

A photograph of a modern building's courtyard at dusk. The scene features a large, multi-level staircase with black metal railings and a wooden ceiling structure illuminated by warm lights. A person is walking on the ground level, and another is standing on the stairs. The foreground is filled with green plants and purple flowers. The sky is a deep blue.

# **2025 Embodied Carbon ACTION PLAN**





# Table of Contents

<b>1</b>	<b>Introduction</b>	<b>4</b>
<b>2</b>	<b>Education Plan</b>	<b>6</b>
<b>3</b>	<b>Knowledge Sharing &amp; Advocacy</b>	<b>8</b>
<b>4</b>	<b>Reduction Strategy</b>	<b>10</b>
<b>5</b>	<b>Reporting Plan</b>	<b>12</b>
<b>6</b>	<b>Case Study: Cardinal Child Development Center</b>	<b>14</b>



# INTRODUCTION

Climate change is the design challenge of our lives. With 11% of greenhouse gas emissions coming from embodied carbon, structural engineers are on the front lines of climate change.

LPA is proud to be a signatory of the SE 2050 Commitment. With this step, we deepen our leadership role in an industry-wide movement toward decarbonization. The goals of SE 2050 align with LPA's sustainability goals as a firm. We are committed to making

sustainability and building performance the foundation of every design, regardless of size, scale, or budget.

The only way to significantly address the challenges confronting us as an industry is to take a holistic, collaborative approach to design, involving engineers, architects, landscape architects, and interior designers at the earliest stages of the process. Our integrated design process breaks down the hierarchy between disciplines and emphasizes the use of actionable research and data.

## LPA IS COMMITTED TO ELIMINATING EMBODIED CARBON.

- With structural engineers at the table from the very beginning of every project, our process ensures that embodied carbon reduction goals are established early in project development and considered in every design decision.
- With a robust program of internal education, we will align and focus the entirety of LPA on the goals of SE 2050.
- With a reputation for thought leadership in the industry, we will continue to advocate for the elimination of carbon emissions from the built environment and set a high standard for sustainable performance.
- With a track record of success in reducing operational carbon emissions, we will apply the same singleness of purpose to tracking, reporting, and reducing embodied carbon.

Evolving to a zero-carbon built environment is imperative, and we pledge to work with clients from the start of every project to address what we know is the biggest issue of our time.



**“If the building industry is really going to tackle climate change, we can’t simply talk about energy and building performance. It must be a much broader discussion, encapsulating all aspects of what we do. As an industry, we need to evolve our approach.”**

**Keith Hempel**, President of LPA, FAIA, LEED AP BD+C, in “To Address Climate Change, Architects Must Tackle Embodied Carbon” for Common Edge





# EDUCATION PLAN

Institutional memory is fleeting — its value depends on our ability to distill and preserve it. With LPA+U, we are constantly building and updating our catalog of original continuing education courses. In 2023 and 24, we invested approximately \$1.5 million worth of billable time to provide approximately 120 hours of courses, summits, seminars and masterclasses to each employee. In this span of time, embodied carbon has become a core part of the curriculum—frequently as a stand-alone subject and always as a part of the discussion.

This year, we made strides in organizing our embodied carbon education efforts. We created a multi-discipline decarbonization team to develop embodied carbon education content for distribution firmwide. The multi-studio structural

engineering group Sustainable Planning And Construction for Engineers (SPACE) continues to oversee education, advocacy and design strategy on embodied carbon in structural materials.

Together with our Sustainability + Applied Research team, the groups authored Decarbonization by Discipline, a quick-reference guide outlining the most important embodied carbon considerations for structural engineers, architects, MEP engineers, site designers (civil engineers and landscape architects), interior designers and lighting designers. These guidelines and the tools they reference are integrated into our new employee onboarding process, and the subject of an ongoing internal webinar series.

