

EMBODIED CARBON ACTION PLAN (ECAP)

STRUCTURAL ENGINEERS 2050 (SE 2050) COMMITMENT PROGRAM
2026



LIONÄKIS



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INTRODUCTION

Lionakis' Embodied Carbon Action Plan (ECAP) has been developed to facilitate the Structural Engineers 2050 (SE 2050) Commitment Program. The aim of this plan is to promote net zero carbon structural engineering practices and progress towards achieving Net Zero Carbon structural systems. This document serves as a guide to achieving that objective. The primary goal we have as a firm is to tackle five crucial areas: education, engagement, reduction, reporting, and advocacy.

With over a century of experience and multidisciplinary services offered across our various offices in California, Lionakis is a leader in structural engineering and architecture. Lionakis acknowledges the environmental impact of structural designs and is committed to reducing the embodied carbon present in the built environment. Our responsibility will be to take an active role in sustainable building practices through structural engineering components. The focus for us is climatic impact associated with structural designs, and which strategies, tools, methodologies, and data are essential for the needed reduction or an offset in global greenhouse gas emissions.

At Lionakis, our mission is Designing a Better Future and we strive to deliver designs that are sustainable, inspiring, and suitable for any project.

We support and recognize the importance behind Structural Engineers fully understanding and making efforts toward eliminating embodied carbon in projects. Often, engineers focus only on elements that they can effect as structural engineers. As a multi-disciplinary firm we realize we can influence and contribute to more than just the structural system.

WHO ARE WE

About Us

Lionakis was established in 1909 and founded by the first California State Architect, George Sellon. With more than 240 employees, Lionakis is a multi-discipline firm specializing in structural engineering, architecture, and interior design services. Building on more than a century of diverse project experience, Lionakis excels at providing solutions for healthcare, educational, civic and commercial clients.

Our Structural Engineering Team

Lionakis has been providing structural engineering services since 1957. Over the last 60+ years, the firm's structural engineers have provided design, evaluation, and peer review services for thousands of civic, education, commercial and healthcare projects throughout California. We have 19 professionals on staff in our Structural Engineering department, including 11 California licensed Structural Engineers. We provide structural engineering design and seismic evaluations as well as structural peer review services, facility assessment studies, due diligence studies, seismic retrofits, and feasibility studies.

This cross-disciplinary reach positions Lionakis to embed embodied carbon thinking earlier in the design process.

Our Offices

- Sacramento
- Oakland
- San Jose
- Irvine
- San Diego



DESIGNING A

BETTER FUTURE

CORE VALUES

We see **design** in every opportunity.

We act with **integrity**, respecting others to earn and retain their trust.

We **lead** with humility, bringing expertise and inspiration to each endeavor.

We **make a difference** in our communities, with work that matters and a culture of giving.

We **put people first**, promoting work life balance and professional growth while valuing diverse perspectives.

We will **create a better future** for those who follow.

CARBON CHAMPION: **NICOLAS PAULI**



ABOUT NICOLAS PAULI

As an Engineer II at Lionakis, Nicolas Pauli brings over 13 years of experience. His experience in the industry allows him to solve problems in a timely and effective manner. Nicolas also takes into consideration all aspects of construction, the phasing of the project, and constructability when creating details for a project.

Nicolas will be supporting a small 2050 group with Matt Melcher at the leadership of the firm. This group will meet monthly to set the goals for the year and assess our progress.

We engage in all offices as we operate as one studio whether in the same office or remote. All offices are expected to follow the same guidelines for their projects.

Each project is reviewed as part of a design critique where a sustainability (including carbon) discussion is required.



EDUCATION PLAN

During the process of educating our team to achieve Net Zero Carbon structures, there must be knowledge about what embodied carbon is and why it is important to reduce it for the future of the environment.

Strategy

In 2026, we are shifting our education goals to understanding how our tools work, where EPD data comes from, and how to use LCA results to make concrete design decisions.

LCA Tools

We are using Tally as our primary LCA tool. In 2025, we completed our first in-house LCA for a project in the design development phase. In 2026, that project is now in the construction document phase. The LCA will be re-run to determine if the reduction strategies were successful.

