

NORR

Integrated Thinking.
Inspired Design.

MEP 2040 Challenge: Building Systems Net Zero Carbon Plan

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Introduction

MEP systems (mechanical, electrical, and plumbing systems) account for 70-75% of a building's lifecycle carbon impact, with embodied carbon representing 15-30% of that total. Proactive action is essential to achieving our long-term decarbonization goals.

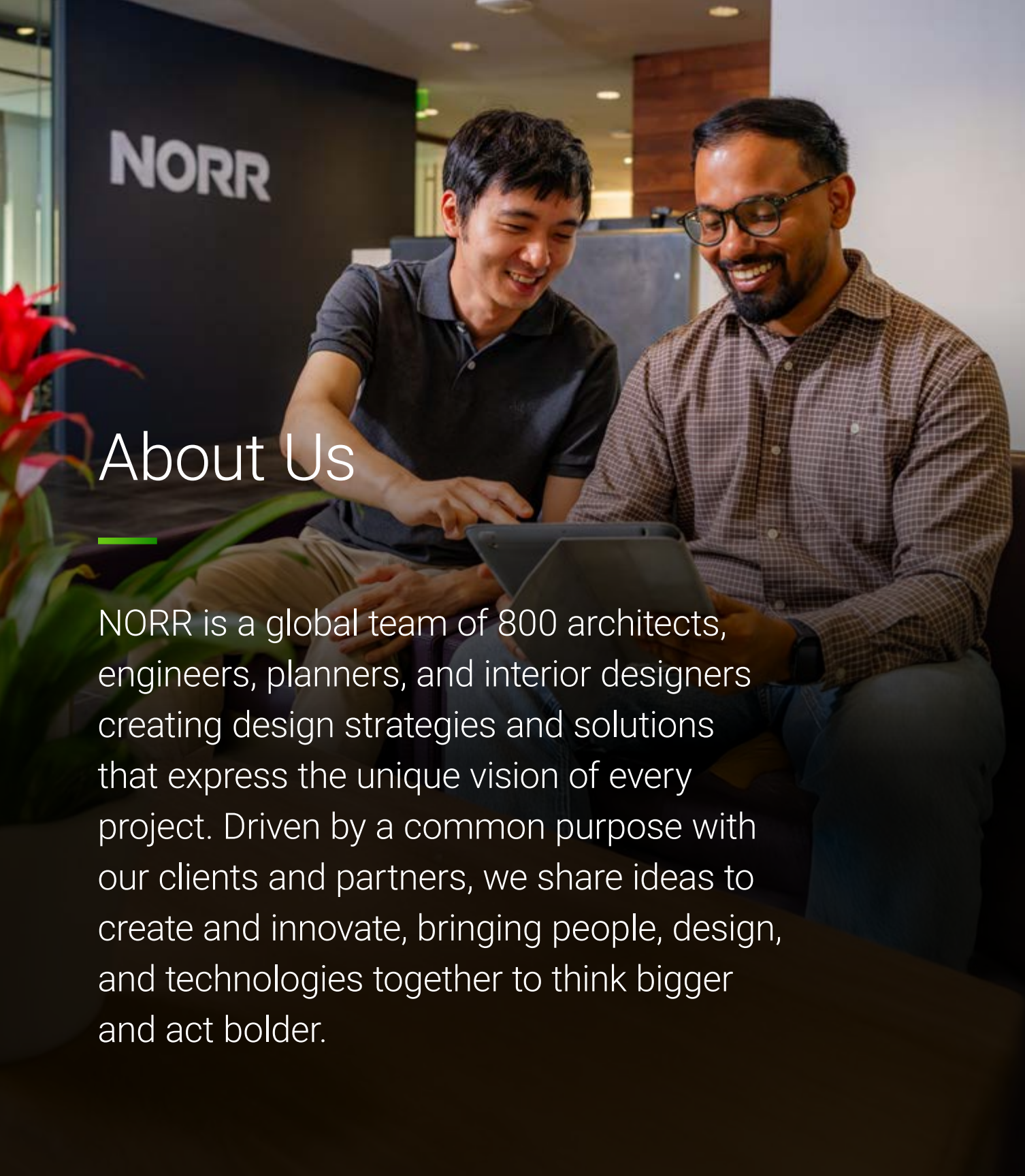
This plan outlines our company-wide strategy and goal to achieve carbon-neutral MEP systems by 2040 aligned with the MEP 2040 Challenge to mitigate climate change.

