2024

EMBODIED CARBON ACTION PLAN

GRIMM+CHEN
STRUCTURAL ENGINEERING

IRVINE | SAN DIEGO

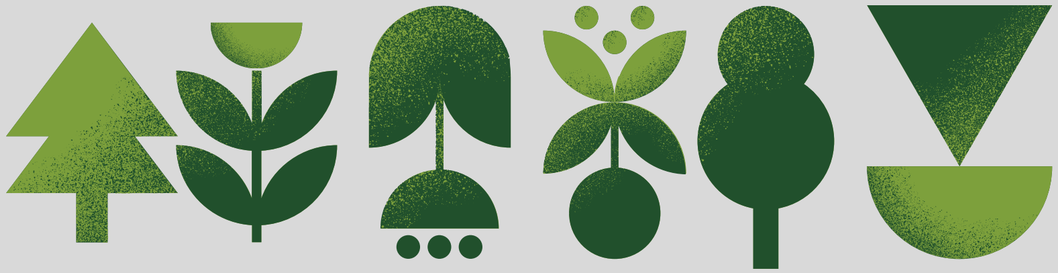
KEYES PORSCHE DEALERSHIP | WOODLAND HILLS, CA

CONTENT

RE-CAP

We joined the SE2050 movement in 2021 with the goal of learning and integrating embodied carbon reduction strategies into our practices. Recognizing the construction industry's significant contribution to the global warming crisis, we are committed to using our expertise in structural engineering to develop sustainable solutions.

Over the past three years, with the invaluable resources and support provided by SE2050, we have steadily advanced our knowledge and made significant progress in this area. By participating in SE2050, we aim to learn from industry peers and leverage our strengths to actively contribute to mitigating the effects of global warming.



EDUCATION PLAN

Embodied Carbon Champion

Key strategies in Embodied Carbon Reduction

- Prioritize Low-Carbon Materials:
  Opt for materials with a lower carbon footprint, such as Type 1L cement, to minimize embodied carbon.
- Flexible Design:
  Incorporate design flexibility to prolong the building's lifespan and reduce future material requirements. Design with potential future changes in use and adaptive reuse in mind.
- Structural Optimization::
  Optimize structural designs to enhance efficiency and minimize material usage without compromising safety or functionality.

Sustainability Awareness Program

Provided an array of educational resources to our team members to deepen their understanding of embodied carbon in structural components and construction practices.

Resources included;

- A publicly available comprehensive webinar
- Wide range of published papers that offered in-depth insights and case studies
- An open Q&A session where team members could engage with embodied carbon champion, ask questions, and discuss real-world applications.

These initiatives aimed to enhance our team's knowledge and commitment to sustainable construction practices.

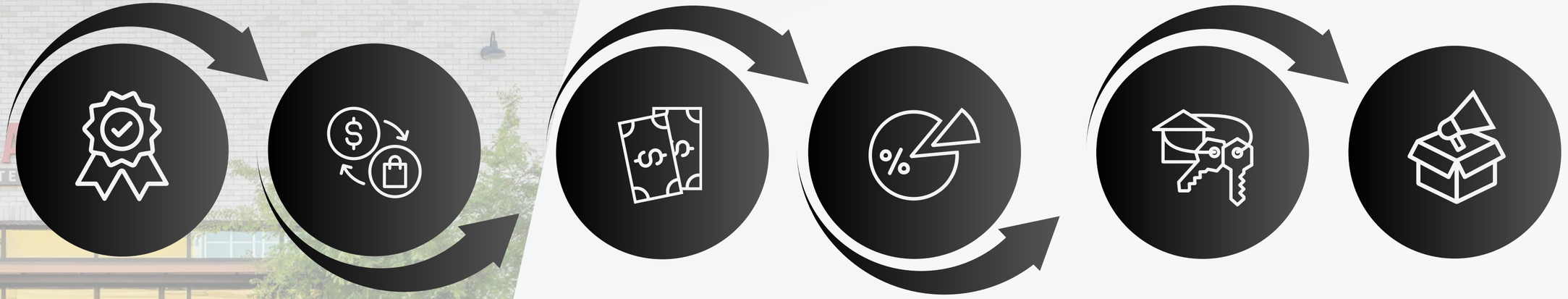
REPORTING

Goal

(2) PROJECTS
PER U.S. OFFICE

LCA scope

A1-A3



Calculation Approach

- Schematic Materials takeoff via REVIT Material Takeoff Schedule.
- Detailed Materials takeoff in collaboration with the construction team.
- Utilizing EC3, a tool specifically designed for calculating embodied carbon, to accurately quantify the environmental impact.

