

**NORR**

# **EMBODIED CARBON ACTION PLAN 2024**



SE 2050 COMMITMENT PROGRAM  
YEAR 3 REPORTING UPDATE

# INTRODUCTION



This report presents our Embodied Carbon Action Plan (ECAP) in line with the Structural Engineering 2050 (SE 2050) Commitment Program, aiming to achieve carbon-neutral structural systems by 2050 to combat climate change.

# OUR COMMITMENT

As part of our steadfast commitment to sustainability, we are dedicated to not only meeting but leading the industry in reducing the embodied carbon (EC) associated with our structural design practices. This initiative aligns closely with the SE 2050 Commitment, reflecting our aspiration to drive innovation and excellence in sustainable engineering.

Recognizing the significant role the construction industry plays in global greenhouse gas emissions, we are deeply engaged in efforts within the SE 2050 Commitment Program. We work alongside other organizations to disseminate essential tools, methodologies and data, fostering a collaborative approach towards reducing embodied carbon and mitigating the climatic impact of construction.

Our vision extends beyond the immediate program period, as we aim to establish NORR as a trailblazer in sustainable structural design practices. This involves designing to achieve

short-term goals, as well as continuously improving and innovating for long-lasting impact.

We understand the importance of our sustainability efforts on stakeholders, including clients, partners and communities. Therefore, we are motivated and enthusiastic about driving positive change through our actions. This updated Action Plan provides a comprehensive overview of our objectives for reducing embodied carbon throughout the 2024-2025 period while reflecting on the progress made in the previous period. It also outlines the internal resources and protocols developed to support our sustainability initiatives.

As we reflect on our progress and reaffirm our commitment to the SE 2050 program requirements, we invite our employees and stakeholders to join us in championing sustainable engineering practices for a brighter, more resilient future.



**We aim to establish NORR as a trailblazer in sustainable structural design practices.**

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# ABOUT US



NORR is an employee-owned, fully integrated A&E firm. Our professional team of 800 architects, engineers, planners and interior designers work collaboratively across 12 market sectors in Canada, the US and UK.

Our mission is to create socially aware, environmentally responsible and financially viable architecture and engineering design solutions to ensure our clients achieve their business goals while contributing to healthier and sustainable spaces and places across the globe.

## **A CARBON CONSCIOUS COMMITMENT**

We are committed to supporting the transformation of the built environment from a major source of carbon emissions to an important contributor to combating the climate emergency. We embrace the climate change mitigation strategy put forth in the COP28 Agreement and accept the urgent challenge to make carbon-neutral buildings a standard practice, rather than the exception.

### **SECTORS**

- Commercial
- Education
- Health Sciences
- Hospitality
- Industrial
- Justice
- Public Buildings
- Residential
- Restaurants
- Retail
- Science & Research
- Transportation

### **SERVICES**

- Architecture
- Interior Design
- Master Planning and Urban Design
- Structural Engineering
- MEP Engineering
- Sustainability

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# EMBODIED CARBON TEAM



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**RUMMAN RAHMAN** P.Eng., M.Eng.  
Structural Engineer  
SE 2050 Embodied Carbon Champion

Rumman is deeply committed to NORR's mission of reducing embodied carbon emissions and is a driving force behind the company's participation in the SE 2050 Program. Rumman holds a Master of Civil Engineering from the University of Waterloo, graduating with distinction. His knowledge, coupled with his passion for sustainability, makes him an invaluable asset to NORR's Structural Engineering team.



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**ALI HUSAIN**, P.Eng., M.Eng., ing.  
Associate  
Studio Manager, Structural Engineering

As the Studio Manager of Structural Engineering with more than a decade of experience, Ali has a proven track record of success in a wide variety of projects in Canada and abroad. With a passion for sustainable design and a deep commitment to finding new and innovative solutions, Ali is an expert in creating structures that meet the highest standards of environmental responsibility.



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**HASSAN SAFFARINI**, P.Eng., Ph.D., PMP, LEED® AP, CAHP  
Principal, Structural Engineering, North America

Hassan heads NORR's structural engineering team in Canada. With 35+ years of professional experience and a Ph.D. from UC Berkeley, he has been particularly aware of the potential impact of architecture and engineering projects on the environment. He became a LEED AP in 2007 and is a board member of the Ontario Association of Heritage Professionals. He thus promptly bought into the SE 2050 commitment in 2021.