Our MEP 2040 Mission



Eliminate embodied carbon in MEP systems by 2040 and dramatically reduce operational carbon through high-performance design, advocacy, and innovation.

This goal commits us to eliminating the embodied carbon associated with MEP systems in our projects by 2040. Embodied carbon refers to the emissions generated from the manufacturing, transportation, systems, and end-of-life of MEP materials and equipment. In parallel, we will prioritize deep reductions in operational carbon—the emissions from energy use during building operation—through the integration of high-performance systems design, adoption of low-carbon technologies, active industry advocacy, and ongoing innovation across all project lifecycles.



NORR

About Us

NORR is a global team of 800 architects, engineers, planners, and interior designers creating design strategies and solutions that express the unique vision of every project. Driven by a common purpose with our clients and partners, we share ideas to create and innovate, bringing people, design, and technologies together to think bigger and act bolder.

Our story began in 1938 and has evolved into an employee-owned, fully integrated company committed to sustainable development goals across 13 market sectors in Canada, the US, and UK. Design excellence continues to guide everything we do.

Our Journey to Net Zero

We are committed to supporting the transformation of the built environment from a major source of carbon emissions into a driver of climate action—across **client engagements** and our internal operations. We recognize decarbonization as a best practice, and we share the vision of the **United Nations Sustainable Development Goals** to strengthen common, global objectives.

Sectors

- Commerical
- Defence
- Education
- Health Sciences
- Hospitality
- Industrial
- Justice
- Public
- Residential
- Restaurants
- Retail
- Science + Research
- Transportation

Services

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

Our Team



Blake Jackson

AIA, LEED Fellow, WELL Faculty, Fitwel Amb,
CPHC, ENV SP
Director, Sustainability

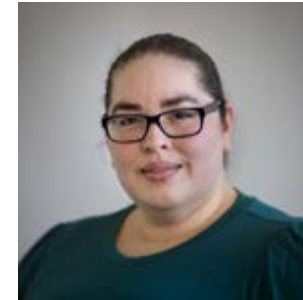
Blake has 25+ years of experience in architecture, interiors, planning and adaptive reuse projects seeking measurable carbon reductions and tangible outcomes for facility owners, operators and users. His sustainable experience includes projects for Commercial, Residential, Education, Public buildings, Health Sciences and Industrial market clients. Blake leads NORR's 2030 and SE 2050 Commitments as well as our alignment with the UN Sustainable Development Goals. These corporate initiatives aim to reduce greenhouse gases and embodied carbon on diverse projects that span all sectors of NORR's portfolio.



Tanmay Naik

LEED AP BD+C, FitWel Ambassador
Designer, Sustainability

Tanmay is a sustainability-focused design professional with over 10 years of experience in architecture and high-performance building design. He is passionate about creating healthier, low-carbon, and more resilient built environments through sustainable design and environmental performance analysis. Tanmay holds an MSc in Architecture with a specialization in High-Performance Buildings from the Georgia Institute of Technology. His expertise includes Life Cycle Assessments (LCAs), embodied carbon analysis, daylighting analysis, sustainability certifications, ESG reporting, and climate-responsive design.



Neva Field

P.Eng, LEED AP (ID+C)
Associate / Studio Manager, Mechanical

Neva has 22 years of experience in engineering, with a B.A.Sc. in Mechanical Engineering from the University of Toronto. She is a Studio Manager for NORR's Mechanical Engineering team, based in Toronto, which supports all sectors and locations across North America. She leads NORR's internal energy modeling group, having played a key role on several projects pursuing alignment with the AIA 2030 Commitment, compliance with jurisdictional requirements and bespoke guidelines, and on projects seeking LEED, CaGBC Zero Carbon Buildings Standards, and other third-party frameworks.



Nicklas Kent

EIT
Mechanical Designer

For 6 years, Nicklas has served as a Mechanical and Plumbing Designer and Engineer in Training within NORR's Retail and Commercial studios, and he is currently our MEP2040 Challenge program lead. He is a graduate of Lawrence Technological University, with a master's in architectural engineering. In his role as program lead, he is working across disciplines and offices with embedded Engineering practices to implement and report back upon progress regarding the strategies within the MEP 2040 Challenge.

