SMITHGROUP

COMMITMENT TO CLIMATE ACTION

SE SO50 EMBODIED CARBON ACTION PLAN

SMITHGROUP



DESIGN A SUSTAINABLE FUTURE:

ADAPTION & MITIGATION

SmithGroup has been a leader in sustainable design since the term was first coined, recognizing that as planners and designers of the built environment, we have responsibility as well as opportunity to mitigate and adapt to the worst impacts of climate change. In 2007, we adopted the 2030 Challenge committing to pursue progressive energy targets across our practice to achieve net-zero energy design by 2030. While we have made strides, we realize that 2030 is imminent and there is a deep need for increased progress and leadership to help us meet this critical time-frame.

We must rethink how we are addressing climate change because we are in the midst of an urgent and growing climate crisis. Annual global temperature is about 1°C hotter than pre-industrial levels, resulting in devastating impacts across the planet. Scientists have confirmed that at our current pace, the world could be 1.5 °C hotter by 2030—the difference between life and death for thousands of people, often our most vulnerable communities. To stay under 1.5 °C, the world must cut carbon emissions in half and transition to renewable energy in this decade. We need aggressive actions beyond our existing commitments to avoid these catastrophic impacts.

The adverse effects of an already altered climate continue to intensify-from unprecedented heat waves, droughts, and wildfires to increased flooding, coastal erosion and habitat loss. These shocks are having a growing impact on the communities we work with, economically, environmentally, and socially. In addition to reducing carbon emissions, our design work must help our communities become more resilient to climate impacts.

The global COVID-19 pandemic shows that our risks are not isolated solely to the environment, nor can they be disconnected from pre-existing systems which have resulted in compounded inequity. This epidemiological crisis has had a disproportionate impact on our most vulnerable and disadvantaged communities. The link between poverty, health, and climate resilience is undeniable, and only stands to worsen as secure food, water, and energy supplies become harder to sustain. We cannot afford the human, ecological, and economic costs of being unprepared for these impacts. By establishing an intersectional framework of equitable planning and design decisions, and advancing climate adaptation and resilience, we can increase the capacity of our cities, institutional systems, and infrastructure to better withstand and recover from the shocks and disruptions we are experiencing globally.

If current trends continue, embodied carbon—the emissions from extracting, manufacturing, transporting, installing, and demolishing building and construction materials—will account for 60% of the world's carbon budget by 2050. SmithGroup will expand our firm's and our industry's focus beyond operational carbon to address and mitigate the full carbon footprint of our designs.

While the climate crisis is enormous, the construction and operation of buildings and the built environment accounts for nearly 40% of global carbon emissions.¹ The impact we can have as a firm and profession is tremendous. Designing a carbon-free and more resilient future will require leadership from every employee within our firm. SmithGroup is committed to rise to this challenge, leveraging our passion for innovation and our multi-disciplinary structure to advance climate mitigation and adaptation in all our work.

¹UNEP and IEA, "Global Status Report 2017: Towards a Zero-Emission, Efficient, and Resilient Buildings and Construction Sector," 2017

CLIMATE ACTION COMMITTEE:

TASK FORCE APPROACH

TAKING ACTION:

To bring our commitment to the next level, we have established a Climate Action Committee (CAC) dedicated to the following mission:

The climate crisis requires us to accelerate our efforts to reduce carbon emissions while we rethink and regenerate how we build our communities and our physical and social infrastructure. SmithGroup's CAC is dedicated to helping our design teams, clients, communities, and the A/E industry realize significant and transformative impact in countering climate change by:

- Providing and supporting collaborative leadership, guidance, education, and mentorship
- Establishing accountability metrics and communicating progress internally and externally
- Developing and sharing new approaches, tools, and resources to enable more informed decisions and advocacy for climate action
- Fostering a culture of dedication, passion, and hope along with marketleading expertise and design innovation

The members of the CAC represent a wide range of disciplines and areas of expertise. Recognizing the complexity of the climate challenge, the CAC is focused and supported by three action-oriented task forces to focus on the key issues that will allow us to make the most significant gains towards our aspiration of a net zero and more resilient future:

