BUILDING PROSPERITY

INSIGHTS ON CANADA'S GREEN WORKFORCE

CAGBC

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ACKNOWLEDGMENTS

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About the Canada Green Building Council (CAGBC)

The Canada Green Building Council (CAGBC) provides products and services the building sector needs to construct and manage buildings that are easier on resources, healthier for people, resilient and cost-effective.

We work with the sector to influence standards, develop best practices, and educate the market on the benefits of green buildings.

For more information visit **cagbc.org**.

CAGBC Canada Green Building Council | Conseil du Bâtiment Durable du Canada

About the Consultants

Delphi produced the quantitative research and analysis at the core of this report. Delphi is a Canadian strategic consultancy providing innovation solutions in climate change and corporate sustainability since 1988. As a pioneer in sustainability and environmental risk management, Delphi has delivered over 2,500 projects with clients across all levels of government, Canadian and U.S. companies, the EU, and not-for-profit organizations.

For more information visit **delphi.ca**.

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EXECUTIVE SUMMARY

Introduction

Canada's green building sector is a powerful economic force and a critical pillar supporting the country's transition to a low-carbon, resilient economy. Over the past decade, the Canada Green Building Council (CAGBC) has tracked the sector's economic contribution in terms of gross domestic product (GDP) and employment. This report builds on previously published research from 2016 and 2020 on the economic impact of the green building workforce, as well as a report on the retrofit workforce in 2022.

Drawing on 2024 data, the most recent available at the time of analysis, *Building Prosperity* examines the market evolution and economic contribution of Canada's green building sector, its growth potential in the face of a rapidly changing economic and policy environment, and finally, addresses the workforce system changes needed to meet demand for green, low-carbon and resilient buildings.

Market Evolution and Green Building's Economic Contribution

Market Evolution

Our 2020 market assessment identified how strong investment in green building had the potential to create 1.5 million jobs by 2030, providing a "green recovery" after the COVID-19 pandemic. However, the anticipated green recovery did not materialize. Persistent inflation, elevated interest rates, labour shortages, permitting delays, and housing affordability pressures constrained growth. After CAGBC initiated this research in 2025, trade disruptions with the United States gave rise to a new economic agenda. Industry and policy focus shifted from economic recovery to risk mitigation. Expanding Canada's trade partnerships, investment in nation-building projects, and increasing housing supply became critical priorities.

Decarbonization in the buildings sector is not a cost burden – it is an engine of productivity, innovation, and economic growth.

Canada's real estate sector also refocused, as new climate risk disclosure rules and rising expectations for performance and transparency have made risk management a growing priority for investors and owners.

The drivers behind green building adoption have evolved, but the fundamental need remains unchanged. High-quality housing, workplaces, community facilities, and institutions are essential to thriving communities. Equally critical is the skilled workforce that enables transition planning and delivers deep retrofits – designing, constructing, and upgrading buildings to meet modern sustainability and performance standards.

Accordingly, this report offers an updated economic assessment, and a forward-looking view of how the green building sector can drive growth and resilience in a rapidly changing landscape.

Green building's economic contribution in Canada in 2024

In 2024, Canada's green building sector generated:

- **$81 billion in direct GDP**
- **501,716 direct jobs** across construction and trades, materials and manufacturing, professional services, utilities, waste and recycling, and policy and education

Since 2018:

- **Employment in green building has grown by 8%** despite macroeconomic pressures.
- **Sector GDP has increased by 40%**, significantly outpacing job growth.[1]
- **GDP per job has risen by 36%**, underscoring rising productivity and value creation.

Green building activity benefits every province and territory, with the largest impact in Ontario (43%), Quebec (20%), and British Columbia (16%), demonstrating that green building results in economic benefits that are national in scope.

Importantly, approximately **a quarter (25%) of sector GDP in 2024 – nearly $20 billion – is directly tied to decarbonization activity**, including:

- Heat pump and high-efficiency HVAC manufacturing and installation
- Electrification and fuel-switching infrastructure
- On-site renewable energy systems
- Building envelope upgrades and deep retrofits

Decarbonization in the buildings sector is not a cost burden – it is an engine of productivity, innovation, and economic growth.

Growth Potential

Buildings account for 13 percent of Canada's direct greenhouse gas emissions and 18 percent when electricity-related emissions are included – making their decarbonization essential to achieving the country's 2030 and 2050 climate targets.

However, progress has been modest: Canada is currently projected to reduce emissions by 28 percent below 2005 levels, falling short of its 40–45 percent target. While commercial buildings are broadly on track for long-term decarbonization under current policies, **residential buildings are not**. Achieving net zero by 2050 will require a dramatic acceleration of retrofit activity for approximately **11 million homes** and **hundreds of thousands of commercial and institutional buildings**.

Today, the pathways to decarbonization are well understood and technology is readily available and proven. The challenge is scale, coordination, and policy consistency. Encouragingly, our analysis demonstrates that accelerating green construction and retrofits strengthens economic growth while advancing climate objectives.

1 *The 2020 Canada's Green Engine* report is based on 2018 data – the most recent data available at that time. References to the 2018 results and growth statistics described in this year's report use those original estimates. Statistics Canada regularly revises economic data as more completed GDP figures become available. The 2018 results have not been recalculated to reflect any updates Statistics Canada may have done since the publication of the initial report in 2020.

For the report, we modelled three potential growth pathways for the sector through 2030:

1 Baseline Scenario (Current Path)	2 Moderate Decarbonization Scenario	3 High Decarbonization Scenario
Continuation of existing market trends and policies.	Expanded retrofit incentives and electrification investments.	Rapid scale-up of retrofits, net-zero new construction, national-equivalency green code adoption, and sustained policy and financing supports.
Results		
↗ **100,000 new jobs** ↗ **$17 billion in additional GDP by 2030**	↗ Meaningful **job and GDP growth**, but insufficient to align fully with net-zero goals	↗ **Sector GDP grows to $146 billion by 2030** ↗ **Employment doubles** with construction and trades gaining approximately 90,000 new jobs

The outcome of our modelling is clear: ambitious decarbonization delivers the strongest economic returns while aligning with Canada's climate commitments. Canada now faces a defining choice — embed sustainability and performance into every new home and building retrofit, or miss the opportunity to build a competitive, resilient, low-carbon economy.

Building the Workforce to Deliver at Scale

The pace of decarbonization is fundamentally linked to workforce capacity. Meeting Canada's housing and climate goals requires a larger, more skilled, and more inclusive labour force.

Key structural shortages include:

- HVAC-R technicians
- Electricians
- Building automation and controls specialists
- Envelope retrofit teams
- Commissioning professionals
- Building operators

Through industry engagement, the report identified a central constraint: workforce expansion depends on predictable project pipelines. Contractors – particularly small and medium-sized enterprises – cannot invest in training without stable, multi-year funding frameworks and policy consistency. Stop-start incentive programs undermine capacity building.

Inclusion is equally critical. Recruitment efforts among women, Indigenous peoples, racialized communities, newcomers, youth, and 2SLGBTQ+ workers are improving, but retention remains a significant challenge. Structured, paid mentorship and supervisor training consistently emerge as the most effective strategies to retain underrepresented workers and strengthen long-term workforce participation.

Canada has the tools, market drivers, and technical pathways required to advance green buildings.

To enable decarbonization at scale, government, industry, and other actors need to address multiple considerations, including:

- Stabilizing retrofit funding through predictable, multi-year commitments
- Embedding training within real retrofit and construction projects
- Ensuring training is aligned to current industry needs
- Supporting SME access to shared resources and training hubs
- Strengthening interdisciplinary mechanical-electrical-digital skills
- Aligning procurement, ESG requirements, and financing with workforce outcomes
- Harmonizing provincial and municipal green building standards
- Reforming apprenticeship and employment insurance structures to improve completion rates

CAGBC will advance market transformation through targeted, industry-aligned education and national leadership on regulations and standards. We will expand learning pathways to equip professionals with practical competencies in green building design, construction, and retrofits to ensure Canada's workforce is positioned to meet growing market demand.

Grounded in established frameworks – including LEED and the Zero Carbon Building Standard – CAGBC will collaborate with governments, industry, and institutional partners to drive adoption of green building standards.

We will also focus on driving greater harmonization by advocating for the alignment of municipal and provincial green building policies so that industry has a clear approach across jurisdictions.

A Pivotal Moment

Canada's green building sector already delivers substantial economic value and measurable emissions reductions. With coordinated policies, sustained investment, workforce expansion, and regulatory alignment, the sector could deliver nearly **$150 billion in GDP and more than one million green jobs by 2030**, while positioning Canada to achieve net-zero buildings by 2050.

The opportunities are significant – but so are the risks of fragmented action. Stabilized retrofit funding, harmonized performance standards, expanded training pathways, and embedded inclusion strategies are essential to unlock the sector's full potential.

Canada has the tools, market drivers, and technical pathways required to advance green buildings. With focus on scale, coordination, and commitment, the green building sector can simultaneously address housing needs, drive inclusive economic growth, and anchor Canada's transition to a resilient, net-zero future.

01 MARKET EVOLUTION

Introduction and Context

This report brings together two prior CAGBC publications and reframes them for today's context. It updates the 2020 market assessment with 2024 data and scenarios, advances the 2022 workforce analysis with system-level insights, and reflects the evolving policy landscape where provincial action, disclosure requirements, and sustainable finance increasingly drive outcomes.

Canada's green building sector is a proven and powerful economic force, and a critical component in the nation's transition toward a resilient and low carbon economy. As the sector's leading voice, CAGBC has regularly classified and quantified the economic contribution of green buildings, including job creation and national Gross Domestic Product (GDP) growth. Starting in 2016, CAGBC has regularly published updated assessments and modelled different growth scenarios to outline recommendations for strengthening the green building workforce.

The last comprehensive economic assessment was published in 2020, during the COVID-19 pandemic. *Canada's Green Building Engine* provided an update on the size of the green building sector and outlined different pathways for a 'green recovery.' In 2022, the *Green Retrofit Economy Report* was published, examining the job-creation potential and the skilled workforce needs of a coordinated, national, and industry-wide deep retrofit agenda.

Canada's green building sector is a proven and powerful economic force, and a critical component in the nation's transition toward a resilient and low carbon economy.

This report builds on these publications, offering an updated look at the sector's economic contribution and demonstrates that Canada's green building sector role as major contributor to Canada's low carbon and resilient future by:

- Highlighting key market trends and drivers that have accelerated the building sector's shift towards green buildings since 2020, and taking stock of the progress made.
- Examining the key challenges that have slowed growth and job creation relative to earlier forecasts, including the housing shortage, affordability pressures, slower-than-expected climate progress, and ongoing economic and geopolitical uncertainty.
- Showing how, despite the economic realities since COVID-19 and the current economic and geopolitical climate, strategic support for Canada's green building sector can unlock **$150B in GDP and create a million green jobs by 2030**, while contributing to Canada's broader net-zero goals.
- Highlighting the critical steps required for the building sector to advance decarbonization efforts and contribute to Canada's 2030 and 2035 targets, while staying on a path to net zero by 2050.
- Articulating the opportunity to build a skilled, inclusive workforce, ensuring workers can upskill and reskill for sustainable jobs.

What's at play: Context setting and market evolution

Despite a robust green building sector, the 'green recovery' advocated for in the 2020 assessment never materialized. Persistent high inflation through the COVID-19 recovery slowed the pace of growth across the building sector. A growing housing and affordability crisis further slowed residential sector growth – macro-economic forces that also influenced green buildings more broadly. Within this context, the green building sector stands at a pivotal moment. Influenced by today's macroeconomic and geopolitical realities, the sector also faces a convergence of forces influencing the need and demand for green buildings: rising market expectations for green buildings, accelerating climate risks, and growing economic opportunity.

Changing regulations and market expectations are increasing the demand for more efficient green buildings, such as zero-carbon buildings (particularly in commercial and institutional sectors) – a demand that is often outpacing current and projected supply.[2] This creates a new "transition risk" for the building owners who fail to prepare their buildings and portfolios for this shift toward energy efficiency and decarbonization. At the same time, as evidenced by record-high insurance payouts,[3] climate risks from weather-related damage are increasing. Investors and regulators are responding to both risks by closely examining climate exposure in portfolios and directing capital toward resilient, low-carbon assets.

These shifts signal a clear direction: Canada's buildings sector is moving toward higher performance, lower emissions, and greater resilience. This transition presents significant opportunities for Canada to turn today's momentum into sustained progress through coordinated action across governments, industry, labour, and financial institutions to scale high-performance green buildings, foster innovation, and build a workforce ready to lead the transition.

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2 Torres, Paulina, "*The green tipping point*," JLL (4 March 2024), https://www.jll.com/en-us/insights/the-green-tipping-point.

3 Insurance Bureau of Canada, "*2024 shatters record for costliest year for severe weather-related losses in Canadian history at $8.5 billion*," IBC.ca (13 January 2025), https://www.ibc.ca/news-insights/news/2024-shatters-record-for-costliest-year-for-severe-weather-related-losses-in-canadian-history-at-8-5-billion.

Defining green buildings and jobs[4]

What is a green building?