GOALS + APPROACH:

Building Systems Net Zero Carbon Plan

We aim to lead the way in achieving carbon neutrality by systematically reducing embodied carbon across MEP systems in all our projects. To demonstrate our organizational strength and dedication to a sustainable future, we have developed a **four-phase approach** that targets progressively more challenging milestones at each stage:



1. Establish clear goals, organize key data, and develop the internal skills and systems required for long-term success and scalability.



2. Implement tools and processes to track and reduce carbon emissions, focusing on minimizing embodied carbon in materials and systems during design and construction.



3. Accelerate carbon reduction by embracing innovative solutions, encouraging industry-wide collaboration, and advocating for supportive policies.



4. Achieve net zero embodied carbon MEP systems through sustainable materials, efficient designs, reuse, and retrofitting existing systems.

PHASE 01: Commitment, Baselineing + Capacity Building (2025–26)



Goal: Establish foundational commitments, data, and internal capabilities.

Our first steps toward meeting the MEP 2040 Challenge are to set clear organizational goals, collect and structure essential data, and build the internal skills and systems needed to support long-term success and scalability.

Public Commitment



One commitment, aligned across every discipline—to eliminate carbon from MEP systems and advance our net-zero objective.



Sign and publish our commitment to the MEP 2040 Challenge

- By publicly committing to the MEP 2040 Challenge, we are demonstrating our dedication to eliminating carbon emissions from MEP systems, aligning with industry climate goals, and setting a foundation for integrating carbon-conscious practices across all operations.



Align MEP 2040 with AIA 2030, SE 2050, AIA Materials Pledge and internal carbon reduction goals

- Aligning with the AIA 2030, SE 2050, AIA Materials Pledge and our company's internal goals ensures a unified, cross-disciplinary approach to decarbonization, whereby all business activities are enhancing design outcomes, carbon accountability, and leadership in carbon-responsible solutions.

Four-Pillar Approach to Carbon Reduction Commitments

MEP 2040
Committing to Zero

SE2050
COMMITTING TO ZERO



Baseline Assessment



Fostering accountability and a culture of continuous improvement toward our carbon reduction goals.



Conduct Whole Life Carbon Assessments (WLCAs) on at least 30% of current projects

- Conducting Whole Life Carbon Assessments on 30% of projects helps us measure full lifecycle emissions of MEP systems, identify high-impact areas, guide low-carbon strategies, and strengthen internal carbon accounting capabilities.



Collect product-level embodied carbon data (e.g., EPDs [Environmental Product Declarations]) for the top 10 specified systems

- Collecting embodied carbon data for the top MEP systems enables informed material choices, supports low-carbon alternatives, improves carbon assessments, and enhances supplier engagement and procurement practices.
- By increasing the market share for manufacturers whose products demonstrate supply chain transparency through EPDs, we hope to increase their impact beyond the scope of our individual projects.

Benchmarking Tools to Carbon Analysis



Internal Training and Knowledge Building

Measuring whole-life carbon to drive informed, low-carbon MEP design at scale.



Train MEP technical employees in Life Cycle Assessment (LCA), embodied carbon and high-performance system design

- Training the MEP technical employees in LCA, embodied carbon, and high-performance design equips our teams to consistently apply low-carbon strategies and make informed decisions across projects.
- Inclusion of our internal sustainability group into MEP projects will further drive measurable, positive outcomes.



“Low-Carbon Champion” program specific to the MEP discipline.

- The “Low-Carbon Champion” program empowers our MEP team members to lead local carbon reduction efforts, support training, and drive sustainability initiatives, fostering accountability and a culture of continuous improvement toward our internal carbon goals.

