Since forming in 2004, Eckersley O’Callaghan (EOC) has established an international reputation for rigorous and creative engineering methods. Sustainability has increasingly become a key driver in our work. Today, we strive to embed sustainable thinking in all our projects.

EOC committed to the SE 2050 initiative, led by the Structural Engineering Institute in 2023. This commitment acknowledges that structural engineers play a critical role in the reduction of construction industry emissions. As such, our structural engineers shall understand, reduce, and work towards eliminating embodied carbon in our projects by 2050.

This Embodied Carbon Action Plan (ECAP) outlines our strategy for achieving the objectives set forth by SE 2050 through Education and Knowledge Sharing, Reduction Strategies, Reporting, and Advocacy.

**Climate Action Charter**

1. Assess the embodied carbon of all our construction projects
2. Challenge the briefs to reduce their environmental impact
3. Optimise designs to be inherently efficient
4. Challenge the industry and traditional practices
5. Specify low carbon materials and systems
6. Facilitate reduced energy consumption and increased internal comfort
7. Develop resilience strategies
8. Maximise the service life of the buildings and challenge the need for new build projects
9. Integrate circularity principles as a basis of our projects
10. Share knowledge and experience
Embodied Carbon Reduction Champion
Our Embodied Carbon Reduction Champion will compile and disseminate educational resources, coordinate lectures, lead discussion groups, and interface with our global sustainability leadership team to advance the understanding of embodied carbon topics in our US and international offices.

Introduction to Embodied Carbon
We consider both calculating embodied carbon and devising reduction strategies as part of our engineers’ fundamental skill set. We have developed pages dedicated to embodied carbon principles and calculation methods on our internal Wiki. This is a living document where knowledge resources will be updated and expanded. Current EOC team members are notified of updates via our Global Teams Group. New employees will be informed of resource availability during on-boarding orientation.

Continuing Education
To facilitate a global office dialogue dedicated to Sustainability, we have created the ‘Sustainability Hub’ on Microsoft Teams. This platform is used to share articles, lectures, team member expertise, and project developments. Additionally, our Sustainability Knowledge Share Collection provides detailed workflows to implement sustainable design strategies into projects.

Embodied Carbon Interest Group
The EOC Sustainability Network was established in 2023 to guide our firm’s commitment to promoting sustainable use of materials, implementing circularity, integrating resilience, and reducing embodied and operational carbon. The Sustainability Leadership Committee meets monthly with sustainability representatives from each office to review R&D progress, discuss building industry policy developments, and share educational resources.

Focused Trainings & Workshops
To further advance embodied carbon education in our office, we are developing embodied carbon calculation/visualization tools and team training sessions. These trainings cover embodied carbon principles, material knowledge, tool implementation, results communication, and low carbon products specification.

Above:
Internal Sustainability Wiki with pages dedicated to Embodied Carbon
Reduction Strategies

Short Term Goals
The embodied carbon initiative at EOC is currently focused on the European market. Our short-term goals are to adapt our current tools, workflows, and resources to the North American market. These goals include:

- Develop a palette of low carbon construction materials readily available in the North American market.
- Incorporate embodied carbon factors and Environmental Product Declarations (EPDs) that are specific to the North American market into ECO2, our custom plug-in for Revit, and Smart Massing Tool (SMT), our custom parametric analysis tool.
- Utilize the CLF’s ‘WBLCA Benchmark Study’ to establish benchmarks for our structural engineering projects.
- Form a working group to develop embodied carbon content for specifications.
- Identify team members to monitor significant advancements in material technology and design for concrete, steel, and timber.

Long-Term Goals
Our long-term goals are to develop our services for the North American and European markets in parallel. These include:

- Integrate embodied carbon options into our proposals and key stage reports.
- Assess life cycle environmental impacts at strategic phases of project development for team evaluation.
- Revise specifications to prioritize performance requirements instead of prescriptive ones. Include EPDs in submittal review requirements.
Methodology
Initial calculations will use the Institution of Structural Engineers (IStructE) Carbon Calculator and Carbon Leadership Forum (CLF) material baselines for North American specific values. Future calculations will implement our custom plug-in for Revit, ECO2, and project specific Environmental Product Declaration (EPD) data. If project specific data is not available, SE 2050 and CLF embodied carbon factors will be referenced.

