

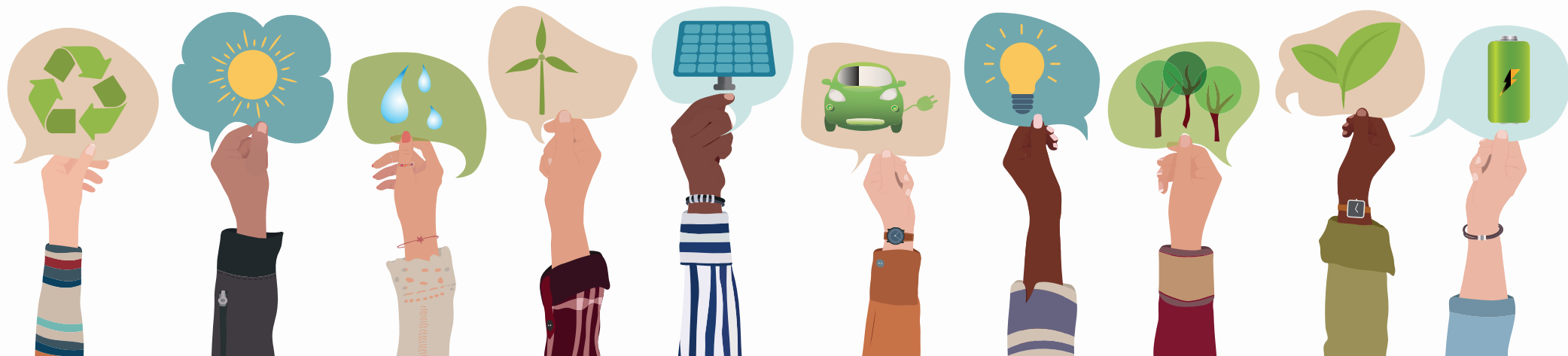
Embodied Carbon Action Plan

# SE2050

2025

**SCH=MM=ER**

*Design with Purpose. Build with Confidence.*



## SCHEMMER'S APPROACH TO SUSTAINABILITY



We believe it is our responsibility, and our duty, to serve clients with sustainability in mind. Whether it's energy savings through advanced heating and air conditioning systems or low-impact landscaping, we aim to engineer solutions that provide the maximum return on investment for our clients and the lowest possible impact on the environment.

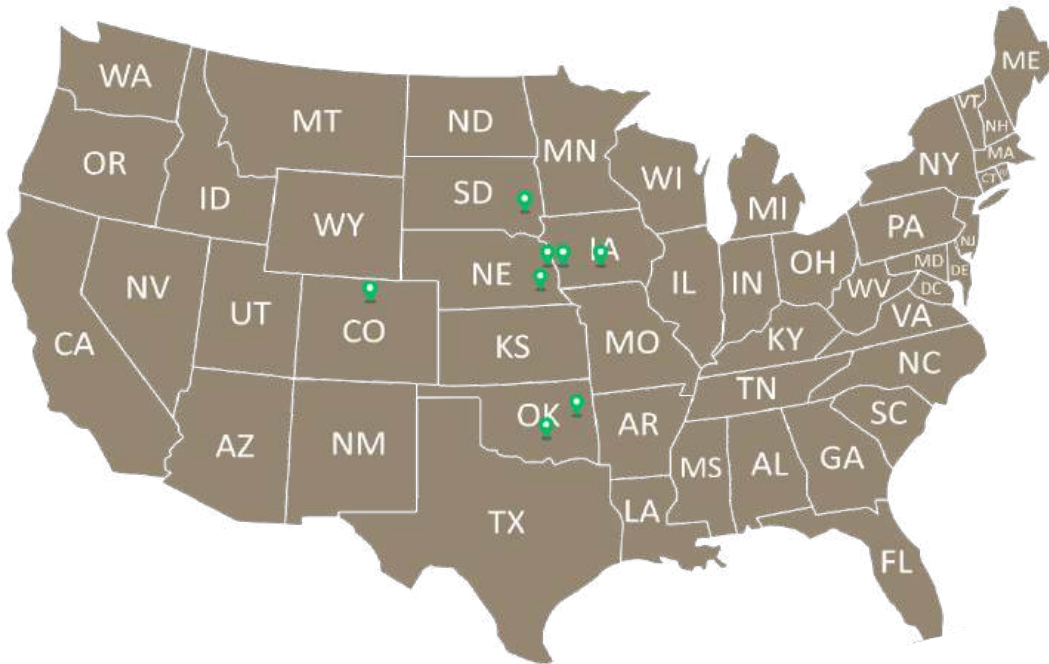
Sustainable building designs have come a long way in the past few decades, and the industry still has quite a distance to cover in the next few years. Similarly, Schemmer's design practices are becoming more sustainable as the years go on, yet we have a vision for a future that requires acceleration in the status quo rather than just keeping up with trends.