In this report, a green building is defined as any new or existing building that is designed, constructed and/or renovated and operated to achieve clearly defined environmental and other sustainable objectives that are measurably above code, often adhering to industry standards (such as Leadership in Energy and Environmental Design® (LEED®) or CAGBC's Zero Carbon Building Standards™ (ZCB Standards)), stepped or tiered codes, green building policies, or high-performance building characteristics. Further, a new or existing green building typically has one or more of the following attributes:

- Reduced greenhouse gas (GHG) emissions from building construction and operation.
- Deep reductions in GHG emissions, including zero carbon buildings and net zero/ net zero ready buildings.
- Efficient use of energy, water and other resources.
- Use of renewable energy, such as solar energy.
- Pollution and waste reduction measures, and the enabling of re-use and recycling.
- Excellent indoor air quality and reduced volatile organic compounds (VOCs).
- Use of non-toxic, ethical, and sustainable materials.
- Consideration of occupant quality of life in design, construction, and operation.
- Adaptable to a changing environment, including climate resilient building practices.
- Consideration for additional environmental outcomes.

Any new or existing building can be a green building, whether it is a home, office, school, hospital, community center, or any other type of structure, provided it embraces these attributes. However, not all green buildings are – nor need be – alike. Geographical regions vary in climatic conditions, their building types and ages, and environmental, economic, and social priorities. All these considerations inform a given jurisdiction's approach to green building.

With greater focus on reducing emissions and protection from extreme weather in the built environment, other terms related to specific aspects of green building have become common in the market. These are included below and in the glossary:

- **Energy efficiency** refers to reducing energy consumption, achieved by addressing the envelope, high efficiency HVAC systems, efficient lighting and smart controls.
- **Net-Zero Energy-Ready (NZER)** Refers to buildings designed and constructed to achieve net-zero energy performance. They rely on a strong envelope – tight air sealing, better insulation, and efficient windows and doors – to cut heat loss and make it possible to use smaller, more efficient heating and hot water equipment, and typically have infrastructure ready for on-site renewable energy integration like solar panels.
- **High performance** focuses on buildings or practices that go beyond code requirements to achieve exceptional energy efficiency and thermal performance, and typically follow advanced standards like LEED, ZCB Standards, among others.
- **Resilient buildings** provide protection from the effects of climate change, especially extreme weather. Designed to withstand and recover quickly from climate related disruptions such as heatwaves, extreme cold, flooding, wildfires, and power outages, they prioritize survivability and critical systems redundancy.
- **Zero-carbon buildings** are highly energy efficient and minimize carbon emissions from operations, and even embodied carbon.

We apply these terms in the report when referencing a policy or industry practice that also uses these terms to focus on a specific concept related to green building. In all other cases, we refer generally to green building.

4 CAGBC's definitions for green buildings and green jobs are largely consistent with those used in our 2020 report – *Canada's Green Building Engine* with a minor update to specifically include zero carbon, net zero / net zero ready buildings, and climate resilient building practices.

What is a green building job?

A **green building job** is a job that focuses on the design, construction, renovation, operation, or evaluation of green buildings as well as jobs in related industries that support green buildings, such as green building materials and products, renewable energy services, recycling services, policy and advocacy, education and marketing.

Our definition includes jobs across six categories:

- Construction and trades
- Materials and manufacturing
- Professional services
- Utilities
- Waste and recycling
- Policy and education.[5]

5 The six job categories are comprised of NAICS Industries. Approximately 50 different NAICS industries are grouped into the above six categories. See Appendix 3 for more details.

Figure 1: Green buildings jobs

Examples of green building industry jobs

Construction & Trades	Contractors	Architects
↗ Construction and trades workers working on green building projects	↗ Contractors working on installing heat-pumps, efficient HVAC systems and solar panels	↗ Green building architects and engineers ↗ LEED consultants
Electricians	**Waste Contractors**	**Policy & Education**
↗ Electricians working on building integrated renewable energy	↗ Waste / recycling contractors for green building	↗ Universities ↗ Public administration ↗ Advocacy related to green buildings

The green building choice we face

There is strong growth potential in the green building sector, driven by increasing demand for sustainable practices, government policies aimed at reducing carbon emissions, and broader investment and policy trends.[6]

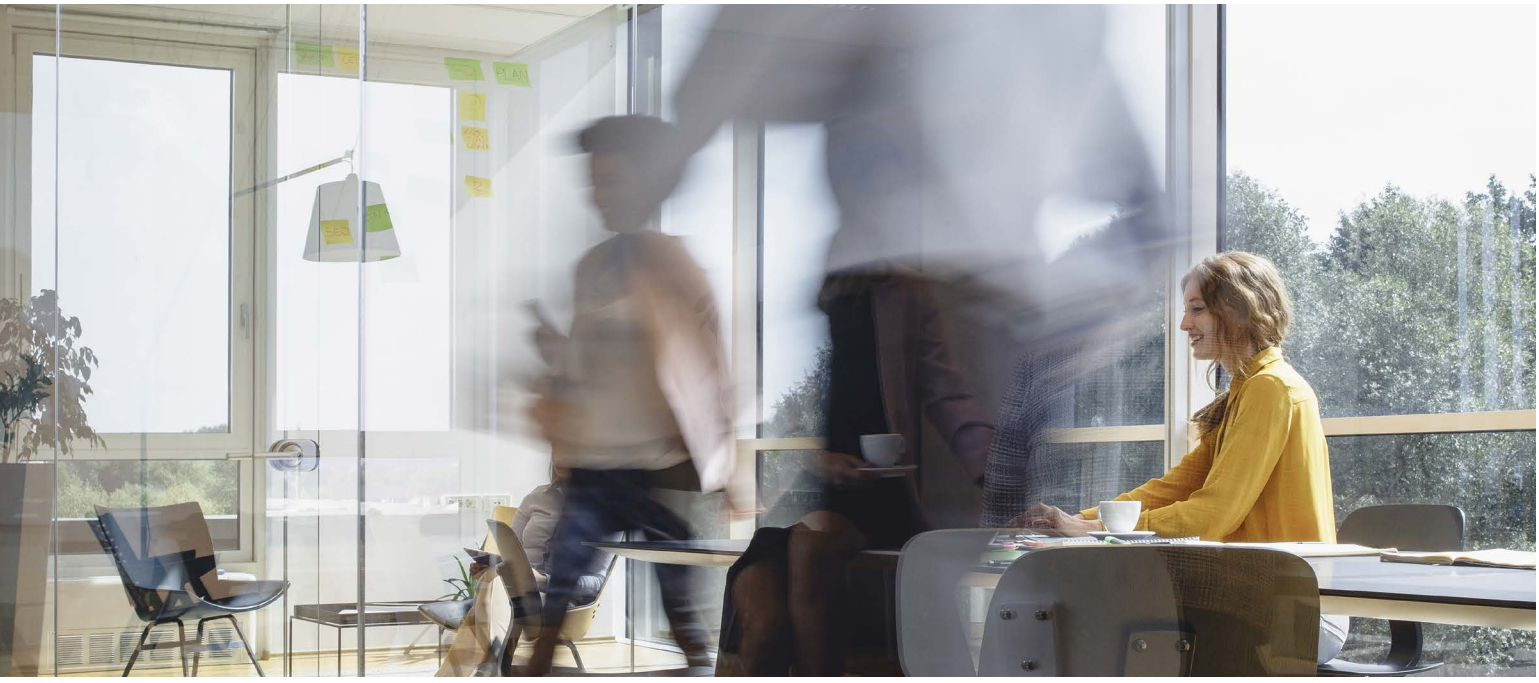
Multiple factors, including construction costs, inflation, tariffs, and labour conditions, directly influence the pace of growth in green buildings and green jobs. Yet progress has been made. First, the Canadian green building sector has grown, a testament to its strength, resilience, and established role in the Canadian economy. Second, there has been modest progress on the building sector's contribution to reducing GHGs.

Buildings account for 13 percent of Canada's direct emissions and 18 percent when electricity-related emissions used by buildings are included. This makes buildings the third largest emitting sector after oil and gas and transportation.[7]

As such, building decarbonization will be a significant contributor to Canada's 2030 GHG emissions reduction target and 2050 net zero goals.[8]

In its recently released *2025 Progress Report on the 2030 Emissions Reduction Plan*, the federal government reconfirmed its commitment to its net zero by 2050 goal and its currently stated emissions target of 40 to 45 percent below 2005 by 2030. The update shows that Canada is now projected to only reduce emissions by 28 percent below 2005 levels.[9] Specific to buildings, emissions have dropped 2.3 percent since 2005, although there has been greater decline in recent years.[10]

A bright spot: previous analysis conducted by the Canadian Climate Institute (CCI) shows that Canada's commercial buildings are on track to decarbonize sufficiently to achieve Canada's net zero goals, based on existing progress and policies announced or in development (shown in Figure 2).[11]



6 The Real Property Association of Canada & Canada Green Building Council, "*Decarbonizing Canada's Commercial Buildings: The Owner & Investor Perspective*," REALPAC.ca (4 December 2024). https://realpac.ca/product/decarbonizationreport/.

7 Natural Resources Canada. "*The Canada Green Buildings Strategy: Transforming Canada's buildings sector for a net-zero and resilient future*," Government of Canada Publications – Canada.ca (2024), https://natural-resources.canada.ca/energy-efficiency/building-energy-efficiency/canada-green-buildings-strategy-transforming-canada-s-buildings-sector-net-zero-resilient-future.

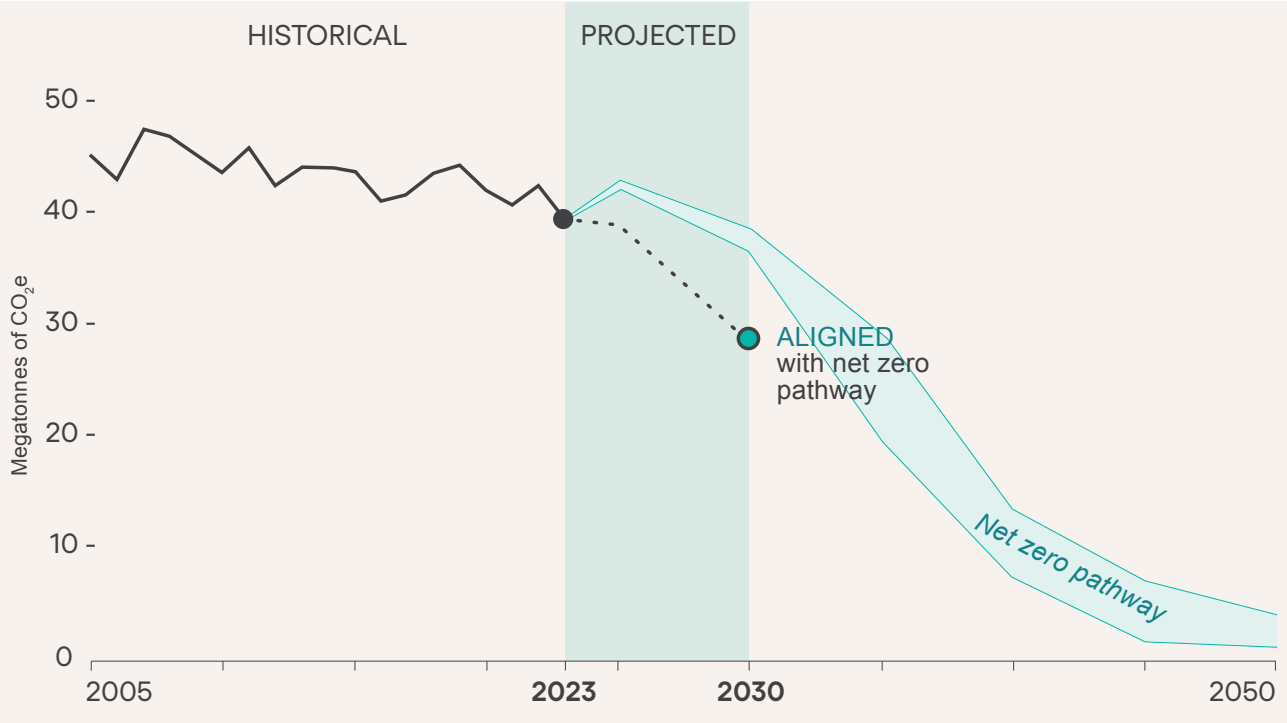
8 Government of Canada's commitment to reduce GHG emissions by 40-45% below 2005 levels by 2030 and to achieve net-zero emissions by 2050, as enshrined in the Canadian Net-Zero Emissions Accountability Act legislation.

9 Environment and Climate Change Canada. "*2025 Progress Report on the 2030 Emissions Reduction Plan*," Government of Canada Publications - Canada.ca (2026), https://publications.gc.ca/site/eng/9.954865/publication.html.

10 Ibid.

11 Canadian Climate Institute. "*440 Megatonnes: Tracking Canada's path to net zero*," 440megatonnes.ca (4 October 2024), https://440megatonnes.ca/.

Figure 2: Total greenhouse gas emissions for commercial buildings



Sources: Statistics Canada, Navius Research, Canadian Climate Institute.

