



TRADING UP

Equipping Ontario Trades with
The Skills of the Future



ABOUT THE CANADA GREEN BUILDING COUNCIL (CAGBC)

CaGBC is a not-for-profit, national organization working to advance green building and sustainable community development practices in Canada

CaGBC consists of industry-led, cross-sectoral stakeholders and members focusing on delivering market-based solutions

Current membership spans:

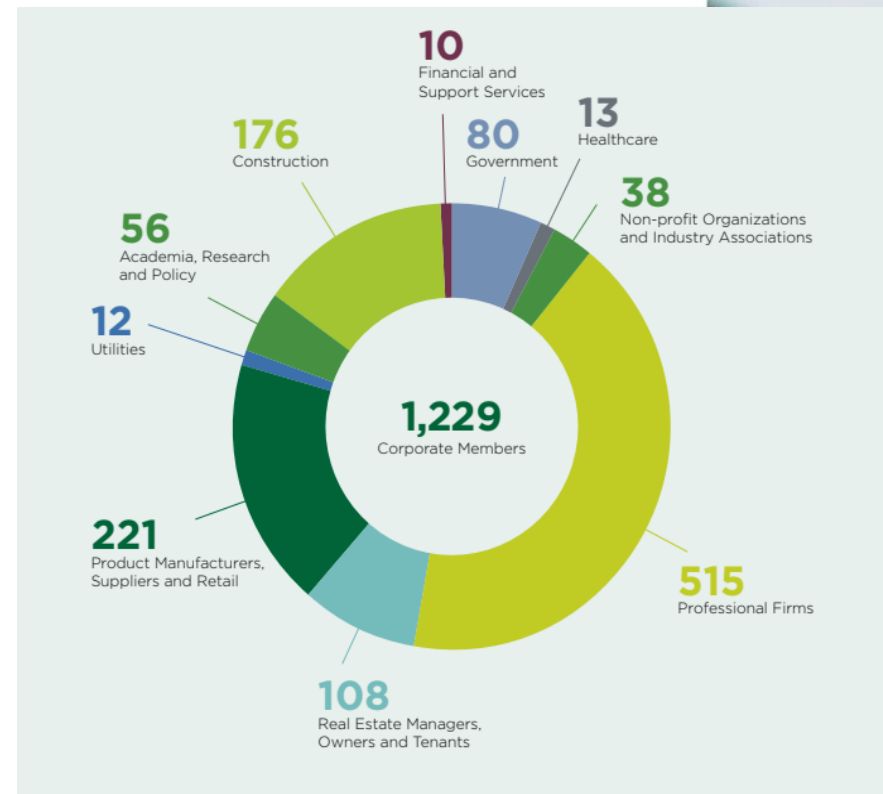
- 12 provinces and territories

- 1,300 national member companies and 4,000 chapter members

- 10,000+ LEED accredited professionals involved in designing, building and operating buildings, homes and communities

Since 2004, CaGBC has educated over 45,000 green professionals to answer the demand for knowledge and jobs in the green marketplace

CaGBC is also the license holder for the LEED green building rating system in Canada and recently launched CaGBC's Zero Carbon Building Standard – Canada's first green building program to make carbon emissions the key indicator for building performance



CAGBC CORPORATE MEMBERSHIP

PROFESSIONAL TRAINING LANDSCAPE IN ONTARIO

- CaGBC - Green Building, LEED, Zero Carbon, EWRB
- Passive House Canada - PH, TEDI
- CIET – Building Operators, Energy Management
- EnerQuality – ENERGY STAR
- Building Knowledge – Residential Building Science
- Endeavour Centre – Natural Building
- TRCA/STEP – Site and Stormwater
- ASHRAE – HVAC
- NAIMA – Insulation & Air Sealing
- NRCAN – Energy Management, Benchmarking
- Green Roofs for Healthy Cities – Green Roofs