Schemmer is driven by knowledge and experience, and is committed to studying and implementing improved technology, best practices and proven solutions that provide the greatest benefit to the communities we serve. We know this is a work in progress, and we have a lot of room to grow. This is why we are seeking opportunities to join like-minded organizations who are along for the same journey. We look forward to working with our clients to utilize our sustainable design knowledge and deliver excellent and holistic project designs to meet their needs.

## WHO WE ARE AND WHAT WE DO

*Design with Purpose. Build with Confidence.* There is no rule - unwritten or otherwise - that says the creation of something that is unique, yet functional, need to be problematic and stressful. Which is why Schemmer takes the opposite tack, infusing the design and construction process with a collaborative spirit that forges a unified sense of purpose and confidence among all involved. It begins with designing a project that meets our clients' goals before a single shovel of dirt is turned over, and doesn't end until what's been put to paper is included in the final build. So when you engage the Schemmer team, you know we'll work harder and smarter to ensure that when all is said and done, your vision has become a reality.

Schemmer is a full-service architecture, engineering and construction field services consultant, providing responsible solutions for complex design and construction-related challenges. Founded in 1959, we are grounded in our past but remain fully committed to the future. Located in five states and eight offices throughout the Midwest, Schemmer provides services to clients from coast-to-coast and border-to-border across the United States.



Our full-service firm offers the benefit of a single point of contact and a highly coordinated project. Through a collaborative, Integrated Design Process, we provide the following services:

- Architectural Design
- Feasibility Studies
- Facility Assessments
- 3D Scanning
- Master Planning
- Facility Programming
- Interior Design
- Structural Engineering
- Mechanical Engineering
- Electrical Engineering
- Civil/Site Engineering
- Transportation Engineering
- Water/Wastewater Engineering
- Survey
- Geotechnical Engineering and Materials Testing
- Construction Phase Services
- Drone Photogrammetry and Surveying

*"We firmly believe that reducing embodied carbon and other environmental impacts from our designs is the engineering problem of our generation. We know that it is our responsibility as stewards of the built environment to ensure we do not leave severe unintended consequences future designers cannot solve. It is our hope that we can leave a legacy of continuously improving the quality of our designs and minimizing the impact we leave." – Elena Hoff, P.E.*

# SCHEMMER'S EMBODIED CARBON CHAMPION



## ELENA HOFF, PE STRUCTURAL ENGINEER



*Schemmer's Embodied Carbon Champion is Elena Hoff, PE*

Elena has ten years of experience as a structural engineer and has worked on many commercial, industrial, education, and multi-family facilities. She has design experience across 16 states. Elena relocated to Denver to establish Schemmer as a premier design firm in the mountain region and better serve clients who value sustainable design. She is committed to learning as much as possible about sustainable design and implementing new technologies and design practices into her projects.

### Education

B.A. Physics

M.S. Architectural Engineering, Emphasis in Sustainable Structures

### Licensure

Professional Engineer - NE, IA, CO, ID, SC, NC

### Affiliations

Carbon Leadership Forum Member

Schemmer's Embodied Carbon Champion for SE 2050 Commitment

Schemmer's Sustainability Committee Chair

LAUNCH Leadership Foundation

Structural Engineering Association of Colorado (SEAC)







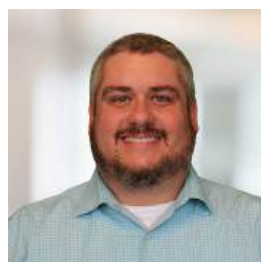
## SCHEMMER'S STRUCTURAL DESIGN TEAM



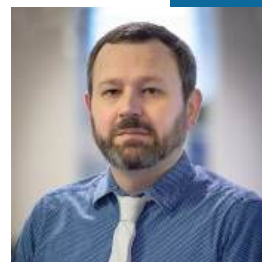
Elena Hoff, PE



Jason Heinze, SE,  
PE, LEED AP



Kevin Wenninghoff,  
SE



Josh Pearce, PE, SE



Tyler Schmidt, PE



Nathan Schmidt, PE



Nick Williams, PE



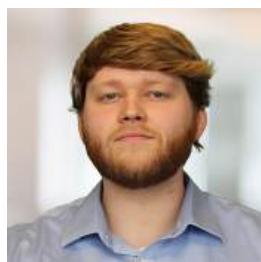
Todd Blackburn, PE

Schemmer's structural team is committed to sustainability and innovation, leveraging advanced technologies and methodologies to provide precise and efficient design solutions. Our client-centric approach emphasizes understanding and responding to the unique needs of each client, ensuring functionality, efficiency, and sustainability across various projects.

