

Our transition to a zero carbon future

SE 2050 Embodied Carbon Action Plan for 2025 (5th year)



SE 2050

Embodied Carbon Action Plan

A climate emergency is upon us. As structural materials represent about 12% of global greenhouse gas emissions, our structural engineers recognize their role in achieving net zero embodied carbon structures by 2050.

Arup is committed to shaping a better world, creating shared value for our clients and communities, and safeguarding our planet. Every part of our firm has a role to play in making sustainable development central to our business. Sustainable development is fundamentally about creating a balance between the needs of a growing world population and the finite resources and health of our planet—our life support system.

Arup embodies **total value** with a holistic design approach, integrating a wide breadth of advisory services and skills in sustainability and resilience, digital, buildings and building envelope design, infrastructure, and masterplanning. We have the opportunity to use our design and advisory services to produce safer, more inclusive, resilient and sustainable cities and infrastructure.

In October 2017, Arup made a commitment to contribute meaningfully to the UN Sustainable Development Goals (SDGs). This commitment was furthered through Arup's [announcement](#) at COP26 to use whole life carbon data to target reductions in operational and embodied carbon.

As designers, engineers and advisors, our skills and vision are increasingly in demand from clients and partners wanting to transition to a more sustainable future.

It is up to each of us, working individually and collectively, to drive change. We must all promote sustainable development as a central basis of our projects, as distinct from a supplementary feature. Everyone has a role to play inspiring and supporting our clients and colleagues alike by offering innovative ideas and challenging the status quo. We are proud to have been part of the development of the SE 2050 Initiative since 2014 and to be among the inaugural signatories to SEI's SE 2050 Commitment Program.

Our commitment requires the publication of our strategy in the areas of education, reporting, reduction, and advocacy. Our Embodied Carbon Action Plan (ECAP) for North America leverages our strong internal Skills Networks and aligns with our global commitment to contribute meaningfully to the UN SDGs.

With each year, we refine our strategies, deepen our understanding, and scale impact. In our fifth year as an SE 2050 Signatory, we continue to push the boundaries of low-carbon structural design, sharing knowledge and lessons learned to accelerate industry-wide transformation.

ARUP



Strategic focus areas

Arup is working to achieve net zero embodied carbon structures by 2050.



Embodied Carbon Milestones

This roadmap showcases Arup's key milestones in advancing embodied carbon reduction. Through industry leadership, research, and practical solutions, we've built a strong foundation for driving meaningful change and supporting a lower-carbon future.

2010



2010: Arup Americas Structural Skills Network (SSN) sustainability group is formed, now known as the Structural Engineering Sustainability Hub (SESH)

2010: Arup contributes to the ASCE publication, *Sustainability Guidelines for the Structural Engineer*



2010: Arup joins Carbon Leadership Forum (CLF)

[Read our spotlight here!](#)



2012: Arup contributes to US Concrete PCR version 1.0



2017: Arup contributes to CLF Benchmarking Study & LCA Guide

2018

2018: Arup is a contributing author to the first released guidance on WBLCA, *Whole Building Life Cycle Assessment: Reference Building Structure and Strategies*

2021

2021: Arup announces a Whole Life Carbon (WLC) initiative at COP26 in Glasgow and commits to undertaking whole lifecycle carbon assessments of all building projects and reduce embodied carbon by 40% in 2030

2021: Arup publishes [Embodied Carbon Stories](#), to showcase exemplar Arup projects in sustainability, focusing on the reduction of embodied carbon

2020: Arup commits to the newly established SE 2050 Commitment Program



2019: Arup launches [Carbon Insights Platform](#), to aid and educate designers at early stages of design



2019: Arup is part of founding the SE 2050 Commitment Program



2019-2020: Arup is technical advisor on Marin County Low Carbon Concrete Code, the first US code with embodied carbon regulations on concrete

SE 2050 Mission Statement:
All structural engineers shall understand, reduce and ultimately eliminate embodied carbon in their projects by 2050.