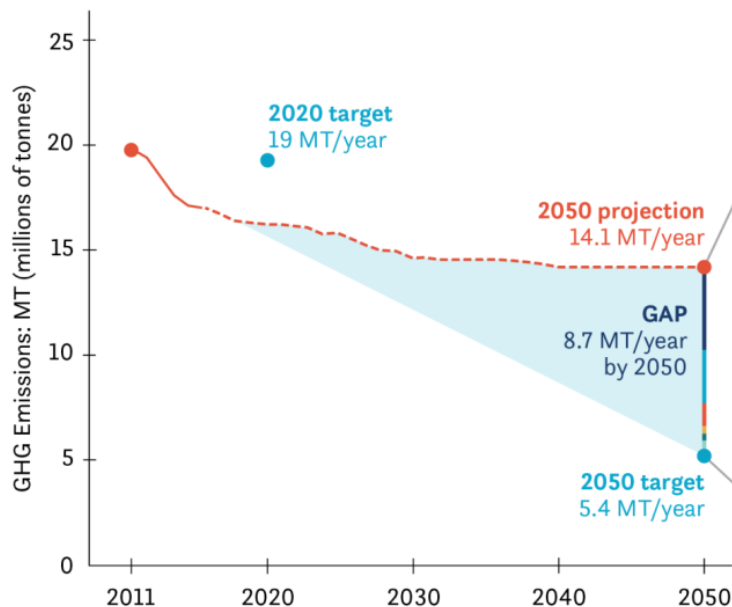
- **Professional Associations** (OAA, OALA, BOMA)
- **College and Universities** (Cert's, Degrees and Con-Ed)
- **Apprenticeships & Unions**
- **Vendors & Consultants**

TORONTO'S 2050 GHG FORECAST CLOSING THE CARBON GAP

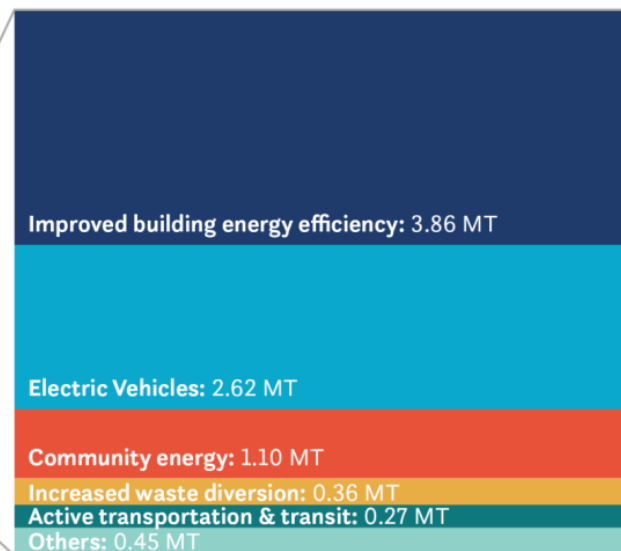


TransformTO

Low-carbon actions can close the 8.7 MT gap



TransformTO Low-Carbon Scenario





ALL NEW
BUILDINGS
DESIGNED TO
ZERO CARBON
BY 2030

GETTING TO **ZERO**
CARBON

EXISTING
BUILDINGS $\frac{1}{2}$
ENERGY USE &
ZERO CARBON
2050



THE ZERO CARBON BUILDING STANDARD



**CaGBC® ZERO
CARBON BUILDING
PILOT PROGRAM**

City of Vancouver Zero Emissions Fire Hall Vancouver, BC	Perkins+Will Confidential Mixed-Use Development Vancouver, BC
East Port Properties Wilkinson Avenue Net-Zero Heating Energy Warehouse Dartmouth, NS	Public Service and Procurement Canada Arthur Meighen Building, 22-55 St. Claire Avenue East Toronto, ON
EcoLock EcoLock, Carbon Capture Mini Storage Kelowna, BC	Seigneurie-des-Mille-Îles School Board New Curé-Paquin Elementary School Saint-Eustache, QC
Province of Ontario Walkerton Clean Water Centre Walkerton, ON	TerraView Homes & Newton Group NIMA Trails - Residential, Commercial Net Zero Building Guelph, ON
Mohawk College Joyce Centre for Partnership & Innovation Hamilton, ON	The Cora Group evolv1 Waterloo, ON
Okanagan College Health Sciences Centre (HSC) Kelowna, BC	Toronto and Region Conservation Authority Toronto and Region Conservation Authority (TRCA) New Headquarters Toronto, ON
Oxford Properties Group 30 Bay Street Toronto, ON 1133 Melville Vancouver, BC	University of Calgary MacKinnon Complex Redevelopment Calgary, AB