LCA Scope
Initial calculations will focus on Practical Completion Carbon (A1-A5). Future calculations will encompass Whole Life Cycle Carbon (A-C) as EPD data becomes more readily available and we gain a greater understanding of the US supply chain.

Design Stages
Preliminary embodied carbon considerations and options will be evaluated and presented to teams at Concept Development and Schematic Design phases for all projects. Embodied carbon calculations will be executed during Design Development and Construction Documents phases to achieve reductions as the design develops for selected projects. Only project data from the Construction Documents phase will be submitted to the SE 2050 database.

Data Visualization
A template will be developed to provide guidance on effectively communicating embodied carbon calculations and options. A custom dashboard to facilitate comparisons across EOC projects will also be developed.

Project Submission
EOC commits to submitting embodied carbon analyses to the SE 2050 database for two projects the first year and aims to increase this number every following year.
Global Industry Initiatives
Our international offices respond to consultations from industry initiatives like the RICS Professional Standard for Whole Life Cycle Carbon Assessment in the Built Environment and the development of the UK Net Zero Carbon Building Standard. Additionally, we have submitted European project data to the Built Environment Carbon Database. Our US team is committed to learning from and collaborating with our global team to leverage advancements in embodied carbon reduction strategies.

Services
We will integrate LCA services into our base proposal language to educate clients and promote LCA integration in to project planning.

Marketing
EOC’s Sustainability Brochure outlines our unwavering commitment to sustainability and details our approach to climate conscious solutions for structures and facades. We will continue to update this document and online materials with US focused embodied carbon reduction work.

The current document is available at https://www.eocengineers.com/from-urgency-to-action/

Social Media & Climate Friday Posts
EOC announced its commitment to SE 2050 via LinkedIn - thereby sharing our pledge to carbon reduction practices and the resources to do so with over 15,000 followers. We will share embodied carbon tool development and project implementation via our social media platforms and Climate Friday posts on the EOC website.
Ashley Reed RA
Senior Engineer | SE 2050 Embodied Carbon Champion

Ashley is a Senior Facade Engineer based in our New York office with over 10 years of professional experience in façade consultancy, computational design, and building science.

Chiara Bariviera BEng
Senior Engineer

Chiara is passionate about sustainable design. At EOC she is an integral part of our sustainability team where she has designed a Carbon and Energy Tool which enables us to assess and quantify the embodied carbon and energy emitted for the different elements of a building.

Douraya Kessaria MEng
Sustainable Development Engineer

Douraya joined Eckersley O’Callaghan in 2023 to further the sustainability practices and efforts of the company, while closely supporting the global teams in this approach.

Chiara joined Eckersley O’Callaghan in 2018 following the achievement of her First-Class Honours in her Bachelor of Civil Engineering. She is part of our structural engineering team and has worked on a range of projects from commercial, cultural, residential and education sectors.

Douraya joined Eckersley O’Callaghan in 2023 to further the sustainability practices and efforts of the company, while closely supporting the global teams in this approach.

After earning her degree, she worked at Foster + Partners in London as a sustainable development consultant, allowing her to combine her passion for design with her determined commitment to finding solutions to the challenges of climate change.

Ashley’s experience at EOC has focused on commercial new construction, adaptive reuse, and prefabrication projects.

Chiara’s passion for sustainable design continues at EOC, where she leads the Sustainability Team and has designed a Carbon and Energy Tool that enables the assessment and quantification of embodied carbon and energy emitted by different building elements.

Douraya’s expertise in sustainability and her educational background in Civil Engineering and Sustainable Building Design have been instrumental in advancing EOC’s sustainability efforts.

Chiara’s achievements at EOC include designing a Carbon and Energy Tool that assesses and quantifies embodied carbon and energy for building elements.

Douraya’s role at EOC includes working with global teams to further sustainability practices and efforts, allowing her to apply her skills and knowledge in various projects.