EMBODIED CARBON ACTION PLAN 2022

“We are building for the future... but the time to act is now.”
EDUCATION

MKA is committed to increasing engagement and understanding of embodied carbon through internal and external education. Our daily design decisions and actions have significant downstream impacts on the carbon footprint outcomes of our work. It is imperative that MKA’s engineers are individually aware of these impacts and that they work to responsibly reduce these impacts wherever possible. MKA pledges to:

a. 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.

b. Designate an embodied carbon reduction Engineering Champion and an MKA executive leadership mentor. This Champion will also lead 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 MKA’s Executive Committee and shared with SE 2050 as part of MKA’s ECAP commitment.

i. MKA ECAP Champion and TST Lead: Catherine Cai, PE

ii. MKA ECAP Mentor: Don Davies, PE, SE

c. Present at least six embodied carbon Webinars (external to MKA) that highlight advancements and changes seen within the industry on embodied carbon and challenge what we all can collectively and collaboratively do to lower the built environment’s carbon footprint.

d. Create MKA’s embodied carbon guide for measuring product stage, construction stage, and Whole-Building Life-Cycle Assessment (WBLCA) impacts to establish our approach to embodied carbon measurement.

e. Conduct an MKA internal workshop that focuses on material quantity control and embodied carbon tracking and management as part of MKA’s internal technical development training.

f. Participate in the ASCE webinar series on Environmental, Social, and Governance (ESG) concepts. Report findings from this back to the MKA Sustainability TST.

MKA has been leading the industry in Embodied Carbon Reduction through our involvement in the Carbon Leadership Forum (CLF), Building Transparency.org, SEI/SE 2050 Initiative, and many other advancements with clients and industry partners.

We strive to improve the industry’s processes with every new opportunity.
MKA recognizes that an important step for carbon reduction is measuring material quantities accurately, then using this information to establish embodied carbon benchmarks for our projects. This data helps the firm and industry set tangible and measurable goals. MKA pledges to:

a. Implement material quantity tracking, carbon measuring, and reporting through the design phases on select MKA projects. This tracking will use industry-average Environmental Product Declaration (EPD) data for establishing project embodied carbon baselines during design. As material suppliers join the project, the tracking will incorporate EPDs specific to products and regions. As a minimum:
   i. Two projects will be written up as Case Studies for external publication.
   ii. Four projects will be submitted to SE 2050 for inclusion within their database. To ensure the quality and integrity of data, MKA will submit A1 to A3 Product Stage data on built projects only.

b. Develop a project-specific WBLCA Basis of Analysis Template to delineate the assumptions and reporting standards to achieve client goals.

c. Engage in advancing and developing non-proprietary and open-source embodied carbon and LCA tracking tools, including in-kind inputs such as MKA’s engagement with the “UpStream” tool by ZGF Architects, the “CARE – Carbon Avoided: Retrofit Estimator” tool by Siegel & Strain Architects, the “EPIC – Early Phase Integrated Carbon Assessment” tool by EHDD Architects, and ongoing support for the Embodied Carbon in Construction Calculator (EC3) tool.

d. 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.

e. Support in-kind and/or fund the development of the TallyCAT 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 and is being pushed significantly forward by Perkins&Will Architects.
A key part of MKA’s action plan is to bring the communication, innovation, and reduction ideas to life at a project level. MKA will take the following proactive measures to advance lower carbon design and construction:

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, suggesting 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 lower carbon value of performance-directed engineering, where more optimized and resilient designs with less material are achieved within the same performance objectives.

c. Develop and publish a low-carbon, material-sourcing guide that builds upon our 2021 published Low-Carbon Concrete Implementation Strategy. This will help clarify a recommended process of specifying and procuring lower-carbon structural materials such as concrete, steel, and timber.

d. Update general notes to include performance-oriented concrete specifications to allow suppliers to best optimize their mixes for achieving low-carbon concrete.

e. Update Revit modeling standards to accurately capture quantities for various materials in the model and seamlessly integrate the Revit model with LCA tools (e.g., Tally).

