2030 NOW
EMBODIED CARBON ACTION PLAN
2024

From the Stantec Carbon Impact Team
We Design with Community in Mind

Today, our communities face compounding challenges—changing climate, widening social inequities and health vulnerabilities, economic breakdowns, and imperiled natural systems and resources—all of which are connected to the climate crisis and demand immediate action to safeguard our collective health and livelihood. The World Economic Forum Global Risks 2022 Report ranked failure to act on climate as the number one threat facing the world, with severe impacts for the next decade. As designers in the built environment, every decision we make today has a potential impact on a community today, tomorrow, next year, and over the next decade.

We cannot wait be enact design solutions that prioritize carbon, climate, health, and justice.
Introduction

There is great opportunity to reduce embodied carbon through design, material selection, and specification. Stantec is committed to the challenge.

The building industry accounts for roughly 37% of annual global CO₂ emissions. For the past 50 years, the building industry has focused on reducing operational greenhouse gas (GHG) emissions through energy efficiency standards, integrated design and assessment tools, building codes, and performance benchmarking. Through collective efforts, the industry has successfully transformed the operational performance of buildings worldwide. As operational emissions continue to be driven down, addressing the whole life cycle of embodied GHG emissions, from the extraction and manufacturing of materials to the construction and end-of-life phases, is the next significant opportunity to limit the building industry’s global emissions. Mitigating the worst impacts of global climate change requires the building industry to halve its emissions by 2030 from its 2015 baseline. With building stock anticipated to double by 2060, now is the time to intervene and turn carbon neutral goals into action.

This Embodied Carbon Action Plan (ECAP) comprises actions we must begin taking today to achieve net zero embodied carbon emissions through structural design and mechanical, electrical and plumbing (MEP) system design.
Our Commitment to Sustainability

Stantec practitioners design with community in mind and recognize the urgency and professional responsibility of mitigating carbon emissions and their impact on the climate and built environment.

Our dedication to sustainability is mirrored in Stantec’s corporate priorities. In 2024, Stantec was ranked one of the most sustainable companies in the world by Corporate Knights, which released its Global 100 Most Sustainable Corporations rankings. Companies in the Global 100 represent the top one percent of companies in the world on sustainability performance.

Stantec is aligned with the United Nation’s Sustainable Development Goals (SDG) framework as a measure of success both for ourselves as a corporate citizen, and in the work we deliver for our clients.

Who We Are

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of place and of belonging. That’s why at Stantec, we always design with community in mind.

We care about the communities we serve—because they’re our communities too. This allows us to assess what’s needed and connect our expertise, to appreciate nuances and envision what’s never been considered, to bring together diverse perspectives so we can collaborate toward a shared success.

We’re designers, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe.

At Stantec, sustainability is a priority and considered in every aspect of the firm’s operations. View Stantec’s Sustainability Report.
Our Commitment to Reducing Embodied Carbon

As a global leader in sustainable design, we are committed to design solutions that make meaningful progress towards carbon neutral buildings and landscapes and prioritize materials that positively impact the environment, climate, human health, and society.

Embodied carbon is responsible for roughly 10% of annual CO2 emissions.1 We are prioritizing the reduction of embodied carbon in our project work and are signatory to the Structural Engineering Institute’s (SEI) Structural Engineers 2050 (SE 2050) Commitment and the Carbon Leadership Forum’s Challenge, and resulting MEP 2040 Commitment.

These commitments complement our AIA 2030 Commitment and AIA Materials Pledge and collectively address embodied carbon, operational carbon, climate change mitigation, and the material health impacts of our projects.

Reference: Letter of Commitment to the SE 2050 Program
Stantec: Embodied Carbon Action Plan

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter

Stantec’s SE 2050 Commitment Letter
At this point in the climate crisis, there is no shortage of information and materials available in the building industry, and society in general, to better understand what it means to design for climate mitigation, climate adaptation, and long-term sustainability.

Stantec Building practitioners have access to internal and external resources that empower advocacy for low-carbon, climate resilient design.

The Stantec community unites approximately 28,000 team members working in over 410 locations across 6 continents. Our global Buildings business is the largest integrated architectural, interior design and engineering firm. Our Buildings operating unit employs over 4,400 people in offices across North America, Australia, New Zealand, Asia, Europe and the Mediterranean, and the North African (MENA) region.