## ONGOING EDUCATION INITIATIVES INCLUDE:

- Throughout 2025, the Decarbonization by Discipline Series of accredited webinars will cover each disciplines’ role in reducing embodied carbon. Required for all design team members.
- Monthly Sustainable Product Spotlight segments in all-hands meetings evaluate structural, architectural and interior design products on five categories of sustainability.
- New educational content on CALGreen Tier Two requirements, is under development.
- Systematically sharing updated regional availability of low-carbon structural products through relationships with concrete suppliers and batch plants.

## EMBODIED CARBON CHAMPIONS



**AJ TEZVEREN-JOHNSON**  
Design Coordinator - Irvine



**JACOB GOTTLIEB, PE**  
Project Engineer - San Diego



**ALEJANDRA HINOJOSA**  
Sustainability Specialist - Dallas

## SUSTAINABILITY IN STRUCTURAL ENGINEERING GROUP



**BRYAN SEAMER, SE**  
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Designer, Structural - Sacramento



**BEN NESS, SE**  
Lead Engineer - Irvine



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**APOORVA PRADHAN**  
Building Performance Specialist - San Jose



**DENISE MENDELSSOHN, AIA**  
Managing Director - Irvine



# KNOWLEDGE SHARING & ADVOCACY

We’re using every tool at our disposal to move the industry and educate clients on embodied carbon. Case in point: the first page of our submission for the AIA 2025 Architecture Firm Award makes a promise: “We’re cutting carbon emissions on every project, regardless of budget, scale or scope. No Excuses.” After winning the award, this promise has become a call to arms. “No Excuses” is the title of our new hardcover book. It’s in every speaking submission we write. It’s even on a pin we wear to conferences as an unobtrusive reminder to our peers that we still have work to do. As Firm Award winners, we have influence, and we’re using it to affect change.

Whether working in-house or with outside consultants, LPA structural engineers are the embodied carbon champions of the integrated team, where knowledge sharing starts. They lead critical early discussions about embodied carbon on every project, set structural embodied carbon goals on every

project, and push the other design disciplines to account for carbon on their own components. This role, and those of every other discipline, is systematized in the Decarbonization by Discipline manual.

Embodied carbon has been a mainstay of Catalyst, our thought leadership magazine, for the last two years. Each quarterly issue features some inventive new angle on embodied carbon, from the May 2023 piece on the Inflation Reduction Act (“New Incentives”) to a series of 2024 articles considering mass timber office buildings (“The Next Step in Corporate Sustainability,” Sept. 2024), reduced-carbon laboratory structures (“Analyzing Strategies for Decarbonizing Lab Structures,” April 2024), carbon-positive landscapes (“Carbon Positive Landscapes,” Feb 2024) and complying with California’s first-in-the-nation embodied carbon building code (“Strategies for Attacking Embodied Carbon,” June 2024)

## ONGOING KNOWLEDGE SHARING & ADVOCACY INITIATIVES:

- Continued thought leadership on embodied carbon via Catalyst.
- Monthly inclusion of embodied carbon resources in our newsletter’s “What we’re reading” section.
- Frequent speaking and publishing on embodied carbon reduction
- Direct client presentations on embodied carbon reduction strategies.
- Working with contractors and material suppliers to increase the development and accessibility of EPD and low-carbon material options.
- Disclosing Carbon Intensity of relevant projects in Catalyst coverage.
- Infusing Decarbonization by Discipline into LPA design process through policies, promotion and education.



“There is no one-size-fits-all solution to embodied carbon. Substantive progress is made by small, incremental moves that add up to meaningful progress over time. Observe what is working and make adjustments to what isn’t.”

■ **Ellen Mitchell**, AIA, LEED AP BD+C, WELL AP Director of Sustainability + Applied Research

## PRESS



[LPA Design Studios receives 2025 AIA Architecture Firm Award](#)  
December 12, 2024



[To Address Climate Change, Architects Must Tackle Embodied Carbon](#)  
May 18, 2023



[LPA Signs SE 2050 Commitment to Eliminate Embodied Carbon from Structures](#)  
April 11, 2023

## CATALYST & WEBSITE



[The Next Step in Corporate Sustainability](#)  
September 16, 2024



[Landmark California Regulation Requires Projects to Confront Embodied Carbon](#)  
August 30, 2024