Embodied Carbon Operation Performance Resilient Design

EMBODIED CARBON TASK FORCE

Our Embodied Carbon task force is co-led by Greg Mella and Andrea Reynolds. The members of the Embodied Carbon task force also represent a wide range of disciplines. The first step our task force took on was to strategize on a holistic and integrated approach to reducing Embodied Carbon. We also signed onto the SE 2050 Commitment and the MEP 2040 challenge. Our commitment to these programs, on top of previously signing onto the AIA 2030 Commitment and participating in the Landscape Architecture Foundation's Green New Deal Superstudio holds us accountable while striving to achieve the aggressive goals necessary to help us achieve neutrality.







Sunhwa Son

Interiors





Dan

Kinkead

Urban

Design





Greg Mella Co-chair

Reynolds r Co-chair Heine

Eva Koeste

Stet Sanborn

Matt Turner

Architecture, Sustainability

ture, Structural bility Engineering

Andrea

Architecture

Chris

Sites / Civil

Mechanical Engineering

Digital Delivery

SE 2050 ECAP: EDUCATE, REPORTE, STRATEGIZE, ADVOCATE

We are excited to leverage our passion for innovation and multi-disciplinary structure to advance climate mitigation. Our architects have supported the AIA 2030 Commitment program for over a decade and have found the structure and rigor of that program valuable as we work towards carbon neutrality. We are excited for SE 2050 to bring a similar approach to the structural engineering of our projects.

We have identified <u>Andrea Reynolds</u>, to be our Embodied Carbon Reduction Champion for the SE 2050 Commitment. Andrea is our Director of Structural Engineering. She has experience in the design of a variety of all structural materials and for a diverse mix of clients and building types. She is a member of the ASCE/SEI Sustainability Committee and is the co-chair of our Embodied Carbon Task Force.

EMCODIED CARBON EDUCATION

We believe that the first step towards engaging our staff in reducing embodied carbon is through education. Embodied carbon is a less familiar topic to most of our staff, compared to their understanding of operational energy use. Education is critical to expand our understanding of how our designers can reduce embodied carbon's contribution to the climate emergency. We strive to be a learning organization and provide a wide range of education opportunities and resources to help us all to understand the impacts of our design decisions and their effects on our environment. Resources that we have provided to educate our staff include the following:

- Microsoft Teams the first step in our education process was to share resources on our Sustainability Teams channel dedicated to Embodied Carbon. These resources include the SE 2050 library of resources and the Top 10 Carbon Reducing Actions for Structural Engineers.
- Embodied Carbon 101 we held 2 live sessions of a presentation that we created. These sessions were recorded and are available to all staff on our education portal (InKNOWvations). The Embodied Carbon 101 recording has been added to our onboarding task for new structural hires.
- < 20 we have created a short video about using the Carbon Designer tool that is available to all staff in our <20 video series for short learning burst. We will be developing additional <20's related to Embodied Carbon.
- One Click LCA we have provided training for One Click LCA to create a team of users throughout the company. This team is piloting the software on at least one project in each of our offices and meets regularly to share lessons learned and identify additional training needs.
- Climate Central our Climate Action Committee is creating a hub that will be available on every employee's home page. This hub will help staff find all resources, education, tools, data, reporting, etc. related to the climate action.
- Discipline specific and more in-depth training will be developed to consider reducing embodied carbon in our system selections and overall design process.
- Presentations and workshops highlighting Embodied Carbon will also be included in our annual Earth Day and Design Week activities.

EMBODIED CARBON REPORTING

Data is essential to making informed decisions and setting important benchmarks and the development of appropriate embodied carbon reduction targets. The SE 2050 database is a central component to building a successful Commitment Program and reaching our collective embodied carbon reduction goals by 2050.

We will enter 2 projects into the SE 2050 database from each of our offices that have structural engineers (Detroit and Chicago) by June 30, 2022. This data will be calculated using One Click LCA, ECOM,- Embodied Carbon Estimator, and other available tools. We are also building a database of our projects internally that can be illustrated in a dashboard on our Climate Center and used for benchmarking purposes. These data will be developed and used in conjunction with our AIA 2030 and MEP 2040 reporting.