Stantec’s Carbon Impact Team, one of the largest dedicated Sustainability & Building Performance practices with specialized teams located across North America, is integrated within our industry sectors. This cross-disciplinary team includes dedicated sustainability champions from a broad range of expertise, including building architects, engineers, landscape architects, scientists, and sustainability specialists.

The Carbon Impact Team hosts monthly internal educational sessions on sustainability themes. Each year a minimum of two internal training sessions on embodied carbon are presented. These virtual training sessions are open to our global offices, recorded, hosted on our internal SharePoint site, and distributed in our global internal Stantec Carbon Impact Advocate newsletter.

Stantec’s Embodied Excellence workgroup aims to advance our internal commitments toward research, education, internal information sharing, and education. This internal workgroup consists of sustainability leaders, embodied carbon modelers, and engineers.
Analysis

The majority of our analysis includes Whole Life Cycle Assessments (WLCA) modules A1-4 and B, and limited modeling of modules C and D. We anticipate that as the embodied carbon industry matures, Stantec’s annual reporting will continue to evolve. We will report on developments in each iteration of our Embodied Carbon Action Plan.
The SE2050 Commitment prioritizes reduction of embodied carbon in our project work, using fewer and/or less impactful structural materials. The mission of the SE2050 Commitment is to transform the practice of structural engineering in a way that is holistic, firm-wide, project-based, and data-driven.

By 2050, Stantec structural engineers will strive to eliminate embodied carbon in their projects.

View Stantec’s SE 2050 announcement.
North America Leaders in Structural Engineering

Nine regional Structural Design Leaders support Stantec’s structural engineering team across our North America multi-discipline offices. The Structural Design Leaders form Stantec’s Structural Engineering Council, which meets monthly to develop and maintain discipline-specific technical standards, high-performance building objectives, shared metrics, frameworks, research and development, and design excellence.

At Stantec, we believe successful solutions do more with less and start with a goal. Our structural team actively reviews and applies the latest structural technologies and innovations to assist in delivering new, renovated, or rehabilitated structures. Experienced and versatile, we design facilities that are efficient and functional – the optimal environment for staff, customers, and the communities we serve.
2023 Education Actions

- Developed and presented two webinars focused on embodied carbon to Stantec’s global staff.
- Joined Stantec’s engineering council meetings to expand educational opportunities beyond our Buildings business line.
- Began nominating staff to participate in the CLF Community Hub and/or task force.
- Presented the document, "How to calculate embodied carbon" to all technical staff.
- Shared SE 2050’s "Top 10 things every structural engineer should know about embodied carbon" with staff.
- Published ASHRAE standard updates on Stantec.com and Carbon Leadership Forum.
- Participated on Urban Green podcast, "Building Tomorrow, cutting down embodied carbon".

2024 Education Goals

- Maintain a minimum of (2) internal webinar training sessions on embodied carbon, with structural design considerations.
- Finalize the narrative for how our Embodied Carbon Reduction Champions will engage embodied carbon reduction in projects at each office.
- Continue to nominate a minimum of (1) employee per region to participate in the Carbon Leadership Forum Community Hub and/or task force.
- Nominate a minimum of (1) employee per region to participate within the American Society of Civil Engineer’s (ASCE) and/or the National Council of Structural Engineers Associations (NCSEA).
- Hold annual trainings on embodied carbon modeling tools applicable for structural design for incoming staff.
- Request material and system environmental product declarations (EPDs) from vendors during material and system considerations. Prioritize low-carbon products during scheduling and specification.
- Provide SpecLink training to engineers to educate on embodied carbon specification requirements.

2023 Internal Stantec Embodied Carbon Trainings

- This session addressed why embodied carbon needs to be addressed, with ideas and examples of implementation in project work.
- Led by Stantec staff, this session provided an overview of Stantec’s commitment to SE 2050 to support reporting kick-off and the use of OneClick.

Embodied Carbon Strategies with Ghina Annan, Samira Zare Mohazabieh, and Alan Dyck
April 6, 2023

SE 2050 Reporting kick-off and OneClick
with Marelle Davey and Aadiyta Patel
July 20, 2023
Stantec has committed to a year-over-year increase in the number of Stantec Buildings projects that have embodied carbon life cycle analysis (LCA).