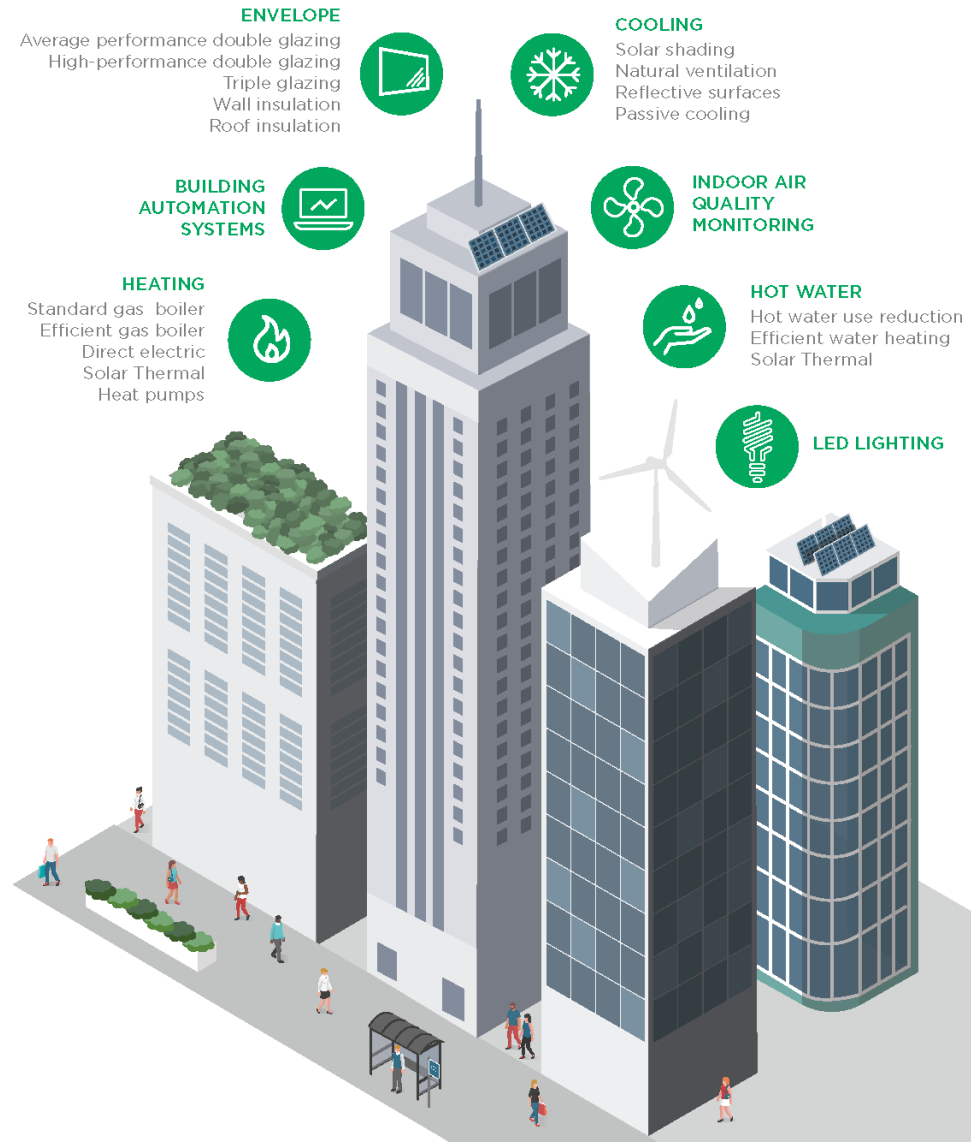
Canada Green Building Council
Every Building Greener

cagbc.org/zerocarbon

- Uses Carbon as the main performance metric.
- Is broadly applicable to all types of buildings, new and existing.
- Recognizes the inherent differences in regional energy sources, including local electricity production.
- Is flexible enough to allow all buildings to participate, regardless of local grid constraints.