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**BLAKE JACKSON**, AIA, LEED® Fellow, WELL Faculty,  
Fitwel Amb., CPHC  
Director, Sustainability

As Director, Sustainability at NORR, Blake supports project delivery, CSR, and he leads the firm's global program to achieve both the AIA 2030 and SE 2050 Commitments. For over 20 years, Blake has been working at the nexus of sustainability, wellness, resiliency and equity, promoting positive, measurable outcomes for built environment projects, worldwide.

# NORR EMBODIED CARBON ACTION PLAN

Our goals are presented in four categories and will be achieved through the identified actionable steps. These outcomes form the base doctrine of our environmental commitment and serve to direct this Action Plan.

## THE FOUR AREAS OF FOCUS OF THE SE 2050 COMMITMENT PROGRAM



### EDUCATION

Educating employees and enhancing professional development on topics related to reducing embodied carbon in design.



### REPORTING

Measuring, tracking and reporting embodied carbon data and comparing determined embodied carbon values to predefined targets.



### EMBODIED CARBON REDUCTION STRATEGIES

Reduce embodied carbon, document lessons learned in pursuing reduced-carbon designs and set embodied carbon goals for projects in design.



### ADVOCACY

Share the goals of the SE 2050 Commitment Program and enhance outreach on the important topic of embodied carbon.

# ECAP



**VISION:** To establish NORR as an industry leader in embodied carbon best practices in structural engineering and ultimately assist in achieving industry carbon-neutrality.

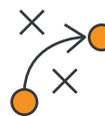


**MISSION:** These four missions lay the foundation for NORR's vision to become a central hub for embodied carbon research, education, dissemination and execution.



## 1. MEET AND EXCEED REQUIREMENTS

The SE 2050 Commitment Program requirements will be met and exceeded through unique solutions that develop our experience in the field. While the SE 2050 guidelines provide a minimum standard to be met, in order to develop excellence in sustainable design and play a significant role in the health of the environment, this standard will be exceeded to achieve the objective by, or before, 2050.



## 2. IMPLEMENT NEW DESIGN STRATEGIES

New structural design strategies will be implemented to enable better assessment and reduction of embodied carbon. As the consideration of embodied carbon is growing, new tools and methodologies will be adopted to effectively achieve the overall vision.



## 3. FACILITATE CARBON REDUCTION GOALS

Property owners' own carbon reduction goals will be facilitated through our proficiency. To elicit the greatest consideration of embodied carbon, the carbon goals of property owners will be achievable to encourage further carbon reduction and to promote industry-wide change.



## 4. CARBON REDUCTION EDUCATION

Technical staff will be inspired and educated in carbon reduction strategies as those are developed internally. One of NORR's greatest strengths is in its multidisciplinary, in-house design teams, which exist alongside and integrate with the structural engineering discipline. The other disciplines will be engaged through company-wide knowledge dissemination.

# GOALS



The following goals address the critical topics of education, reporting, embodied carbon reduction and advocacy that are essential to an effective carbon reduction plan.

1. Identify and refine structural design processes within the scope of our current procedures that can yield improvements to embodied carbon totals.

**Action:** Embodied carbon comparative studies included as part of design process from the conceptual design stage.

2. Establish embodied carbon as an additional criterion to monitor on all major structural design projects.

**Action:** Embodied carbon implemented as an on-going check in design.

3. Work with clients to set embodied carbon reduction targets for projects.

**Action:** Reduction targets established at kick-off for selected projects.

4. Influence other disciplines' consideration of embodied carbon through advocacy and resource sharing.

**Action:** Our Architectural teams have committed to AIA 2030. Multidisciplinary embodied carbon and operating carbon presentations are held.

5. Advocate multi-disciplinary sustainability studies of embodied and operational carbon to arrive at the most environmentally conscious solutions.

**Action:** Ongoing for select prototypical commercial and retail projects and for projects across multiple sectors in the company.