Current Progress

	Carbon Literate Organization (CLO) Bronze (achieved in 2025)
	64 Carbon Literacy-trained employees
	8% of employees trained

Future Target

	Carbon Literate Organization (CLO) Silver (targeted for 2030/31)
	244 Carbon Literacy-trained employees
	30% of employees trained

Target by Year-End 2026



Employee Training
10% of MEP employees trained in LCA analysis



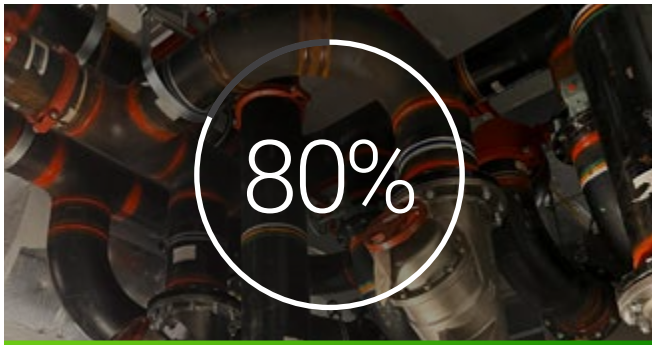
Project LCAs
30% of projects with completed WLCAs



Carbon Baseline
Establish baseline tCO2e for MEP systems



Principal-in-Charge (PIC)
Establish a PIC within the MEP disciplines to champion effort and collaborate with the team



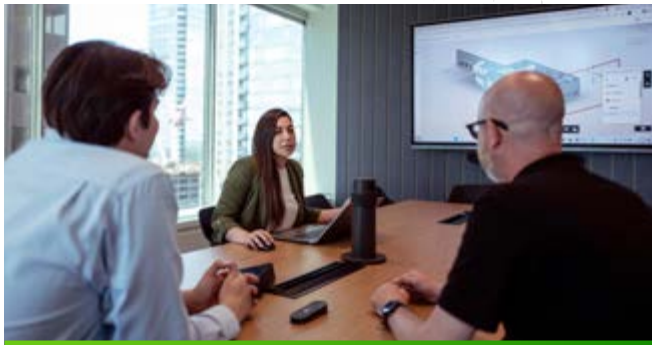
Supplier Data
Collect EPDs for 80% of top 20 MEP products



Annual Reporting
Submit collected project data within AIA 2030 DDx platform



Annual Carbon Action Plan
Generating an annual Carbon Action Plan (CAP) specific to MEP disciplines



Discipline-Specific Responsibilities
Define discipline-specific roles across all engineering offices to support Challenge goals

NORR Toronto Workplace Case Study

Our office at 2 Bloor Street East, Toronto, is an 8,325 SF destination workplace, one of only three in Canada registered for the Zero Carbon Certification™ by Living Future®. It achieved Ready designation for the Zero Carbon Certification™ in August 2026.

This requires projects to work within stringent budgets for operational and embodied carbon, verified after a year's worth of measured occupancy, with perpetual offsetting to remain carbon neutral over its lifecycle. The project catalyzed our decision to join the MEP 2040 Commitment, and focused on no added combustion, Energy Star equipment and appliances, LED lighting, and occupant/daylight sensors and controls to promote energy efficiency and promote evidence-based design.

25%

Lighting Power Density reduction in alignment with AIA 2030 Commitment

80%

Overall reduction in verified embodied carbon emissions, including transportation and construction activities

76%

Modeled energy use reduction over AHRAE 90.1-2019 baseline and in alignment with AIA 2030 Commitment



PHASE 02: Integration and Reduction (2027–30)



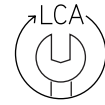
Goal: Integrate carbon accounting into workflows and reduce embodied carbon in active design.

Implement tools and processes that track and manage carbon emissions throughout the design and construction phases, with a focus on reducing embodied carbon in materials and systems used in active design.



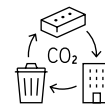
Design + Specification Integration

Designing adaptable, low-carbon systems that reduce waste and support long-term performance.



Standardize LCA and carbon tracking in all project phases using EPDs, BIM + LCA plugins

- EPDs provide reliable data that standardizes LCA and carbon tracking, enabling accurate, automated assessments through BIM and LCA tools.
- Integrating BIM with LCA tools enables real-time carbon tracking, streamlines workflows, and supports informed decisions across project lifecycle.



Revise specification language to prefer low-carbon materials (e.g., copper alternatives, low-impact refrigerants, leak detection systems)

- Revising specifications to prioritize low-carbon materials in MEP systems embeds sustainability in design stages and procurement, sets clear expectations, promotes eco-friendly products, and reduces carbon across the supply chain.



System Optimization

Designing modular and reusable HVAC and lighting systems across projects enhances flexibility, maintenance, and adaptability, while reducing waste and embodied carbon.