EMBODIED CARBON REDUCTION STRATEGIES

We must establish and implement strategies to achieve the goal of reducing the embodied carbon of structural materials. We are developing best practices and actively collaborating with the design community.

Our Embodied Carbon task force has been collecting and sharing resources, brainstorming on how we can improve our processes, and conducting pilot exercises on projects. The pilots have considered how we can incorporate Embodied Carbon considerations in project pursuits and system selections for projects in early design phases. They are using One Click LCA to calculate the Embodied Carbon on more complete work. And the pilots are collaborating with contractors in opportunities to reduce Embodied Carbon (I.E. concrete mix designs).

Our project design process includes a Discovery Sprint - a multi-step, crossdiscipline, integrated design charette with the aim of creating sustainable and resilient solutions based on the ten principals of the AIA Framework for Design Excellence.

Our structural cast-in-place concrete specification sections have always encouraged replacement of cement with more sustainable options, but we are in the process of altering the language to require rather than recommend sustainable cement options. We are also extending this same language to the other concrete sections in our library (architectural, civil, and landscape concrete sections). We will be updating other master specifications with language for reduced Embodied Carbon solutions and requiring Environmental Product Declarations (EPDs) for critical components.

Finally, we are working to benchmark our projects and researching industry benchmarks in effort to establish Embodied Carbon Targets going forward.

EMBODIED CARBON REDUCTION ADVOCATE

True change can only come with industry-wide adoption. We understand that our impact reaches beyond our firm. We are always seeking opportunities to share our experience and knowledge within our firm, with our clients and contractors, with the design community, and beyond.

We have included our Climate Action Statement on our outward facing website and will soon be adding an article related to reducing embodied carbon. To engage our clients, we regularly conduct sustainability workshops on active projects and in advisory boards. We are working to develop a business case related to climate action to further engage more of our clients and potential clients.

To engage the industry, we have several people that participate in various sustainability related committees and efforts and our SE 2050 Embodied Carbon recently joined the ASCE/SEI sustainability committee. We have also been encouraging our teams to reach out to structural consultants that we work with to encourage them to also sign onto the SE 2050 and MEP 2040.

See the SG Embodied Carbon Action Plan Checklist on subsequent pages for additional information.

EDUCATION

We believe that the first step towards engaging our staff in reducing embodied carbon is through education. We strive to be a learning organization and provide a wide range of education opportunities and resources to help us all to understand the impacts of our design decisions and their effects on our environment.

REQUIREMENTS:

Status	Requirement	Implementation
8	Distribute firm-wide announcement of firm's pledge to join the SE 2050 Commitment. After the first year, make an announcement sharing your ECAP from the previous year.	Firmwide announcement was sent to all staff on October 10, 2021. Announcement was also included in a company-wide Engineering Dsicipline Newsletter on October 20, 2021 and in our 2021 year-end presentation "SmithGroup LIVE: Living Our Purpose", February 10, 2022. Commitment was also shared with all structural engineering staff.
8	Provide a brief narrative promoting a firm-wide education program for EC reduction and the firm's commitment to SE 2050.	SmithGroup (SG) has various levels of education and resources available as described in the Education portion of the ECAP.
8	Nominate an Embodied Carbon Reduction Champion for the firm. Include a brief profile in ECAP.	SG has nominated Andrea Reynolds to be our Embodied Carbon Reduction Champion. We have a multi-disciplinary EC task force, and discipline-focused groups to work towards reducing EC.
8	Set a date within the first year to present an "Embodied Carbon 101" Webinar to the firm.	SG's "Embodied Carbon 101" was presented firmwide on November 17 and 19, 2021. A recording has been posted to our InKNOWvations learning portal and is available to all staff. Onboarding process for all structural engineering staff has been updated to require "Embodied Carbon 101" for all new hires. A discipline-specific virtual presentation was made to all structural engineering staff.