6. Ensure we apply state-of-the-art tools and methods to achieve a reduction in embodied carbon annually.

**Action:** Developed an in-house Excel-based Carbon Calculator that is linked to Revit-based schedules for ease of gathering project data.

7. Improve upon available embodied carbon reduction tools for structural designs and identify knowledge gaps following their adoption.

**Action:** Lessons learned while using embodied carbon tools relayed to internal team to improve procedures.

8. Engage our multi-disciplinary technical staff to encourage feedback and facilitate discussion towards embodied carbon goals on a semi-annual basis.

**Action:** We are growing our Sustainability group to facilitate multidisciplinary engagement on an increasing number of projects.

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# STRATEGIES



The following strategies outline the means through which the goals will be achieved and inform the actionable tasks.

1. Examine in-house tools for potential add-ins to facilitate embodied carbon consideration.

**Actions:**

2. Develop procedures for optimizing embodied carbon reduction over the course of a project.

**Actions:**

3. Conduct estimates of embodied carbon in ongoing projects using Life-Cycle Analyses (LCAs) of building materials following a year of commitment.

**Actions:**

4. Engage clients and architects to optimize the use of structural materials and suggest lower-carbon alternatives when available.

**Actions:**

5. Host discussions with other disciplinary teams to increase engagement and assist in determining areas of potential embodied carbon reduction.

**Actions:**

6. Identify and acquire necessary software for monitoring embodied carbon throughout a project.

**Actions:**

7. Review available embodied carbon data analysis tools and develop a standardized method of reporting project data.

**Actions:**

8. Schedule semi-annual meetings to update the firm on the EC reduction implementation progress and ongoing tasks.

**Actions:**

9. Engage our Global Marketing and HR departments to help establish the SE 2050 campaign and build awareness of the initiative.

**Actions:**

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# ACTIONS



This section presents the actionable steps to be taken to ultimately meet our carbon reduction vision and goals. The tasks are divided into the four critical components identified by the SE 2050: education & knowledge sharing, reporting, embodied carbon reduction and advocacy.

In this report we reaffirm our commitment to the SE 2050, provide an update about our actions and our plan to continue on this trajectory.



# EDUCATION & KNOWLEDGE SHARING

We recognize that education plays a crucial role in driving internal action toward embodied carbon reduction. Our strategy focuses on empowering employees with the knowledge and skills necessary to contribute effectively to our sustainability goals.

## EDUCATION

Our SE 2050 Champion is tasked with leading efforts to embed embodied carbon reduction practices into our daily practice. The champion serves as an ambassador for sustainability, facilitating educational initiatives and fostering a culture of awareness and action.

We are committed to raising awareness about embodied carbon across all levels of our organization. To achieve this, we host monthly webinars focused on embodied carbon (accessible to all employees) and integrate recorded sessions into our onboarding process. This ensures that every new team member is equipped with foundational knowledge about embodied carbon and its significance in our work.



Recognizing the pivotal role of structural engineers in driving embodied carbon reduction, we conduct recurring workshops on core concepts and skills related to measuring, reducing and reporting embodied carbon. Through these workshops, we empower our engineers to incorporate sustainability principles into their design decisions effectively.

To facilitate ongoing learning and collaboration, we have established an Embodied Carbon Committee within our practice. This committee, while broadly addressing sustainability topics, prioritizes embodied carbon reduction initiatives. In collaboration with our Sustainability team, this committee promotes interdisciplinary dialogue and knowledge sharing and enhances the collective understanding and commitment to sustainable engineering practices.

We actively engage with the Carbon Leadership Forum (CLF) Regional Hubs to stay abreast of the latest developments and best practices in embodied carbon reduction. Our participation includes attending presentations, working sessions and reporting back to the firm. By leveraging regional networks, we strengthen our knowledge base and enhance our capacity to drive meaningful change.

In addition to these initiatives, we continually explore new avenues for promoting embodied carbon education within our firm. Through ongoing evaluation and feedback, we refine our educational strategies to ensure maximum impact and engagement across our organization.

