical staff.

We will present "How to calculate embodied carbon" to the technical staff along with case studies of the embodied carbon information from the two Keast & Hood projects that will be submitted to the SE2050 database for our first year in the program.



Share the embodied carbon reduction strategies with the firm as outlined in "Top 10 Carbon Reducing Actions for Structural Engineers" document produced by SE 2050.

We will share the Top 10 document with the staff in the second bimonthly internal education session this fall.

Attend a presentation or demo of an LCA-based tool used to calculate embodied carbon.

Members of the Sustainability Committee will attend presentations on LCA-based tools in the fall as we develop the best practices to integrate calculation of embodied carbon with our current workflows and internal processes. The lessons learned from these sessions will be presented to the rest of the staff as part of the bimonthly embodied carbon education sessions.

Keast & Hood Reporting

The firm will measure, track, and report embodied carbon data in the following ways:

A minimum of two (2) projects will be submitted to the SE 2050 Database for 2021.





Calculate Embodied Carbon

On projects where Revit models are created, we plan to use the Revit models to develop quantity takeoffs for structural materials. Revit plugins such as Beacon or Tally will then be used to determine the embodied carbon information. Region specific EPD's will generally be used unless product specific EPD's are available.

Perform Life Cycle Analysis

Our goal for this year is to calculate embodied carbon on a selection of projects that are either recently completed, in construction, or in the construction documents design phase based on the A1-A3 LCA phases. We will develop internal processes that will be incorporated in our project delivery standards



Internal Training

KH will provide internal training to staff members on importance of measuring embodied carbon and the functionality of the Beacon and EC3 tools. The training is also expected to include adjustments to internal Revit modelling standards to enable data collection that mirrors the data fields in the SE2050 database.



Life Cycle Analysis Cont.

in 2022. In the future, we expect to evaluate embodied carbon conceptual "bay-study" alternatives in the early design phases, and quantity take-offs will generally occur at project milestones.

Software

For smaller projects without Revit models, the information in the EC3 database and SE2050 ECOM tool will be used to determine the order of magnitude of embodied carbon. We will collect data on projects internally to understand the carbon usage on projects and identify areas of carbon reduction.

Keast & Hood Embodied Carbon Reduction Strategies



Set embodied carbon reduction goals for the coming year and an implementation narrative.

Our focus for the first year in the program will be internal staff education and establishing embodied carbon calculation processes and internal procedures for data collection. Over time this data will allow us to track our progress in reducing embodied carbon on projects.

Coming in 2022!

In the second year of the program we will provide a narrative about what we have learned about embodied carbon reduction in the first year.

Electives

01

Update your specifications and incorporate embodied carbon performance. Include embodied carbon in your submittal review requirements

We will add embodied carbon performance requirements to our specifications, starting with the concrete and steel sections in 2021 and additional sections in 2022.

02 Collaborate with your concrete supplier to reduce embodied carbon in a mix design.

We have started conversations with local general contractors and concrete suppliers to understand current capabilities with respect to low-carbon concrete mix designs. Many are exploring low-carbon concrete mixes in response to interest from Owners, but EPD's are not commonly available in this region because EPD's are not specified. To break this "chicken and egg" cycle, we will continue these conversations and start including EPD's in our submittal requirements. Even if this requirement is waived initially, by including it in our specifications we can elevate the conversation over time.

03 Integrate embodied carbon mitigation strategies in your General Notes.

We will incorporate embodied carbon reduction strategies in our General Notes, starting with the concrete and steel sections in 2021.

Keast & Hood Advocacy

Requirements



How do you plan to share knowledge and data to accelerate adoption of embodied carbon reduction?

Systemic change requires that different sectors of the industry act collectively to raise awareness and enact change. We have proposed to form a Sustainable Design Committee for our local NCSEA chapter, the Delaware Valley Association of Structural Engineers, to share knowledge on embodied carbon and engage with other local organizations. One of our committee members participates on the Philadelphia AIA Committee on the Environment's Policy and Advocacy Subcommittee, which focuses on embodied carbon policy and other environmental initiatives. Finally. we plan to participate in the newlyformed Philadelphia hub of the Carbon Leadership Forum.



Describe the value of SE 2050 to clients. How can we collaborate to drive adoption?

The SE2050 program has raised awareness in the structural engineering community on the environmental impact of our design By providing resources decisions. and collecting data to determine benchmarks, the SE2050 program will accelerate the sharing of information and the reduction of embodied carbon across professions. We hope that by sharing information we can influence entire project design team decisions.



Declare your firm as a member of the SE 2050 commitment on boilerplate proposal language.

Our commitment is listed in our Firm Profile and on our website. We will also develop additional language emphasizing our commitment to the SE2050 program to be included in proposals.

Electives



Share your commitment to SE 2050 on your company website.

We announced our participation in the SE2050 Commitment on our website and social medial in March of 2021. We plan to incorporate a Sustainability section in our website by the end of 2021 highlighting our embodied carbon reduction efforts. \checkmark

Discuss with the Owner / Client the option of requiring that some of the structural materials come with facility-specific or product-specific EPDs.

We participated in sustainability charettes on a current project that included discussions with the Owner on embodied carbon reduction approaches. In future conversations on this project we intend to advocate for the inclusion of EPD's in the project specifications.





EMBODIED CARBON Action Plan 2021

Submitted August 6, 2021