2022: West Implementation Group begins sustainability reviews on structural projects

Zero

Arup's Whole Life Carbon Buildings Program

2025+

2022: Arup creates Zero Data collection platform and begins year 1 of WBLCA data collection campaign

2022: Arup creates Sustainable Engineering Skills e-learning modules across disciplines (architectural, building envelope, bridges, civil, SMEP, lighting, rail, water)

2023: Arup launches the Carbon Transformation Awards (CTAs) to recognize and celebrate reductions in whole life carbon emissions

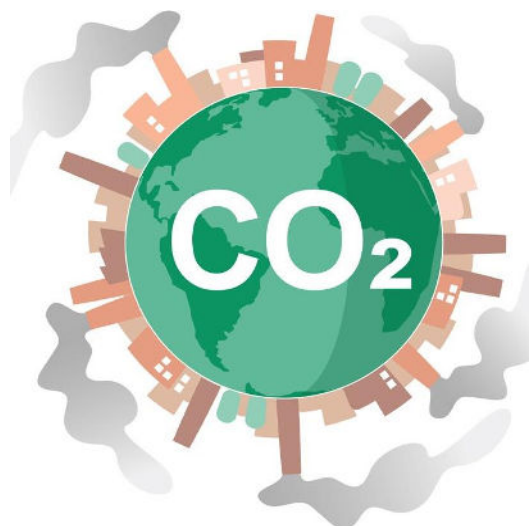
2022-2023: With the first two years of data, Arup has compiled information on over 1,000 projects, having more than 1,400 building assets in over 50 countries

[Read our Case Study here!](#)

2024-2025: Arup continues its WLC Buildings Program & introduces the Hot Spot Based approach into engineering workflows



Understanding carbon is the first step to reducing it. Arup is closing the carbon data gap by making whole lifecycle assessments standard on every project.



Reporting

In 2021, Arup committed to conducting whole lifecycle carbon assessments (WLCAs) for all building projects—new and retrofit. With less than 1% of projects globally assessed for full carbon impact, this marked a key step in closing the gap in understanding emissions over a building’s lifespan. Identifying the scale and source of embodied and operational carbon is crucial for effective decarbonization strategies.

This milestone builds on over a decade of Arup’s leadership in embodied carbon, from contributing to US Concrete PCR and WBLCA guidance to being a founding member of the SE 2050 Commitment Program in 2019. The launch of Arup’s Zero data platform in 2022 streamlined data collection and analysis to support WLCAs. In line with SE 2050’s mission, Arup also shares a portion of its embodied carbon data with the SE 2050 Database, helping the industry gain insights while deepening our own understanding of carbon impacts.

Adopting whole lifecycle carbon assessment is the crucial next step that will allow the global buildings sector to progress toward 50% carbon emissions reduction by 2030. Find more details [here](#).

Arup commits to calculating embodied carbon per the SE 2050 Program Requirements and submit to the SE 2050 Database. The requirements align with Arup’s own internal initiative to perform LCAs on all our projects with Arup’s new software platform, [Zero](#). Regionally appropriate tools and workflows will be used by project teams to complete life cycle assessment (LCA) studies. The results will be submitted to SE 2050 to gain insights into the embodied carbon of structural designs.



Project delivery

Arup’s high-level process for integrating embodied carbon reduction and reporting into projects.



Education

Knowledge Sharing

Arup's commitment to education and knowledge sharing is central to advancing embodied carbon reduction. Our global culture fosters collaboration across disciplines and geographies through 'skills networks'. The Structural Skills Network (SSN), one of Arup's most established, serves as a learning hub, with the Structural Engineering Sustainability Hub (SESH) as its branch dedicated to sustainability.

Regional sustainability hubs within SESH keep teams connected and aligned on embodied carbon goals.

In the Americas, structural sustainability champions across our offices lead these efforts, promoting embodied carbon literacy internally and engaging the wider industry. Led by **Ann Jiras**, **Zoe Brown**, and **Genevieve Graham**, this group drives Arup's SE 2050 commitments, develops resources, and leads workshops to foster cross-disciplinary learning.