Standardize use of all electric systems and renewables (e.g., PV, heat pumps, geo-exchange) where grid carbon intensity is low

- Standardizing all-electric MEP systems in low-carbon grid regions significantly reduces operational carbon, supports decarbonization, improves indoor air quality, and ensures compliance with evolving energy regulations and sustainability standards.



Design for modularity and reuse, especially in HVAC and lighting systems

- Designing modular and reusable HVAC and lighting systems across projects enhances flexibility, maintenance, and adaptability, while reducing waste and embodied carbon.
- This approach supports circular economy principles, extends system lifespan, and lowers environmental impact by minimizing material use and demolition waste.
- Integration with Construction and Demolition Waste Management Planning, and specification of products with manufacturer take-back programs, can significantly reduce lifecycle carbon impacts and provide valuable incentives to owners and manufacturers who promote circularity.



Procurement Policies

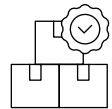


Our team will adopt procurement policies that prioritize products with verified EPDs, promoting carbon transparency in purchasing.



Require suppliers to disclose product carbon data

- Our team supports the disclosure of product carbon data, such as EPDs, to ensure supply chain transparency, enable low-carbon material choices, improve product sustainability, and facilitate accurate carbon assessments, ultimately driving demand for greener building materials.



Implement a shift towards EPD-backed procurement policies

- Our team will adopt procurement policies that prioritize products with verified EPDs, promoting carbon transparency in purchasing.
- This approach supports informed decision-making, encourages credible data from suppliers, drives market shifts toward low-carbon products, and helps us achieve our embodied carbon reduction goals.

Target by 2030



Carbon Reduction

30% reduction in average embodied carbon intensity from baseline



Low-Carbon Specs

100% of specs to prioritize EPD-backed materials



Electrification

Increase number of all electric projects within our portfolio



Waste Management

Construction and Demolition Waste Management Plans for all projects



Carbon Tracking

100% of projects to use LCA tools by DD phase



Reuse / Maximizing Lifecycle

Commit to reusing existing components in our designs to minimize embodied carbon



Renewables

Increase the number of projects that include renewable energy systems



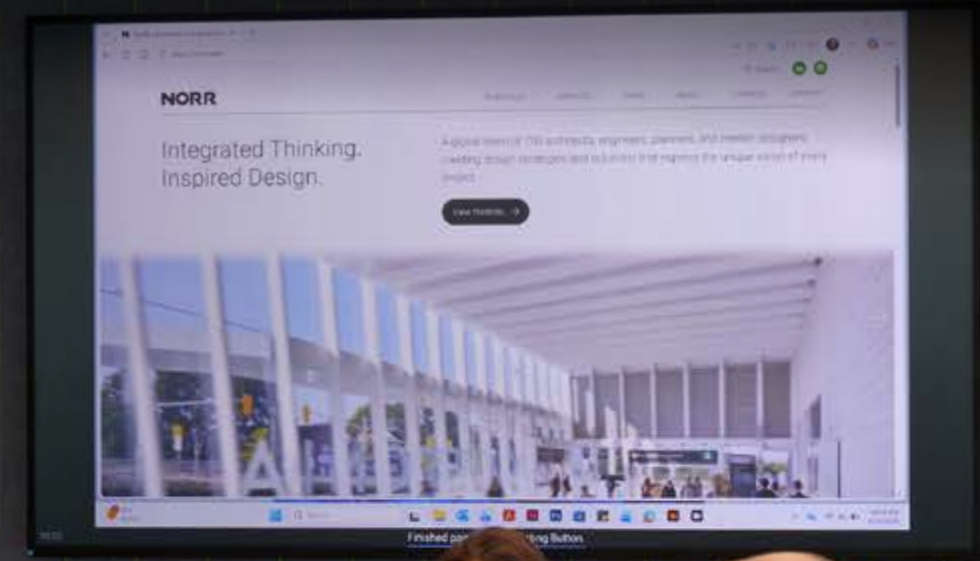
Manufacturer Partnerships

Specify/amplify manufacturers supporting circularity and take-back programs

PHASE 03: Innovation, Scaling, + Advocacy (2031-35)

Goal: Accelerate reduction through innovation, industry collaboration, and advocacy.

Drive faster carbon reduction by leveraging innovative solutions, fostering collaboration across the industry, and prompting supportive policies through advocacy.