ZERO CARBON BUILDING

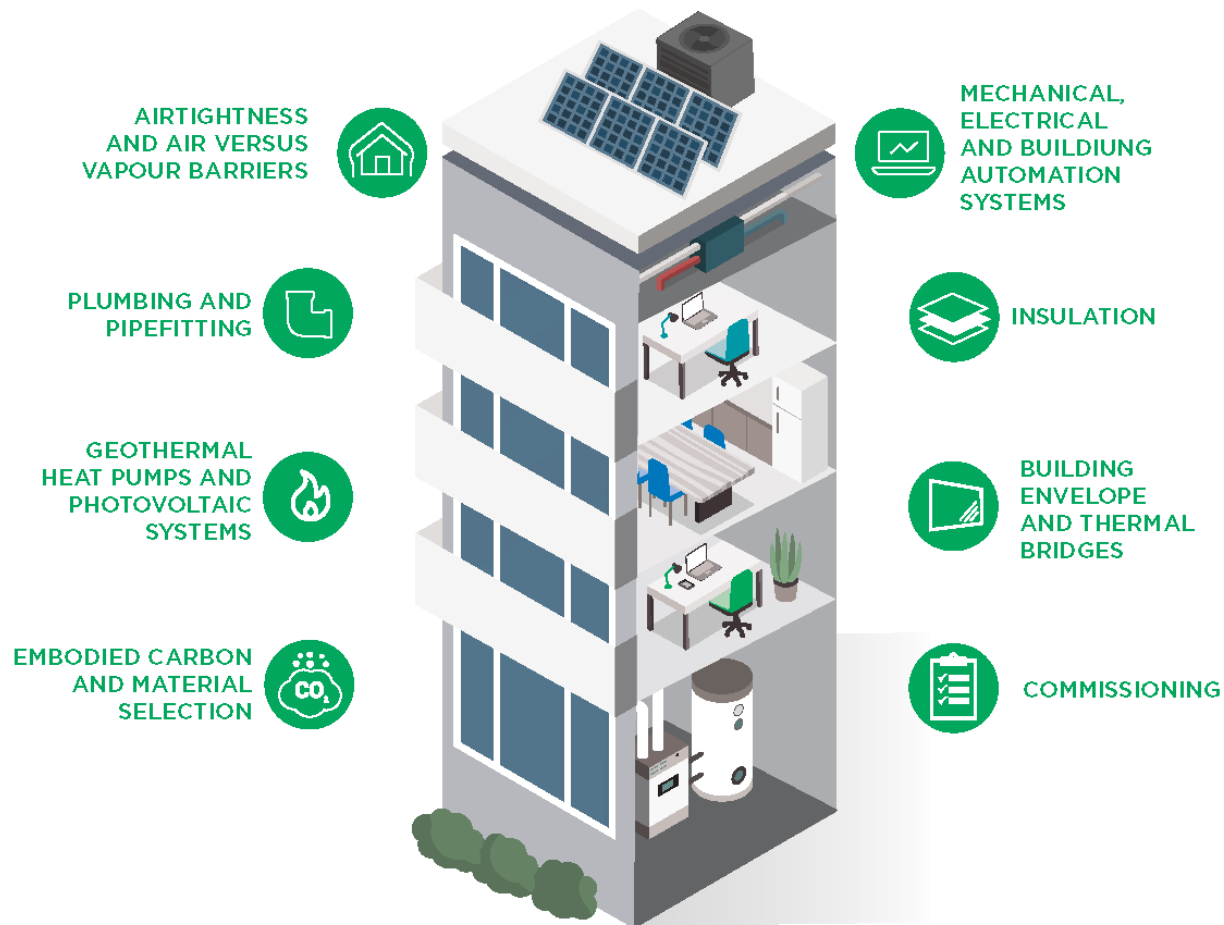
A high-performing building is defined as one that is highly energy-efficient and produces on-site, or procures, carbon-free renewable energy in an amount sufficient to offset the annual carbon emissions associated with its operations.