Knowledge Creation

Arup uses its internal Arup University as platform for internal research, enabling our teams to explore and develop solutions that advance structural sustainability alongside other industry challenges. Through this initiative, our members investigate low-carbon materials, circular design strategies, and digital tools to drive embodied carbon reduction. This year our members researched topics from low carbon stone and concrete to design research on the embodied carbon of airport structural systems to internal tool development to improve embodied carbon tracking across projects.

Meet Arup's 2024/2025 Arup SESH Office Leads

All our offices in North America are well connected through SESH, which hosts seminars and creates resources as well as providing sustainability champions across offices.



Boston – Cassandra Mitsinikos, Maggie Smith



Chicago – Dalton Keys



Dallas/Austin/Houston – Charys Clay



New York/New Jersey – Kimberly Avelar, Zoe Brown



Montreal/Toronto – Georgette Harun



Los Angeles – Ann Jiras, Genevieve Graham



San Francisco/Oakland – Marissa Visconti



Seattle – Spencer Schrandt



Washington D. C. – Ashley Cooper, Antony Sutanto



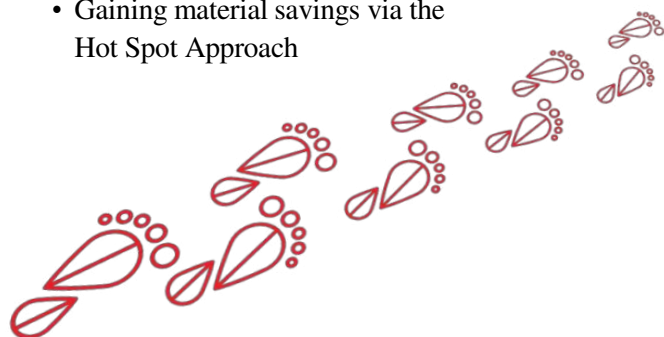
Five years in, forging forward—targeted reductions, collaborative innovation, and real-world impact on the path to a carbon-neutral future.

Reduction strategy

As Arup's global strategy calls on us to transition to a zero-carbon economy and respect our planetary boundaries, we have developed resources to support structural engineers in reducing embodied carbon in their designs.

We seek to make embodied carbon reduction a key design criteria alongside elegance, fitness for purpose, speed of construction, and future flexibility. Our regional structural skills network (SSN) provides guidance on several strategies, which include:

- specifying low-carbon concrete
- sourcing sustainable mass timber
- specifying recycled steel
- existing structure reuse
- pushing material efficiency beyond standard practice
- Gaining material savings via the Hot Spot Approach



Many of these are aligned with the SE 2050 electives. Each office will choose from these strategies and other SE 2050 electives to employ at least one elective on chosen projects. Embodied carbon savings will be calculated to show the effects of improved design and specifications and used to spread awareness both internally and externally.

Advocacy

Arup has been sharing knowledge and data on embodied carbon with the buildings industry for over a decade. Our SESH representatives are active participants in external organizations such as the SEI Sustainability Committee, Carbon Leadership Forum, SEAONC Sustainable Design Committee, and the SE 2050 leadership group.

By acknowledging the greater role and responsibility of structural engineers in reducing carbon emissions, we have expanded our technical services to offer:

- whole-building life-cycle assessments
- embodied carbon policy assistance
- third-party expert support on low-carbon concrete
- design for circularity
- other non-traditional design strategies

We realize that reaching net zero embodied carbon is an ambitious goal that will take significant collaborative effort. Arup will continue to seek out ways to engage with others in the buildings industry, inclusive of clients, policymakers, manufacturers, builders, academia, and our peers.

Lessons Learned

Entering into Arup's 5th year committed to the SE 2050 program, we have these lessons to share:

1. **Hot Spots Approach:** We learned that the biggest reductions can be made by targeting the highest-impact structural elements through a hot-spot-based approach. We analyze carbon data to prioritize key elements like foundations, slabs, and columns. We apply a phase-by-phase strategy, introducing tailored reduction measures from concept to construction. This focused approach delivers measurable carbon savings and sets a framework for our projects.
2. **Low Carbon Concrete:** This year, we successfully implemented concrete GWP reduction targets on many projects. As structural engineers, we learned the importance of close collaboration with our internal materials experts and suppliers to derisk novel low-carbon concrete technologies. This resulted in aggressive carbon savings on concrete mixes in several projects. We also gained new insights on the performance of these low-carbon mixes from studying their strength, for instance, extensively across dozens of mixes and multiple conditions and how it correlates to temperature and time for varying levels of SCM and different types of SCM.

