



STRUCTURAL
ENGINEERING
INSTITUTE



EMBODIED CARBON ACTION PLAN

2024



Background

Linchpin Structural Engineering, Inc. (Linchpin) is an actively participating member in the SE 2050 Program and its collaborative effort of understanding and reducing our industry's impact on the environment. As a component of our participation in that program, the Linchpin sustainability committee produces an annual Embodied Carbon Action Plan (ECAP). In each year's ECAP, we lay out a series of long- and short-term goals and a defined action plan to meet them. Our goals and efforts are focused in four main categories: Education, Reporting, Reduction, and Advocacy. In this report, we reflect on our efforts toward our goals in each of those categories in 2023. By drawing on lessons learned over the past year and years prior, we also present new goals for 2024 and our plans to achieve them.

This document does not provide overall background information on the SE2050 initiative or the basics of embodied carbon - for more comprehensive background information, please refer to Linchpin's inaugural 2022 ECAP, which provides significantly more detail.

Education

This section notes the efforts undertaken to further Embodied Carbon education among sustainability committee members as well as all Linchpin employees.

Last Year's Achieved Initiatives:

- ✓ Updated Linchpin's employees on our accomplishments and status of last year's goals.
- ✓ Educated Linchpin's designers on best modeling practices in Revit to ensure accurate takeoffs and GWP data.
- ✓ Included embodied carbon education within the onboarding process for new employees.
- ✓ Obtained LEED Green Associate status (single committee member) with the goal that all additional members will obtain status in the upcoming year.
- ✓ Attended conference sessions "Buy Clean and Sustainability Policies: What Every Structural Engineer Needs to Know" and "Embodied Carbon 201" at the 2023 NCSEA Summit.
- ✓ Conversated with active members of the SE 2050 board to discuss critical actions for committed firms.

Last Year's Initiatives Still in Progress:

- Obtain LEED Green Associate Status for all Sustainability Committee members.

Current Year's Initiatives:

- Seek additional conferences (or conference sessions) and webinars focused on embodied carbon.

In general, we feel that we are achieving very strongly on the education front; our committee members are engaged and involved in many areas of continuing education for the embodied carbon sphere. We do hope to extend that engagement and interest to the company's entire employee base, to avoid tokenizing our participation and leaving the burden of sustainability solely on the sustainability committee.

Reporting

This section notes the work completed regarding documenting and reporting the embodied carbon and GWP for our designs.

Last Year's Achieved Initiatives:

- ✓ Standardized Revit material libraries and schedule/takeoffs systems to allow for quick, seamless carbon takeoffs.
- ✓ Integrated GWP calculator into design template and encouraged use on projects.
- ✓ Submitted embodied carbon data for (4) projects to the SE 2050 database.

Last Year's Initiatives Still in Progress:

- Development of GWP Reporting widget to be included on project cover sheets that shows the basic embodied carbon data for the structure.

Current Year's Initiatives:

- Mandate (1) project GWP takeoff per employee in the coming year, to reduce workload on data gathering for reported projects.
- Long-term, we will develop an in-house project database for comparing project GWP data and seeking reduction opportunities.

Now that we have field-tested and verified the efficacy of our in-house developed GWP calculator, we will focus on integrating it into the project design process for more (and eventually all) projects company-wide. During the calculator roll-out, the committee will provide support to designers to ensure that it is being used correctly, with the long-term goal of including project GWP data in all deliverables and performing internal data comparisons.

Reduction

This section discusses our progress with reducing the embodied carbon content of our designs.

Last Year's Achieved Initiatives:

- ✓ Updated concrete specifications to a more performance-based design and included GWP metrics and baselines in the specification.
- ✓ Overhauled material specifications to request (but not require) Environmental Product Declarations (EPDs) from manufacturers, fabricators, and suppliers to begin the conversation regarding material impacts and lower-carbon options.

SPECIFICATION SECTION 01 81 13- SUSTAINABLE DESIGN REQUIREMENTS

IT IS RECOMMENDED, THOUGH NOT REQUIRED, THAT THE CONTRACTOR OBTAIN AND PROVIDE ENVIRONMENTAL PRODUCT DECLARATIONS (EPDs) AS INFORMATIONAL SUBMITTALS AS WELL AS REQUIRED MATERIAL SUBMITTALS. EPDs MUST INCLUDE A FACILITY-SPECIFIC MANUFACTURER DECLARATION THAT IS INDEPENDENTLY VERIFIED.

- ✓ Developed and standardized material libraries and schedule/takeoff systems to allow for quick, seamless carbon takeoffs as a standard part of our design process.

Last Year's Initiatives Still in Progress:

- Exploring options of replacing Portland Cementitious material with equivalent materials (such as fly ash and other natural pozzolans).
- Working with concrete suppliers to understand their capacity to provide concrete mixes designed to reduce embodied carbon and familiarize ourselves with the Environmental Product Declarations of manufacturers. Collaborate to develop sample design that meets NRMCA baseline.

New Year's Initiatives:

- None currently

Reduction was decidedly our biggest effort for the past year. The Sustainability Committee spent a great deal of time rewriting our project specifications with several goals including clarity, consistency, and accuracy. We also reviewed our specifications and added sections with the goal of reducing embodied carbon where possible. While this will be an ongoing process, we are pleased with the progress in our specifications and feel that it will have a notable impact on our long-term ability to specify reduced-carbon materials.

Advocacy

This section addresses our efforts to advocate for sustainable design efforts, both within our company and in the broader community.

Last Year's Achieved Initiatives:

- ✓ Developed a template summarizing the project's embodied carbon analysis that may be included in a project's deliverable package.
- ✓ Successfully reached out to several building departments and individuals in various jurisdictions; it remains difficult to get continued engagement with any individual or organization. In general, the feedback we received is that there are no sustainability-focused initiatives or standards in place in the building jurisdictions.

Last Year's Initiatives Still in Progress:

- Continue reaching out to local material suppliers to open avenues of conversation regarding low-carbon material options and EPDs.

New Year's Initiatives:

- Continue to seek opportunities to discuss sustainability requirements with local governments and shift to a more proactive approach of lobbying for new sustainability requirements in jurisdictions.
- Develop a project management plan for use on all projects that includes basic sustainability checks and goals.

We see advocacy as our next main area of focus, having successfully developed our internal specifications and reporting mechanisms. In the coming year, we anticipate a strong emphasis on lobbying for sustainable practices for local manufacturers and suppliers, as well as in local project jurisdictions.

Ongoing Initiatives

This section summarizes several practices and efforts that will be considered generally ongoing, as opposed to time-restricted and/or completion-oriented. These initiatives will be the focus of our education for all Linchpin employees with the goal of standardizing sustainability-oriented mindsets and practices.

Ongoing Initiatives:

- Seek out and prioritize participation in LEED projects.
- Advocate for wood construction and partially grouted CMU walls.
- Economize concrete designs to minimize embodied carbon by leveraging concrete strength and minimizing overdesign.
- Collaborate with project design teams to implement designs that reduce embodied carbon emissions.