THE PURPOSE OF THE RESEARCH REPORT

- Describe the skills training required to meet the demand for the construction of low-carbon buildings.
- Identify the barriers to the uptake of low-carbon building skills training among tradespeople.
- Propose the delivery models necessary to optimize training uptake.
- Create an actionable education roadmap for Ontario labour, government, educational institutions, and industry to use to drive low-carbon skills development.

TECHNICAL SKILLS GAPS FOR HIGH-PERFORMING BUILDINGS



PRIORITIES

Thermal Energy Demand

- Air Tightness, Thermal Bridging, Insulation

Energy Source

- Local Emissions Factors

Energy Efficiency

- Total System Design, Equipment, Commissioning

Onsite Renewables

- Geo, PV, Thermal

Offsite Renewables

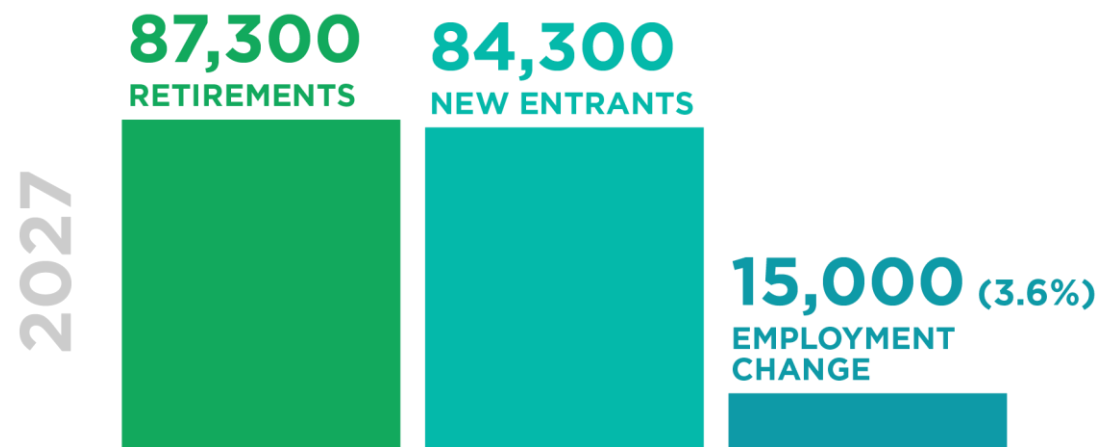
- RECs

LOW CARBON BUILDING WORKFORCE

Workforce Members	Planning & Design	Construction	Operations	Retrofits	Demolition
Architects, Engineers, Designers	◆	◆		◆	
Contractors, PMs		◆		◆	◆
Construction Trades		◆	◆	◆	◆
Building Officials	◆	◆	◆	◆	◆
Commissioning Agents		◆	◆	◆	
Developers, Finance	◆	◆	◆	◆	
Building Operators			◆	◆	
Property/Facility Managers			◆	◆	
Equipment Suppliers, Manufacturing, Service	◆	◆	◆	◆	
Real-Estate, Leasing			◆		