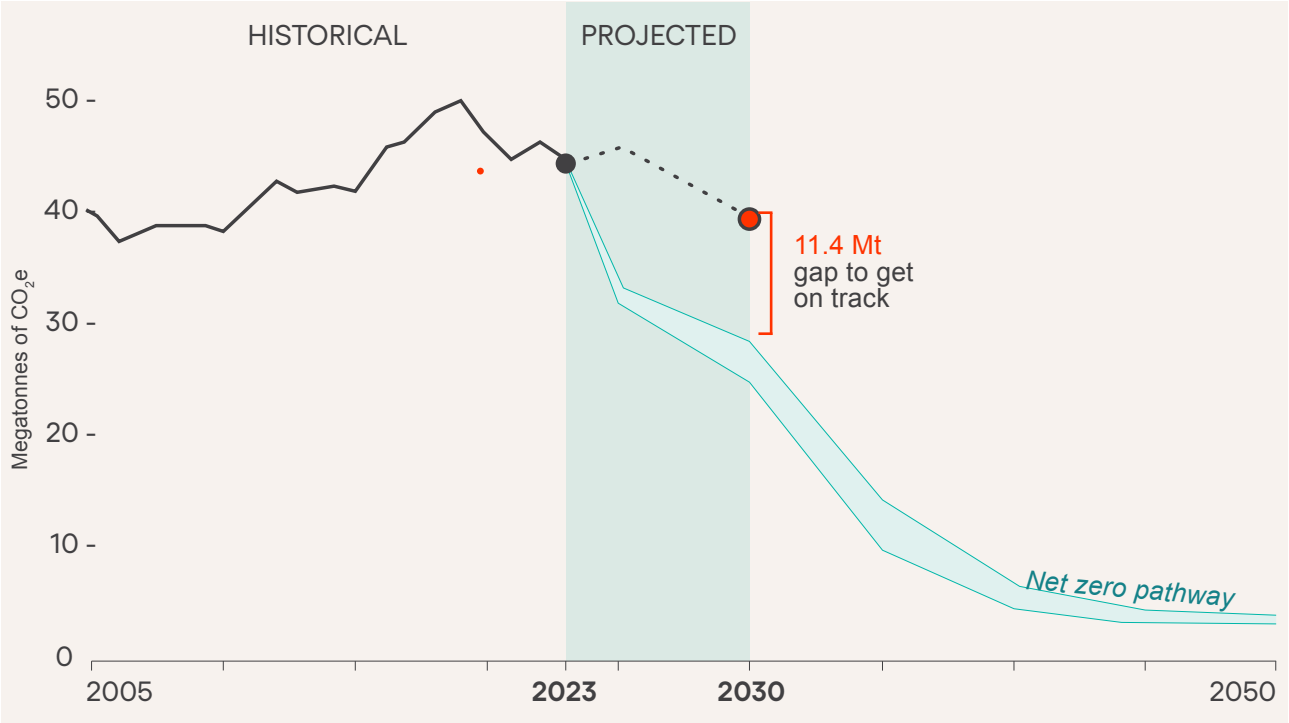
The pace of retrofits and sustainable construction for residential buildings will need to significantly ramp up to achieve net zero by 2050.

Residential buildings, however, are not on track to meet either 2030 targets or net zero by 2050. Retrofits completed from 2020 through to the end of 2024 achieved roughly half the average savings per retrofit needed to support Canada's net-zero targets.

In addition, swings in policy support have hindered uptake, and many households continue to face barriers such as upfront costs and limited contractor availability.[12] The pace of retrofits and sustainable construction for residential buildings will need to significantly ramp up to achieve net zero by 2050.

12 Einarson, L. "*2025 National Progress Report on Retrofitting Canada's Homes*," Green Communities Canada (April 2025), https://greencommunitiescanada.org/2025-national-progress-report-on-retrofitting-canadas-homes/.

Figure 3: Total greenhouse gas emissions for residential buildings



Sources: Statistics Canada, Navius Research, Canadian Climate Institute.

While more progress is needed to accelerate residential decarbonization, meaningful steps have already been taken, including increased utility incentives that promote energy efficiency as a cost-effective way to reduce peak demand and avoid major grid infrastructure upgrades.

As a result, there has been significant adoption of heat pumps, one of the biggest successes in the residential sector in recent years. By 2023, approximately nine percent of Canadian households used a heat pump as their primary heating system, an increase of three percentage points since 2021, with particularly strong adoption in Atlantic Canada.[13]

Other important developments include the tightening of efficiency standards, evident in the *National Energy Code for Buildings* and provincial codes. While the adoption of national model codes across provinces remains uneven, their development is an encouraging step forward.

Municipalities such as Vancouver and Montréal have led the way with ambitious policies, including Montréal's new roadmap to achieve zero-emission buildings by 2040, which requires new developments to meet increasingly stringent performance standards.

Nationally, the 2024 release of the *Canada Green Buildings Strategy* (CGBS)[14] as part of Canada's *2030 Emissions Reduction Plan* outlined a broad vision for accelerating the shift to greener, more energy-efficient, and more affordable homes and buildings. While the strategy falls short of a comprehensive, forward-looking roadmap to decarbonize Canada's buildings by 2050, it does provide a starting framework and leaves the door open for industry, provinces, municipalities, and the new federal government to help plot the course toward a fully decarbonized built environment.

13 Canadian Climate Institute. "*440 Megatonnes…*" https://440megatonnes.ca/.
14 Natural Resources Canada. "*The Canada Green Buildings Strategy…*".

The path forward

Green buildings represent a rare and powerful opportunity for Canada: the chance to meet urgent housing needs, create inclusive and future ready jobs, and accelerate climate action.

The scale of the challenge

16 million homes + 500,000 buildings

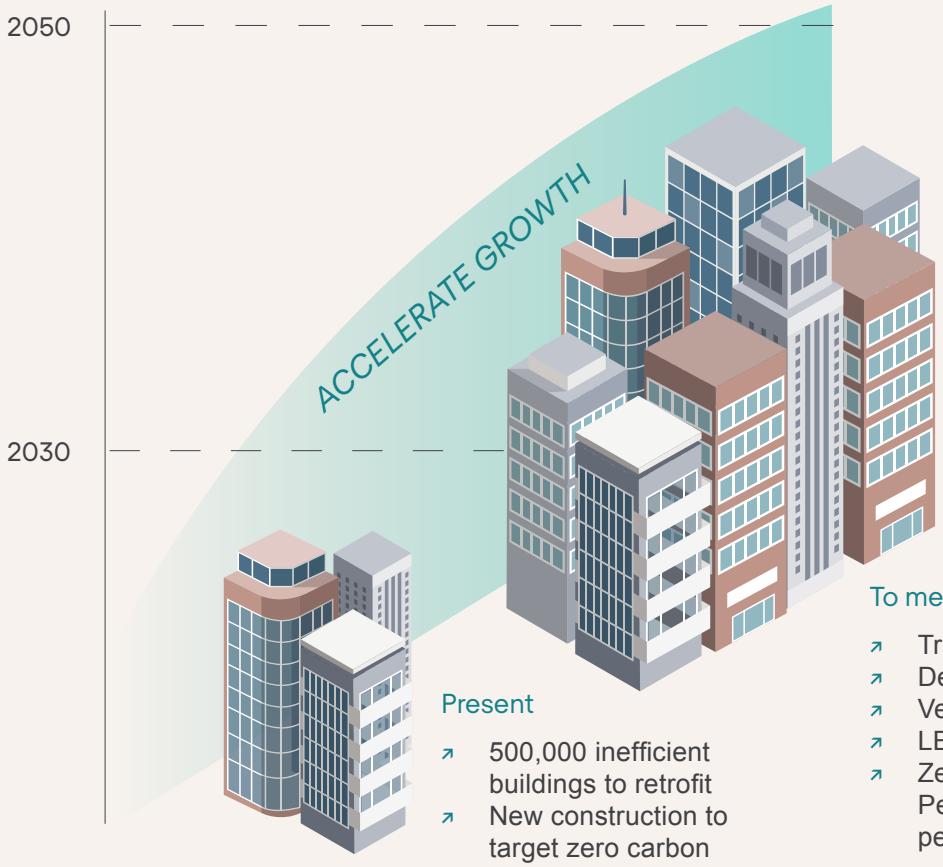
At least 16 million homes and 500,000 large buildings in Canada exist today and will still be standing in 2050 (16 million residential homes, 564,000 commercial and institutional buildings, and 34,000 government buildings).[15] [16]

2050: 25 percent potential household increase

By 2050, the number of households in Canada may increase by up to 25% from 2023.[17]

Low-carbon buildings are a priority

To reach our climate goals, Canada needs to accelerate the retrofit of approximately 11 million buildings and construct millions of new, low-carbon buildings in the coming decades.[18]



Present

- 500,000 inefficient buildings to retrofit
- New construction to target zero carbon

Verification through certification

- LEED®
- Zero Carbon Building Standards™
- Investor Ready Energy Efficiency™

To meet emissions goals

- Transition planning
- Deep retrofits
- Verify Performance
- LEED O+M
- Zero Carbon Building - Performance and other performance standards

15 Natural Resources Canada. "*The Canada Green Buildings Strategy*," Government of Canada (2024), https://publications.gc.ca/collections/collection_2025/rncan-nrcan/M144-331-2024-eng.pdf.

16 Canada Mortgage and Housing Corporation. "*CMHC releases latest housing supply gaps report*," cmhc-schl.gc.ca (19 June 2025b), https://www.cmhc-schl.gc.ca/media-newsroom/news-releases/2025/cmhc-releases-latest-housing-supply-gaps-report.

17 Canadian Mortgage and Housing Corporation. "*Estimating how much housing we'll need by 2030*," cmhc-schl.gc.ca (19 June 2025b), https://www.cmhc-schl.gc.ca/observer/2023/estimating-how-much-housing-we-need-by-2030.

18 Natural Resources Canada. "*The Canada Green Buildings Strategy: Transforming Canada's buildings sector for a net-zero and resilient future*," Government of Canada Publications – Canada.ca (2024), https://natural-resources.canada.ca/energy-efficiency/building-energy-efficiency/canada-green-buildings-strategy-transforming-canada-s-buildings-sector-net-zero-resilient-future.

Canada faces a defining choice: embed sustainability into every new home and building retrofit, or risk falling behind the global shift toward resilient, low-carbon economies.

Energy-efficient, green buildings are essential to ensure low energy bills and operating costs while future-proofing our communities. They also present an enormous economic opportunity, drawing on skilled trades and low-carbon construction materials, clean technologies and innovative building design. Every region of Canada has the potential to benefit from the transition to green buildings, considering their unique circumstances based on geography, natural resources, and local markets and expertise.

Canada faces a defining choice: embed sustainability into every new home and building retrofit, or risk falling behind the global shift toward resilient, low-carbon economies. This moment offers an opportunity to reset and renew our ambition for green building in Canada. As Canada moves toward its 2050 net zero target, our actions in the coming years will determine if the sector fully delivers on its potential for environmental leadership, economic growth, and social equity.

Policy signals and implications for Canada's green building sector

Recent federal policy announcements highlight continued attention on housing supply, infrastructure needs, and the clean economy – factors that shape the environment in which Canada's green building sector will operate. Investments related to community infrastructure, the development of Canadian sustainable investment guidelines, and updates to federal financing tools such as the Canada Infrastructure Bank indicate a policy landscape that is evolving to support high-performance buildings and energy-efficient retrofits.

At the same time, shifting timelines and inconsistent funding approaches for national energy-efficiency programs mean sector participants experience variations in how support is delivered. This underscores the importance of sustained long-term planning, skilled workforce growth, and scalable retrofit solutions as Canada moves toward a low-carbon built environment.[19]

19 Efficiency Canada. "*What Budget 2025 means for energy efficiency*," Efficiency Canada (5 November 2025), https://www.efficiencycanada.org/budget-2025-energy-efficiency/.

02 THE ECONOMIC IMPACT OF CANADA'S GREEN BUILDING SECTOR

During the study period, the green building sector added approximately 40,000 new direct jobs across all sub-industries.

This section outlines how Canada's green building sector has grown since CAGBC's 2020 market assessment. It details the sector's growth and how current contributions to jobs and gross domestic product (GDP) are estimated and broken down by sector and industry.

National 2024 results: Employment and GDP

Our 2024 analysis estimates that **Canada's green building sector generated $81 billion in GDP and employed 501,716 full-time workers.** This includes all direct green building jobs in construction and trades, as well as related industries: materials and manufacturing, professional services, utilities, waste and recycling, policy and education. Just over one third (36%) are construction and trades jobs. When considering the full value chain, including direct, indirect and induced jobs, the green building sector generates over a million jobs and over $150 billion in GDP. During the study period, the green building sector added approximately 40,000 new direct jobs across all sub-industries.