Our team is known for its efficient workload management and internal mentorship, fostering continuous improvement. Our team is adept at modeling, structural analysis, design, and construction documentation, ensuring that projects are executed with precision and expertise.



Madeline Campbell



Matt Wissing, EI

As part of Schemmer's Embodied Carbon Action Plan, our structural team actively incorporates low-carbon design strategies into every phase of a project. This includes selecting materials with lower environmental impact, optimizing structural systems to reduce unnecessary mass, and collaborating early with architects and contractors to identify carbon-saving opportunities. By aligning engineering decisions with sustainability goals, our team helps clients meet performance targets while contributing to a more sustainable built environment.

## ABOUT SE2050

The mission of the SE 2050 Commitment is to transform the practice of structural engineering in a way that is holistic, firm-wide, project-based, and data-driven. By prioritizing the reduction of embodied carbon, through the use of less impactful structural materials, participating firms can more easily work toward net-zero embodied carbon structural systems by 2050.

### *What is SE 2050?*

SE 2050 stands for the Structural Engineers 2050 Commitment Program which is in response to the SE 2050 Challenge issued in 2019 by the Sustainability Committee of the Structural Engineering Institute of the American Society of Civil Engineers. This comprehensive program has been designed to ensure substantive embodied carbon reductions in the design and construction of structural systems by the collective structural engineering profession.

**The hope is that through small changes in our design practice every year, we will be much better positioned to consistently reach net zero embodied carbon designs by the year 2050.**





## SCHEMMER'S EDUCATION PLAN

Schemmer continues to build momentum in our commitment to sustainability. We are committed to educating our staff on the impact of embodied carbon and what sustainability means for our firm. Our sustainability committee launched this initiative with an all-company Lunch and Learn in early 2023, followed by a session in May 2023 highlighting the LEED, WELL, Green Globes, and Energy Star rating systems.

In 2024, we deepened our focus to educate our team on embodied carbon, sparking discussions on immediate improvements to our design practices. Our structural team participated in a webinar on "Innovations in Concrete," exploring industry advancements in reducing embodied carbon in cementitious materials. Attendance at the Greenbuild Conference is becoming an annual occurrence followed by 8-12 hours of sharing session recordings with the sustainability committee after the conference prompting thoughtful discussion.

**Looking ahead in 2025,** we are diving deep into our education series with monthly learning topics during sustainability meetings with the focus on items we can apply directly to our design practices. Our next session will be a hands-on "show and tell," where we'll walk through our Life Cycle Assessments (LCAs) for SE2050, identifying key takeaways to enhance our design processes. Additionally, insights from SE2050 quarterly meetings, local USGBC and Carbon Leadership Forum (CLF) events and attending the Greenbuild conference this fall will further inform our sustainability strategies, ensuring we stay at the forefront of industry best practices. We plan to bring these new ideas and understandings to the entire company as we refine our long-term sustainability goals.



## KNOWLEDGE SHARING NARRATIVE



Schemmer intends to post this annual update to our Embodied Carbon Action Plan (ECAP) in a blog post and host it to our website to draw attention to our firm's commitment to reduce the Global Warming Potential (GWP) of our projects.

Additionally in 2025, we plan to continue our quarterly blog posts to focus on embodied carbon reduction tactics we've included in our design documents.

**Q1: Carbon targets in our concrete specifications**

**Q2: EC as a parameter in selecting steel shapes**

**Q3: Alternative structural systems to reduce embodied carbon**

**Q4: Lessons from Schemmer LCAs**

As we are beginning to conduct LCAs on select projects every year, we will report those results to the design team and the client along with an executive summary outlining successful methods of carbon reduction and opportunities for carbon reduction on future projects.



As designers, our approach to sustainable design involves optimizing materials for strength and quantity to reduce unnecessary raw material extraction. This saves clients both time and money while reducing our impact on natural resources.