EPD Data Acquision

- Most EPD data sheets are readily available on EC3 and/or manufacturer websites.
- In case where such information is unavailable, utilize regional average EPDs.

CLEARING GALLERY | LOS ANGELES, CA

REDUCTION STRATEGY

Short-term Goals: (by end of 2024)

- Encourage contractors and suppliers to prioritize Portland-Limestone cement due to its lower carbon footprint compared to Ordinary Portland cement.
- Update specifications to include embodied carbon performance criteria. Include embodied carbon in your submittal review requirements.
- Conduct internal case studies to evaluate the embodied carbon impact of building designs using various materials. Use findings to inform future design decisions and promote low-carbon alternatives.

Long-term Goals: (by end of 2029)

- Establish maximum allowable Global Warming Potential (GWP) limits for concrete specifications.
- Develop a decision-making tool for early-stage design that integrates embodied carbon considerations. Create a user-friendly tool or framework to assist designers in evaluating and optimizing embodied carbon during the initial phases of project development.
- Foster collaboration with Architects and MEP teams to comprehensively reduce embodied carbon across all project aspects.

ADVOCACY

KEYES PORSCHE DEALERSHIP | WOODLAND HILLS, CA

Educate Clients and Stakeholders about SE2050 Initiatives:

We educate our clients and stakeholders about SE2050 initiatives, emphasizing the benefits and importance of reducing embodied carbon. By getting involved in the early decision-making process, we ensure sustainable practices are integrated from the outset.

Recommend Suppliers and Manufacturers with Low-Carbon Design Focus:

We recommend suppliers and manufacturers who prioritize low-carbon design principles. By doing so, we actively support sustainable material choices that align with SE2050 goals, ensuring our projects have a minimal environmental footprint.

Public Awareness

Regularly broadcast our commitment to SE2050 on social media by publishing our ECAP updates to demonstrate our dedication to reducing embodied carbon in structural engineering and promoting sustainable design practices.

LESSON LEARNED

STAT

ECAP Completed:	3	(including this report)
LCA completed:	3	(See next page)
Sustainability resources:	Continuously expanding firm-wide sustainability digital library.	
Specification Changes:	Including PLC as alternative to OPC.	

EDUCATION / GROWTH

This year, we have taken our team on educational tours of various construction material suppliers, including a concrete ready-mix plant, a steel fabrication factory, an engineered wood plant, and a masonry plant. These tours aim to provide firsthand insights from industry experts on their sustainability initiatives and to educate our team members about the widely available low-carbon alternatives in the market. By directly engaging with these suppliers, we are deepening our understanding of sustainable practices and strengthening our commitment to integrating these practices into our projects.

LCA REPORTED

2021 DATA

RUSNAK PORSCHE AUTO DEALERSHIP

Thousand Oaks, CA

Type: New
SDC: D
Risk: II
Scope: A1-A3
LOD: 500 (As-Built)
Tools: EC3
Area: 149,300 sf
EC: 2.033M kgCO2e
21.2 kgCO2e/sf

2022 DATA

THE POST TOUCHSTONE CLIMBING

Pasadena, CA

Type: Adaptive Reuse
SDC: E
Risk: II
Scope: A1-A3
LOD: 500 (As-Built)
Tools: EC3
Area: 25,800 sf
EC: 776.7k kgCO2e
30.1 kgCO2e/sf

2023 DATA

KEYES PORSCHE AUTO DEALERSHIP

Woodland Hills, CA

Type: New
SDC: D
Risk: II
Scope: A1-A3
LOD: 500 (As-Built)
Tools: EC3
Area: 176,200 sf
EC: 4.311M kgCO2e
21.6 kgCO2e/sf

HAUSER & WIRTH | WEST HOLLYWOOD, CA

GRIMM+CHEN
STRUCTURAL ENGINEERING

EMBODIED CARBON CHAMPION
SITANAN TANYASAKULKIT, S.E.

SE2050 COMMITMENT
SINCE APR 2021