Figure 4: Canada's value chain green building jobs & GDP

Total Value Chain	Jobs	GDP
Direct	**501,716**	**47,922**
Indirect	**383,116**	**64,297**
Induced	**227,964**	**39,723**

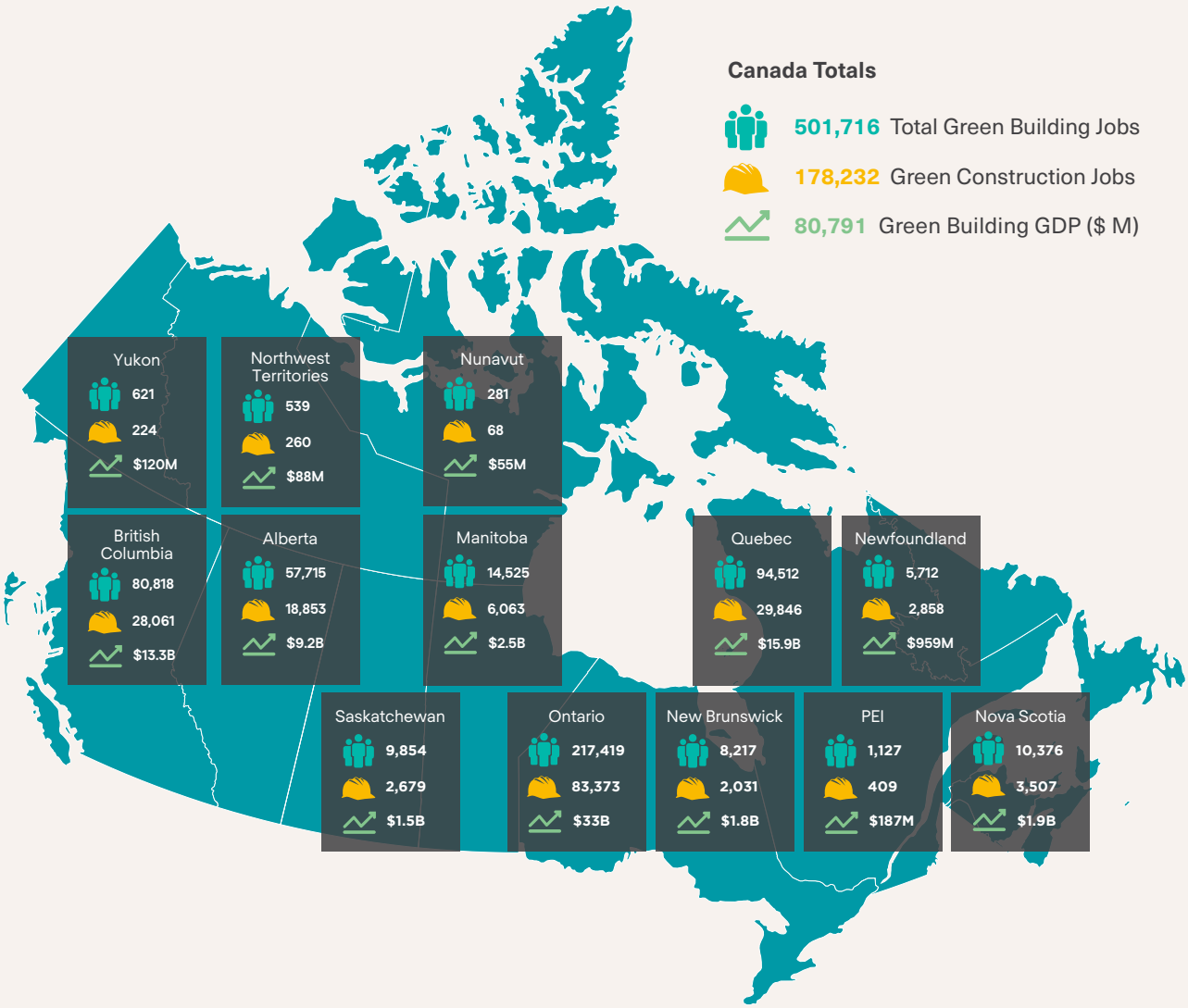
Figure 5: Green building growth compared to other sectors

Industry	2018	2024
Forestry & Logging	**33,395**	**24,192**
Oil & Gas Extraction	**70,730**	**54,334**
Mining & Quarrying	**71,825**	**83,701**
Support Activities for Oil & Gas Extraction	**86,920**	**75,367**
Green Building Jobs	**462,150**	**501,716**

Green buildings across Canada

Green buildings contribute to Canada's economic growth and green jobs in every region. As shown in the figure below, Ontario has the largest portion of green building jobs and GDP contribution (43%) followed by Quebec (20%) and British Columbia (16%).[20]

Figure 6: 2024 Green building sector economic impact



These results show that the green building industry continues to deliver strong economic contributions for Canada. Green building jobs have grown (+8%), while GDP increased by 40 percent since our previous economic update.[21] This equates to a 36 percent increase in GDP per job overall, and a 33 percent increase in GDP per job from green building construction.

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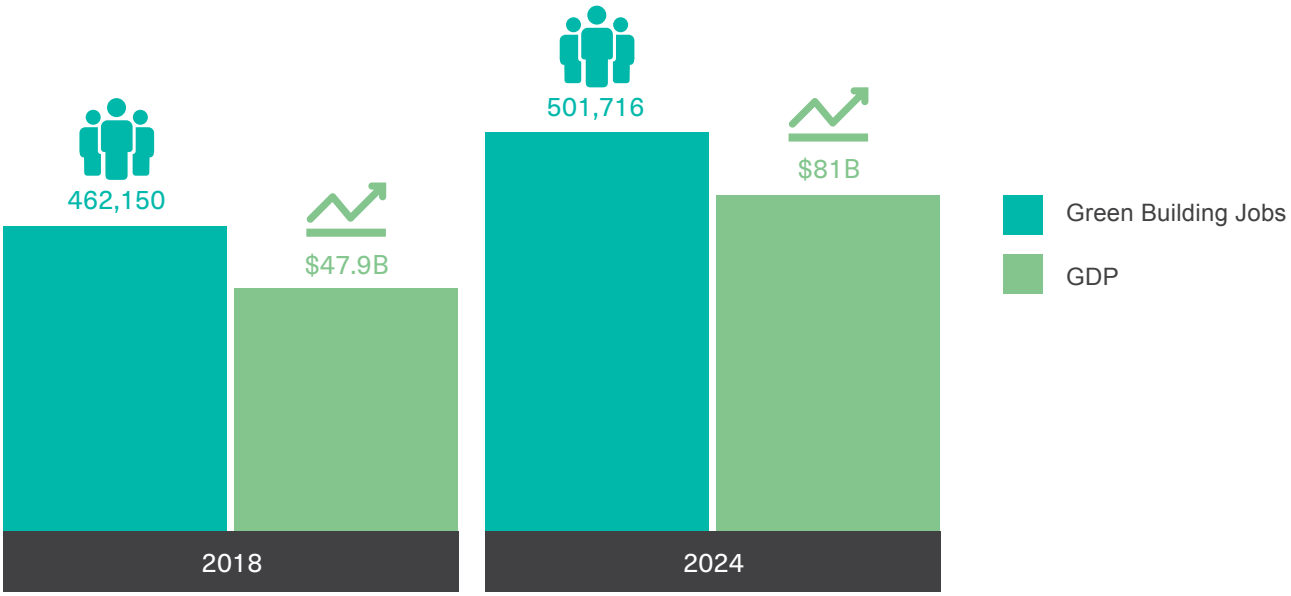
20 Percentages refer to jobs. GDP percentages are the following: Ontario (41%), Quebec (20%), BC (16%).

21 The *2020 Canada's Green Engine* report is based on 2018 data – the most recent data available at that time. References to the 2018 results and growth statistics described in this year's report use those original estimates. Statistics Canada regularly revises economic data as more completed GDP figures become available. The 2018 results have not been recalculated to reflect any updates Statistics Canada may have done since the publication of the initial report in 2020.

Figure 7: Growth of green building jobs & GDP



From 2018 to 2024, the green building sector saw strong results despite a tumultuous economy, which saw a sharp decline in 2020 due to the pandemic, a rebound in 2021, and moderate growth and fluctuation through 2023 and 2024.

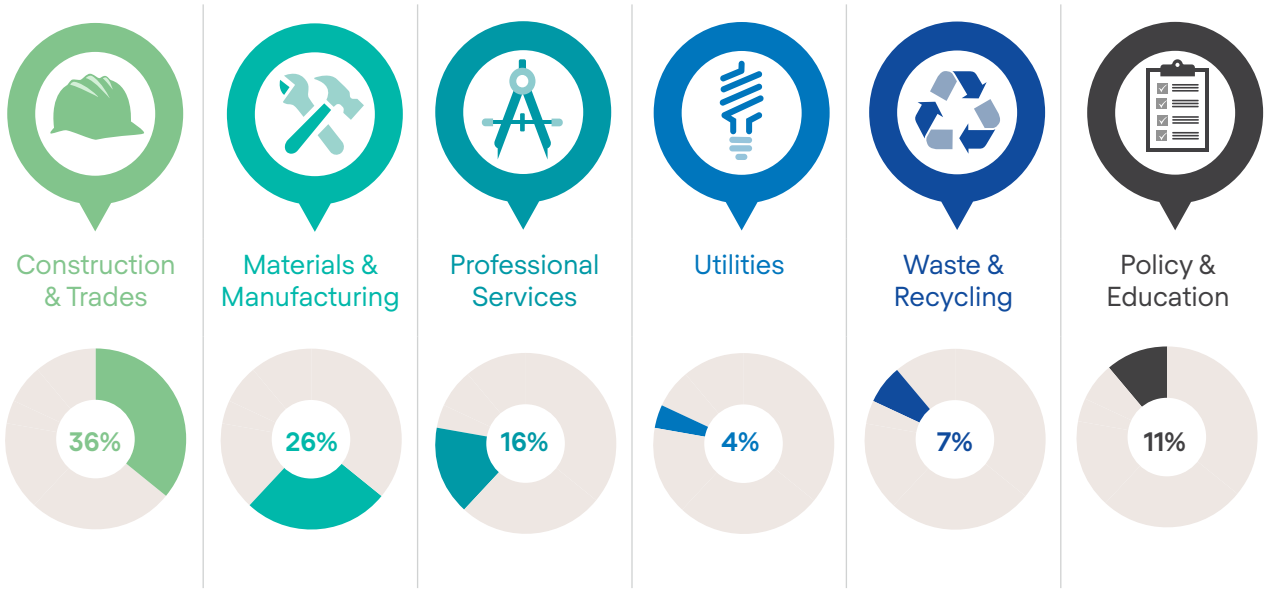
Green building jobs: Growing but slowly

Our analysis shows that the green building sector added approximately 40,000 jobs since 2018. This growth is attributed to the expanded use of more efficient building-specific energy systems, including renewable energy installations and building automation systems. The growth includes green construction jobs in renewable energy and utilities; building contractors supporting the installation of efficient HVAC equipment, solar panels, and heat pumps; building computer and energy management systems; and professional services related to green building design and construction (including building architects and engineers).

Green jobs were also added in universities, trade schools, colleges and the public sector, as well as in waste and recycling services. Growth areas included new positions focused on building decarbonization, such as HVAC-R technicians, building automation and controls specialists, commissioning and re-commissioning professionals, building envelope retrofit specialists, electricians, and low-carbon building operators.

While continued growth in green jobs is a positive, the overall rate of growth has slowed. We attribute this to the economic fluctuations experienced between 2020 – 2022, but also to the moderating impact of residential and non-residential building construction activity during this period.

Figure 8: Green building jobs by subsector



Green growth: Decarbonizing buildings generates economic growth

While green jobs growth is moderate, our analysis shows strong GDP growth across all categories of the green building sector. In fact, GDP growth significantly outpaces job growth, suggesting that green building jobs are highly productive – delivering significant economic value relative to labour inputs.

The expanded use of renewable energy and renewable energy systems in buildings (i.e., onsite renewable energy, solar panels, and a greater proportion of renewable electricity provided by utilities) were a primary driver of the 2024 increase, demonstrating how decarbonization is driving GDP gains.

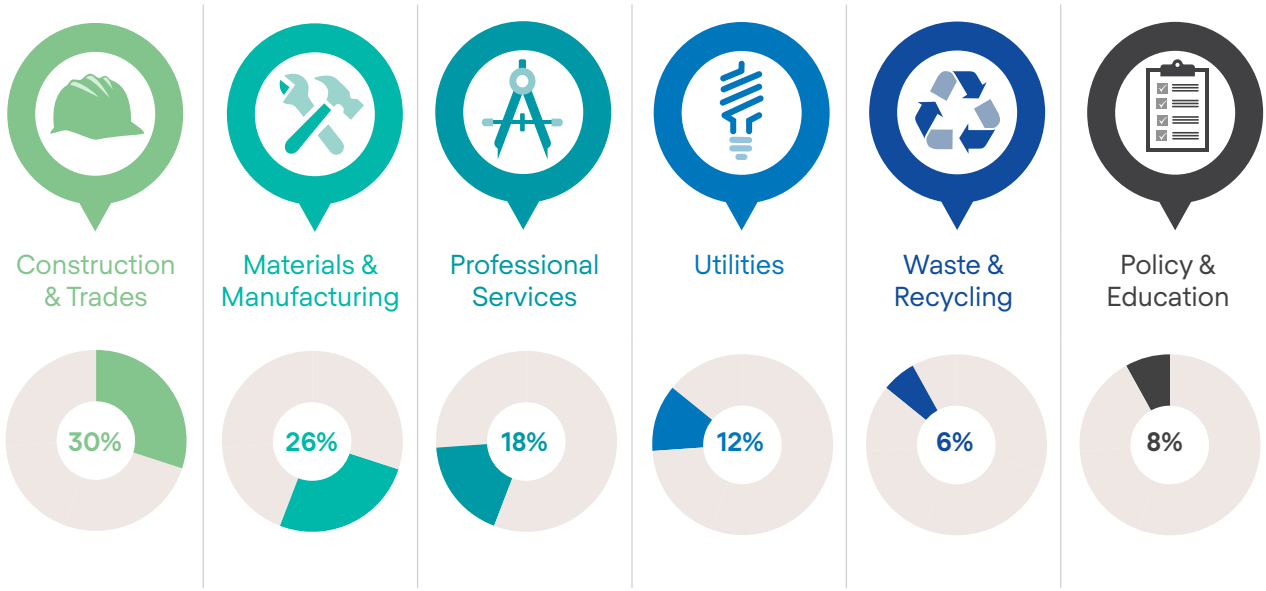
Efforts to decarbonize buildings created significant GDP growth with renewable energy and high-efficiency systems contributing 25% of GDP in 2024.