 Item has been completed

 Item in process

(1 required, 4 recommended per year)

Status	Elective	Implementation
8	Have one representative of the firm attend quarterly external education programs (E.G. webinar, workshop) provided by SE 2050, Carbon Leadership Forum (CLF) or other EC resources.	
8	Share SE 2050 library of resources with technical staff.	Our SG – Sustainability site contains resources available to all staff and these were highlighted in Embodied Carbon 101 webinar. Available resources shall be enhanced by our Climate Central.
8	Share EC reduction strategies as outlined in Top 10 Carbon Reducing Actions for Structural Engineers document produced by SE 2050.	This has been made available to all staff on our SG – Sustainability site. Strategies for reducing EC were included in Embodied Carbon 101 webinar.
	Nominate a minimum of one employee per office to participate in a CLF Community Hub and/or task force.	
X	Provide narrative outlining plans for minimum of two firm-wide presentations per year on the topic of EC.	Our EC task force has identified several additional firm-wide presentations and <20's to be presented in the upcoming year.
	Present the document "How to calculate embodied carbon" to all technical staff.	
8	Attend a presentation or demo of an LCA-based tool used to calculate EC.	Training for One Click LCA has been and a <20 session for Carbon Designer has been made available to all staff.
8	Initiate an EC interest group within your firm and provide a narrative of their goals.	EC task force has been created. Focused structural engineering interest group has also been created.
X	Provide a narrative of how the Embodied Carbon Reduction Champion will engage EC reduction at each office.	Our EC Reduction Champion is leading the structural engineering interest group that includes from all offices that have structural engineers.
X	Provide a narrative for other appropriate actions.	Present case studies of EC and adaptive re- use in SG's annual Design Week

EMBODIED CARBON REPORTING

Data is essential to making informed decisions and setting important benchmarks and the development of appropriate embodied carbon reduction targets. The SE 2050 database is a central component to building a successful Commitment Program and reaching our collective embodied carbon reduction goals by 2050.

REQUIREMENTS:

Status	Requirement	Implementation
8	Provide a narrative of how EC data is measured, tracked, and reported. Considering the following:	For each project the software used will be tailored to the project needs and the design
	 How EC will be calculated for structural materials? 	phase. Software that may be used includes One
	 What commercially available LCA software(s) will be used to quantify EC? 	Click LCA, EC3, ECOM as well as in house design aids.
	 What Life Cycle Analysis (LCA) methodology will be used? 	Tools will be used in early design phases to inform system selections and set preliminary EC targets.
	 How and how often will material quantities by extracted? 	One Click LCA shall be used to extract EC information from our Revit models and into a database of our projects.
8	Describe the internal training for EC measurement provided (or that will be provided).	Training has been provided by the software provider for One Click LCA for at least one employee in each office.
		Each person is piloting the use of OCLCA on a project. Regular meetings and a group chat have been created to collaborate through using the technology and adjusting how systems are modeled in Revit.
		Follow up training is being planned with the software provider.
X	Submit an annual minimum of (2) project per office with structural engineers (Detroit and Chicago) to the SE 2050 database.	2 projects will be provided from each of our Detroit and Chicago offices will be reported.

Q Item has been completed X Item in process

(None required, 1 recommended per year)

Status	Elective	Implementation
	Submit all projects to the SE 2050 database.	
	Meet target average embodied carbon reduction from the previous year.	
	Report a greater percentage of projects than the preceding year.	
	For a project submitted to the database, ask the Owner if the project has a carbon budget or if there are project sustainability goals at the project kick- off meeting.	
X	Provide a narrative for other appropriate actions.	We are working to benchmark our projects beyond those reported in the first year to use for establishing EC targets.

EMBODIED CARBON REDUCTION STRATEGIES

It is necessary to identify and set strategies to achieve the goal to reduce the embodied carbon reduction of structural materials. We are developing best practices and actively collaborating with the design community.