SE 2050 requires us to Plan, Implement, and Share. These Arup projects illustrate what implementation looks like and show us the critical role structural design can have in achieving net zero carbon projects.



Airport Comparative Case Study

New York, NY

Summary: The study of four airport concourses explores the carbon impact of reuse vs rebuild, and the impacts of site conditions on substructure embodied carbon.

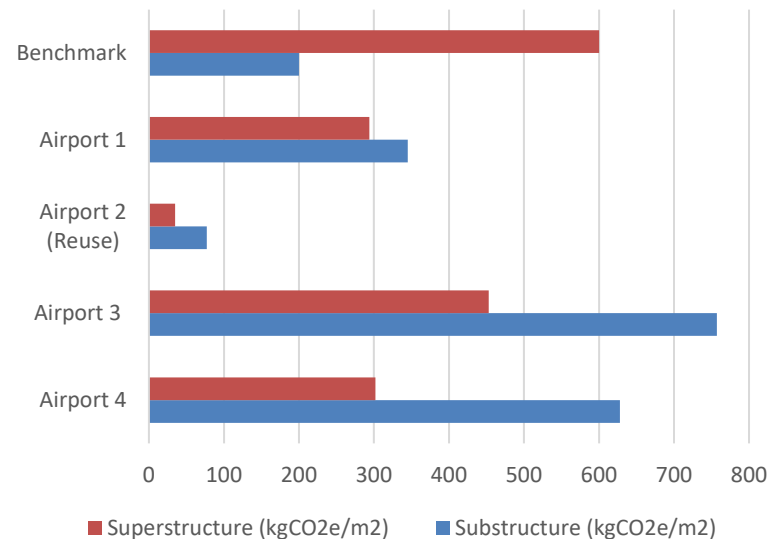
Key Facts

- Superstructure carbon was 300-450kgCO₂e/m²
- Substructure carbon was 350-750kgCO₂e/m²
- Average total embodied carbon ~950kgCO₂e/m²
- Re-use saved 90% of embodied carbon compared to new build airport projects
- Steel tubing used for piles contributes to 25% volume, but 75% of total embodied carbon

This study aimed to provide insight on the typical embodied carbon for airport projects, as there is currently limited information available on benchmarking quantities. Four airport projects in New York were studied - three new build and one existing building reuse. The embodied carbon of each airport concourse varied, with an average of 350kgCO₂e/m² for superstructure and 600kgCO₂e/m² for substructure for new builds. This is ~2.3x higher than the industry average for typical office buildings.

The high embodied carbon for the new build projects is likely due poor site conditions, as substructure embodied carbon made up 60% of the total. This relationship is typically much less, with Arup benchmarking suggesting substructure is approximately 25% of the total. Further study showed that steel HSS tubing used for piles contributed to 75% of the substructure embodied carbon whilst only making up 25% of the volume. There would be benefit in further exploring the impact that site conditions have on the embodied carbon of substructures.

A huge carbon win, however, was the reuse project which saw an embodied carbon reduction of approximately 90% (55% in substructure and 90% in superstructure) when compared with the other projects. This project followed similar trends of sub-to-super structure proportions but at a significantly lower quantity. This project also worked hard to save significant portions of the façade, which is not account for in these calculations but a great carbon saving.



Arup project contact: grace.hahnel@arup.com

Case studies (2025)



SE 2050 requires us to Plan, Implement, and Share. These Arup projects illustrate what implementation looks like and show us the critical role structural design can have in achieving net zero carbon projects.