Our analysis confirms that a quarter (25% or ~$20B) of the total green building GDP in 2024 can be attributed to renewable energy (wind and solar) or to the manufacture and installation of high-efficiency HVAC systems and building equipment, including the expanded use of heat pumps for low-carbon heating and high-efficiency boilers in commercial buildings.

This contribution comes from four sub-industries:

1. Electric power generation, transmission & distribution (Utilities)
2. Building equipment contactors (Construction & Trades)
3. Utility system construction (Construction & Trades)
4. HVAC manufactures (Materials & Manufacturing)

Figure 9: Green building GDP by subsector



These findings are supported by national data trends signaling building decarbonization over the past five years:

- Total onsite GHG emissions from buildings in Canada have decreased by over 10% since 2018,[22] reflecting industry-wide efforts to improve energy efficiency, reduce fossil fuel-based energy use for heating, and the increased use of heat pumps.
- Canada's renewable energy sector saw significant growth. 70% of newly installed electricity capacity came from wind and solar, while overall wind and solar installed capacity grew 46%.[23] Renewables growth contributed to a 29% decrease in Canada's total GHG emissions from electricity.[24]

Decarbonizing Canada's buildings is a high-impact economic strategy, reducing emissions while driving strong GDP growth, with the potential to deliver $150 billion in GDP and over a million green jobs by 2030.

Taken together, efforts to decarbonize onsite building emissions (i.e., heating) combined with expanded renewable energy and grid decarbonization have resulted in measurable reductions of building emissions nationally. Our analysis shows these activities have resulted in strong GDP growth.

Decarbonizing Canada's buildings is a high-impact economic strategy, reducing emissions while driving strong GDP growth, with the potential to deliver $150 billion in GDP and over a million green jobs by 2030.

22 This reflects onsite building emissions (primarily from heating) and is based on data from StatsCan. "*National Inventory Report 1990 –2023: Greenhouse Gas Sources and Sinks in Canada*," StatsCan (2025), https://publications.gc.ca/collections/collection_2025/eccc/En81-4-2023-1-eng.pdf.

23 Canadian Renewable Energy Association. "*By the Numbers*," renewablesassociation.ca (2021), https://renewablesassociation.ca/by-the-numbers/.

24 Public Services and Procurement Canada. "*National Inventory Report: Greenhouse Gas Sources and Sinks In Canada*," Government of Canada Publications (1 July 2002), https://publications.gc.ca/site/eng/9.506002/publication.html.

Growth potential for the green building sector

Here we outline the future role of green building sector in contributing to Canadian GDP and employment while accelerating the pace of building decarbonization.

In our 2020 report, we modelled scenarios that paired Canada's COVID-19 pandemic recovery with targeted actions to accelerate green buildings and decarbonization efforts. The analysis showed that a green recovery could deliver substantial jobs and GDP growth. However, despite meaningful steps taken by government and industry, a green recovery for did not materialize (See Context Setting).

Consequently, Canada has not realized the full economic benefits the green building sector could potentially deliver. With the 2024 results, we demonstrate sustained progress, but current jobs and economic growth remain below what we previously estimated to be possible – and what we believe is still achievable with a more coordinated approach to sector decarbonization.

Simply put, there is substantially more to do. To understand the path ahead, we modelled three different growth scenarios out to 2030. Each scenario highlights a different level of economic growth and job gains achievable through targeted decarbonization efforts, alongside macro-economic gains.

Scenario model overview

The 2030 scenarios are: **Baseline** (Current Path), **Moderate Decarbonization**, and **High Decarbonization**.

Each scenario is modelled on the 2024 results and five primary growth factors:

1. Annual Green Intensity Ratio Adjustment
2. Annual Investment Growth
3. Annual Productivity Gains
4. Annual GDP Adjustment Factor
5. Annual Labour Adjustment Factor

For each scenario, our model adjusts the five factors considering current decarbonization policies and initiatives, macro-level sector economic forecasts (including population growth), and different levels of decarbonization interventions. Key decarbonization scenario assumptions are shown below. Appendix 2 provides further detail on technical methods and assumptions, data sources, and scaling factors.

Scenario decarbonization intervention assumptions

↗ 2030 Baseline Scenario

The **Baseline Scenario** reflects a continuation of current policies and practices without significant new interventions. We assume energy efficiency and emissions reductions continue at near current rates, driven by existing national and provincial regulations, building codes, and current market momentum. This includes incremental advancements as outlined in *Canada's Green Building Strategy*, and the continuation of the legislated policy measures included in *Canada's Emissions Reduction Plan* (ERP).

↗ 2030 Medium Decarbonization Scenario

The **Medium Decarbonization Scenario** assumes moderate policy and investment enhancements from current levels, specifically related to increased investment in building retrofits and electrification, and dedicated residential retrofit investments. This scenario broadly aligns with the legislated, developing, and announced policy pathways used by Canada Climate Institute's *440 Megatonne* project[25] for commercial and residential buildings, with the addition of greater policy support and investment to spur residential building retrofits.

↗ 2030 High Decarbonization Scenario

The High Decarbonization Scenario envisions an ambitious shift toward deep decarbonization. It includes the rapid scale-up of retrofit activity in both residential and commercial buildings, a dedicated strategy for green and net-zero construction in new residential buildings through Build Canada Homes, increased adoption of net-zero building certification standards in commercial buildings, and a national-equivalency green building code/standard.

This scenario assumes strong policy leadership, like that seen in Quebec's building performance regulations and utility-backed decarbonization efforts, creating an investment environment that enables market transformation to meet or exceed net zero by 2050.

25 Canadian Climate Institute. "*440 Megatonnes Dashboard*," 440megatonnes.ca (n.d.), https://dashboard.440megatonnes.ca/.

Canada's building decarbonization pathways: A summary

Before exploring the results of each scenario, it is important to review the key pathways necessary to decarbonize the building sector. These pathways are well documented and largely agreed upon by industry participants. Elements of these pathways are built into each scenario, as the question for decarbonization is less about *what* to do, and more about how to accelerate the necessary actions.

a. Electrification of heating

Space and water heating dominate building GHG emissions, accounting for over 96 percent of direct operational emissions from buildings.[26] Most comes from fossil fuel–based equipment such as natural gas furnaces, boilers, and oil-fired systems.[27]

Electrification of heating, primarily through heat-pumps, is therefore the most critical and cost-effective pathway to decarbonize buildings, particularly as many provinces already operate low-carbon or near-zero-carbon electricity grids.[28]

In regions where electrification faces significant constraints (such as limited clean electricity supply or grid capacity), other low-carbon heat sources (including district energy, renewable gases, or bioenergy) may play targeted roles.[29]

Net-zero scenarios require that most space and water heating be electric by 2050, supplemented by district energy and limited use of renewable or low-carbon gases in specialized applications.

To achieve building electrification at scale, the Canadian Climate Institute highlights the need for a managed, strategic decline of natural gas use in buildings to avoid stranded assets and misaligned investments.[30]

b. Deep energy retrofits

Most of the buildings that will exist in 2050 are already standing today. Analyses by Efficiency Canada emphasize that virtually all existing buildings will require energy and carbon retrofits by mid-century.

Key retrofit elements include:[31]

- Envelope upgrades (insulation, air sealing, high-performance windows).
- Mechanical upgrades (heat pumps, efficient ventilation, building controls).
- Advanced automation to optimize performance and reduce peak demand.
- Fuel switching from gas/oil/propane to electricity or district energy.

The Pembina Institute highlights that Canada must increase retrofit activity to around three percent (~3%) of the building stock per year, with a high proportion being deep retrofits. Unfortunately, current retrofit rates remain well below this threshold.[32]

To achieve building electrification at scale, the Canadian Climate Institute highlights the need for a managed, strategic decline of natural gas use in buildings to avoid stranded assets and misaligned investments.

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26 Natural Resources Canada. "*The Canada Green Buildings Strategy*," https://publications.gc.ca/collections/collection_2025/rncan-nrcan/M144-331-2024-eng.pdf.

27 Natural Resources Canada. "*Comprehensive Energy Use Database*," The Office of Energy Efficiency at Natural Resources Canada (15 December 2004), https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/menus/trends/comprehensive_tables/list.cfm.

28 Harland, K., Gibson, S., Dion, J., Gajudhur, N., & Mifflin, K. "*Heat Exchange: How today's policies will drive or delay Canada's transition to clean, reliable heat for buildings*," Canadian Climate Institute (2024), https://climateinstitute.ca/wp-content/uploads/2024/06/Heat-Exchange-Report-Canadian-Climate-Institute.pdf.

29 Government of Canada. "*2030 Emissions Reduction Plan – Sector-by-sector overview*," Canada.ca (12 July 2022), https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview/emissions-reduction-2030/sector-overview.html#sector2.

30 ESMIA Consultants. "*The Future of Building Heat and the Natural Gas Network in a Net Zero Canada*," Canadian Climate Institute (2024), https://climateinstitute.ca/wp-content/uploads/2024/06/Technical-Report%E2%80%94The-Future-Of-Building-Heat-Natural-Gas-Net-Zero.pdf.

31 Natural Resources Canada. "*The Canada Green Buildings Strategy (Discussion Paper)*," Natural Resources Canada (2022), https://natural-resources.canada.ca/sites/nrcan/files/engagements/green-building-strategy/CGBS%20Discussion%20Paper%20-%20EN.pdf.

32 Frappé-Sénéclauze, T.-P., Heerema, D., & Wu, K. "*Deep Emissions Reduction in the Existing Building Stock*," Pembina Institute (2017), https://www.pembina.org/reports/retrofit-strategy-bc-report-2017.pdf.

c. High-performance net-zero energy-ready new construction

New buildings must avoid adding to future decarbonization burdens. Canada's 2020 *National Model Codes* (NECB 2020 and NBC 2020) introduced tiered performance levels that map out a path to net-zero energy-ready buildings by 2030.[33]

- Tier 1 = modest performance improvement.
- Tier 4 (or top tiers) = net-zero energy ready.

Under the *Pan-Canadian Framework*, all provinces and territories have committed to adopt or align with the tiered performance framework established in the 2020 national model codes – progressively moving from lower tiers toward the top tiers (net-zero energy-ready) by 2030.[34]

d. Decarbonized electricity and flexible demand

The success of building electrification depends on a clean and reliable power grid. The federal ERP and *Clean Electricity Regulations* aim to achieve a net-zero electricity grid by 2035, building on major reductions already achieved since 2005.

Net-zero pathways also expect buildings to support the grid through:[35]

- Demand response and load management
- Smart controls and thermal storage
- On-site solar PV + storage

e. Codes, standards, and performance regulations

Strong regulatory frameworks are essential to drive consistent progress. Priorities include:

- Adoption of higher tiers of national model codes.
- Harmonized green development standards (e.g., *BC Step Code*, *Vancouver Zero Emissions Building Plan*).[36] [37]
- Operational performance standards for large existing buildings or Provincial Building Performance standards (e.g., *Quebec Environmental Performance of Buildings*).[38] [39]

While the above pathways are applicable across the entire building sector, it is especially important that decarbonization efforts and the pathways noted above are applied to the residential building stock as well as commercial buildings. As shown in Market Evolution, current decarbonization progress is further ahead in commercial buildings than in residential. Achieving net-zero and a decarbonized building sector will not happen without the transformation of the residential building stock.

Achieving net-zero and a decarbonized building sector will not happen without the transformation of the residential building stock.

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33 National Research Council Canada. "*National Building Code of Canada 2020*," nrc.canada.ca (28 March 2022), https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada/codes-canada-publications/national-building-code-canada-2020.

34 Efficiency Canada. "*2023 Energy Efficiency Programs Update: Provinces and Territories Report*," Efficiency Canada (2023), https://efficiencycanada.nationbuilder.com/programs_update_report.

35 Canadian Climate Institute. "*Bigger, Cleaner, Smarter Pathways for aligning Canadian Electricity Systems with Net Zero*," Canadian Climate Institute (2022), https://climateinstitute.ca/wp-content/uploads/2022/05/Bigger-Cleaner-Smarter-May-4-2022.pdf.

36 Government of British Columbia. "*BC Energy Step Code - Province of British Columbia*," Gov.bc.ca (2025), https://www2.gov.bc.ca/gov/content/industry/construction-industry/building-codes-standards/bc-codes/2024-bc-codes/step-codes/energy.

37 City of Vancouver. "*Zero Emissions Buildings - Policies and Code Requirements*," Vancouver.ca (27 March 2019), https://vancouver.ca/green-vancouver/zero-emissions-buildings.aspx.

38 City of Vancouver. "*Annual Greenhouse Gas and Energy Limits By-Law NO. 13472*," Vancouver.ca (2022), https://bylaws.vancouver.ca/consolidated/13472.PDF.

