2021–2022 Climate Action Report







Confronting the climate crisis is the most important goal that drives SOM's work. As architects, designers, engineers, and urban planners, we are working together to accelerate the decarbonization of the built environment—which today accounts for nearly 40 percent of carbon emissions worldwide.

As a leading architecture and engineering firm, we have the opportunity and a responsibility to set the example for our industry. That's why we have made a twofold pledge to achieve net zero carbon emissions: in our own business operations, and in every project that we design.

We are proud to announce that SOM is now a net zero emissions business, achieved through a series of measures to reduce our emissions across every area of our global practice, together with carbon offsets. As we continue to reduce the carbon emissions associated with our business operations each year, we have our sights set on becoming a net zero emissions business without offsets by 2030.

In line with our pledge to meet the AIA 2030 Commitment, we are targeting net zero operational carbon for 100 percent of our active design work by 2030. We have also committed to the 2050 goal of targeting net zero whole life carbon in all of our active design work. In fact, we intend to reach this milestone ten years early-by 2040.

A key lesson we have learned through this research and exploration is that reaching any meaningful solution will require working collaborativelywithin and beyond our industry-toward clear and well-defined goals. Decarbonizing the building sector depends on everyone with a stake in the built environment making this a shared commitment and working together. We are excited to partner with you on this journey.

We are working toward a zero-carbon future.

In our first Climate Action Report, we are outlining our commitments, tracking our progress, highlighting innovative projects, and introducing some of the people driving this effort. We also describe the climate tools and strategies that we've developed through research and built experience. This report offers a 360-degree view of climate action at SOM and a snapshot of the state of our industry.



Practice

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Wellesley College Science Cel Renovation & Expansion Wellesley, Massachusetts



Our net zero benchmarks

By 2040, we are targeting net zero whole life carbon for 100 percent of our active work

2021–2022 Climate Action Report

Headquarters Building on Lake Geneva Geneva, Switzerland



We have achieved net zero carbon business operations with offsets



By 2030, we are targeting net zero operational carbon for 100 percent of our active work



We've pledged to help accelerate the decarbonization of the building industry

SOM has committed to:

and we plan to exceed by 2040:

New United States Courthouse—Los Angeles Los Angeles, California

WorldGBC

Net Zero Carbon Buildings Commitment

AIA2030 Challenge Net Zero Operational Carbon

Building Health Alliance

United Nations Race to Zero Campaign Business Ambition for 1.5 °C (Through the Science-Based Targets Initiative)

COP26 Communique

Architecture 2030 China Accord

SE 2050

Net Zero Embodied Carbon Structures by 2050

WorldGBC Bringing Embodied Carbon Upfront

Net Zero Embodied Carbon by 2050

WorldGBC Advancing Net Zero Built Environment

Sector Decarbonization by 2050

MEP 2040

Net Zero Whole Life Carbon by 2040

SOM is Now a Net Zero Emissions Business with Offsets

Carbon Emissions Attributed to SOM Business Operations, 2021-2022

SOM offset 100 percent of carbon emissions related to

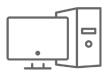
working to reduce these

emissions to achieve net zero without offsets.

our global business operations over the past year. We are

2.1%—Bollets 2.1%—Hotel 2.1%—District Steam 2.7%—Refurbishment 6.6%—Office Supplies 8.3%—Commute
23%—Electricity
54%—Business Travel

	0%—Water
	0.1%-Sewage
	0.1%-Waste
	0.3%—Freight
	0.9%-Cloud
	1.1%—Refrigerators



Business Travel

Office Technology



Water Use

Waste & Recycling

After implementing a comprehensive range of strategies to reduce operational emissions across all of our offices, SOM purchased carbon offsets for the 3,750 metric tons of carbon attributed to our global business operations in 2022. We will continue to further reduce our emissions, with the goal to become a carbon-neutral business, without offsets, before 2030.

Our strategy to cut emissions extends to every area of our business operations. We are tracking the carbon impact of business travel. We are reducing energy needs by moving our IT operations—by far the most energy-intensive function in our offices-to a cloudbased system; once this transition is complete, we expect to have decreased electricity use by more than 75 percent in our three largest offices.

Smart technology in our offices, such as smart lighting systems and automatic blinds, contributes to cutting energy use related to heating and cooling. We have reduced single-use materials and supplies and cut down on printing. And we have implemented rigorous waste reduction and recycling programs in each of our offices.





Supplies & Materials

Electricity

Building Systems







Carbon Offsets

Printing

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MOYNIHAN TRAI

Roadmap to Net Zero Operational Carbon

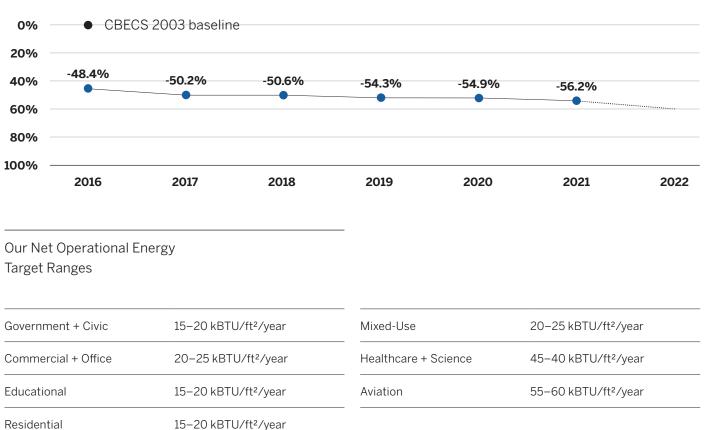
EXCELSIOR

MARKZZŻ

By 2030, Targeting Net Zero Whole Life Carbon for Every Project

Firmwide Reduction in Operational Energy

Area-weighted percentage reduction below 2003 Commercial Buildings Energy Consumption Survey (CBECS) baseline



Target Ranges

EVER UPWARD

MOYNIHAN

9 Ticketed Waiting Room

9

10

Government + Civic	15–20 kBTU/ft²/year
Commercial + Office	20-25 kBTU/ft²/year
Educational	15–20 kBTU/ft²/year
Residential	15–20 kBTU/ft²/year

Note: Embodied carbon targets are estimated as an average across the program type. Target ranges are continuously being revised for each project as more data becomes available.