[Strategies for Attacking Embodied Carbon](#)  
August 6, 2024



[Analyzing Strategies For Decarbonizing Lab Structures](#)  
April 16, 2024



[Class B Metamorphosis](#)  
February 5, 2024



[Carbon Positive Landscape](#)  
February 5, 2024



# REDUCTION STRATEGY

Everything at LPA comes down to process. Over the last year, we have continued to improve and refine our material specifications and selections, challenging our vendors to make sustainable products more readily available and affordable. We’ve revised our concrete specifications to use performance-based metrics in line with NRMCA, CNCA and ACI recommendations and requirements. And we’ve established a firmwide project database to track embodied carbon based on square footage, type of construction and location.

Over the next year, we are implementing a firmwide policy to measure and optimize embodied carbon at every stage of every project. Like we saw with the AIA 2030 Commitment, we expect transparency to change how we work — turning embodied carbon reduction into a shared effort across teams, studios and practices. Each team will set goals for

embodied carbon reduction at the start of every project, integrating life cycle assessments (LCAs) from the earliest phases. LCAs will be run at every milestone, ensuring that carbon reduction remains a key factor in design decisions. While structural data will be a focus, the same rigorous approach will apply to interiors, architecture, mechanical systems and landscapes — bringing every discipline into the conversation.

By working as integrated teams, we expect to find opportunities for embodied carbon reduction in the spaces between disciplines. Our experience with operational carbon emissions makes clear that when every discipline supports every other, each strategy dominos into the next, creating a cascade of optimizations that informs how we work and what we build. Together, we’ll make a greater impact.

## ONGOING REDUCTION STRATEGY INITIATIVES:

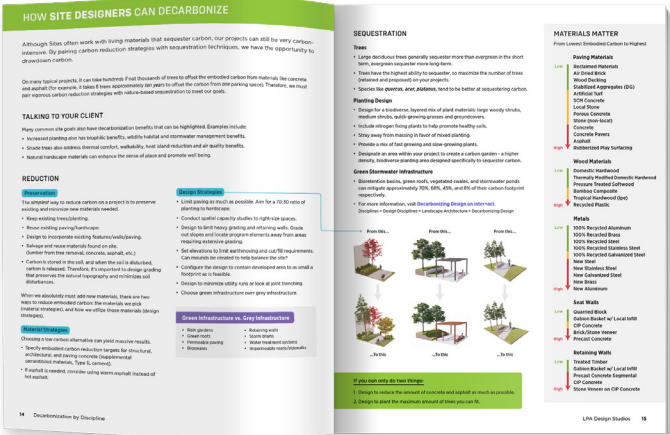
- Discuss and establish embodied carbon reduction goals on every project.
- Update specifications to:
  - Meet or exceed CALGreen Tier 2 requirements for all materials.
  - Consider adaptive reuse/retrofit before new construction.
  - Require EPDs for all structural project materials.
- Establish performance-based concrete specifications and allow for novel materials.
- Higher strength rebar; header bars instead of hooks
- Evaluate natural sequestration and use cases for LPA projects.
- Run Life Cycle Assessments (LCAs) on all projects at model creation and at each project milestone.
- Collaborate with local and national suppliers to source reduced carbon materials.
- Continue integrated design approach to carbon reduction at early phases of project design, setting a carbon budget and informing other disciplines on the impact of design decisions.
- Continue development of an in-house database of structural systems and Carbon Intensity (CI) for informed design discussions at the project concept phase.
- Focus on increasing structural efficiency and avoiding higher carbon output alternatives for framing layouts and material specs.



“It’s going to take an integrated design process, partnerships throughout the supply chain, and innovations both existing and not-yet-invented to achieve the kind of progress SE 2050 demands.”

**Daniel Wang, SE**, Design Director, Structural Engineering

## DECARBONIZATION BY DISCIPLINE SERIES





# REPORTING PLAN

At LPA, we believe everything counts. For the 2030 Commitment, that means measuring and reporting every project’s operational carbon performance and disclosing it transparently any time we publish a project, good or bad. We’re taking the same approach with embodied carbon.