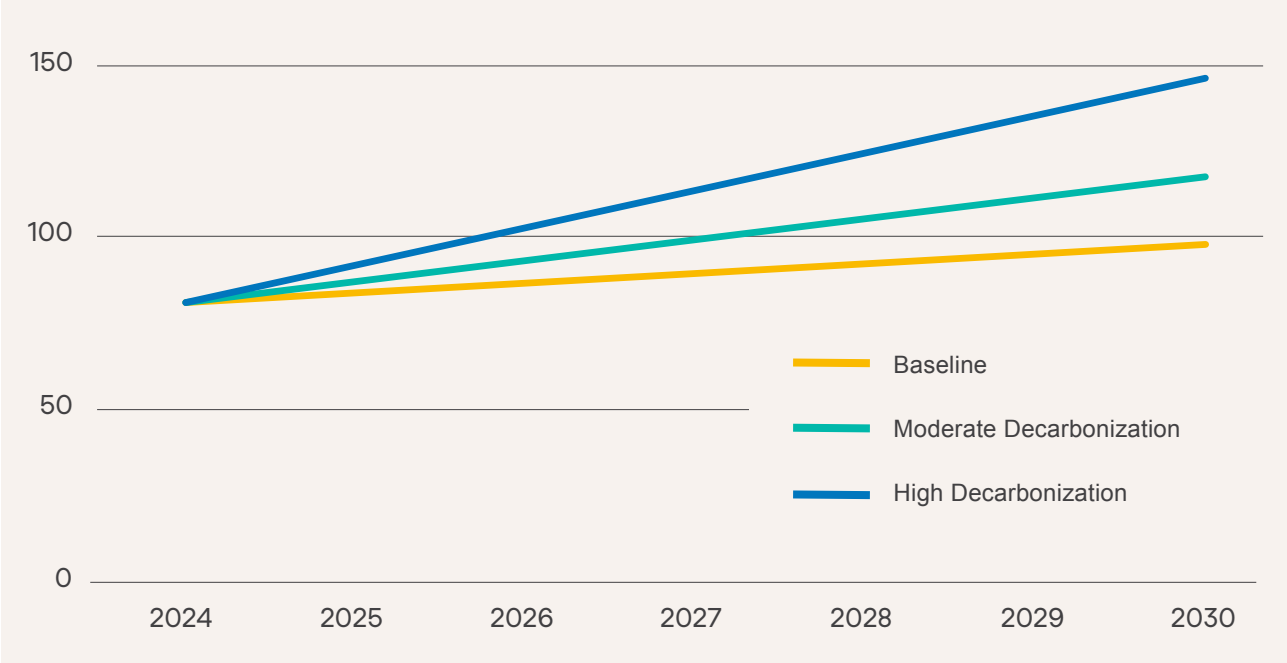
39 National Assembly of Québec. "*First Session Forty-Third Legislature: An Act to enact the Act respecting the environmental performance of buildings and to amend various provisions regarding energy transition*," Québec Official Publisher (2024), https://www.publicationsduquebec.gouv.qc.ca/fileadmin/Fichiers_client/lois_et_reglements/LoisAnnuelles/en/2024/2024C5A.PDF.

Scenario results: Economic impacts of decarbonization

Our analysis shows that accelerating sector-wide decarbonization efforts can deliver significant job growth and economic benefits across the country.

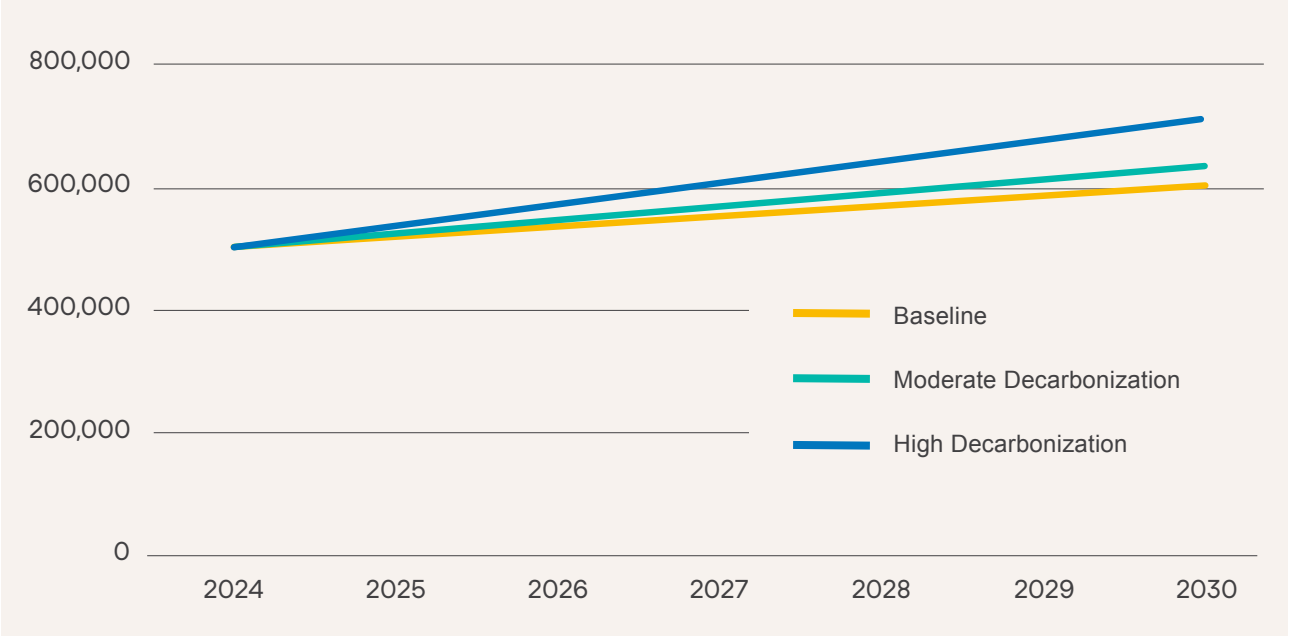
Our Baseline Scenario shows that Canada's current path for building decarbonization is positive. The sector stands to gain 100,000 new jobs while adding an additional $17 billion in GDP by 2030. However, pursuing a deep decarbonization pathway offers a significantly bigger economic return. **We estimate that pursuing a coordinated, high decarbonization growth scenario could grow the green building sector's GDP to $146 billion while doubling the green building workforce.**

Figure 10: Green building GDP growth under decarbonization scenarios



In the High Decarbonization Scenario, job growth can be expected across all sub-sectors of the green building sector, with the highest rate of growth would be seen in the construction and trades industry, **generating nearly 90,000 new construction jobs.**

Figure 11: Green building job growth forecast (2024-2030)



Our analysis shows that the green building industry can be an even greater driver of economic growth in Canada, but as the industry's experience over the previous five years shows, realizing these economic benefits is not a guarantee. The technical path to decarbonize the building sector is well known but achieving it will require a coordinated and stable set of policies, investments, and regulatory improvements for both commercial and residential buildings to produce a stable, long-term investment environment to facilitate market transformation.

Pursuing a coordinated, high decarbonization growth scenario could grow the green building sector's GDP to $146 billion while doubling the green building workforce.

03 BUILDING A SKILLED AND INCLUSIVE WORKFORCE TO DELIVER GREEN BUILDINGS AT SCALE

The decarbonization challenge facing Canada's building sector is deeply connected to the industry's workforce as well as the other macro trends transforming the industry: housing pressures, demographic shifts, digitalization, and rising expectations for green buildings that are resilient and high performing. These trends are reshaping labour needs across the entire ecosystem – from trades and building operators to designers, engineers, and commissioning professionals. As these forces converge, having a prepared, sufficiently staffed, and inclusive workforce has become essential to meet Canada's decarbonization goals.

CAGBC's *Green Retrofit Economy Report* estimated that green retrofits could create **2.1 million jobs by 2050**, and that meeting retrofit demand will **require tripling today's green building workforce by 2030**. Yet labour pressures are already significant: one in five workers expected to retire in the next decade is in the skilled trades; Canada will need **917,000 skilled trades workers by 2028**; and apprenticeship completion rates sit at roughly 50 percent, falling below 40 percent for several underrepresented groups. To understand how Canada can build a workforce for the future, a comprehensive assessment of the policy, financing, training, retention, and equity factors shaping the workforce is necessary.

This report builds on that 2022 study by examining these dynamics in greater depth and highlighting opportunities to strengthen and expand Canada's green building workforce.

For the updated analysis, we undertook extensive consultations with industry participants through interviews, focus groups, and a national survey. A literature review was conducted to examine how decarbonization is reshaping skill requirements, where labour shortages are most acute, and which systemic changes – from financing and procurement to training systems and workplace culture – are needed to ensure workforce readiness. Engagement was conducted throughout the summer and fall of 2025 and is summarized in the table below.

Figure 12: Industry engagement methodology for assessment of the skilled and inclusive workforce for this report

Method	Details	Participants
1:1 Interviews	Cross-section of construction, training, investment, public sector, and building organizations to identify drivers, barriers, and workforce implications of the shift to high-efficiency, zero-emissions buildings.	14
Survey	Sector-wide survey on demographics, equity and inclusion, barriers and opportunities for underrepresented groups, effectiveness of diversity initiatives, and key actors needed to drive change.	111
Focus Groups	Two dedicated sessions exploring decarbonization workforce pathways and experiences of underrepresented groups.	11

This section of the report summarizes our research findings, the implications for the green building workforce, and recommendations for action with two distinct, yet interrelated aspects of the green building workforce: building a skilled workforce and building an inclusive workforce.

Building a skilled workforce

Across all stakeholders we engaged with, one message was consistent: while the technologies needed for decarbonization already exist, the systems required to deploy them at scale – training, financing, coordination, and supportive workplace conditions – are not yet fully in place. Workforce development is closely tied to predictable capital flows. Contractors invest in training only when project pipelines are reliable, incentives are stable, and funding cycles are long enough to justify upskilling. Stop-start programs weaken both workforce readiness and retention.

At the same time, Canada cannot meet its labour needs without addressing persistent retention challenges. Although more workers from underrepresented groups are entering the trades, many leave within their first few years due to jobsite culture, inconsistent supervision, and limited pathways for advancement. Addressing this requires cultural, structural, and systemic change – including formal mentorship, accountable supervision, and inclusive apprenticeship practices – because technical training alone is insufficient to build and sustain a diverse workforce capable of delivering large-scale decarbonization.

Here, we synthesize these insights, outline the implications for workforce planning, and offer systems-level recommendations for developing a skilled, diverse, and resilient workforce to support Canada's decarbonization goals.

Literature findings

1 *Decarbonization pathways are clear; multi-trade skills are not available.*

A strong consensus in the literature shows that Canada's building decarbonization pathways are technically feasible, well understood, and broadly aligned across jurisdictions.[40] [41] [42] [43]

Core pathways include:

- Deep energy retrofits to reduce heating and cooling loads.
- Electrification of space and water heating, primarily through heat pumps.
- High-performance standards for new construction.
- Enhanced building controls, automation, and operational optimization.
- Commissioning and re-commissioning, ensuring systems perform as designed.[44] [45]

These pathways have broad agreement among governments, utilities, industry associations, and researchers. The limiting factor is not technology or cost; rather, it is **workforce readiness and delivery capacity**, especially given that financing challenges continue to limit the scale and consistency of retrofit activity. In fact, the labour supply required for electrification, envelope upgrades, commissioning, and building automation **far exceeds current availability**.

Particularly high-demand roles include:

- HVAC technicians
- Electricians
- Building automation specialists
- Envelope retrofit and air-sealing teams
- Commissioning and re-commissioning professionals

40 ESMIA Consultants. "*The Future of Building Heat …*" https://climateinstitute.ca/wp-content/uploads/2024/06/Technical-Report%E2%80%94The-Future-Of-Building-Heat-Natural-Gas-Net-Zero.pdf.

41 Natural Resources Canada. "*The Canada Green Buildings Strategy…*" https://natural-resources.canada.ca/energy-efficiency/building-energy-efficiency/canada-green- buildings-strategy-transforming-canada-s-buildings-sector-net-zero-resilient-future.

42 Public Services and Procurement Canada. "*2030 Emissions Reduction Plan: Canada's Next Steps to Clean Air and a Strong Economy*," Government of Canada Publications - Canada.ca (1 July 2022), https://publications.gc.ca/site/eng/9.909338/publication.html.

43 The Real Property Association of Canada & Canada Green Building Council. "*Decarbonizing Canada's Commercial Buildings…*" https://realpac.ca/product/decarbonizationreport/.

44 Kennedy, M., & Frappé-Sénéclauze, T.-P. "*Canada's Renovation Wave: A plan for Jobs and Climate*," Pembina Institute (2021), https://www.pembina.org/reports/canadas-renovation-wave.pdf.

45 Canada Green Building Council & Delphi. "*Green Retrofit Economy Study*," Delphi (2022), https://delphi.ca/wp-content/uploads/2022/09/Green-Retrofit-Economy-Study-20220602.pdf.

The literature emphasizes that decarbonization is not a shift within any single trade – it is a **multi-trade transformation** requiring integrated sequencing and systems thinking.[46] [47]

A recurring insight across sources is that Canada cannot simply train or recruit its way to decarbonization. Workforce development must be embedded directly into program funding and project delivery models. Readiness depends on predictable capital flows, stable multi-year retrofit pipelines, and synchronized funding cycles that give employers the confidence to invest in people. This finding is elaborated on further in the Considerations section.