## REDUCTION STRATEGY SHORT TERM GOALS

### SHORT TERM GOALS

To continue our efforts from the past year, our structural team will complete our move beyond simply providing performance based concrete specs that state minimum requirements across multiple uses of concrete. We have rewritten them to be clear and concise about the strength and durability requirements for each type of concrete on the project. This is done in table format and there will be a column for GWP intensity targets for each mix design based upon EPDs we have recently received from local concrete suppliers on past and current projects. Our goal is to adjust these targets each year and achieve a reduction by at least 10% by 2026.

**By the end of 2025, we aim to have a clearer understanding of the embodied carbon impact of our designs and a refined strategy for deeper reductions in the years ahead.**

In 2025, we will gather and dissect our recent LCAs to identify lessons learned to employ on future projects. Additionally, we will:

- Expand our material tracking efforts by requiring EPDs for structural steel and concrete to establish baseline GWP intensities.
- Work with our suppliers to encourage transparency and push for lower-carbon material options.
- Develop internal training sessions for our design team to reinforce best practices in material optimization and carbon-conscious decision-making.
- Pilot at least one project using concrete mixes that incorporate high SCM content, carbon capture technology, or alternative binders.
- Continue collaborating with contractors to ensure our specifications translate into practical and achievable carbon reductions on site.

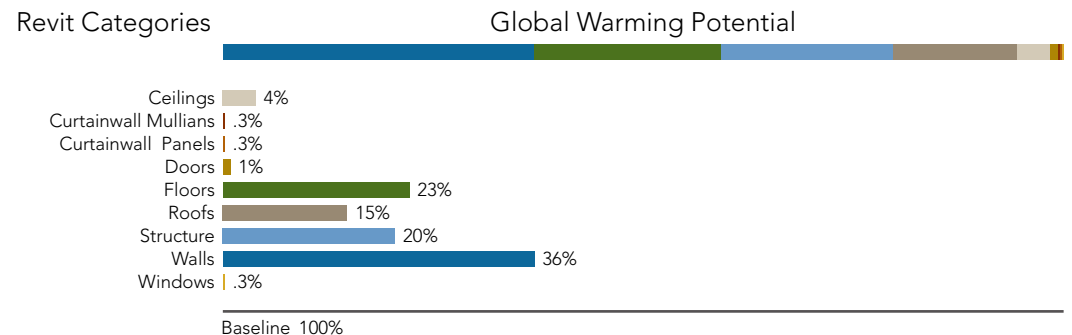
# REDUCTION STRATEGY

Change does not happen overnight, however, we are moving in the right direction. The hope is that through small changes in our design practice every year, we will be much better positioned to consistently reach net zero embodied carbon designs by the year 2050.

## LONG TERM GOALS

Schemmer currently only has internal capacity to run LCAs on a few projects each year and these projects are selected based on client requests or design team curiosity. It would be ideal to begin running assessments on a larger selection of projects, aiming for at least 10 per year, such that we may begin to identify trends across market sectors and engage more designers in the process.

To assist the goal of running more LCAs per year, we are actively training a handful of architects and engineers on conducting LCAs and will be exploring options to add more Tally licenses as project demand increases. The goal is to spend one full-time equivalent (FTE) per year working on planning, training and documenting sustainable initiatives within Schemmer by 2028.





## REPORTING PLAN

Schemmer uses Tally (a Revit Plugin) to run LCAs on our BIM model for both the architecture and the structural disciplines at the point of completion of Construction Documents. The scope of our life cycle assessments includes:

- Product Stage [A1-A3]
- Construction Stage [A4]
- Maintenance Stage [B2-B5]
- End of Life Stage [C2-C4]
- Module D

Following is a summary of the building components that are often included in the scope of our assessments.

### INCLUDED IN SCOPE:

- Foundations
- Floor slabs
- Exterior ramps and stairs
- Steel framing (beams, joists and columns)
- Metal roof deck
- Roofing
- Insulation
- Doors and windows
- Ceilings
- Floor and wall finishes

### NOT INCLUDED IN SCOPE:

- Equipment foundations
- Exterior pavement
- Demo of existing building elements
- Credits for use of existing building elements (i.e., existing foundations)
- New paint on existing walls
- Mechanical and electrical equipment

In addition to Tally, Schemmer requests EPDs for concrete mix designs and structural steel in our specifications on public projects. This information is collected for use in setting reduction targets on future projects.