### KNOWLEDGE SHARING

Effective knowledge sharing is essential for driving external awareness and understanding of embodied carbon reduction efforts. We are committed to transparently communicating our initiatives, successes and lessons learned with clients, the design community and the public at large.

We are employing a multifaceted approach to external communication, leveraging various channels to share information about our embodied carbon reduction work. This includes regular updates on our website, social media platforms and industry publications to reach a broad audience and foster engagement.

We actively engage with professional networks and associations to share our embodied carbon reduction journey and exchange insights with peers. Through participation in industry events, panel discussions and webinars, we contribute to advancing the discourse on sustainability in structural design.

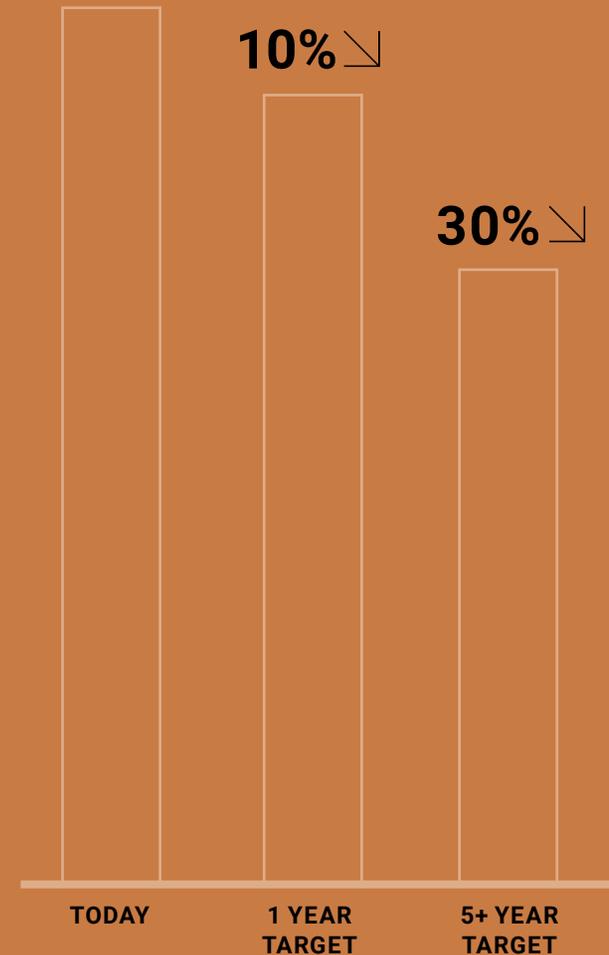
Through these initiatives, we aim to catalyze broader awareness and action on embodied carbon reduction, fostering a culture of sustainability within the design community and beyond.



# EMBODIED CARBON REDUCTION STRATEGIES



We are committed to implementing specific and measurable strategies to reduce embodied carbon in our project work both in the short term and the long term. Our reduction strategy is grounded in innovative approaches that prioritize sustainability without compromising design integrity or structural performance.





NORR has established reduction targets for embodied carbon: 10% in the short term (less than one year) and 30% in the long term (five or more years). These targets serve as guiding principles for our design teams, driving innovation and encouraging the adoption of sustainable practices across all projects.

We are implementing a workflow that facilitates early design decisions based on embodied carbon considerations. By integrating embodied carbon analysis tools into our design process, we empower our teams to identify low-carbon alternatives and optimize material selections from the outset.

We have updated our specifications to incorporate embodied carbon performance criteria, ensuring that sustainability considerations are integrated into all aspects of our project documentation. By specifying low-carbon materials and construction methods, we drive demand for environmentally responsible practices within the industry.

We compare different design options using embodied carbon as a performance metric during the project concept phase. By evaluating the environmental impact of various design alternatives, we identify opportunities for optimization and refinement that minimize embodied carbon emissions while maximizing project value. We communicate embodied carbon impacts of different design options to clients using effective data visualization techniques. Through visually engaging presentations and reports, we empower clients to make informed decisions that prioritize sustainability without sacrificing project goals or objectives.



**We empower clients to make informed decisions that prioritize sustainability without sacrificing project goals or objectives.**



# REPORTING

Transparent and accurate reporting is fundamental to our commitment to embodied carbon reduction. Our reporting plan outlines how we will measure, track and report embodied carbon data, ensuring accountability and facilitating informed decision-making throughout our projects.