To complete our annual reporting and public disclosure on Stantec's environmental, social, and governance (ESG) issues and achievements, in accordance with the Global Reporting Initiative (GRI) Sustainability Reporting Standards, Stantec tracks metrics from the Buildings Business Operating Unit (BOU). We report on sustainability metrics from our project work, including total revenue aligned with the United National Sustainable Development Goals, and project sustainability performance data. Using an internal database, with an established custom methodology, we track our modeled energy and both operational and embodied GHG emissions performance expectations for projects over 25,000 square feet.

Reporting annually to SE 2050 is a key component of Stantec’s corporate governance and sustainability reporting.

SE 2050 Reporting Vision
In 2023, Stantec coordinated with Autodesk, a global leader in design software, to develop an early phase embodied carbon modeling tool. As a result of this collaboration, automated embodied carbon reporting is in process. We anticipate that as the embodied carbon industry matures, Stantec’s annual reporting will continue to evolve. Developments will be included in each iteration of our Embodied Carbon Action Plan.

Stantec commits to manually complete SE 2050’s submission files for a minimum of 5 projects located in the United States. Over time, we may opt to include international submissions, as we have a significant portfolio of embodied carbon analysis projects within the UK, Canada, and Australia.

2024 Goals
• Complete the SE 2050 reporting spreadsheet for a minimum of (5) total projects across North America, Australia, and Europe.
• 100% of embodied carbon LCA modeling projects are entered into the Stantec Buildings 2030 database.
• Develop automation of embodied carbon analysis and reporting process for North America.

2023 Reporting Actions
• Completed the SE 2050 reporting spreadsheet for ten projects across North America, Australia, and Europe.
• Increased Stantec’s annual project work including embodied carbon modeling.
• Reviewed the SE 2050 reporting form with embodied carbon modeling staff and structural engineers.
• Trained staff to ask about project carbon budgets or established project sustainability goals during proposals, predesign, and/or project kickoff meetings.

• Required SE 2050 action steps
Innovations & Reduction

Stantec initiated our internal embodied carbon reduction commitment in 2019 through inaugural corporate investment toward research and development of embodied carbon analysis tools. During the pandemic, staff continued to work on assessing industry tools, developing our structural library of Environmental Product Declarations for commonly used materials, and volunteered in organizations that support industry embodied carbon action.

Within the first year of Stantec’s SE 2050 commitment, we prioritized the reduction of embodied carbon in projects through the power of procurement. Requesting Environmental Product Declarations of high-impact structural elements and systems, reviewing material and system alternatives during project development, and ultimately specifying low embodied carbon options has demonstrated up to 20% reduction of total structural embodied carbon.

BETA TESTING
Innovation and high design are integral to Stantec’s design culture and practice. Over the course of 2023, Stantec beta tested an early design embodied carbon analysis tool. As integrative design firms understand, early high-performance opportunity assessments support design efficiency, saving the owner and project budget costly redesign or construction changes. Stantec’s subject matter experts are donating their knowledge and time to support this tool’s development over the course of the year. Our goal is to generate industry-wide reduction of embodied carbon in architectural master planning, pre-design, and schematic design phases.

INDUSTRY STANDARDS
Stantec’s Carbon and Climate Discipline Leader has been appointed by ASHRAE to vice-chair the development of a joint ICC/ASHRAE Standard 240P, Evaluating Greenhouse Gas (GHG) and Carbon Emissions in Building Design, Construction and Operation. This innovative building industry standard will provide a code-enforceable methodology to quantify the whole building life cycle GHG emissions, including both embodied and operational emissions.

2023 Innovations & Reduction Actions

- Specified lower carbon building materials and systems in building construction documents.
- Continued investing corporate research budgets toward embodied carbon research, innovations, and tools.
- Completed beta testing of master planning and early design phase embodied carbon analysis tool.
- Continued serving on the joint ICC/ASHRAE Standard 240P committee.