# ELECTIVE DOCUMENTATION



## EDUCATION

### Team Engagement

Elena Hoff, Schemmer's ECRC, will continue leading embodied carbon reduction efforts and integrating strategies into all projects. Weekly department meetings will highlight alternatives to carbon-intensive materials and processes. She will also equip project managers and architects with tools to introduce these strategies early in design and to communicate our sustainability goals to clients.

### Firm-Wide Training

Host at least one firm-wide webinar on embodied carbon reduction.

Expand internal documentation and integrate embodied carbon strategies into new employee onboarding.

### LCA Training & Implementation

Conduct an annual LCA how-to session, training at least four employees across structural, architectural, and BIM teams.

Refine LCA workflows for more efficient and actionable assessments.

By embedding carbon-conscious design into daily practice, we aim to drive measurable reductions across all projects.





# ELECTIVE DOCUMENTATION

## REPORTING

1. Schemmer will submit at least four projects annually to the SE2050 database, continuing its commitment to industry-wide carbon tracking.
2. An executive summary will accompany each LCA, summarizing key findings for the design team and clients (upon request).

## REDUCTION

1. Set Targets:
  - a. Short-term reduction (< 1 year)
    - i. Reduce Embodied Carbon Intensity on specified concrete by at least 10 percent below the National Ready Mixed Concrete Association (NRMCA) regional baseline.
  - b. Long-term reduction (> 5 years)
    - i. State targets in the specifications that reduce Embodied Carbon Intensity on specified concrete by at least 20 percent below the NRMCA regional baseline.
2. Schemmer will rewrite its concrete specs to be clear and concise about strength and durability requirements for each type of concrete on a typical project. This will be done in table format and there will be a column for GWP intensity targets for each mix design.



# ELECTIVE DOCUMENTATION



## ADVOCACY

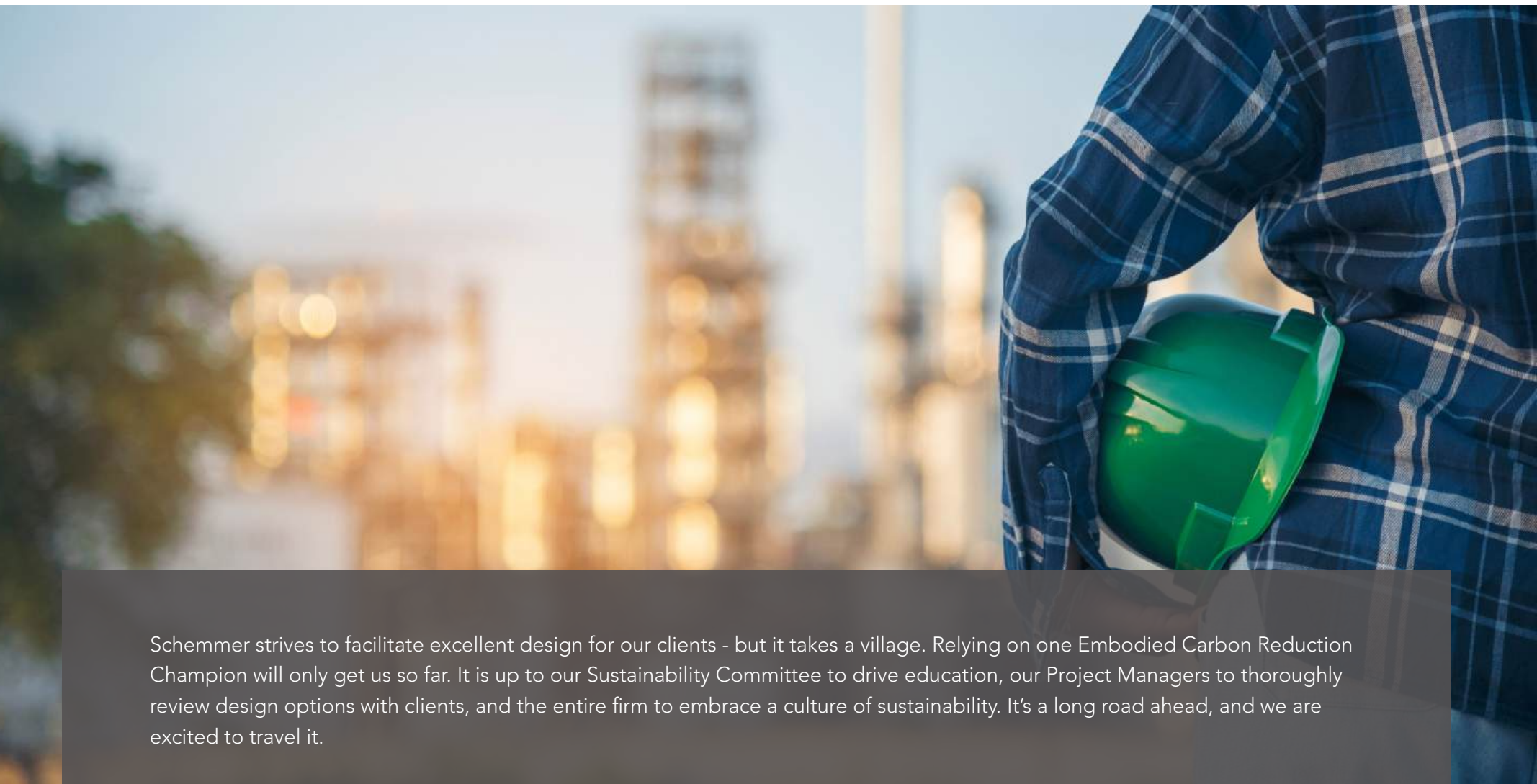
1. Schemmer has publicly declared our firm as a member of the SE2050 commitment via a blog post published on March 30, 2023 (shown in Appendix B). Schemmer also has a webpage dedicated to sustainable design and at the top of the page (<https://www.schemmer.com/sustainability/>), we highlight our commitment to SE2050.
2. Schemmer sends out quarterly newsletters to our clients and, in an upcoming issue, we will describe how our SE2050 commitment is not only a pledge to our industry, but also to our clients, that we are actively pursuing design alternatives that will reduce their projects environmental impact while respecting their bottom line.