©Meta

Client

Meta

Key collaborators

Ozinga

Key facts

- Delivered trials in multiple US regions
- 35% carbon reduction in slabs vs. regional benchmarks
- 25 optimized mix designs tested

Key services provided

Regionalized strategy planning
Materials specification review
Mix design optimization
Mix prequalification and quality control testing

Arup project contact:
adam.jaffe@arup.com

Low-carbon concrete for hyperscalers Multiple US Regions

Summary: Arup is helping Meta to maximize use of low carbon concrete using industry standard materials across their US sites, enabling them to reach their net zero carbon goals. By working with Meta and a regional materials supplier, Arup provided key technical support from project inception to delivery, to culminate in several field trials around the country.

Honing decarbonization strategies

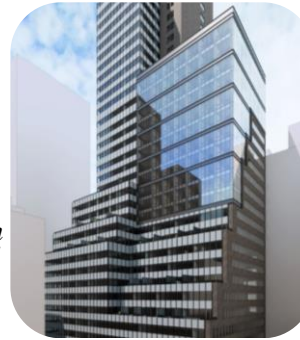
We started by engaging concrete suppliers and contractors local to each build site, analyzing their typical mix designs and specifications and then creating a phased program to introduce lower carbon concrete. We considered different approaches to introduce cement replacement in higher proportions while accounting for supplier familiarity and schedule and cost impacts. We also identified where use of concrete can be significantly reduced or eliminated in the structural design.

Reducing risk

We then worked closely with Meta and local partners to implement a technical risk reduction strategy, recommending alternative mix designs, writing test specifications to measure fresh and hardened properties, analyzing results, and monitoring performance in-situ before trialing larger volumes. We traveled to build sites to oversee construction pilots, troubleshoot issues, and document lessons learned.

Delivering industry-leading outcomes

Our efforts helped deliver a 35% reduction in carbon intensity in trial slabs, a structural element where carbon abatement is hard to achieve. We are now working with Meta to capture these approaches in updated design documents and methods. We will lead a second phase to test additional novel technologies to enable even more aggressive carbon reductions.



©Gensler

Client

Gensler

Owner

SL Green

Key facts

- Office to residential conversion
- Adaptive re-use to minimize waste and environmental impact
- Extensive analysis to minimize reinforcement of existing structure

Key services provided

Structures

Arup project contact:
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750 Third Avenue Schematic Study New York City, New York

Summary: By repurposing an existing building and converting office into residential spaces, 750 3rd Ave represents an excellent example of adaptive re-use to support the circular economy.

The existing 35-story, steel-framed office building, constructed in 1958, was once at the forefront of New York City architecture. Now largely vacant, the building owner sees an opportunity to embrace the principles of the circular economy by transforming outdated office spaces into modern apartments, aiming to create 639 new rental homes. SL Green has engaged Gensler Architects and Arup to develop a scheme that involves the addition of 11 floors and a green roof.

Optimizing re-use of existing materials

The office-to-residential conversion project has optimized the re-use of existing materials by repurposing structural elements, significantly reducing the need for new structure. This approach not only minimizes construction waste but also lowers the carbon footprint associated with manufacturing and transporting new materials, promoting more sustainable practices when compared to a rebuild project.

Minimizing structural reinforcement & strengthening

Arup conducted a thorough analysis of the existing building and the proposed vertical extension schemes to maximize the available capacity and minimize the need for column strengthening. The geotechnical engineer was also engaged early in the design process to justify increases in bearing capacity of existing foundations and avoid reinforcing, which would trigger a seismic retrofit and add substantial material cost.

Still in the early phases, this project exemplifies how the re-use of an existing building, combined with thoughtful expansion and conversion, can support the circular economy. Through this initiative, we are setting a precedent for future developments, proving that sustainable practices and economic growth can go hand in hand.

Case studies (2025)



SE 2050 requires us to Plan, Implement, and Share. These Arup projects illustrate what implementation looks like and show us the critical role structural design can have in achieving net zero carbon projects.