2024 Innovations & Reduction Actions

- Advance the development of a new industry specification with industry partners for the reporting of WBLCA modules A4 and A5.
- Explore innovative design solutions that use fewer materials without compromising structural integrity.
- Required SE 2050 action steps.
Advocacy

In response to the climate emergency and the urgency for rapid industry transformation, Stantec commits to leveraging our market influence and resources, not for market gain, but as a service to our clients, our communities, and our staff. We advocate for reduced embodied carbon emissions throughout our Buildings services, including:

- Policy development
- Master planning
- New construction
- Existing building reuse design

In addition to our Buildings services, our integrated, multi-business line, Climate Solutions, provides an internal and external advocacy mechanism to support the whole-building life cycle assessment (WBLCA) chain of impact, including:

- Net Zero Mining
- Transportation electrification
- Fourth industrial revolution
- Manufacturing process retooling
- ESG advisory services
- Energy transitions
- Planning and community engagement

Stantec supports the entire chain of embodied carbon reduction.

2023 Advocacy Actions

- Developed Marketing and Business Development material to explain the market value of SE 2050 and improved embodied carbon performance.
- Presented Stantec projects with successful embodied carbon reduction strategies and lessons learned.

2024 Advocacy Goals

- Mentor our pre-approved structural engineering subconsultants on the SE 2050 program and embodied carbon reduction opportunities.
- Support the embodied carbon Harmonization and Optimization (ECHO) collaboration to drive consistent embodied carbon reporting requirements and databases for embodied carbon challenges.
- Create a menu of performance analytics scope options to assist pursuits and proposals.
- Develop and present at least two seminar sessions on decarbonization within the international community.

* Required SE 2050 action steps

NORTHLAND NEWTON DEVELOPMENT, NEWTON, MASSACHUSETTS

APPENDIXES

Embodied Carbon Action Plan
Lessons Learned

EDUCATION
- Interns had limited exposure to embodied carbon, presenting opportunity at the educational level.
- Client education of embodied carbon is crucial in the early project phase.
- Industry exposure around embodied carbon expertise has been well received.

REPORTING
- Reporting at a global scale requires continuous engagement.
- There is an opportunity for staff to provide training and reporting support.
- There is value in including all families in Revit for exporting materials.

INNOVATION & REDUCTION
- Assessing MEP energy conservation measures (ECMs) with structural embodied carbon provides ROI on the whole life of a building.
- Early design consideration impacts the extent of reduction.
- Prefabrication / modular construction can reduce emissions when close in proximity to the site.
- Climate risk and resilience research is needed to understand short versus long term costs.
- Engagement with vendors can escalate embodied carbon savings.
- Opportunity for EPD design growth.
- There are limitations in understanding variances between construction methods.

ADVOCACY
- There is value in discussing real world examples.
- There is opportunity to provide objective information and encourage collaboration.
- Language standardization.
The MEP 2040 Commitment is an effort to radically reduce total carbon emissions associated with mechanical, electrical, and plumbing (MEP) building systems by 2040.

The commitment challenges Stantec systems engineers to advocate for and achieve net zero operational carbon by 2030 and net zero embodied carbon by 2040 in their projects. This includes direct emissions from systems during their operational life and emissions associated with system’s manufacture, installation, maintenance, and disposal. By focusing on both operational and embodied carbon, MEP engineers are encouraged to explore innovative design solutions, utilize low-carbon materials, and apply energy-efficient technologies to minimize the carbon footprint of building systems.

View Stantec’s MEP 2040 announcement.
To honor our commitment to MEP 2040, we must measure our progress. In 2024 we are prioritizing the development of baseline measurements. The results will offer a view of our specifications and where we can continually improve to achieve net zero carbon in operations by 2030 and net zero embodied carbon intensity by 2040 for all new buildings.

Stantec supports the industry transition toward low Global Warming Potential refrigerants found in mechanical and plumbing systems. We have limited data on the amount of refrigerant specified in our project work and the equivalent carbon emissions. We will use the 2024 business year to capture the total tonnes of potential GHG emissions associated with our project work. Based on the results, in 2025 our target will be to achieve a minimum 25% reduction of GHG associated with potential refrigerants on Stantec’s new building designs.

### Objectives

To honor our commitment to MEP 2040, we must measure our progress. In 2024 we are prioritizing the development of baseline measurements. The results will offer a view of our specifications and where we can continually improve to achieve net zero carbon in operations by 2030 and net zero embodied carbon intensity by 2040 for all new buildings.

Stantec supports the industry transition toward low Global Warming Potential refrigerants found in mechanical and plumbing systems. We have limited data on the amount of refrigerant specified in our project work and the equivalent carbon emissions. We will use the 2024 business year to capture the total tonnes of potential GHG emissions associated with our project work. Based on the results, in 2025 our target will be to achieve a minimum 25% reduction of GHG associated with potential refrigerants on Stantec’s new building designs.

