

SE 2050
**EMBODIED
CARBON**
ACTION PLAN
2021

MAGNUSSON
KLEMENCIC
ASSOCIATES



Structural + Civil Engineers



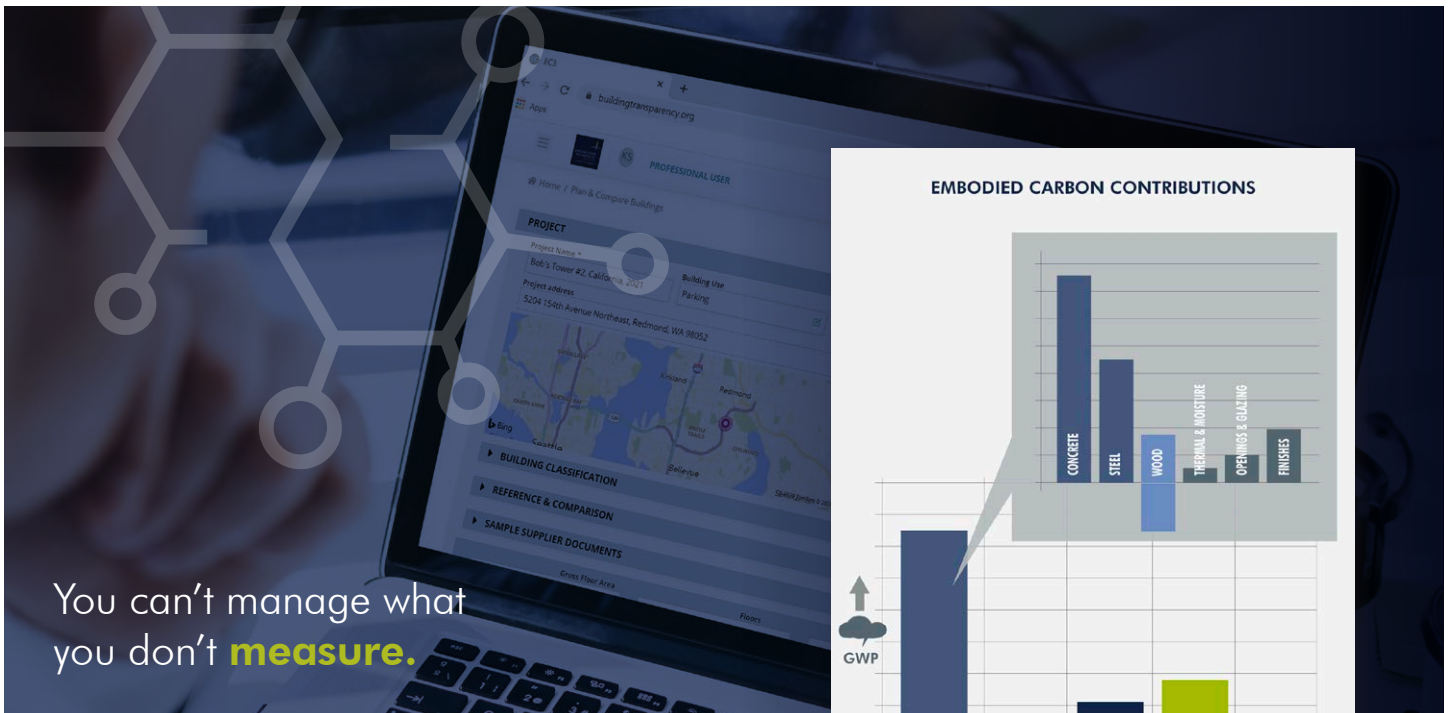
It is imperative that MKA's engineers are all individually aware of the impacts of Embodied Carbon and that we **proactively** work to responsibly reduce them wherever possible.