## LESSONS LEARNED



Schemmer strives to facilitate excellent design for our clients - but it takes a village. Relying on one Embodied Carbon Reduction Champion will only get us so far. It is up to our Sustainability Committee to drive education, our Project Managers to thoroughly review design options with clients, and the entire firm to embrace a culture of sustainability. It's a long road ahead, and we are excited to travel it.

# COMMITMENT LETTER

We firmly believe that it is our responsibility as stewards of the built environment to ensure we do not leave severe unintended consequences future designers cannot solve. It is our hope that we can leave a legacy of continuously improving the quality of our designs and minimizing the impact we leave.



## RE: LETTER OF COMMITMENT TO THE SE 2050 PROGRAM

February 10, 2023

To: Laura Champion  
Director, Structural Engineering Institute

From: The Schemmer Associates, Inc.  
1044 N. 115<sup>th</sup> St. Suite 300  
Omaha, NE 68514

Dear Laura:

Schemmer, a 150-person firm located in the Midwest and headquartered in Omaha, Nebraska, is hereby signing on to the SE 2050 Commitment Program. We support the vision that all structural engineers must understand, reduce, and ultimately eliminate embodied carbon in our projects by 2050.


Reducing embodied carbon and other environmental impacts from our designs is the engineering problem of our generation. We firmly believe that it is our responsibility as stewards of the built environment to ensure we do not leave severe unintended consequences future designers cannot solve. It is our hope that we can leave a legacy of continuously improving the quality of our designs and minimizing the impact we leave.

We therefore commit Schemmer to take the following steps which are part of the SE 2050 Commitment Program:


- Within six months and annually henceforth, we commit to reporting an Embodied Carbon Action Plan (ECAP) and permit the ECAP document or form to be made public on the SE 2050 website.
- Within one year and annually henceforth, we commit to submit data to the SE 2050 project database in a collaborative effort to understand embodied carbon in structural engineering projects and to set attainable targets for future projects.

We look forward to joining this coalition and industry effort to achieve the goals of the SE 2050 Program.

Sincerely,

  
Elena Hoff, PE  
Structural Engineer  
Embodied Carbon Champion

  
Kevin Wenninghoff, SE  
Structural Engineering Manager

  
Jason Heinze, PE, SE, LEED AP  
Executive Vice President

  
Steve D. Kathol, PE, SE  
President & CEO

## INTERNAL ANNOUNCEMENT

On March 30, 2023, Schemmer announced that we had joined the SE2050 initiative to transform the practice of structural engineering in order to work toward net-zero embodied carbon structural systems by 2050. This announcement was made on both Schemmer's internal communications portal and on our website.