2021–2022 Climate Action Report

In line with our pledge to meet the AIA 2030 Commitment, we have adopted specific targets toward designing all of our projects to reach net zero operational energy by 2030.

As an industry leader, SOM is committed to measuring the energy use and carbon impact of all of its global portfolio to help inform design decisions and accelerate decarbonization strategies in every design and planning project we take on. A series of upskilling initiatives across the firm, together with in-house design guides and tools, is enabling all SOM staff to be well equipped with the effective knowledge and tools to deliver net-zero-carbon projects.

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SOM plans to reach 2050 carbon goals by 2040

By 2040, Achieving Net Zero Whole Life Carbon in Every Project

2021–2022 Climate Action Report

Professional organizations have called upon our industry to reach net zero carbon both embodied and operational—by 2050. We've pledged to meet this goal by 2040.

To facilitate this, we have a comprehensive climate action plan and a framework that collectively guide us in progressively reducing emissions in our built environment projects.

Our Actions:

Developed a Carbon Action Plan for SE 2050

Signed up to SE 2050 and MEP 2040

Developed Embodied Carbon 101 tool with the aim to use it in all projects; provided training and education

Engaged with and influenced industry organizations including Carbon Leadership Forum, WorldGBC, RIBA, AIA, ASHRAE, International Code Council, and more

Collaborated with industry leaders and academics to implement an effective carbon assessment methodology in projects

Expanded the Carbon Action Plan to include a roadmap for SOM's 10 Design Principles

Developed "carbon loop," a firmwide platform for reporting energy performance and carbon impact