EDUCATION

MKA is committed to increasing engagement and understanding of Embodied Carbon through internal education. Each individual's daily design decisions and actions have significant down-stream impacts on the carbon footprint outcomes of our work. It is imperative that MKA's engineers are all individually aware of these impacts work to responsibly reduce them wherever possible. MKA will:

- a. **Distribute a firm-wide announcement of our pledge to join the SE 2050 commitment**, including this Embodied Carbon Action Plan.
- b. **Operate a Sustainability Technical Specialist Team (TST)**. This TST meets quarterly to share industry- and firm-wide innovations, discuss embodied carbon reduction strategies and case study successes, and be a resource for the rest of the firm for MKA's sustainability initiatives.
- c. **Designate an embodied carbon reduction Engineering Champion** and an MKA executive leadership mentor. This Champion will also be the lead of MKA's Sustainability TST and will be responsible for ensuring MKA meets its SE 2050 ECAP goals and objectives. This includes writing an annual summary report outlining progress on MKA's goals. This report will be presented to both MKA's Executive Committee and shared with SE 2050 as part of MKA's ECAP commitment.
 - i. MKA ECAP Champion and TST Lead: Tim Lewis
 - ii. MKA ECAP Mentor: Don Davies
- d. **Create a workshop within MKA's internal technical development training that focuses on both material quantity control and embodied carbon tracking and management.**
 - i. This will include a practice problem and a test to ensure engagement with the class.
- e. **Present at least one Embodied Carbon Webinar within our firm annually that highlights advancements and changes we are seeing** within the industry.





You can't manage what you don't **measure**.

MEASURING & REPORTING

MKA recognizes that one of the important steps to carbon reduction is measuring material quantities accurately, then using this information to establish embodied carbon benchmarks for our projects. This information helps the firm and industry set tangible and measurable goals. MKA will:

- a. **Implement material quantity tracking, carbon measuring, and reporting through our design and construction phases on a minimum of six MKA projects per year.** This tracking will use industry-average Environmental Product Declaration (EPD) data for establishing project embodied carbon baselines during design. As material suppliers are brought on to the project, the tracking will incorporate product and region-specific EPDs. As a minimum:
 - i. One project will be written up as a Case Study for external publication.
 - ii. Two projects will be submitted to SE 2050 for inclusion within their database.
- b. **Engage in the advancement and development of non-proprietary and open-source embodied carbon tracking tools, including in-kind and financial contributions.** This includes MKA's assistance in the initial development and funding for the Embodied Carbon in Construction Calculator (EC3) tool, as its lead funder prior to launch, through the MKA Foundation. EC3 is an open-source database of industry-average and product-specific EPDs, used in the comparing, tracking, and reporting of embodied carbon material information for a project.
- c. **Support in-kind and/or fund the development of OpenIMPACT Life Cycle Inventory (LCI) open-source data.** This is a non-proprietary initiative by BuildingTransparency.org to make early decision-making and industry-average embodied carbon data easier to understand and more comparable.
- d. **Support in-kind and/or fund the development of the TallyCAT Life Cycle Analysis (LCA) tool.** This is an open-source and non-proprietary initiative by BuildingTransparency.org to create the next-generation version of Tally. It will rely upon the generated OpenIMPACT LCI data sets, which integrate easier with the EC3 procurement decision-making EPD tool and database and make it easier to establish early project benchmarks for embodied carbon.



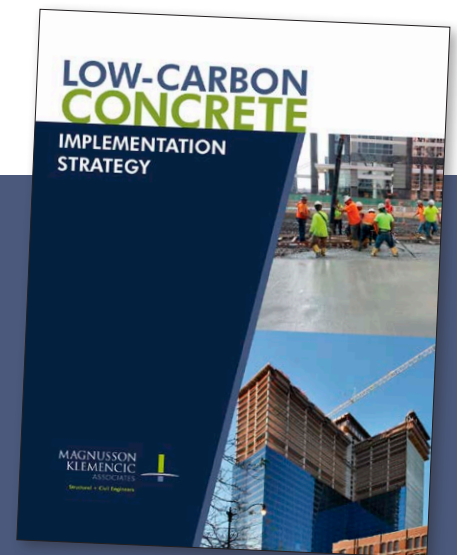
COMMUNICATION, INNOVATION, & REDUCTION

A key part of MKA's action plan is to bring the communication, innovation, and reduction ideas to life at a project level. The effective and innovative execution of project work is the all-important step where results are ultimately realized. MKA will take the following proactive measures to advance lower carbon design and construction ideas forward for implementation:

- a. Actively research industry advancements through the MKA Sustainability TST, staying informed about the state of the practice and the most current sustainable material technologies and opportunities. **Publish one or more ideas per quarter for internal consideration**, which suggests lower carbon ideas we can bring forward on projects when the opportunity presents itself.
- b. **Support the development of Performance-Based Design standards within Seismic, Wind, and Fire engineering.** MKA recognizes the value of performance-directed engineering, where more optimized and resilient designs with less material are achieved within the same performance objectives. The active development and promotion of design standards that advance performance-based engineering industry-wide is critical to our collective ability to deliver new innovations and lower-carbon design alternatives.
- c. **Develop and publish a low-carbon concrete guide**, which helps clarify the process of creating and using lower-carbon, performance-oriented concrete specifications and provides bidding/procurement strategies.
- d. **Support research that advances lower-carbon, bio-based structural systems.** This will specifically target composite construction, including the use of mass timber and mass bamboo floor systems, acting compositely with concrete topping slabs.
- e. Facilitate collaboration between structural material suppliers, contractors, architects, and owners through a **low-carbon strategy workshop a minimum of four times each year.** The focus of these workshops is to promote communication, create a common understanding of how to collectively work on advancing lower-carbon objectives, and to de-mystify what is possible, and practical, for lower-carbon design and construction.



MASS BAMBOO RESEARCH AND DEVELOPMENT



MKA's **Low-Carbon Concrete Implementation Strategy** was published in 2021—outlining a process which delivers both environmental and economic benefits.



MAGNUSSON KLEMENCIC ASSOCIATES FOUNDATION



Building
Transparency



Carbon
Leadership
Forum



ADVOCACY & INVESTMENT

The Magnusson Klemencic Associates (MKA) Foundation was established to advance innovation in design and construction for the built environment. We are committed to providing financial sponsorship, plus collaborative, in-kind, structural and civil engineering support for research and actions that lead to non-proprietary and, ideally, collective-action industry advancements.

Initiatives that move our industry forward on embodied carbon reduction have been a key foundation focus and are critical to our response to the climate challenge. MKA and the MKA Foundation's 2021 investments include:

- a. **Engagement with in-kind and/or financial support of SE 2050.**
- b. **Engagement with in-kind and/or financial of the Carbon Leadership Forum (CLF).**
- c. **Engagement with in-kind and/or financial support of Building Transparency.**
- d. **Engagement with in-kind and/or financial support of the SEI Sustainability.**
- e. **Engagement with in-kind and/or financial support of ASCE Performance-Based Design efforts.**
- f. **Engagement with in-kind and/or financial support of the Climate Smart Forestry Summit, hosted by World Wildlife Fund, Architecture 2030, and CLF.**
- g. **Technical support and testimony for the advancement of Buy Clean legislation within the 2021 Washington State legislature.**
- h. **Technical support and committee engagement in the writing of embodied carbon measurement and reporting policy for the Washington State Department of Enterprise Services (DES).** This committee was created as an outcome of a Washington State 2021 legislative budget proviso.
- i. **Advocacy for and the use of EPDs within the Concrete Procurement process to a minimum of one new city per year.** This requires educating owners and contractors on the value of EPDs in a double bottom line procurement process and educating the local ready mix suppliers on the value of EPDs for their mix designs.





Magnusson Klemencic Associates

1301 Fifth Avenue, Suite 3200 | Seattle, WA | 98101

www.mka.com | T: 206-292-1200