Crucially, decarbonization is not a single-trade shift, but a re-organization of how multiple trades work together.

2 *There is a labour shortage of integrated trades*

Labour shortages in the skilled trades that combine mechanical, electrical, digital, and building-operations expertise are a major constraint on building decarbonization. These roles are fundamental to electrification, deep retrofits, building automation, and achieving actual performance outcomes. However, demand for these workers is growing much faster than current recruitment and training systems can meet.

The most consistently high-demand roles include:

- HVAC-R technicians
- Electricians
- Building automation and controls specialists
- Building operators
- Envelope retrofit and air-sealing teams
- Commissioning and re-commissioning professionals

Crucially, decarbonization is **not a single-trade shift, but integration of how multiple trades work together.**[48] Sequencing, integration, and commissioning are increasingly central to project delivery,[49] requiring new supervisory and cross-disciplinary competencies.[50]

3 *Training levels cannot meet demand without systemic change*

Canada cannot train or recruit its way to a decarbonized building sector under current conditions. Training systems must be redesigned to align directly with project delivery models, capital programs, procurement, and financing cycles. Otherwise, contractors – particularly small-medium enterprises (SMEs), which deliver most retrofit and residential construction work – cannot justify hiring apprentices, releasing workers for training, or undertaking costly upskilling.

Workforce readiness cannot be separated from broader structural issues: access to capital, predictable retrofit pipelines, permitting timelines, and multi-year program funding have direct impacts on workforce development.

46 The Real Property Association of Canada & Canada Green Building Council. "*Decarbonizing Canada's Commercial Buildings*…" https://realpac.ca/product/decarbonizationreport/.

47 Canadian Climate Institute. "*Bigger, Cleaner, Smarter* …" https://climateinstitute.ca/wp-content/uploads/2022/05/Bigger-Cleaner-Smarter-May-4-2022.pdf.

48 National Assembly of Québec. "*First Session Forty-Third Legislature: An Act to enact the Act respecting the environmental performance of buildings and to amend various provisions regarding energy transition*," Québec Official Publisher (2024), https://www.publicationsduquebec.gouv.qc.ca/fileadmin/Fichiers_client/lois_et_reglements/LoisAnnuelles/en/2024/2024C5A.PDF.

49 Future Skills Centre. "*The Future of Work Addressing Skill Imbalances in Canada*," Future Skills Centre (2024), https://fsc-ccf.ca/wp-content/uploads/2024/12/the-future-of-work_2024.pdf.

50 The Conference Board of Canada & Future Skills Centre. "*The Future of Work: Addressing Skill Imbalances in Canada*," Fsc-Ccf.ca (2 December 2024), https://fsc-ccf.ca/research/addressing-skill-imbalances-in-canada/.

Efficient, low-carbon buildings need skilled workers

Envelope performance

Walls, roofs, windows and doors

Relevant trades:

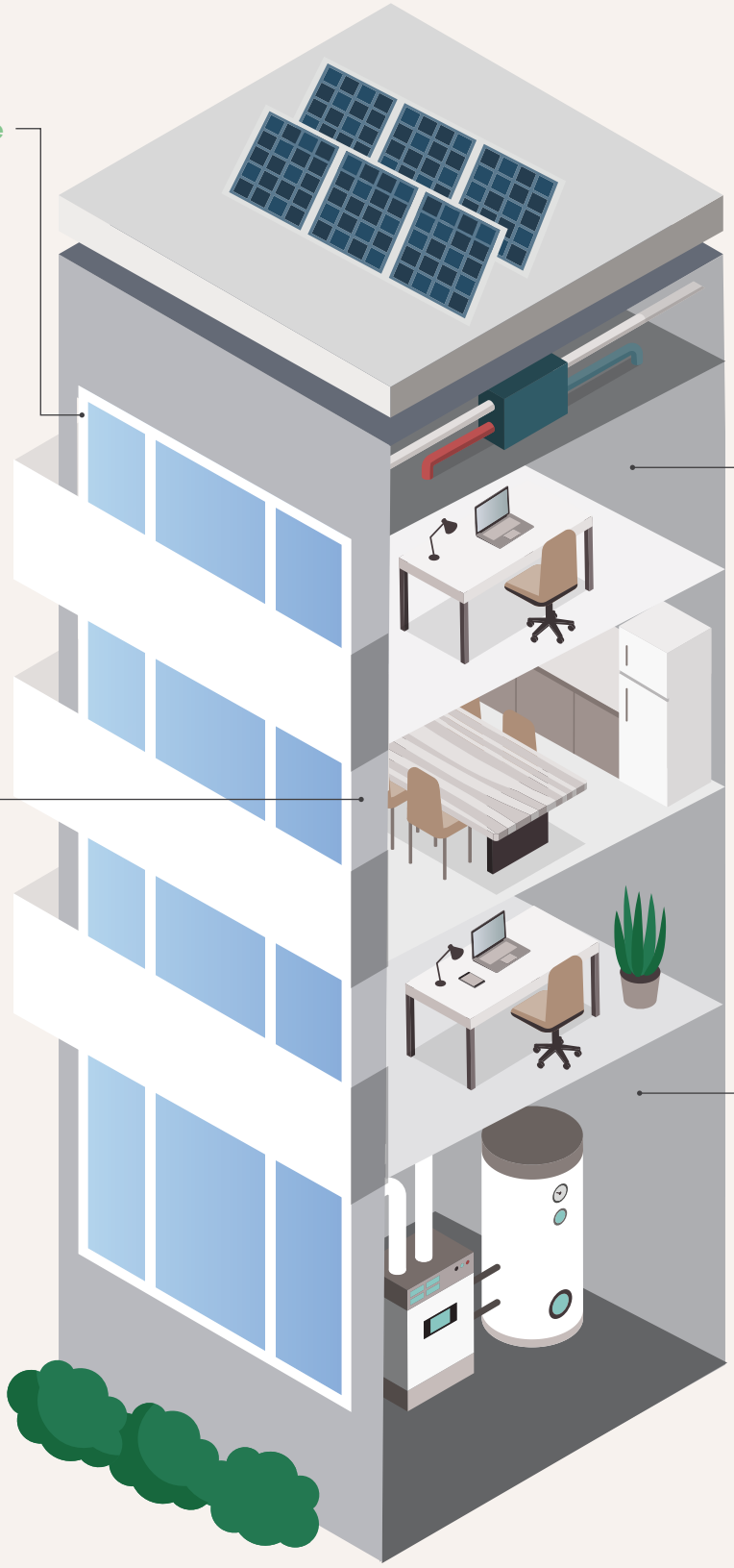
- Carpenters
- Sheet Metal Workers
- Glaziers
- Insulators
- Electricians

Mass timber construction

Low-carbon materials and construction innovation

Relevant trades:

- Carpenters
- Machinist
- Riggers
- BIM Modellers



Advanced electrical systems

- Lighting
- Plug loads and digitization

Relevant trades:

- Electricians
- Controls Technician

High efficiency mechanical systems

- Space heating and cooling
- Ventilation
- Hot water heating

Relevant trades:

- Plumbers
- RAC Mechanics
- Controls Technicians
- Electricians
- Sheet Metal Workers
- BIM Modellers

Interviews, focus groups and survey findings

Overall, the findings from stakeholder engagement closely aligned with the literature: while decarbonization pathways are well defined, financing and workforce constraints remain deeply interconnected. Participants emphasized that workforce capacity depends on coordinated changes across planning, procurement, financing, training systems, workplace practices, and project delivery models.

1 *Financing and workforce constraints are deeply intertwined*

Across industry engagement, participants highlighted the tight linkage between **financing constraints and workforce capacity** – a nuance that was less explicitly discussed in the literature. Many developers and contractors delay or scale back green building projects due to higher capital costs and loan premiums. One interviewee noted that even a **two percent (2%) premium** caused by higher borrowing costs can postpone major retrofit investments.

When financing for green buildings is unpredictable, project volumes become unstable, and workforce development collapses. Contractors avoid hiring apprentices, reduce training opportunities, or revert to business-as-usual construction practices.

2 *Capacity among SME contractors and gaps in delivery, integration and operations skills are the critical bottleneck*

Industry engagement revealed that lack of awareness about decarbonization technologies is **not the main barrier**. Contractors generally understand what needs to happen; the challenge is having enough skilled tradespeople and professionals across key roles to deliver projects at scale. Skills related to delivery, integration, commissioning, and operations – rather than basic technical awareness – emerged as the most significant bottleneck. Commissioning and operations were consistently described as the least standardized yet among the most critical for achieving energy and emissions targets.

A second nuance not captured in the literature is the disproportionate pressure on small and mid-sized contractors, who make up most of the sector.

These firms cannot absorb productivity losses associated with training unless those costs are explicitly built into project budgets or supported by program funding. Without this, they struggle to upskill staff or take on apprentices, perpetuating labour shortages.

Stakeholders identified acute shortages across several roles, including electricians, HVAC-R technicians, controls specialists, building operators, envelope trades, and commissioning professionals. These gaps, combined with limited training capacity and inconsistent delivery models, were seen as major constraints on scaling building decarbonization.

3 *Structural challenges impede the workforce transition*

Broad alignment emerged around the need for systemic change in **how retrofit and construction work is procured, financed, and scheduled.**

Key barriers include:

- **Short-term and fragmented incentive programs.** Funding windows of 1 to 3 years create volatility that discourages training investments.
- **Contractor uncertainty.** Without visibility into future retrofit activity, firms hesitate to hire or upskill workers.
- **Program rules changing mid-stream.** Inconsistent or evolving incentive criteria undermine predictable project pipelines.
- **Municipal–provincial–federal misalignment.** BPS timelines, retrofit incentives, and capital financing programs often do not synchronize.
- **Grid upgrade timelines.** Electrification rollouts are not fully coordinated with local utility upgrade schedules, slowing project sequencing.

Stakeholders stressed that **a workforce transition cannot succeed without structural reforms** that enable long-term planning.

Implications for the workforce

- **Upskilling mid-career workers will have greater impact than recruitment alone** but requires stable financing to support paid training.
- **Training must be tied directly to project delivery** – onsite, earn-and-learn models suited for SMEs.
- **New interdisciplinary skills are essential**, combining mechanical-electrical-digital competencies and new supervisory abilities.
- **Retention of underrepresented groups is critical** to meeting labour needs.
- **Stable multi-year retrofit pipelines support retention**, especially for groups facing employment volatility.
- **Without predictable financing, Canada cannot train or maintain enough skilled workers** to meet decarbonization targets.

Building an inclusive workforce

Canada's transition to low-carbon buildings requires a larger and more skilled workforce than the current system can supply through traditional recruitment and retainment channels alone. Increasing participation and retention of underrepresented groups is both a **labour market necessity** and a **core requirement of a just transition**. Both the literature and industry engagement emphasized that recruitment alone is insufficient; retention gaps remain substantial. These gaps are driven by jobsite culture, inconsistent supervision, limited mentorship, and uneven access to advancement opportunities.

These findings make clear that i**nclusion is not a "social add-on."** It must be embedded into the operational fabric of projects, workplaces, and training systems to grow and sustain the workforce required for decarbonization transition.

Canada's transition to low-carbon buildings requires a larger and more skilled workforce than the current system can supply through traditional recruitment and retainment channels alone.

Literature findings

1 *Workplace conditions are determinants of retention*

While underrepresented groups are entering trades in growing numbers – largely through pre-apprenticeship and introductory programs – retention remains low. Most departures occur within the first two to four years due to workplace culture, site conditions, and barriers to advancement.[51] For example, only about 64 percent of women apprentices complete their programs compared to 100 percent of men – an effective completion gap of around 36 percentage points (reflecting the Institute for Women's Policy Research or IWPR's reporting that women's median earnings post-completion are 64.6 percent that of men).[52]

Across multiple sources, a consistent conclusion emerges: **workplace culture, supervision, and crew-level norms – not technical difficulty – determine whether underrepresented workers stay or leave.**

Findings include:

- Women and racialized workers frequently report isolation and increased harassment risk when they are the only person like themselves on site.
- Supervisors and journeypersons often gatekeep access to complex tasks, slowing skill development.[53]
- Indigenous workers frequently report racism, lack of cultural safety, and expectations to relocate far from community to complete apprenticeships.[54]
- 2SLGBTQ+ workers report a lack of psychological safety, identity concealment, and lack of visible role models.[55]

These conditions directly contribute to the "retention cliffs" observed across trades.

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51 Statistics Canada. "*Educational pathways of individuals who discontinue their apprenticeship programs*," 150.Statcan.gc.ca (27 September 2022), https://www150.statcan.gc.ca/n1/pub/81-595-m/81-595-m2022006-eng.htm.

52 Institute for Women's Policy Research. "*Apprenticeships Can Deliver High Earnings but Do So Less for Women than Men*," IWPR (2023), https://iwpr.org/wp-content/uploads/2023/11/Quick-Figure-Apprenticeship-2023.pdf.