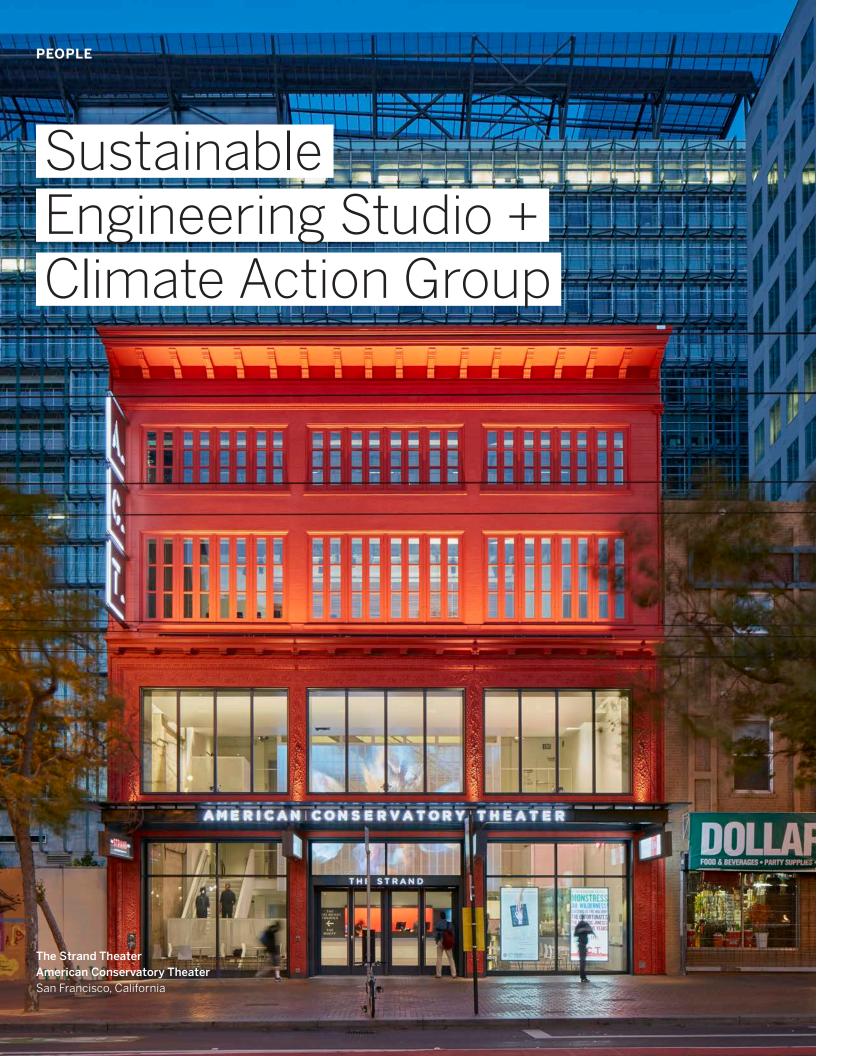


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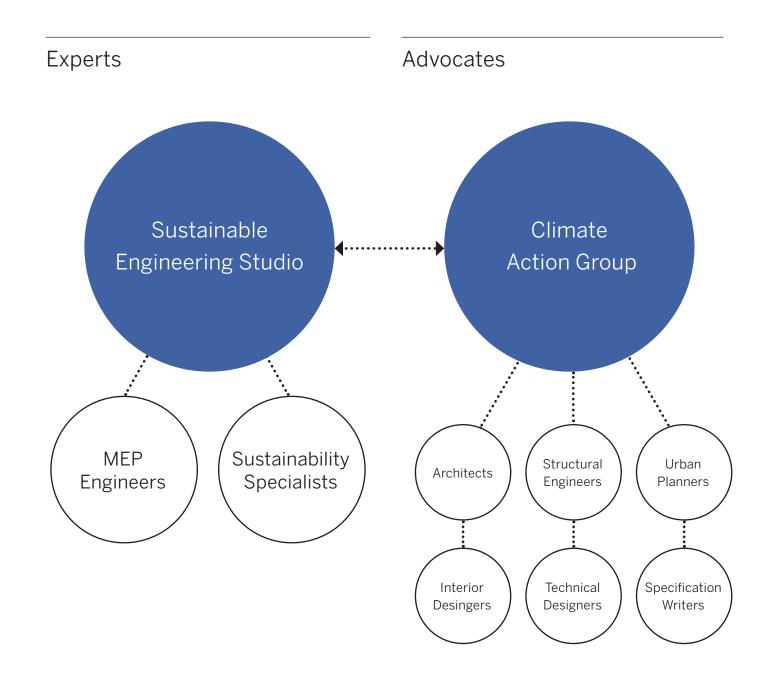
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People





As a global network of technical experts and sustainability advocates, we collaborate to accelerate the decarbonization of the building industry.





LEED and WELL accredited professionals across all of our offices

Meet our experts and advocates



"At the onset of a decade that may very well determine the future of our planet, we approach each project with a focus on conserving resources and supporting the transition to a zero carbon economy."

"To limit the consequences of climate change, prioritizing planetary and human health in all facets of the built environment must become the rule, not the exception. Strong and effective advocacy is a critical part of this process, as it raises public awareness on interrelated challenges. Biodiversity protection and climate justice should be addressed in tandem with decarbonization."

Mina Hasman Sustainability Director



"We are engineers, analysts, and designers but, first of all, we are thinkers: nature is our endless source of wonder and inspiration. We envision a built environment where technology supports passive design, where nature is not a resource to be exploited but an integral part of our lives, where occupants are aware of and accountable for their choices. We use data, science and creativity to instill change."

Marzia Sedino Sustainability Director

"We recognize the need to alter the trajectory of climate change by going beyond net zero. We need to take carbon out of the atmosphere through the built environment, and with our concept for Urban Sequoia, we have developed a design to do just that."

Chris Cooper Design Partner





"We are seizing the opportunity to respond to urgent environmental challenges. Research has always been central to our practice—and by teaming up with universities, innovative start-ups, and other partners across industries, we are exploring the unknown and pioneering new solutions that can make a tremendous positive impact when applied at a global scale."

Yasemin Kologlu Design Principal

Kent Jackson Design Partner



"Traditionally, the construction industry has only considered operational carbon emissions, while overlooking embodied carbon. This is no longer sufficient. By centering our design approach on whole-life embodied carbon and regenerative design, my goal is to interconnect strategies to reduce both operational and embodied carbon, while integrating circular economy principles."

Mirko Farnetani

Firmwide Embodied Carbon Leader





Expertise and Advocacy

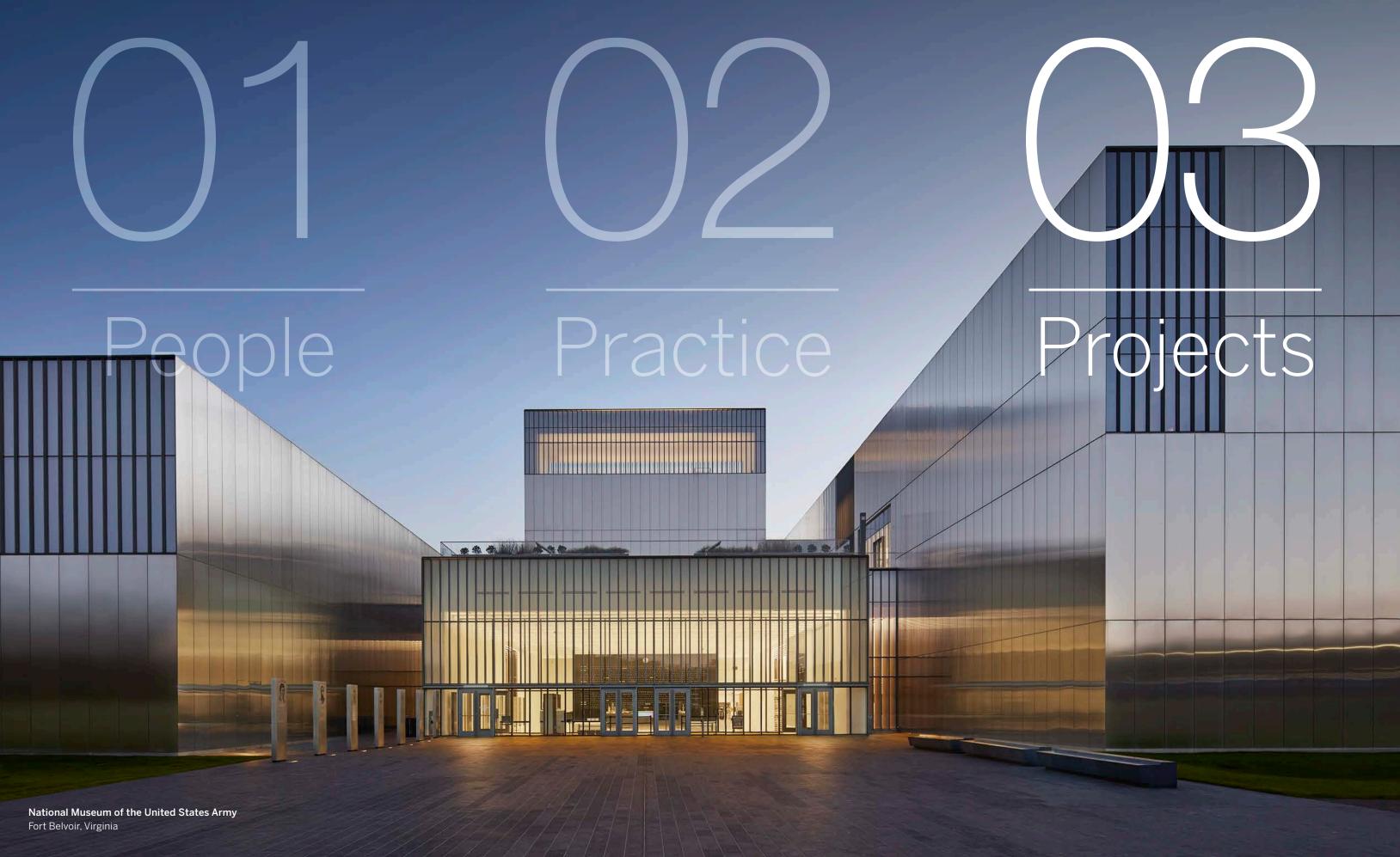
Sustainability leaders from SOM have authored or helped to launch some of the key climate action initiatives across our industry. Here are some of the organizations we've engaged with to maximize our impact:

Global	United Sta
ASHRAE Decarbonization Committee	AIANY Comn Environment
ICC Whole Life Carbon Standard Committee	Be-Ex Archite
Commonwealth Association of Architects Council	City of Chica Task Force
ULI Policy Think Tank	Carbon Lead
ULI Health Network	Illinois Green Advisory Boa
UNEP/GlobalABC COP Task Force	NREL Comm
WorldGBC Advacing Net Zero Steering Committee	NYSERDA De Buildings Ste
MEP 2040 Founding Members	USGBC Loca

We can only confront the climate challenge collectively. That's why we are focused on contributing our expertise and teaming up with organizations that are making an impact. Decarbonizing the built environment sector depends on everyone with a stake in the built environment—designers and developers, clients and contractors, institutions and governments, and finally, the people who use buildings and spaces—making this a shared commitment and taking action.

tates	United Kingdom
nmittee on the nt	Architects Council of Europe Sustainability Group
itect Advisory Council	CIBSE Intelligent Buildings Group
cago Decarbonization	RIBA Council and Practice & Policy Board Committee
adership Forum	UK Construction Industry Council Climate Change Committee
en Carbon Drawdown oard	UKGBC Board of Trustees
mittees	
Decarbonizing NYC Steering Committee	

cal Chapters



10 Design Principles for Sustainability + Wellbeing

A Holistic Approach to Sustainability

Underpinned by the UN Sustainable Development Goals for 2030, we have defined our 10 Design Principles: a set of goals and standards that guide the vision, design approach, and delivery for every project.

We believe in a holistic approach to sustainability, encompassing environmental, social, and economic values. Our goal for 2023 is to use the 10 Design Principles as the foundation for all of our design projects, in order to deliver resilient built environments and a prosperous future for everyone.

SOM's 10 Design Principles





ECOLOGY Leverage and Protect Nature

ECONOMY + EQUITY Provide Low Carbon Urbanism for All

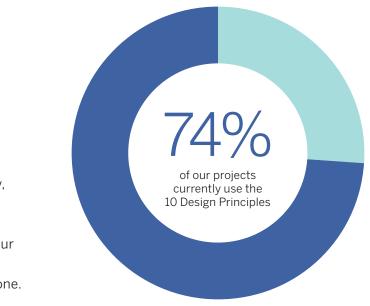




LIVABILITY + WELLBEING Design Places where People Thrive

MOBILITY Promote Sustainable Connectivity an

Headquarters building on Lake Geneva Geneva, Switzerland



Our goal is to apply the 10 Principles in 100 percent of our projects in 2023.