Education Goals

Deliver joint training for architects and structural engineers.

Cal Green GWP requirements and how to read EPDs:

- What an EPD measures and how to find one for a specified material.
- Key Fields—understanding unit used (e.g. MT CO₂e/ MT), minimum lifecycle, GWP values, and what they mean for design decisions.

- When Cal Green GWP limits apply to concrete structural systems.
- How Tally and EC3 connect to EPD data and where default values come from.

Each session will be recorded and posted to the intranet and included in new employee onboarding.

The Tally training session will be focused on:

- How Tally assigns default embodied carbon values and which databases they come from.
- When and how to substitute a product-specific EPD to improve accuracy.
- How to read LCA output and identify which materials drive the result.
- How to export results for SE 2050 database submission.

Completed 2025: Type 1L cement training delivered; incorporated as the default cementitious material in Lionakis structural specifications. Every concrete project produced under a Lionakis specification now starts with a lower-carbon baseline.

2026 Goals: Expand our concrete specification to increase SCM replacement limits and add Cal Green GWP performance goals to the submittal section.



REDUCTION STRATEGY

At Lionakis, we will continue to strive for engineering solutions to reduce embodied carbon with our structural designs. With the collective help of the 2050 signatory firms establish reduction goals to achieved zero-carbon by 2050. We will report the findings to determine future goals for the most sustainable designs.

4 life cycle stages for a structure:

- Production stage
- Construction stage
- Use stage
- End-of-life stage

Our current reporting focuses on production and construction stages (materials and construction activity). Use and end-of-life stages will be incorporated as our LCA practice develops.

Firm-Wide Targets

Short-Term—2026: Achieve structural GWP at or below the Cal Green 2022 Baseline on all applicable DSA projects. In 2025 we completed our first Cal Green-compliant project. The goal for 2026 is consistency.

Long-Term—By 2031: Achieve Cal Green Enhanced performance on DSA projects 50,000 square feet or greater. Reduce portfolio-average structural embodied carbon by 20% relative to our 2024 SE 2050 baseline.

2026 Reduction Goals

For DSA projects 50,000 square feet and above, target Cal Green Enhanced GWP performance.

Strategy:

- Initiate an embodied carbon conversation early, before mix designs are set.
- Work with concrete suppliers to explore mix designs meeting Tier 1 GWP thresholds.
- Add Cal Green Enhanced GWP language to the structural specification as a stated design goal.
- Material substitutions (lower carbon materials)
- Design efficiently
 - Understanding where re-use is effective.

Update concrete specifications to include:

- Type 1L cement as standard —already in place.
- Increased SCM replacement range—minimum and maximum—with durability review required by the structural engineer.
- Cal Green GWP Baseline as a spec requirement; Cal Green Tier 1 and Tier 2 as a design goal.

REPORTING PLAN

Each year, Lionakis will commit to lowering embodied carbon in our designs through analysis and engineering solutions through our participation in the SE 2050 Challenge.

Data submitted to SE 2050 each year is how we measure whether our strategies are working. The Carbon Champion group—Nicolas Pauli and Matt Melcher—is responsible for coordinating collection and submission across all offices by the March deadline.

Tools and Process

LCA Tool: Tally for structural material quantity takeoff and embodied carbon calculation. EC3 for benchmarking and EPD sourcing.

Responsibility: Nicolas Pauli maintains the firm's project tracking list. The structural EOR on each project initiates the LCA and provides output for submission.

Architect Alignment: Where a Lionakis architect is performing an LCA for AIA 2030, coordinate with architects for greater efficiency.

Early Design Comparison: Compare structural system options on embodied carbon at concept phase using Tally estimates.

EPD Submittal Integration: Request EPD data from concrete suppliers as part of the mix design submittal process on applicable projects.

SE 2050 Submissions

2026 Target: minimum five project submissions, at least one per active California office (Sacramento, Oakland, San Jose, Irvine, San Diego).