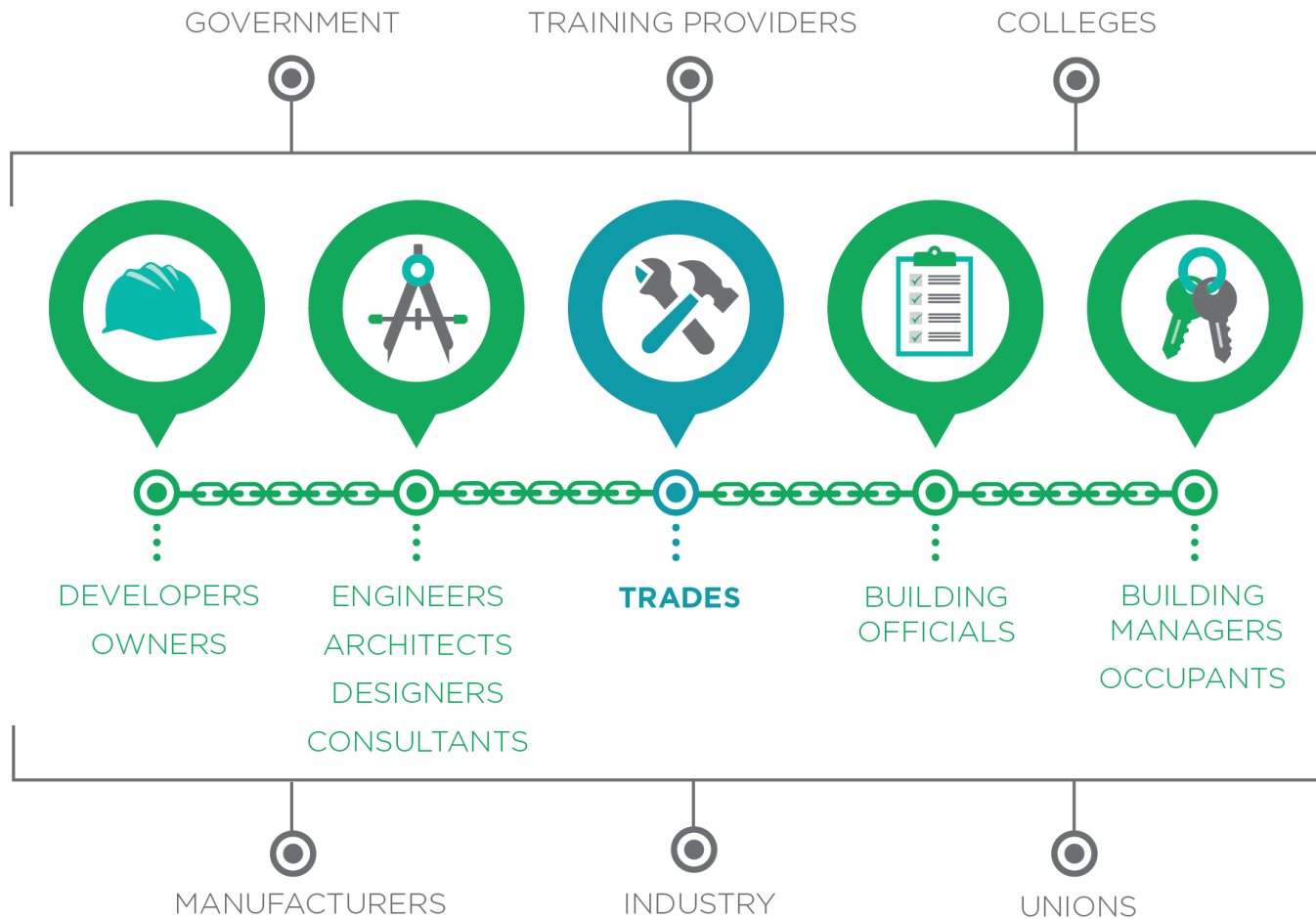
CONSTRUCTION INDUSTRY IN ONTARIO

- **520,000 people** are working in Ontario's construction industry
- Value of industry is **99 billion**
- **40% of the jobs** that will be created in Canada over the coming decade will be **skilled trade positions**.
- **85,000 retirements** are forthcoming and a need for **80,000 new recruits** needed by 2026 to sustain the sector.
- The construction sector already has a **workforce utilization rate of 93%**.
- The impact of the skills gap in Ontario is estimated at **\$24.3 billion of GDP** in foregone company revenues, with an additional **\$3.7 billion lost** in foregone taxation