National Geographic Base Camp Washington, DC

***Summary:** Arup is providing structural and acoustical services on the transformation of the existing National Geographic headquarters, which includes a new jewel box public entrance pavilion connecting the headquarters, an expanded museum, and new public spaces. In line with National Geographic's mission to protect the planet, Arup prioritized sustainability across the project, focusing on reducing embodied carbon by targeting high-impact materials like concrete and insulation.*

EPS and XPS Insulation

Arup chose to challenge typical structural raised slab details across 23,000 ft² of raised slab. These details often rely on rigid void formers made of carbon-intensive XPS or EPS insulation to ensure loading from new thin slabs at a high elevation bears directly on primary structural slabs at lower elevations. In lieu of using rigid void formers, Arup designed an alternative spanning slab over knee wall scheme with metal deck as sacrificial formwork that replaced the planned use of nearly 63,000 ft³ of rigid insulation with air.

NWC vs. LWC

Another component targeted for carbon reduction was the large area of new slab-on-deck construction across the site. A striking realization came when the design team found that equal volumes of lightweight concrete have a 60 to 80% higher carbon footprint (based on industry averages) than normal weight concrete. The team implemented a normal weight concrete solution that used less concrete through inclusion of sprayed fire-resistant material beneath the deck to enhance fire protection, which resulted in approximately 10% total embodied carbon savings on the pavilion structure.

Concrete Specifications

Arup further reduced embodied carbon by mandating carbon reductions in the carbon mix designs developed for the project. This was done by shifting from more traditional, prescriptive mix requirements to performance-based criteria. This performance-based approach gave the contractor the flexibility to hit embodied carbon requirements through their own preferred methods. Specific to the project, the team set a concrete carbon budget, a strategy to achieve overall concrete carbon reductions by requiring a minimum 20% carbon reduction across the total volume of concrete used, relative to NRMCA Eastern Region Benchmarks.



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Client

Hickok Cole Architects

Project Owner

National Geographic

Key collaborators

HITT Contracting
Interface Engineering

Key services provided

Structural Engineering
Acoustics

Key facts

- Eliminated nearly 63,000ft³ of rigid insulation from raised slabs
- Eliminated the use of lightweight concrete in slab-on-deck construction
- Utilized performance-based specifications and carbon budget approach for concrete carbon reductions

Arup project contact:
jordan.woodson@arup.com

Table of requirements: Education (2025)

Arup satisfaction of requirements	Requirements/Electives	Implementation
✓	Provide a narrative of how the Embodied Carbon Reduction Champion will engage embodied carbon reduction at each office.	Through our SSN, we regularly share tools and procedures to educate all structural engineers in the region. Our implementation plan for the Embodied Carbon Reduction Plan will be shared through our monthly calls and the structural sustainability champion in each office.
✓	Present at least (1) webinar focused on embodied carbon and make a recording available to employees. Include this resource in your orientation and onboarding program.	SSN members will present to their respective offices, at minimum, once per year on embodied carbon reduction tools, targets, or education. Presentations are recorded and saved for future viewing for new hires.
✓	Train all of your firm's structural engineers on the core concepts and skills required to measure, reduce, and report embodied carbon.	Arup directs all structural engineers to internal training regarding embodied carbon. Additionally, many of our SESH representatives are active in the Sustainability Implementation Group, an accessible task force dedicated to sharing knowledge, driving reduction strategies, and encouraging reporting within project teams.
✓	Incorporate embodied carbon education in your onboarding for all new employees.	Arup directs its new structural engineers to internal training regarding embodied carbon during the onboarding process. Introductory booklets given to new graduate engineers includes resources about embodied carbon.
✓	Initiate an embodied carbon interest group within your firm and outline their goals. This group may more broadly address sustainability, but they must include embodied carbon.	Arup currently has multiple groups: SESH (Global, Americas, UK, Americas Region Decarbonization Group, and the Structural Sustainability Implementation Groups. These groups are available on Arup's Teams platform and continually keep members apprised of news and resources related to embodied carbon.
✓	Create an Embodied Carbon digital resource wiki and/or forum on your firm's website for staff to create, share, and discuss Embodied Carbon educational resources.	Arup shares its embodied carbon resources through a central repository Teams channel called SESH (Structural Engineering Sustainability Hub).
✓	Engage with a CLF Regional Hub. This could include attending presentations or working sessions and reporting back to the firm or co-chairing a hub.	Arup engineers across the country engage with their local CLF Hub. In Washington D.C., San Francisco, and New York, Arup engineers are part of the CLF Hub leadership. Additionally, Arup is a sponsor to CLF National, with active participants on CLF National's monthly advisement calls. Lastly, Arup engineers are active in local CLF hubs in NYC, Boston, Washington D.C., Los Angeles, San Francisco, and Seattle.
✓	Provide narrative outlining plans for minimum (2) firm-wide presentations per year on the topic of embodied carbon.	As described in the ECAP, Arup University and our internal skills networks play a pivotal role in knowledge sharing across Arup. Seminars are hosted monthly and at least twice per year the topic of embodied carbon is presented.
✓	Propose other actions promoting embodied carbon education and describe their value.	Arup University is hosting a cross-disciplinary seminar series (2024-2025) that focuses on sharing key aspects of each discipline for more effective collaboration. Through this series, the structural session(s) 'Structural Engineering...for Everyone Else' will showcase embodied carbon reduction strategies as they relate to other disciplines.