ENERGY + CARBON Design and Deliver Net Zero Carbon Built Environments



MATERIALS + RESOURCES Specify Responsibly and Prioritize Efficiency



WATER Value Every Drop



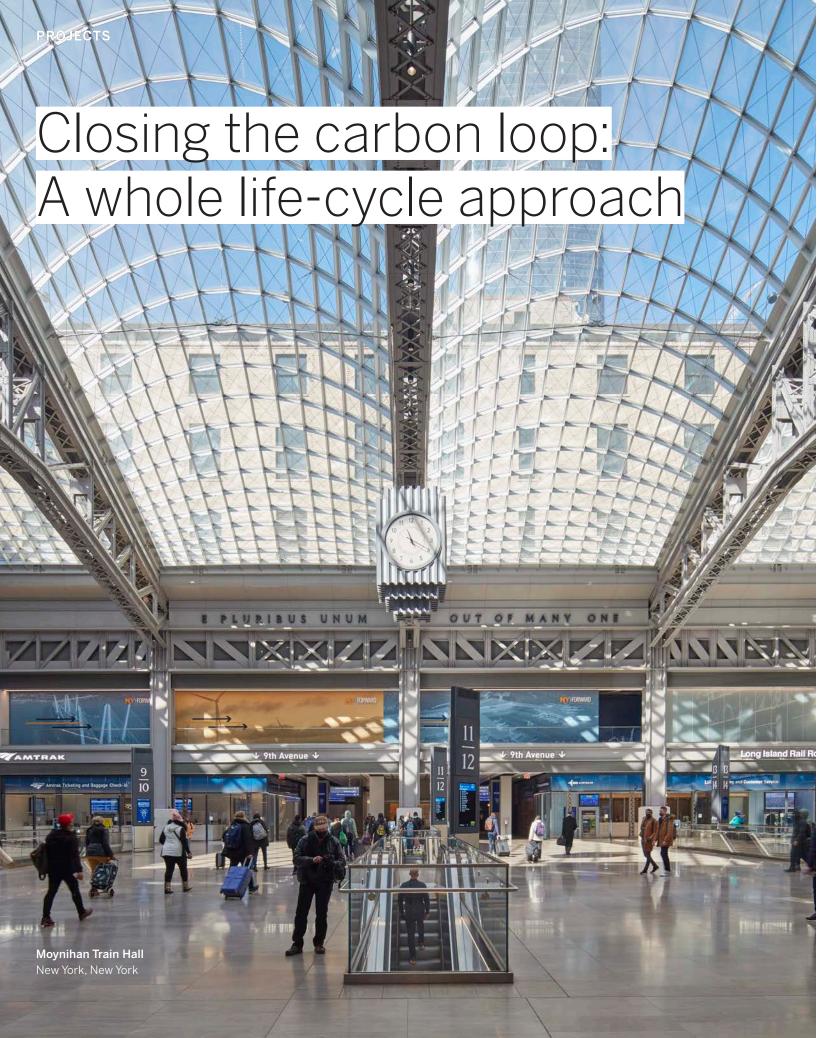
RESILIENCE Adapt for Climate Change



WASTE Do More with Less



HERITAGE + IDENTITY Cultivate Authentic Connections



We're measuring and reporting progress across all of our projects worldwide.

We believe that data makes a difference. By monitoring embodied and operational carbon in every project we undertake—using our own "carbon loop" tools, while also collaborating with internal and external experts-we are gathering and sharing insights that allow us to improve our design processes. This effort is essential to our commitment to reduce carbon emissions across all of our projects, working toward our 2040 net-zero goal.

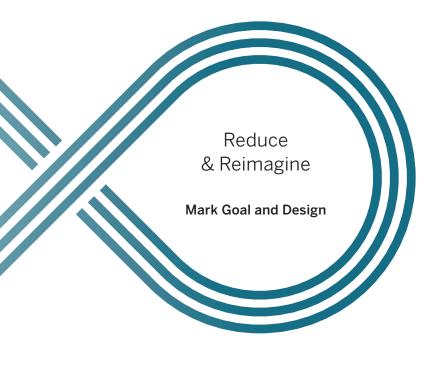
In order to achieve this goal we are continuously improving our process, using industry tools as well as creating our own.

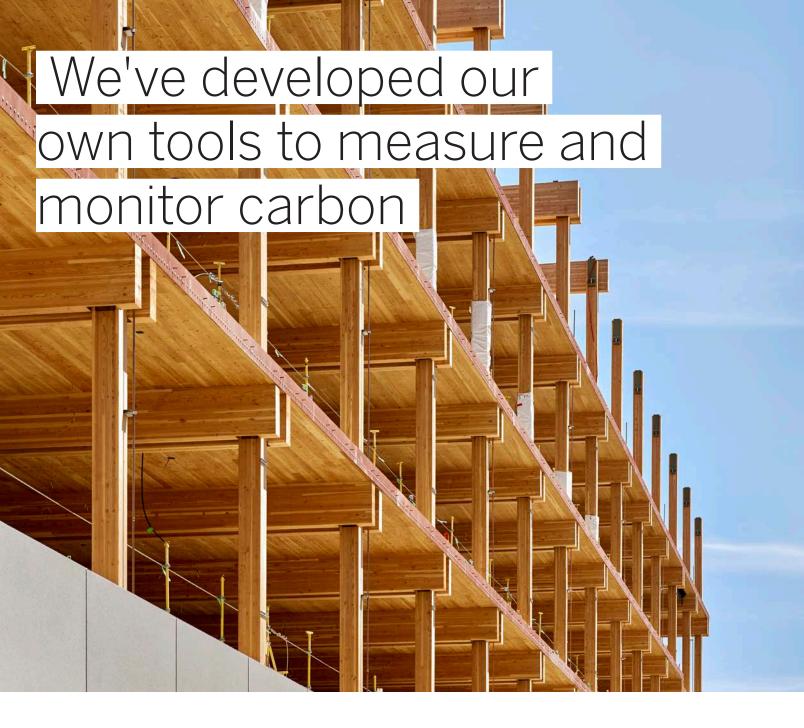
> Identify, Transparency, Quantify

Use Tools to Set a Goal

We currently measure operational energy for 100 percent of our projects, and we calcluate embodied carbon for 55 percent of our projects.

Our goal is to calculate operational energy, operational carbon, and embodied carbon for 100 percent of our projects in 2023.

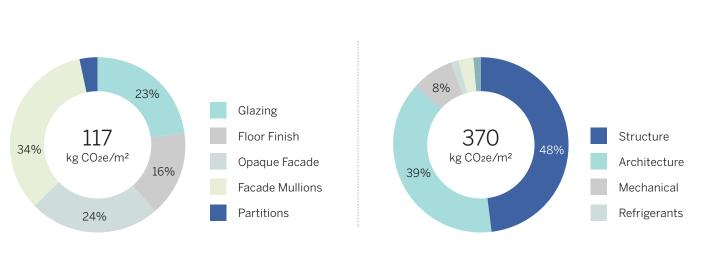




EA Tool

EC101

Prototype Example



Embodied Carbon by Component

Sharing knowledge maximizes the potential for impact, so we have created resources to promote progressive and sustainable building practices. By making the results of our research available to others, we aim to catalyze change throughout the industry.

