EMBODIED CARBON ACTION PLAN 2022

"We are building for the future... but the time to act is now."



(III)

TERM

Structural + Civil Engineers



EDUCATION

MKA has been

in **Embodied**

through our

involvement

in the Carbon

(CLF), Building

Transparency.

org, SEI/SE 2050

Initiative, and many

other advancements

with clients and

industry partners.

Leadership Forum

leading the industry

Carbon Reduction

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:

- initiatives.
- commitment.
- ii. MKA ECAP Mentor: Don Davies, PE, SE
- footprint.
- d. embodied carbon measurement.
- training.

a. Operate a Sustainability Technical Specialist Team (TST). This TST meets guarterly 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

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

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

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

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

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

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

CONCEPT DESIGN THROUGH AS-BUILT REPORTING CHART





MEASURING & REPORTING

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:

- - projects only.
- b.
- (EC3) tool.
- and more comparable.
- e. significantly forward by Perkins&Will Architects.

You can't

manage

what you

measure.

don't

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

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

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

Support in-kind and/or fund the development of the TallyCAT LCA tool. This is an opensource 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

Hines Embodied Carbon Reduction

Guide — MKA is partnering with Hines to develop a guide for directing the actions of Hines Development teams around WBLCA and embodied carbon measuring, reporting, and reduction strategies.



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. MKA will take the following proactive measures to advance lower carbon design and construction:

- presents itself.
- achieved within the same performance objectives.
- concrete, steel, and timber.
- d
- procurement phase.
- q



Low-Carbon Concrete Sourcing Implementation Strategy —

Outlining a process that delivers both environmental and risk reduction benefits when sourcing lower carbon concrete.

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

Support the development of Performance-Based Design standards within seismic, wind, and fire engineering. MKA recognizes the lower carbon value of performancedirected engineering, where more optimized and resilient designs with less material are

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

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

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).

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

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.

MAGNUSSON KLEMENCIC Associates Foundation







CLF Carbon Leadership Forum

BUY CLEAN

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 doublebottom-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.

MKA'S SUSTAINABILITY TECHNICAL SPECIALIST TEAM



LEADER: Catherine Cai, PE



MENTOR: Don Davies, PE, SE



"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

AS OF APRIL 2022:

Beatriz Arostegui, PE Robert Baxter, PE, SE Morgan Brun Nicole Carter Sean Clifton, PE, SE Pablo Echeverria Garcia Laurel Goldammer Alejandro Esparza Gonzalez, PE Guillaume Hart Henry Holm Alejandra Hurtado Guerra Dimple Ji Peter Kornyoh, PE Ishan Kulkarni Kevin Kuntz, SE, LEED AP Amy Kuo, PE, SE, LEED AP BD+C Brandon Lester Nanaissa Maiga Colin Martin Rishabh Moorjani, PE Pruthvi Patel Isabella Stahl Marissa Stone Kristine Svehla-Brown Afzal Syed Ian Tuttle



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.

A LOOK BACK AT 2021

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:

- change.
- per year.
- of lateral frame components in PBD projects.
- projects per year.
- - lished Dec. 17-23, 2021)
- Record, published Jan. 3-17, 2022)
- one new city, Chicago.

GNUSSON

• 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

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

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

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

• 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:

- Inslee's Low Carbon Task Force is Long Overdue (Puget Sound Business Journal, pub-

- Viewpoint: Why We Need Buildings Framed with Timber Bamboo (Engineering News-

• 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



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