f. Craft and implement a forest sourcing/disclosure questionnaire on a project that brings upstream disclosure and inventory control reporting beyond industry-average data. The questionnaire will assist our project client with more informed decision-making during the procurement phase.

g. Develop and publish the Hines Embodied Carbon Reduction Guide. This will guide the actions of Hines Development teams around WBLCA and embodied carbon measuring, reporting, and reduction strategies. Hines will utilize this guide across all its development platforms within the US, Europe, and Asia. The guide will initially be written for a North American audience, with future additions to focus on different regions of the world.
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 and collaborative, in-kind, structural and civil engineering support for research that leads to non-proprietary and collective-action industry advancements.

Embodied carbon reduction initiatives are a focus for the MKA Foundation and are critical to our response to the climate challenge. MKA's and the MKA Foundation's 2022 investments include:

a. Engagement with in-kind and/or financial support for the following organizations:
   • SE 2050
   • Carbon Leadership Forum (CLF)
   • Building Transparency
   • SEI Sustainability
   • ASCE Performance-Based Design efforts
   • Climate-Smart Forestry Working Group

b. Technical support and testimony for the advancement of Buy Clean legislation within the 2022 Washington State legislature.

c. Technical support and engagement in the Pacific Coast Collaborative. This collection of West Coast US state and Canadian provincial governments are working to draft language for a common ask for EPDs and embodied carbon procurement.

d. Advocate the use of EPDs within the Concrete Procurement process. 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.

e. Declaration of MKA as a member of the SE 2050 Commitment in our boilerplate proposal language.

f. Support experimental research that advances lower-carbon, bio-based structural systems. This will specifically target composite construction, including the use of hybrid systems with steel, timber, concrete, and bamboo.
“Never underestimate the power of a small group of committed people to change the world. In fact, it is the only thing that ever has.”

– Margaret Mead
Looking back at our 2021 ECAP and commitments, below is a summary of our progress and accomplishments from the past year.

We are happy to report that we exceeded the measurable goals of our 2021 ECAP with the following highlights:

- We helped develop and publish a low-carbon concrete implementation strategy, which was released to the public in partnership with the CLF in May 2021. We have identified that establishing client-specific guides is an important next step in pushing forth industry-wide change.

- An internal class that focuses on material quantity tracking and control was established and taught as part of our MKA Quantity Control Workshop. Our next step is to incorporate embodied carbon tracking and management into this workshop.

- Relevant embodied carbon presentations were shared within the internal Sustainability TST, which were then summarized and disseminated throughout the firm a minimum of four times per year.

- Significant effort was made to advance Performance-Based Design (PBD) standards within seismic, wind, and fire engineering. This includes establishing basis of design guidelines and publishing an internal white paper on recommended design practices for initial proportioning of lateral frame components in PBD projects.

- Our goal was achieved to implement material quantity tracking, carbon measuring, and reporting through our design and construction phases (A1 to A3) on a minimum of six MKA projects per year.

- Financial and/or in-kind support was provided to UpStream (ZGF), EPIC (EHDD), OpenIMPACT (Building Transparency), and TallyCAT (Building Transparency).

- We wrote articles in support of advancement in low carbon construction, EPD measuring and reporting standards, and bio-based structural systems, as noted below:
  - Viewpoint: Why We Need Buildings Framed with Timber Bamboo (Engineering News-Record, published Jan. 3-17, 2022)

- Collaboration between structural material suppliers, contractors, architects, and owners to encourage a low-carbon approach has been facilitated on a project-by-project basis, with a frequency exceeding our goal of four times each year.

- We were advocates for the use of EPDs within the concrete procurement process incorporating one new city, Chicago.

After a year-long delay due to COVID-19, MKA celebrated its 100th Anniversary at the Olympic Sculpture Park in Seattle, WA. An MKA project completed in 2007, this 8.5 acre park included a brownfield restoration that reconnected the city’s upland to a restored shoreline, a new seawall with salmon habitat, and a new pocket beach.