After measuring and reporting the required six projects for the last two years as SE 2050 signatories, we have upped our ante to commit to submitting all new-build projects to the database. The more we report, the more we will learn, and the faster we will make meaningful progress

During the first two years, we met the SE 2050 Commitment’s baseline requirement to run Life Cycle Analyses (LCAs) at the Construction Documents phase of “all feasible projects.” This year, we’re committed to running LCAs at model creation, and at each major milestone. The more projects we report, the quicker our industry will have a critical mass of data, and the faster we can shift our focus from establishing baselines to the real work of innovating, developing new best practices and pushing toward our target of zero emissions.

### ONGOING REPORTING INITIATIVES:

- Committed to running LCAs at model creation and each major milestone.
- Set CI reduction goals at the beginning of each project and document after project completion, every time.
- Continue submitting embodied carbon data for every new-build project to the SE 2050 database.
- Continue collecting EPD data of common specified products and adding requirements for EPD data to be incorporated in submittals.





# CASE STUDY:

## CARDINAL CHILD DEVELOPMENT CENTER

### Small Feet, Smaller Footprint

An early childhood education center provides key lessons in developing an integrated approach to embodied carbon reduction.

San Bernardino City USD’s Cardinal Child Development Center reimagines early childhood education, replacing a portable classroom with a purpose-built facility that integrates indoor and outdoor learning. The 15,000 SF campus consists of two single-story buildings that wrap around a diverse landscape of outdoor classrooms and play areas, connected by a substantial canopy. LPA’s integrated team worked across disciplines to meet the district’s LEED Platinum goals, including earning two points for cutting embodied carbon by at least 5%.

Rather than limiting their attention to structural embodied carbon, the integrated team targeted holistic strategies that involved architects, engineers, landscape architects and interior designers. Early team discussions established goals to preserve existing trees, replace high-carbon materials with low-carbon alternatives, optimize structural systems and weave aesthetic considerations with performance. The result is a project that exceeded its embodied carbon targets while maintaining durability, function, and design intent.

The team started by evaluating the mature tree canopy, a source of future carbon sequestration and shade for the site, and used the analysis to arrange and lay out both buildings. Designers selected a heavy timber structure for the biogenic

carbon it continues to store, avoiding high-embodied carbon options like steel and concrete. For the exterior cladding, they employed a wood rain screen system, minimizing the use of high-carbon plaster. For most classrooms, the team left structural concrete exposed as the finished floor, reducing the assembly, and worked with an acoustical consultant to specify lightweight ceiling panels to both improve acoustics and reduce structural materials. Steel components, sourced from an electric arc furnace, further lowered carbon, while reuse of landscape materials such as a masonry site wall avoided still more emissions. Throughout construction, designers and builders worked closely with an arborist to maintain the health of the tree canopy.