We have developed:

- → An initiative to de-chemicalize and de-carbonize material specifications and provide information on sustainable and healthy materials
- → Design guides to advance active, passive, and net zero design strategies
- → An analysis tool to reduce embodied carbon in architecture, MEP, interior fit-outs, and structural design

The Environmental Analysis Tool[™] (EA Tool[™]) is an application developed by SOM in 2013 to estimate the equivalent carbon dioxide emissions of structures for various building types, with consideration of initial construction, service life, repair after hazardous events, and deconstruction.

Architects, engineers, developers, building owners, contractors, and students can utilize the EA Tool[™] for research purposes. The EA Tool[™] can be used to evaluate and assess the implications of new construction, retrofit construction, and existing structures.

The Embodied Carbon (EC) 101 is designed as a simple embodied carbon calculation tool used by all teams during early design phases on projects.

The goal is raise basic knowledge, understanding, and awareness of embodied carbon from the outset of a project and to help populate an internal embodied carbon database for all SOM projects. EC101 does not intend to replace the more detailed and accurate tools, but rather to fill the gap in basic embodied carbon calculations during early-stage design.

Embodied Carbon by Discipline

Specifying the right material at the right time can make the difference

Care PJ

Bio-concrete is an algae-based constructio material that absorbs carbon, developed by Prometheus Materials in collaboration with SOM

Decarbonizing Materials

"D-Specs" is our effort to de-carbonize and de-chemicalize our material specifications. The way we specify architectural materials has a major impact on the performance and carbon footprint of any built environment project. We aim to make a broader impact in the industry by influencing manufacturers, clients, and contractors to consistently prioritize healthy and sustainable materials.

Design Guides

SOM has created a series of design guides to facilitate integrated design in all built environment projects from their inception. These resources guide project teams on passive design approaches, active systems, material choices, and net zero carbon strategies.

nd How do we choose better materials? Through education, selection, and specification.

- → Raising awareness on materials
- → Informing early design decisions
- → Compiling multiple globally recognized sources on healthy materials into a single database
- → Expanding access by building a digital materials library
- → Influencing specifications decisions
- → Implementing on projects, elevating our work

Our design guides allow project teams to:

- → Learn about the environmental impact of commonly used materials
- → Understand the characteristics and design implications of different passive design strategies based on climate zones
- → Compare the performance of different active building systems
- → Learn from case study examples that implemented the described strategies
- → Take informed decisions when selecting material samples, and specifying sustainable and healthy materials in projects

As a research-based practice, SOM has a long history of advancing technological and design innovations that have transformed the industry. Today, we are applying decades of global experience to local contexts in order to address the climate and biodiversity emergencies.



of our research projects are focused on sustainability and resilience Current areas of research include:

- → High Performance Design
- → Mass Timber
- → Bamboo Structures
- → Sustainable Materials
- → Direct Air Capture
- → Carbon Quantification





What if buildings could act like trees—capturing carbon, purifying the air, and regenerating the environment? Taking inspiration from nature, Urban Sequoia is a design concept that is buildable today, setting the stage for a new carbonremoval economy and a resilient future for cities.

At COP26, SOM unveiled this concept for buildings and their urban context to absorb carbon. By optimizing building design, minimizing materials, and integrating biomaterials and carbon capture technologies, our prototype design achieves substantially more carbon reductions than what has been possible by applying these techniques separately. Over a 100-year lifespan, an Urban Sequoia building would absorb more than 300 percent of the amount of carbon emitted in its construction and operation. These nature-based strategies can be used in buildings of all sizes and types, and can even be applied to urban planning and infrastructure.

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Developing an algae-based concrete that absorbs carbon

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rettdividu wer/ad@sign buildings

Bio-Concrete

SOM is determined to develop new methods and materials in the pursuit of creating zero-carbon and carbon-negative buildings. Prometheus Materials, a start-up company spun out of a research program at the University of Colorado Boulder, has teamed up with SOM to explore and establish applications for a new generation of biological materials that could turn the construction industry into a positive force in the fight against climate change.

Bio-concrete, developed with Prometheus, applies solutions found in nature. The algae-based building material uses two natural mechanisms to sequester and store CO2 in material form: photosynthesis (the absorption and storage of CO2 during the growth of the algae) and carbonate mineralization (CO2 reacting with a metal to create a mineral during the curing process). Applied to a concept like SOM's Urban Sequoia—in which buildings function as trees in a whole-life carbon cycle, capturing CO2, purifying the air, and regenerating the environment—the carbon captured through bio-concrete can be put to use in various industrial applications, forming the basis of a new carbon-removal economy.

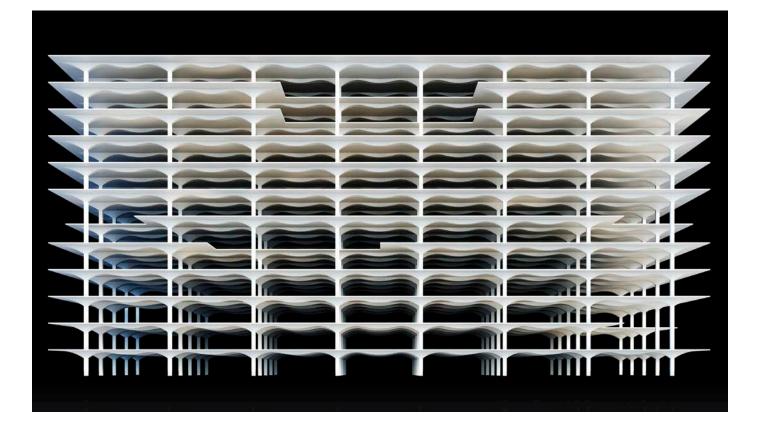


Reducing the carbon impact of concrete construction

Stereoform Slab

at scale.