### 2024 Actions

- Create a specified refrigerant-based emission baseline, with the objective to reduce GHG emissions in new building design by 25% in 2025 by specifying lower GHG potential refrigerants.
- Request material and system EPDs from vendors during material and system considerations. Prioritize low-carbon products during scheduling and specification for 100% of the projects that include a LCA.
- Include specification language for EPDs and refrigerants for MEP systems.
- Include detailed MEP embodied carbon analysis for all LCA modeled projects and enter the results in the Stantec 2030 Toolkit.

### 2024 Education Goals

- Maintain a minimum of (2) internal training sessions on embodied carbon, with MEP system design considerations.
- Coordinate with structural engineering to finalize the narrative for how our Embodied Carbon Reduction Champions will engage embodied carbon reduction in projects at each office.
- Hold annual trainings on embodied carbon modeling tools applicable to MEP system designs for incoming staff.

### 2024 Participation

- Nominate a minimum of (1) employee per region to participate in the Carbon Leadership Forum Community Hub and/or task force.
- Nominate a minimum of (1) employee per region to engage with organizations and initiatives relevant to MEP professionals, such as ASHRAE or the American Society of Plumbing Engineers.
- Nominate a minimum of (1) employee to participate in MEP 2040 from each of the following working groups:
  - Data, Analysis & Reporting
  - Manufacturers and EPDs
  - Partnerships
  - Communications and Resources
Buildings Signature Projects

We apply building science and design solutions that help reduce the generation of carbon emissions in the built environment and deliver projects with a positive effect on the socio-ecological health of our communities.

Building projects reducing embodied carbon in structural design

BUFFALO CROSSING VISITOR CENTRE
A mass timber structure, high performance envelope, and low carbon design combine to create a new sustainable building exemplar.

Learn more

WINNIPEG, MANITOBA, CANADA

NORTHLAND NEWTON DEVELOPMENT
Design strategies for this mixed-use redevelopment include the use of mass timber structure with CLT floor planks, glulam beams, and glulam columns.

Learn more

NEWTON, MASSACHUSETTS, USA

ONE THE ESPLANADE
The project was able to reduce the highly carbon intensive concrete component by 46 percent against business-as-usual.

Learn more

PERTH, WESTERN AUSTRALIA
External Initiatives

We care about the communities we serve—because they’re our communities too. This allows us to assess what’s needed and connect our expertise, to appreciate nuances and envision what’s never been considered, to bring together diverse perspectives so we can collaborate toward a shared success.

Our team includes designers, engineers, scientists, and project managers who are innovating together, sharing their expertise, and advocating for carbon neutral buildings and landscapes and prioritize materials and process that have a positive impact on the environment, climate, human health, and society.

Industry Influence

Stantec staff have been active in task forces and committees contributing to sustainable, equitable, and health-centric design initiatives.

Informative Tools

Stantec staff have access to collateral and visuals that enable client education around reducing embodied carbon.

Thought Leadership

Stantec staff are active leaders and contributors to thought leadership advocating for reducing embodied carbon in design initiatives.

ASHRAE STANDARD 240P ANNOUNCEMENT

Stantec’s North America Sustainability Discipline Leader, Beth Tomlinson, services as Vice Chair of the joint ASHRAE/ICC Standard 240P – Evaluating Greenhouse Gas (GHG) and Carbon Emissions in Building Design, Construction and Operation, extending our commitment and leadership within the Buildings industry.

EMBODIED CARBON EXPERTISE

Regulations in the building industry are evolving, calling for reduced embodied carbon emissions. We have developed an overview addressing regulations and requirements impacting reduced embodied carbon through design.

EMBODIED CARBON: WHY IT MATTERS TO THE STRUCTURAL ENGINEER—AND HOW TO REDUCE IT

NEW ASHRAE STANDARDS TIP THE BALANCE TOWARD NET ZERO BUILDINGS

Recycle your building: 8 reasons to consider adaptive reuse and retrofitting

Carbon: A common language for change—now is the time to act

Are net zero energy and net zero carbon buildings a must-have?

Low-carbon building materials: designers discuss alternative options

New ASHRAE standards tip the balance toward net zero buildings