Table of requirements: Reporting (2025)

Arup satisfaction of requirements	Requirements/Electives	Implementation
✓	Submit a minimum of (2) projects per U.S. office with structural engineer services to the SE2050 Database. You are not required to submit more than (5) total projects across your firm, but we encourage you to submit as many as possible!	We commit the SE 2050 Program Requirements including the submission requirements of embodied carbon data.
✓	For multi-office firms, describe how each office is measuring and reporting embodied carbon. For single-office firms, describe how different project teams or managers are measuring and reporting embodied carbon.	For each project that we decide to report embodied carbon for, it is up to the project team which tool they wish to use. Within Arup we have access to Athena Impact Estimator, Tally, ECOM Tool, EC3, and an internal Arup Carbon tool called Zero Platform. When studying embodied carbon, we plan to only use tools that are regionally appropriate for the project calculation and aim to complete full LCA studies spanning modules A to C. We are beginning to develop tools to better utilize our Revit models to extract material quantities and link quantities and LCA results to the Zero Platform, a project information database. Our plan is for this to be fully compatible with the SE 2050 database.
✓	Compare the embodied carbon from multiple projects across your firm. Analyze and document what data and pieces of information are most important and communicate the findings to your firm.	Arup assessed the embodied carbon of airport structural designs across North America, with findings included in the 2025 ECAP submission. See the case studies section for details. Comparative analysis of embodied carbon in airport projects will continue.
✓	Propose other actions that promote the reporting of embodied carbon data and describe their value.	Arup had launched a global initiative titled Zero , which collects LCA data across all projects. This effort stands as an additional action Arup is actively taking to enhance the reporting and assessing of embodied carbon data. The Zero tool is being complemented by internal digital processing of SMQ data to facilitate WLCA and embodied carbon assessments.

Table of requirements: Reduction (2025)