ADVOCACY AND KNOWLEDGE SHARING

Lionakis aims to maintain a schedule for presentations to discuss the embodied carbon action plan. Spreading this information will guide our industry to establish goals, strategies and track progress.

- Provide continuous knowledge to our employees.
- Distribution of market materials.
- Contain active conversations with suppliers and clients for carbon reduction opportunities.
- Integrate low carbon materials to our structural designs.

We, at Lionakis, will advocate for climate action and SE 2050 in several ways:

- **Clients:** Communicate the value of embodied carbon tracking to healthcare and civic clients during design review. Develop a client-facing one-pager on Lionakis' structural embodied carbon approach by Q3 2026.
- **Public Declaration:** Lionakis is listed as an SE 2050 signatory. SE 2050 membership and Best Newcomer recognition to be promoted on Lionakis website and LinkedIn in 2026.
- **Suppliers:** Request EPD data from concrete and steel suppliers in Sacramento and Bay Area markets as part of normal procurement—normalizing the expectation.
- **Code & Industry:** Monitor Cal Green GWP requirement development; participate in SEAOC/SEAOC/SEAONC embodied carbon discussions.

Please see below for an example of the resources we currently have available on our intranet in regards to sustainable design.

Welcome to the High Performance Design Community!

This community contains resources and posts that are specific to High Performance Design.

Looking to share something about High Performance Design? Head over to the [projects + practice](#) feed and be sure to tag your post with [#HighPerformanceDesign](#).

Have an update to existing content or an idea for new content? Contact the LEO Sustainability Community Managers listed on the (bottom) right-side menu of this page.

Sustainability Posts



AIA 2030 Project List

Wondering if your project team needs to report data for our 2024 AIA 2030 Commitment goal? Take a look at this project list to confirm project and status.

Kristina Williams - Dec 9



California Energy Design Assistance (CEDA)

Looking for help in energy design as we reach for net zero carbon? CEDA can provide design assistance if your project is located in one of the investor-owned public utilities (SDG&

Steve Kendrick - Aug 13



SEAOC/AIA CalGreen Embodied Carbon Webinar Series #3: Implications of Material Procurement for Design Professionals

Don't miss the third in a series of four free webinars on Wed., April 10 from 12 noon - 1pm. Link to AIA webinar page which includes a link to registration here:

Joyce Fuss - Apr 3

Resources



AIA 2030 Reporting

Lionakis Internal Database



Sustainability Documents

Description here



Sustainability Resources

Description here

WELLness Initiative



WELLness at Lionakis

WELL-Related Resources and Policies

Projects



LEED Projects

Sustainable Integrated Design, LEED, WELL

ECAP SUMMARY

2025

2026

EDUCATION PLAN

- Type 1L Cement Training
- Embodied Carbon Training with Architects and Engineers



- Training on Cal Green GWP Requirements
- Tally Training Session

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REDUCTION

- Add Type 1L cement to specs
- Increase SCM maximum limit in concrete mix design tables



- Expand concrete specifications to increase SCM replacement limits
- Revise specifications adding Cal Green Tier 1 GWP limit for concrete

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REPORTING

- Determine who will be responsible for tracking projects
- Minimum one in-house LCA



- Min two in-house LCAs
- Submit minimum 5 projects to SE2050 (one from each office)

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REPORTING

- Create Teams “Channel” with SE2050 updates



- Post to Teams channel once per quarter
- Develop client-facing one-pager on structural embodied carbon
- Promote that Lionakis was voted Best Newcomer in 2025 as part of the SE20250 Recognition Program

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Exceeded Goal



Goal Achieved



Needs Improvement

**WE PLAN TO BECOME
EFFECTIVE ADVOCATES
BY MENTORING AND
ENCOURAGING OUR TEAM
ON SUSTAINABLE BUILDING
DESIGN AND WHY IT'S CRUCIAL
FOR THE BETTER
OF OUR FUTURE AND
FUTURE GENERATIONS.**





STRUCTURAL ENGINEERING
ARCHITECTURE
INTERIOR DESIGN