REQUIREMENTS:

Status	Requirement	Implementation
X	Set EC reduction goal for coming year and an implementation narrative. Qualitative goals focused on education are appropriate for the first year	We are working to benchmark our projects and researching to understand benchmarks within the industry. This data will be used to establish EC targets.
X	For second year and beyond, provide a narrative of lesson's learned related to EC reduction in the past year. Describe success and misses for program improvement.	
X	Minimum (1) additional elective to reduce EC in design, why the elective was selected and its significance.	See electives

x	Item has been completed
X	Item in process

(1 required, 4 recommended per year)

Status	Elective	Implementation
X	Incorporate data visualization into ECAP to assist in making informed decisions and communicate design options to clients.	As we track our EC and benchmark EC on our projects we will be including data visualizations on our Climate Central.
X	Provide a project case study in ECAP to share lessons learned.	We will include a case study that will be included in our next ECAP
	Create a project-specific EC reduction plan.	
8	Complete an embodied carbon comparison study during conceptual design on a project.	We have developed a comparison study for a health care project that incorporates EC into the decision matrix for selecting structural systems. This study has been used to create a tool our structural can and have used for designing similar health care projects.
8	Participate in a LEED, ILFI Zero Carbon, or similar design charrette and speak to potential design consideration impacting EC.	Nearly every design project utilizes design workshops early on to identify sustainability goals, including strategies to reduce EC.
	Calculate your firm average benchmark for EC.	
X	Update your specifications and incorporate EC performance.	We are in the process of "greening" our structural specifications to incorporate EC performance. We are also similarly updating our site and architectural sections for concrete, metals, and wood.
8	Collaborate with concrete supplier to reduce EC in a mix design.	We have collaborated with our contractor (and their suppliers) on a project in TN to reduce EC in our concrete mix designs.
	Work with a contractor during material procurement to meet an EC performance criteria.	
	Have an Environmental Product Declaration (EPD) created as a result of a project.	
	Incorporate biogenic materials on at least one project annually	
	Provide a narrative of how circular economy has been used on your projects.	
X	Incorporate re-use or design for deconstruction into at least one project.	We are working on the design of a couple projects that include the deconstruction and reconstruction of existing modular buildings.

	Quantify construction waste reduction on a project and the impact to EC	
X	Integrate EC mitigation strategies in your General Notes.	We are in the process of "greening" our general notes in coordination with updates to our specifications.
X	Provide a narrative for other appropriate actions.	We are evaluating and enhancing our processes and workflows to better consider EC reductions for the design of our structural systems, as well as, other site, architectural, and engineering systems.

EMBODIED CARBON REDUCTION ADVOCACY

True change can only come with industry-wide adoption. We understand that our impact reaches beyond our firm. We are always seeking opportunities to share our experience and knowledge within our firm, with our clients and contractors, with the design community, and beyond.

REQUIREMENTS:

Status	Requirement	Implementation
8	Provide a narrative about how knowledge and data will be shared to accelerate adoption of EC reduction.	Our Embodied Carbon Reduction Champion participates in SEI Sustainability committee and several of our staff participate in sustainability efforts in the building design and construction industry.
X	Describe the value of SE 2050 to clients. How can we collaborate to drive adoption? Attach associated marketing materials as desired.	Our EC task force is developing a business case for reducing embodied carbon to share with clients.
X	Declare firm as a member of the SE 2050 commitment on boilerplate proposal language.	Our Climate Action Committee and EC task force are working on standard language for proposals and slides for project interviews to be shared company-wide.

 R
 Item has been completed

 X
 Item in process

(None required, 2 recommended per year)

Status	Elective	Implementation
X	Share commitment to SE 2050 on company website.	EC task force is developing content for "Perspectives" related to EC to be shared on our website.
	Give an external presentation on EC that demonstrates a project success or lessons learned.	
	Discuss with project Owners / Clients the option of requiring that some of the structural material come with facility-specific or product-specific EPDs.	
	Share educational opportunities with clients.	
	Provide a narrative encouraging industry and policy change incentivizing availability of low-carbon and carbon-sequestration materials.	
X	Start an EC community of practice or mentorship program in your office.	Our EC task force connects a diverse group targeted towards reducing EC. The task force is supported by discipline-focused groups in these efforts.
	Mentor a firm new to the EC space.	
õ	Provide a narrative for other appropriate actions.	We have encouraged our partners around the firm to reach out to any consultants that they may use to encourage those companies to also sign on to the SE 2050.
		We have also signed onto the MEP 2040 to further our commitment to reducing EC on our projects.