Stereoform Slab is a prototype for a future building system designed using advanced robotic fabrication techniques. As an alternative to the ubiquitous concrete slab, it demonstrates an innovative method to dramatically reduce the carbon impact of construction. Research shows that 40 to 60 percent of a building's carbon footprint results from the development of the concrete slab itself. With this sustainable fabrication technique of concrete formwork using advanced robotics, the design team used 20 percent less concrete than a conventional system, resulting in a 20 percent overall carbon reduction.



At the Chicago Architecture Biennial, SOM unveiled a prototype for an efficient construction method that dramatically reduces concrete quantities—and it has the potential to transform the building industry if applied

Stereoform Slab extends the length of the conventional concrete span from 30 to 38 feet. This has the potential to extend a building's lifecycle, as longer bays can more easily be adapted to changing demands.



SPLAM Timber Pavilion

Timber is both a renewable resource and has the capacity to sequester carbon, making it an inherently sustainable material. With an optimized timber weave framing system, SPLAM [SPatial LAMinated timber] showcases an efficient new model for design and construction.

SPLAM is a full-scale prototype of a single-story structural framing system used in mid-rise construction. Lighter in weight than conventional building framing methods, spatial-laminated timber, or SLT, reduces material use by 46 percent compared to a traditional cross-laminated timber panel. It achieves this by making use of shorter 2x4s that interlock to create an optimized dimensional layout. This layout can be endlessly modified to suit the structural demands of a building's form or functional needs, becoming denser where the lattice needs to accommodate heavier loads, and more sparse in non-loadbearing areas.



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The product of a multi-year collaboration between SOM and the University of Michigan Taubman College of Architecture and Urban Planning, the SPLAM pavilion shows how this system could dramatically reduce timber quantities and embodied carbon when applied in a construction project.

Reducing carbon with innovative timber construction methods

County Office Building 3

Redwood City, California

The new county headquarters building in San Mateo, California, will be the one of the first net-zero-energy, ultralow-carbon civic buildings in the United States. With a structural design that uses cross-laminated timber to reduce embodied carbon, County Office Building 3 demonstrates a high-impact solution that can be applied in many other construction projects.

Every decision in construction detailing and structural design was motivated by the goal to reduce the building's carbon footprint. Leveraging engineering knowledge and insight from the firm's research on mass timber construction, SOM lowered the volume of timber in the building, reduced the piece count, and pared down the number of steel components. While a typical mass timber structure has 65 to 75 percent less embodied carbon than a conventional steel structure, COB3's structural timber design lowered structural embodied carbon by 85 percent.





ENERGY + CARBON Energy generated on-site with solar panels

Glulam columns and beams with cross laminated timber (CLT) flooring

2021–2022 Climate Action Report

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MATERIALS + RESOURCES



LIVABILITY + WELLBEING

Facade design reduces solar heat gain and maximizes daylighting

An energy-efficient workplace that supports wellbeing

Headquarters Building on Lake Geneva

Geneva. Switzerland

This contemporary addition to a historic campus creates an inspiring and collaborative workplace, where sustainability and wellbeing go hand in hand. Designed to harmonize with its singular natural setting above Lake Geneva, the new building descends toward the lake in a series of terraces. The design creates a sense of a continuous connection between inside and outside, bringing the green of the park within to the open offices. The terraces are just one of the features that enhance employees' wellbeing and promote collaboration.

Designed to meet stringent Swiss Minergie standard, the building features a hybrid structure of concrete columns with floors supported by alternating mass timber and concrete beams, which are visible in the offices. Water from Lake Geneva is used to heat and cool the building using hydrothermal technology, while roof-mounted solar panels contribute to the building's energy use reduction. Through the elegant glass facade, abundant natural light provides comfort as well as further energy savings.





ENERGY + CARBON Hydro-thermal technology to heat and cool the building

2021–2022 Climate Action Report



LIVABILITY + WELLBEING

User-centered design with outdoor access from every floor



MATERIALS + RESOURCES

Structures-related embodied carbon emissions reduced by 40%

Applying a holistic design approach to our own home

SOM New York Studio at 7 World Trade Center

New York, New York

For decades, SOM has designed cutting-edge workplaces with the conviction that architecture can shape an organization's culture. In designing our own studio at 7 World Trade Center-an SOM building which set a benchmark as the first commercial office building in the world to achieve LEED Gold certification—we took the opportunity to push these principles further.

Completed in 2020, our new home in New York exemplifies where we think workplace design will move in the future. The design manifests a philosophy we refer to as "radical reduction"—it is an expansive, flexible space characterized by healthy materials and a responsible approach to the use of resources. SOM created a rigorous set of criteria to choose a sustainable material palette. Natural and renewable materials such as cork, tectum, and white oak complement the exposed concrete floor slabs, while plants throughout the office and abundant natural light boost wellbeing.





ENERGY + CARBON Daylight sensors control lighting and blinds to reduce energy use

Continuous air-quality monitoring; biophilic design with plants throughout

2021–2022 Climate Action Report





LIVABILITY + WELLBEING



WASTE

Lowered carbon emissions through reuse and reduction strategies

Implementing sustainable strategies for a next-generation workplace

800 Fulton Market

Chicago, Illinois

certification.