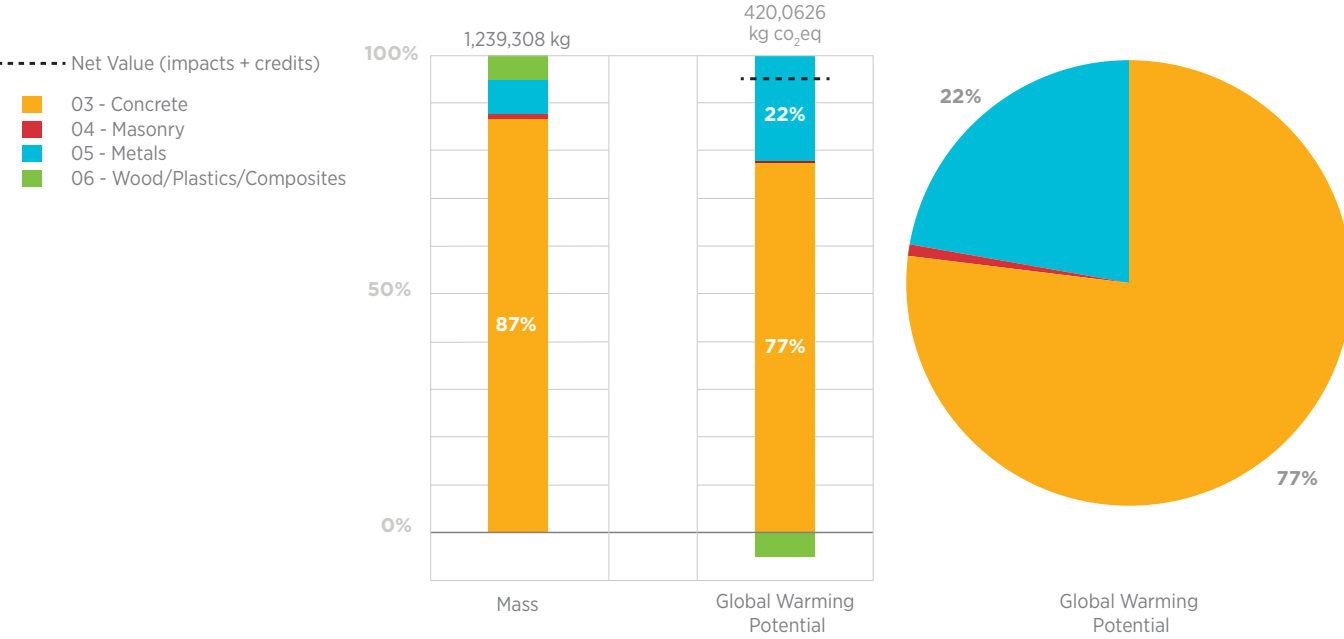
Structural engineers used a performance-based approach to reduce embodied carbon emissions in the specification of concrete. The ultra-low-carbon mix design specified type IL cement and used fly ash for 30% of the cementitious material in footings, slab and site paving. This reduced the mix’s GWP by 13% as compared to the NRMCA Regional Baseline. As a result, the overall building structure reaches 12% reduction of embodied carbon. (This number does not account for the contributions of architectural, interior and site elements, which are not included in SE 2050 reporting.)

### LESSONS LEARNED

- We don’t do this alone.** Addressing carbon reduction calls for collaboration across all design disciplines and construction trades. While SE 2050 reporting requirements isolate structural elements, real progress as an industry demands an integrated approach. Non-structural elements such as the wood rainscreen system, reuse of landscape materials and reduction of interior finishes all played a role in the approach, but were not calculated. Additionally, low carbon concrete mix availability is very much regional. Contractors play a pivotal role in finding the proper concrete mix and enabling flexibility on alternative mix designs.
- Baseline definitions need standardization.** Without a universally accepted baseline, there’s potential for designers to inflate initial carbon estimates to make reductions appear more significant. We took a more conservative approach, modeling our baseline structure with wood rather than steel. Setting a lower-carbon baseline ensured a more meaningful reduction at the cost of a higher number. But in a business context, ethical dilemmas like this present a slippery slope. We need a consistent, industry-wide baseline for transparency and comparability.
- Start earlier.** This project was already minimizing carbon before LPA signed the SE 2050 Commitment, but an earlier life cycle analysis would have led to even more reductions. Future projects will integrate LCAs and embodied carbon goal setting from the first phase, using our Decarbonization by Discipline guide.
- Tally had limitations.** The software’s default options for concrete mixes weren’t flexible enough to account for the product-specific EPDs as confirmed in procurement and construction. The team was able to supplement Tally with manual calculations, but at the cost of decoupling the Tally reports from the actual project.
- Remember the trees.** Though not measured in any matrix, it’s important to maintain mature trees on site. Demolition, disturbance of soil organic carbon and decomposition are significant and unaccounted-for sources of GWP. Additionally, mature trees promote carbon sequestration and storage at a much higher rate than newly planted ones.



### RESULTS PER DIVISION





# Everything Counts.



Changing Lives by Design®

## STUDIOS

Irvine

Sacramento

San Jose

San Diego

Dallas

San Antonio

Austin

## EXPERTISE

K-12

Higher Education

Sport + Rec

Civic + Cultural

Commercial + Workplace

Healthcare

Mixed-Use

Adaptive Reuse