Advanced System Innovation



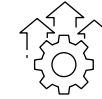
Advocacy for low-carbon HVAC (e.g., CO₂ heat pumps, geothermal loops)

- We will advocate for low-carbon HVAC technologies to drive innovation, reduce both embodied and operational carbon, and enhance energy efficiency across projects.
 - This approach strengthens sustainable design leadership and provides scalable, cost-effective solutions for clients seeking high-performance, low-impact MEP systems.
-



Develop proprietary design guides for zero-embodied-carbon retrofits

- Creating proprietary design guides for zero-embodied-carbon retrofits offers a standardized roadmap for upgrading existing buildings by installing low-impact MEP systems.
- These guides compile best practices and strategies to ensure consistent, efficient project delivery and help clients meet their sustainability targets.



Retrofit Focus

Launch a dedicated “Retrofit-Zero” working group for decarbonizing existing building stock

- This working group, within NORR and its sister company Cion, will focus on decarbonizing existing buildings by upgrading MEP systems, electrifying heating and cooling, enhancing efficiency, and using low-carbon materials.
 - This initiative aims to reduce emissions, extend building lifespans, and cut both operational and embodied carbon.
-



Partner with clients to phase out legacy refrigerants and HVAC materials

- We will collaborate with our clients to phase out high-GWP refrigerants and HVAC materials by identifying and replacing them with low-impact alternatives.
- This involves assessing current systems, planning replacements, and aligning with environmental standards.

Industry Leadership



Publish annual embodied carbon performance reports

- We will publish annual embodied carbon performance reports from 2026 onwards to track progress toward reduction goals, document MEP system impacts, benchmark against industry standards, and identify potential improvement opportunities.
- Sharing this data across different channels promotes transparency, accountability, and industry-wide learning.

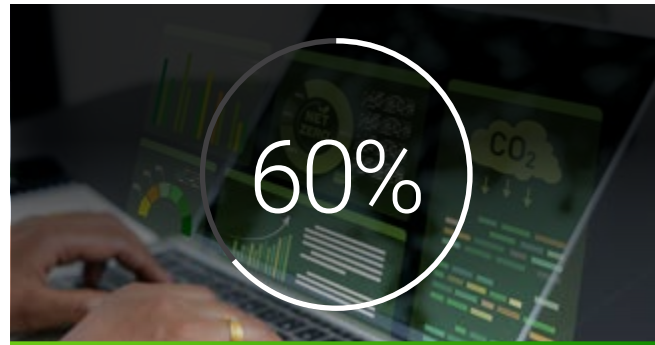


Collaborate with manufacturers on product innovation and EPD development

- Collaborating with manufacturers on product innovation and EPD development enables the creation of low-carbon, high-performance MEP components.
- These strategic partnerships promote transparency, support sustainable material choices, and drive industry-wide progress in carbon reduction.



Target by 2035



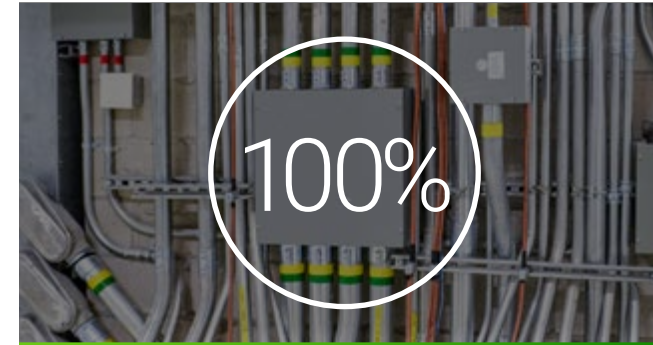
Embodied Carbon

60% average reduction from baseline



LCA and LCCA integration

60% of projects utilize both practices in tandem to drive carbon reduction



Verified EPDs

100% of specified mechanical and electrical equipment will have verified EPDs



Waste Management

Construction and Demolition Waste Management Plans divert >90% of waste from landfill



Industry Leadership

5-6 publications and/or conference presentations per year on leadership



Employee Training

50% Carbon Literacy-trained employees



Retrofit Projects

The majority of our portfolio will feature significant carbon-reduction retrofits



Carbon Neutral Case Studies

Build a portfolio of carbon neutral case study projects, at least one per sector

PHASE 04: Zero Carbon Delivery and Legacy Impact (2036-40)

Goal: Deliver zero-embodied-carbon MEP systems on all projects and ensure legacy impact.