ENERGY + CARBON Smart building systems help to

limit operational energy use

This mixed-use building is a milestone in the transformation of Chicago's formerly industrial Fulton Market District. Through extensive analysis of the building's life cycle and an efficient structural design, the design team reduced structural embodied carbon by 65 percent when compared to an average commercial office building. The project is certified LEED Platinum and is targeting WELL Building Standard Gold

Billed by its developer, Thor Equities, as "Chicago's Smartest Building," 800 Fulton Market features a range of smart building systems that promote wellness, sustainability, and energy efficiency. Landscaped terraces with native plantings on every other floor and ample daylighting within the office spaces bring wellness and sustainability to the forefront of the user experience.





LIVABILITY + WELLBEING

Air-filtration system and plants help maintain healthy air quality



ECOLOGY

Landscaped terraces with native plantings on every other floor

Planning the first carbon-neutral public research university campus in the U.S.

University of California, Merced 2020 Campus Expansion

Merced, California

The University of California, Merced is the youngest campus in the UC system and the first North American research university to be established in the 21st century. After designing the university's original master plan in 2002, SOM was selected to lead the 2020 Project—an ambitious public-private partnership that nearly doubles the campus footprint to support the enrollment of 10,000 students by the year 2020. The expansion project of a new campus plan, design guidelines, infrastructure, open space, and 11 new buildings, including state-of-the-art research facilities, laboratories, a greenhouse, and dining hall.





WATER Rainwater harvesting

Designed to adapt for different uses and future expansion, the master plan organizes the campus as a compact, walkable environment with dynamic public spaces. The university is the first public research institution in the U.S. to achieve carbon neutrality and the only academic campus to have every building LEED certified, with all 2020 Project buildings earning LEED Platinum certification.



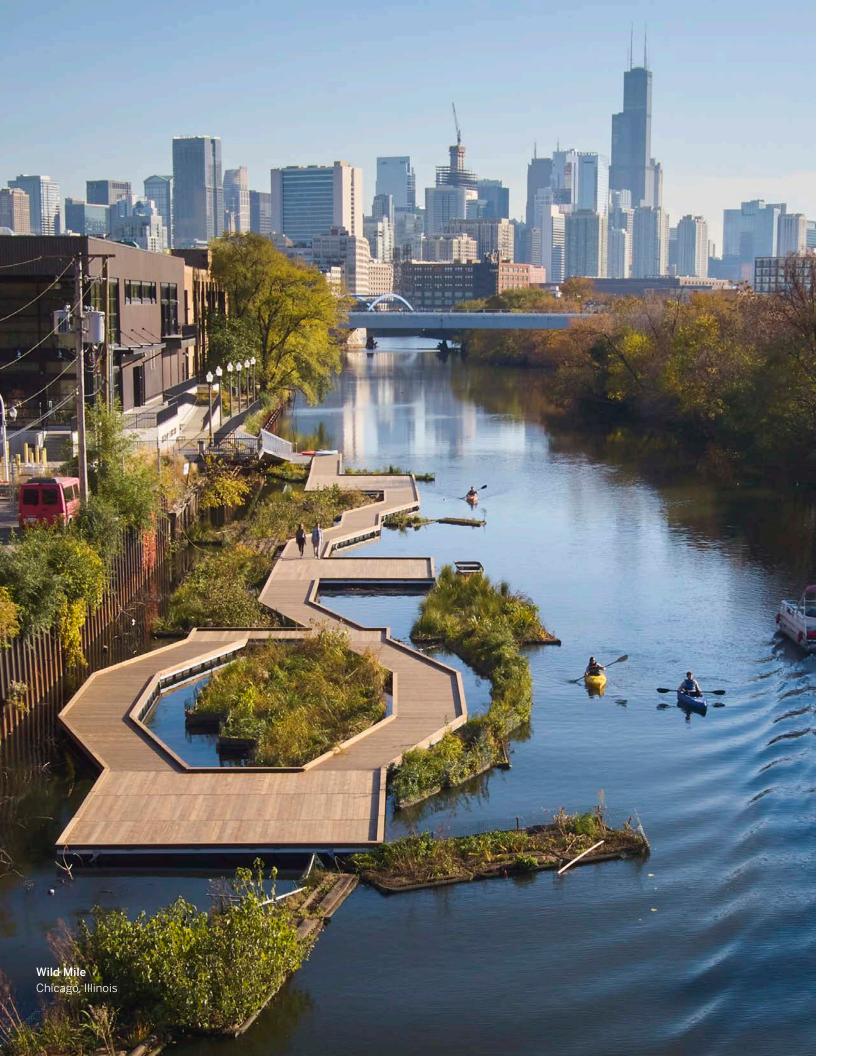


ECOLOGY Drought-resistant plantings



LIVABILITY + WELLBEING

Pedestrian-friendly campus planning



Driving change in our industry, today and into the future

that we design.

In this report we have declared SOM's commitments, shared our progress, and highlighted key projects and people who are leading our response to the climate crisis. With clarity of purpose, and driven by our three major goals—reaching net zero operational carbon with offsets in our business operations as of 2022, targeting net zero operational carbon on all projects in design by 2030, and targeting net zero whole life carbon for all projects in design by 2040—we are continuing to shape a more sustainable built environment.

There is much more to be done. We will continue to work across industries, leveraging our interdisciplinary expertise, insights from our clients, and innovations from our design teams, to do our part in addressing the defining challenge of our time. This is an ongoing conversation: we will continue to hold ourselves, and our industry, accountable as we seek to drive collective change in the way we operate our business and, most importantly, in the built environment