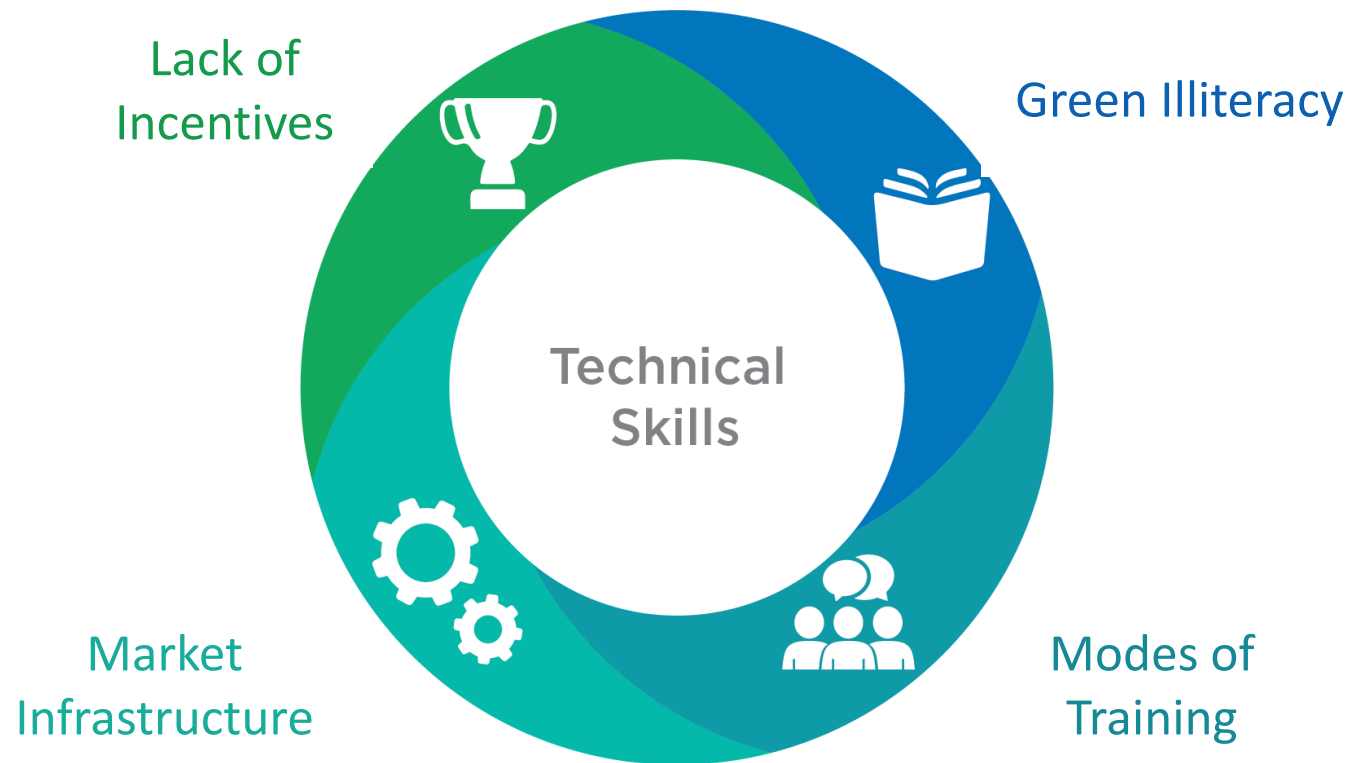


10-YEAR WORKFORCE OUTLOOK FOR ONTARIO

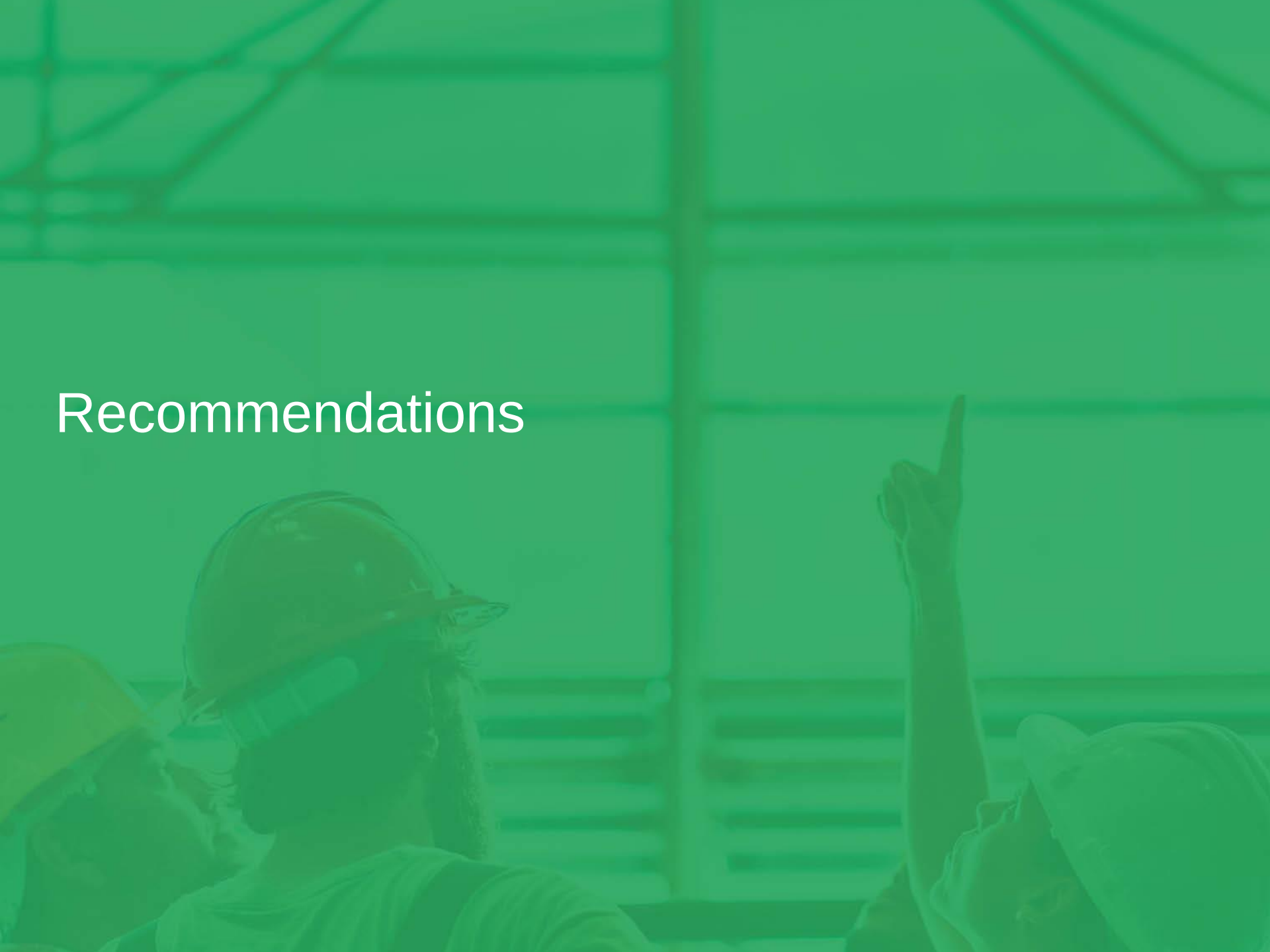
THE CONSTRUCTION ECOSYSTEM



BARRIERS



Recommendations





AMEND THE MODES OF TRAINING



Integrate low-carbon skills into the existing design and construction education



Make continuing education credentials mandatory for trades



Consider making more construction apprenticeships compulsory



Leveraging existing education infrastructure



Train multiple trades in cross-disciplinary, hands-on training



Support a diversity of media and formats



Train the trainer: create a peer-network for trainers, professors and coaches



Embrace digitalization and new technologies

ADDITIONAL RELEVANT RECOMMENDATIONS OF TRADING UP



IMPROVING GREEN LITERACY



Foster a broader ecological mindset and awareness throughout the construction industry.



Train other stakeholders in ecosystem, such as building officials and building managers



Train the trainer: create a peer-network for trainers, professors and coaches



ADAPT THE MARKET INFRASTRUCTURE



Work with an integrated design approach



Improve communication and collaboration on-site and during construction



Change bidding and hiring processes and contract agreements



IDENTIFY AND CREATE INCENTIVES



Leverage government funds to subsidize training and lower the cost barriers for trades to participate



Develop a certificate for low-carbon skills



Further research into training programs and opportunities



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