Deliver zero-embodied-carbon MEP systems by using low-carbon materials, efficient design, and sustainable procurement, while also addressing the legacy impact of past systems through retrofits and responsible end-of-life strategies.

Zero Carbon Projects



All projects will deliver MEP designs with net-zero embodied and operational carbon (through design and verified offsets or removals if necessary)

- All MEP designs will target net-zero embodied and operational carbon by minimizing lifecycle emissions and offsetting any unavoidable impacts through verified methods.
- This encourages the use of top sustainability standards while delivering high-performing, reliable systems.



Third-party certifications pursued

- Pursuing certifications like Zero Carbon Certification™ by Living Future®, LEED, CaGBC Zero Carbon Building Standards, etc., validates net-zero MEP designs, boosts credibility, supports continuous improvement, and aligns projects with industry best practices.



Full Transparency and Disclosure



Publish all projects' carbon impacts

- We will track, report, and disseminate the collective carbon impacts of all projects to continually monitor progress, gaps, and opportunities for ongoing improvement and alignment with our objectives.
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Incorporate embodied carbon data into BIM for O+M phases

- Integrating embodied carbon data into BIM for O+M phases will provide our project owners with lifecycle carbon insights, enabling sustainable maintenance and retrofit decisions while supporting ongoing carbon tracking beyond construction.

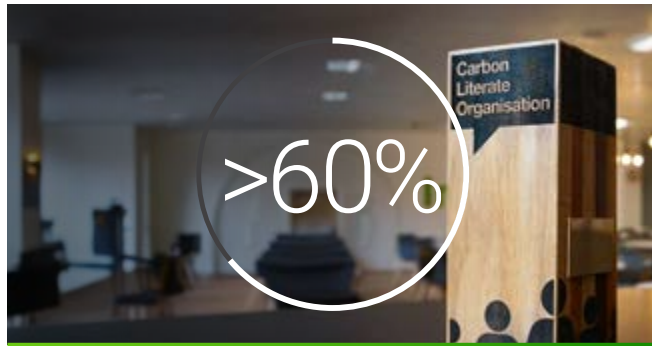


Global Standards Alignment

Align design policies with US federal carbon targets, Canadian federal carbon targets, UK federal carbon targets, EU taxonomy and other global frameworks

- We will align design policies with global carbon targets and sustainability frameworks, ensuring MEP project compliance, reducing regulatory risk, supporting market access, and demonstrating leadership in sustainable design.
- Aligned with SDGs (Sustainable Development Goal): Focus on Health (SDG 3), Clean Energy (SDG 7), Innovation (SDG 9), Sustainable Cities (SDG 11), Resource Efficiency (SDG 12), and Climate Action (SDG 13).
- Aligned with leading carbon-reducing third-party rating systems that emphasize energy efficiency, electrification, and the use of LCA to reduce embodied carbon.

Target by 2040



Carbon Literacy

More than 60% of our employees, including C-suite executives, trained in Carbon Literacy



Reporting

100% of product and project carbon will be fully disclosed



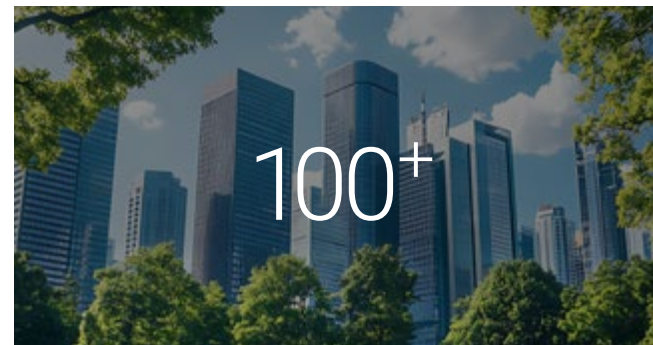
Net Zero MEP Systems

100% of projects will deliver zero-embodied-carbon MEP designs



Carbon Neutral Enterprise

NORR, by its 100th anniversary (2038), becomes carbon neutral



Legacy Impact

100+ carbon-neutral buildings completed



Global Alignment

All work complies with regional low-carbon legislation or better



NORR

Integrated Thinking.
Inspired Design.