Arup satisfaction of requirements	Requirements/Electives	Implementation
✓	Update your specifications to incorporate embodied carbon as a performance metric during the project concept phase. Explain what you did and what the results changed (if anything).	Arup has shifted from prescriptive concrete specifications to performance-based criteria, incorporating GWP targets relative to NRMCA Regional Benchmarks that contractors must uphold. In steel specifications, Arup requires contractors to submit product-specific Type III EPDs to demonstrate steel meets the recycled content requirements noted for a minimum of 90% of steel by weight.
✓	Develop and implement a workflow that makes it easier to make early design decisions based on embodied carbon.	For structural projects, we have developed a Hot-Spot Based approach to embodied carbon, providing a phase-by-phase framework to identify and target the most carbon-intensive elements for maximum impact. This is paired with a best-practices checklist that teams review at each major milestone to reinforce structural sustainability. By streamlining sustainable decision-making, this approach paves the way for effective carbon assessments and reduction strategies.
✓	Submit a Circular Economy Narrative describing how a project supports the circular economy. This can be done by incorporating re-use or design for deconstruction into at least one project.	Refer to the 750 Third Ave Case Study to see how Arup is advancing the circular economy by transforming an existing tower through an office-to-residential conversion project.
✓	Communicate the embodied carbon impacts of different options to clients with create and effective data visualization. You are welcome to include these visualizations in your Elective Documentation, though it is not required.	Refer to elective below. At Arup, our comparative studies of potential structural solutions frequently use the lens of embodied carbon. It is typical for these studies to be presented with the accompanying data to our clients when collaborating on solutions and paths forward.
✓	Compare different design options with embodied carbon as a performance metric during the project concept phase. Explain what you did and what the results changed (if anything).	In a recent concept report, we compared a steel composite deck system to a mass timber option, showcasing significant carbon savings and value. The compelling results led the client to choose the mass timber scheme, marking a major sustainability win. Additionally, see our case studies section for details on an assessment comparing concrete mixes and optimizing for embodied carbon reduction while maintaining design requirements.
✓	Participate in a LEED, ILFI Zero Carbon, or similar project design charrette and speak to potential design considerations impacting embodied carbon.	Arup regularly supports client in their LEED goals, which includes a design charrette in which a structural engineer participates.
✓	Collaborate with your concrete supplier to reduce embodied carbon in a mix design below an acceptable baseline (e.g. NRMCA regional baseline values). Discuss what you found and what it means in your market.	Arup has incorporated performance-based design in our specifications for concrete suppliers to uphold, incorporating CO2e reductions as part of the requirements. Additionally, to internally champion broad application of these GWP reduction targets, Arup distributed a 'how-to' internal guidance document for our PMs and engineers to navigate low carbon concrete and successfully implement it on projects. These combined actions regularly results in collaborative conversations with concrete suppliers.

Table of requirements: Advocacy (2025)

Arup satisfaction of requirements	Requirements/Electives	Implementation
✓	Describe the value of SE 2050 to clients. How can your design teams collaborate to reduce embodied carbon? Please attach any associated marketing materials.	External kickoff meetings include slides on Arup's commitment to sustainable development. For structural, this includes a statement of our commitment to the SE 2050 Commitment Program. See Arup roadmap earlier in this ECAP showcasing our journey in the Americas as it relates to the embodied carbon of structural systems.
✓	Publicly declare your firm as a member of the SE 2050 Commitment however you see fit (e.g. on your website, LinkedIn, or other social media).	Upon joining SE 2050, Arup announced its commitment in 2020. This commitment continues to be visible on Arup's website. Our commitment to the SE 2050 Commitment Program is renewed via an annual regional call for our structural engineers. Furthermore, Arup internally and externally continues to support SE 2050 through media posts through our internal newsroom that broadcasts to 18,000+ Arupians and media posts to a public network of 1M+.
✓	Give an external presentation on embodied carbon that demonstrates a project success or lessons learned. Get connected at a CLF regional hub near you and be sure to post the recording.	Arup presents at external conferences around the globe with embodied carbon being a frequent topic. Examples from 2024 include: CLF Northeast Embodied Carbon Summit (moderator), Greenbuild Presentation PDX (speaker), SEI Sustainability Summit (speaker), Holcim Foundation Fellowship (host firm)
✓	Mentor a firm new to the embodied carbon space. Describe how you identified their needs and what improvements were made.	In our partnerships with SBEs, Arup has taken intentional steps to educate around embodied carbon by holding structural sustainability workshops and encouraging design studies comparing embodied carbon of different options.
✓	Engage with structural material suppliers in your region to communicate the importance of Environmental Product Declarations (EPDs) and low carbon materials options.	Arup champions the need for EPDs on its projects. Our boiler-plate structural specs have EPD clauses and commentary to guide conversation with the client.
✓	Engage with local, state, and federal governments to communicate the important of low embodied carbon procurement and construction policies and provide expert testimony to this effect.	<p>Examples of Arup's industry and policy influence to encourage low carbon and carbon-sequestering materials of 2024:</p> <ul style="list-style-type: none"> • Technical support to the DC Green Building Advisory Council regarding embodied carbon reduction • Advisement to NYC department of buildings task group for low carbon concrete • CLF Hub involvement and leadership across multiple cities • Low EC technical assistance to Alameda County municipal and multi-family projects • All For Reuse launch partner