We utilize a robust methodology to calculate embodied carbon for structural materials. This methodology encompasses Life-Cycle Assessment (LCA) principles and considers the environmental impacts associated with material extraction and manufacturing. When calculating embodied carbon or specifying materials on our projects, we employ a systematic approach to finding, selecting or requesting Environmental Product Declaration (EPD) data. Our methodology prioritizes EPDs from reputable sources and ensures that data quality and reliability are thoroughly vetted.

In addition to the internally developed Carbon Calculator, we utilize industry-leading LCA software, such as One-Click LCA and Beacon, to quantify embodied carbon in our projects accurately. The scope of our LCA encompasses relevant life-cycle stages, including A1-A3 (cradle-to-gate), A1-A5 (cradle-to-grave), or other specified boundaries as required by project goals and objectives.



**Our reporting plan encompasses a comprehensive scope of embodied carbon data, covering all structural materials used in our projects.**

We employ standardized procedures for calculating material quantities at various project stages, ensuring consistency and accuracy in our reporting. Whether at the conceptual design phase or during construction administration, our reporting methodology accounts for material usage throughout the project lifecycle.

Our reporting plan encompasses a comprehensive scope of embodied carbon data, covering all structural materials used in our projects. We strive to capture data from a representative sample of projects across our portfolio, providing insights into trends and performance metrics at both the project and firm levels. We commit to submitting a minimum of two projects per US office with structural engineering services to the SE 2050 Database. While we are not required to submit more than five total projects across our firm, we endeavour to maximize our contributions to the SE 2050 Program and promote transparency in our reporting practices.

# ADVOCACY



Our commitment is to advocate for policies, practices and initiatives that promote embodied carbon reduction and sustainability in the built environment. Our advocacy plan outlines strategies to engage with clients, industry partners, governmental organizations and the public to advance our shared goals of environmental stewardship and climate resilience.

We actively communicate the value of the SE 2050 Commitment to our clients, highlighting how our participation in the program aligns with their sustainability objectives and contributes to positive environmental outcomes. By showcasing the benefits of embodied carbon reduction, we foster collaboration and alignment with clients who share our commitment to sustainability.

We publicly declare our firm as a member of the SE 2050 Commitment, reinforcing our dedication to reducing embodied carbon and promoting transparency in our sustainability efforts. We showcase our commitment on our website, social media platforms and other relevant channels to demonstrate leadership and inspire others to join us in this important initiative.

We engage with structural material suppliers in our regions to communicate the importance of Environmental Product Declarations (EPDs) and low-carbon material options. By advocating for greater transparency and sustainability in the supply chain, we drive market demand for environmentally responsible materials and encourage suppliers to prioritize embodied carbon reduction.

Through these advocacy initiatives, we demonstrate our commitment to driving positive change and advancing sustainability in the built environment. We leverage our experience, partnerships and influence to advocate for policies and practices that prioritize environmental stewardship and contribute to a more resilient and sustainable future.



**We leverage our experience, partnerships and influence to advocate for policies and practices that prioritize environmental stewardship and contribute to a more resilient and sustainable future.**

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# FINAL REMARKS



This report represents our third annual Embodied Carbon Action Plan as inspired by the SE 2050 Commitment Program as well as our dedication to environmental stewardship.

The framework presented in this report outlines the company's vision, goals, strategies and immediate tasks to implement the means to create a reduction in embodied carbon through structural design. Action items are divided into education & knowledge sharing, embodied carbon reduction, reporting and advocacy subtasks which will form the structure for our embodied carbon response for the next 26 years and beyond. This Action Plan will enable us to emerge as a front runner in sustainable structural engineering practice through internal embodied carbon education, advanced carbon-conscious design procedures, superior sustainability coordination with clients and a uniquely inspired employee environment. Together, these components will develop continuously in the future and ultimately contribute to achieving net zero structural engineering practices by 2050. We are committed to reducing embodied carbon in our projects and incorporating this important metric across all of its actions.



**NORR** | Integrated Thinking. Inspired Design.