53 The Ontario Building and Construction Tradeswomen (OBCT). "*Advancing Recruitment and Retention of Women in the Building Trades*," https://680183a4-ac6e-414c-95c1-50d5cffeb450.filesusr.com/ugd/8b599e_7c3ae59d15ba4bed8836e57182a93efd.pdf; BC Centre for Women in the Trades: Final Evaluation Report Funding provided through the Canada-British Columbia Labour Market Development Agreement. The Social Research and Demonstration Corporation (SRDC) (2025), https://srdc.org/wp-content/uploads/2022/07/bccwitt-final-evaluation-report.pdf.

54 Canadian Apprenticeship Forum. "*Supporting Retention for Indigenous Peoples in the Skilled Trades*," caf-fca.org (2025), https://caf-fca.org/wp-content/uploads/2024/07/2024-CAF-FCA-report-EN.pdf.

55 Appiah, A., Halpenny, C., & Pakula, B. "2S/LGBTQ+ populations in the trades in Canada: Exploratory insights: Final report," The Social Research and Demonstration Corporation (SRDC) (2023), https://srdc.org/wp-content/uploads/2023/09/2SLGBTQ-in-the-Trades-final-report.pdf.

2 *Mentorship and supervisory practices are the strongest predictors of retention*

Evidence from across literature shows retention rises sharply when mentorship is structured, paid, and supported by supervisors.[56] Tradeswomen in BC Centre for Women in the Trades (BCCWITT) programs report that **peer mentorship increased their likelihood of remaining in the trades by 25 percent.**[57]

3 *Apprenticeship and certification systems unintentionally disadvantage underrepresented groups*

Apprenticeship and certification systems unintentionally disadvantage women, Indigenous workers, and newcomers due to:

- Mobility requirements
- Unpredictable work hours
- EI ineligibility during training blocks
- Lack of clear and transparent advancement criteria

4 *There is a lack of clear skilled pathways*

The literature highlights that many women, youth and equity-deserving groups lack exposure to skilled trades pathways. Targeted outreach and early education initiatives are needed to increase awareness and reduce barriers to entry for these groups.[58]

Application processes for apprenticeships were frequently described as complex, inconsistent across regions, and difficult to navigate. The shortage of employers willing to sponsor apprenticeships make it competitive and challenging for new entrants to access the system.[59]

The literature points to a **need for more streamlined, standardized, and accessible pathways**, including simplified application processes and centralized tools that help prospective apprentices understand requirements, identify opportunities, and connect with employers.

Interviews, focus group and survey findings

1 *Endorsement of inclusion as part of procurement and ESG commitments*

There was strong endorsement for connecting inclusion to procurement and environmental, social and governance (ESG) commitments – particularly among real estate investment trusts (REITs) and large developers who increasingly view **inclusion as part of risk management and talent attraction.** Industry stakeholders emphasizes that these requirements are strategic workforce tools that improve retention, expand access to skilled labour, strengthen project delivery capacity, enhance organizational performance, and reduce volatility linked to chronic shortages of experienced tradespeople.

2 *A need for focus on retention tactics*

Across industry engagement, participants consistently emphasized that retention – note recruitment – is the most significant workforce challenge for underrepresented groups. While targeted recruitment initiatives have expanded pathways into the trades, the methods reaffirmed that **Canada loses a substantial proportion of these workers within the first few years**, long before they reach journeyperson status or have opportunities to enter advanced decarbonization roles.

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56 See, for example: Canadian Apprenticeship Forum. "*Best Practices for Recruitment and Retention Guide Recruiting and Retaining a Dynamic and Diverse Workforce,*" Canadian Apprenticeship Forum (2023), https://cupe.on.ca/wp-content/uploads/2024/01/Best-Practices-Guide-Recruitment-and-Rentention.pdf; Pakula, B., & Gurr, S. "*BC Centre for Women in the Trades: Final Evaluation Report Funding provided through the Canada-British Columbia Labour Market Development Agreement*," The Social Research and Demonstration Corporation (SRDC) (2020), https://srdc.org/wp-content/uploads/2022/07/bccwitt-final-evaluation-report.pdf, Kanhai, L., Gagnon, S., & Cukier, W. "Bridging the Gender Gap Skills for the Advancement of Women," fsc-ccf.ca (2024), https://fsc-ccf.ca/research/bridging-the-gender-gap/, Ontario Society of Professional Engineers. "Breaking Barriers for Women in STEM," ospe.on.ca (2018), https://ospe.on.ca/wp-content/uploads/2019/11/breaking_barriers_white_paper_report_single.compressed.pdf.

57 BC Centre for Women in the Trades. "*Final Evaluation Report Funding provided through the Canada-British Columbia Labour Market Development Agreement*," The Social Research and Demonstration Corporation (SRDC). https://srdc.org/wp-content/uploads/2022/07/bccwitt-final-evaluation-report.pdf, Kanhai, L., Gagnon, S., & Cukier, W. "*Bridging the Gender Gap Skills for the Advancement of Women*," Fsc-Ccf.ca (2024), https://fsc-ccf.ca/research/bridging-the-gender-gap/.

58 Ibid.

59 Canadian Apprenticeship Forum. "*Facilitating Pathways into Apprenticeship: Barriers and Opportunities*," caf-fca.org (2025), https://caf-fca.org/research_reports/facilitating-pathways-into-apprenticeship-barriers-and-opportunities/.

A central theme across all engagement activities was that workplace conditions – particularly mentorship, supervision, and psychological safety – are decisive in determining whether underrepresented workers stay or leave. Survey respondents identified **workplace culture and supervision as the top barrier to retention**, surpassing wages, physical working conditions, or job demands. Build a Dream and Canada's Building Trades Unions (CBTU) reinforced that retention improves dramatically when mentorship is formalized as a site policy rather than left to individual discretion, a finding strongly aligned with the literature. The survey mirrored this insight: participants ranked **structured peer mentorship and onsite support as the most effective retention strategies.**

The engagement also highlighted the lived experience of exclusion on job sites. Women and racialized workers frequently described being "the only one" on site, heightening feelings of isolation and vulnerability to harassment. Indigenous participants reported direct experiences of racism and a lack of cultural safety. 2SLGBTQ+ tradespeople often concealed their identities due to psychological safety concerns, limiting their ability to fully participate in the workplace. These patterns directly erode retention and reinforce systemic barriers to advancement.

In addition, interviews and focus groups reaffirmed the exclusionary nature of current apprenticeship structures, echoing concerns well documented in the literature. Travel-based rotations, long or irregular hours, and block-release training disproportionately burden caregivers (predominantly women) and Indigenous workers who maintain close ties to their communities. These **conditions create structural barriers** that prevent many from completing apprenticeship programs and advancing in their trade.

Newcomers, by contrast, encounter more significant barriers at the point of entry rather than retention, including through language barriers, informal hiring networks, and challenges with credential recognition.[60]

Participants also emphasized how practical access barriers matter. Childcare, transportation, and training proximity were repeatedly identified as barriers to retention. Survey findings reinforced this: the top barrier to entry was lack of awareness of career pathways, while the top barrier to retention was workplace culture and supervision. Participants stressed that **without clear opportunities for advancement, workers – particularly those from underrepresented groups – are less motivated to stay and develop the specialized skills needed for decarbonization roles.**

One insight that emerged more strongly from the engagement methods than from the literature was the central importance of representation in leadership. Workers reported higher retention when supervisors, forepersons, and site leaders reflected their identities or lived experiences. This leadership gap is significant: 67 percent of survey respondents rated diversity in leadership as "low" or "very low," suggesting that many workplaces lack visible role models in senior positions and reinforcing systemic barriers to advancement. Overall, survey results reinforced these findings, with participants identifying **supervision, mentorship, and workplace culture as the most important factors affecting retention** – above wages or physical working conditions.

Implications for the workforce

Recruitment is increasing, but retention is not. Solutions must prioritize sustaining participation through:

- Structured, paid mentorship.
- Supervisor training.
- Local, community-based, flexible apprenticeship pathways.
- Training programs that encourage workplace psychological safety.
- Targeted progression pathways into technical, advanced roles – not just entry-level ones.
- Leadership development for underrepresented groups.
- Stable, multi-year project pipelines that reduce employment volatility and are critical to retaining diverse workers who otherwise leave the sector.
- Inclusion embedded into procurement and financing – not as a voluntary initiative.

Without these conditions, Canada will be unable to build or maintain the workforce required for decarbonization.

60 The Conference Board of Canada. "*Learning From One Another Skill Gaps in Labour Markets in Northern Ontario, Yukon, and Nunavut*," Future Skills Centre (2025), https://fsc-ccf.ca/wp-content/uploads/2025/04/skills-gaps-in-labour-markets-N-Ontario-Yukon-Nunavut_mar2025.pdf.

04 CONSIDERATIONS: BUILDING A WORKFORCE READY FOR DECARBONIZATION AND INCLUSIVE BY DESIGN

To avoid generic recommendations and reinforce accountability, actions are organized by who can lead: governments, industry, and education/training providers — and how CAGBC is advancing specific work within this agenda.

Canada's ability to meet its climate, housing, and economic goals will increasingly depend on a workforce strategy that integrates **skills development, predictable financing and project pipelines**, and **equity and inclusion**. Interviews, focus groups, and literature show that these elements are inseparable: decarbonization goals are unlikely to be met without an inclusive labour force, and inclusion efforts cannot succeed without stable, well-designed decarbonization programs that provide reliable employment and training opportunities.

The following considerations outline potential pathways for key players to combine the decarbonization and inclusion pathways into a single, coordinated set of actions.

Government Actions

Federal, provincial, and municipal governments can:

a. Embed training into funded projects

Governments can strengthen workforce readiness by integrating training directly into funded projects:

- Integrating paid training release time into retrofit incentives and capital financing programs.
- Requiring workforce training plans in large retrofit and public construction procurement.
- Funding demonstration sites and on-the-job training models.

These approaches can create predictable project pipelines while reducing cost and risk for contractors.

b. Stabilize retrofit pipelines through predictable, multi-year funding and support policy alignment

To To enable contractors, unions, and training providers to confidently invest in hiring and upskilling, governments could help create retrofit pipelines that are stable, coordinated, and long-term.

This requires adequate funding, and continuity and predictability of existing funding streams, paired with coherent policy direction.

Governments can:

- Align municipal building performance standards (BPS) with provincial ones, incorporating LMI and workforce capacity into BPS compliance timelines.
- Commit to stable, long-term federal funding streams for housing retrofits Consider alignment of public retrofit schedules with workforce training schedules.
- Explore mapping electrification and deep retrofit rollouts against grid upgrade schedules.
- Support coordinating permitting, code updates, and retrofit program windows.
- Consider publishing multi-year retrofit and public building renewal schedules.

Predictability – not new funding – may be among the most powerful lever for workforce investment. The issue is less about expanding funding volumes and more about ensuring that funding remains stable, synchronized, and long-term, giving contractors the confidence to hire, retain, and train the skilled workforce needed for decarbonization.

c. Consider reforms to apprenticeship and employment insurance structures to improve completion rates

Only half of apprentices complete training, and EI ineligibility during block release disproportionately harms women, Indigenous workers, and newcomers. The federal government and provincial apprenticeship authorities could consider the following actions:

- Modernizing EI to support apprenticeship training interruptions.
- Expanding local apprenticeship models to reduce travel burdens. Encouraging the adoption of transparent, competency-based evaluation and advancement criteria in apprenticeship pathways.

d. Encourage alignment of procurement, financing, and ESG requirements with workforce and inclusion outcomes

Inclusion and training should not rely solely on voluntary action; they are more likely to be effective when built into the design of decarbonization programs and capital projects. Municipalities, Crown corporations, public infrastructure agencies, and large building owners could consider the following approaches:

- Tying workforce inclusion, mentorship, and local hiring commitments to public-sector retrofit and construction bids.
- Encouraging contractors to include workforce development and equity strategies in financing applications.
- Supporting efforts to encourage REITs and large developers to integrate inclusive workforce practices into ESG reporting.

Industry Actions

Contractors, Developers, Unions, Building Owners can:

a. Create shared resource hubs for SME contractors

Because SMEs perform the majority of retrofit work, support could be provided by the federal and provincial governments, as well as organized labour and workers' rights associations, that includes:

- Shared training facilitators and equipment.
- Wage subsidies for workers in training.
- Invoice-eligible training hours.
- Regional retrofit resource centres.

These models could help enable SMEs to participate in decarbonization markets they cannot currently access.

b. Strengthen interdisciplinary skills: Mechanical–electrical–digital integration, sequencing, and commissioning

Decarbonized buildings require tradespeople who understand how envelopes, mechanical, electrical, and digital systems interact. Commissioning and controls – critical to performance – are the least standardized and most understaffed roles.

Training providers, unions, colleges, and industry associations could consider:

- Supporting the development of national and regional training modules for interdisciplinary deep retrofit sequencing.
- Consider prioritizing commissioning, re-commissioning, and building automation training programs.
- Explore creating advanced pathways into controls, commissioning, and supervisory roles.

c. Support the formalization and funding of mentorship to improve retention

Mentorship is the strongest predictor of retention across groups such as women, Indigenous workers, newcomers, youth, and 2SLGBTQ+ tradespeople. Informal mentorship fails; structured mentorship works.

Federal and provincial governments, unions, contractors, community organizations can:

- Explore funding paid mentorship programs modelled on effective approaches, such as those from BCCWITT and CBTU, as well as Indigenous-led approaches.
- Consider requiring mentorship plans in procurement and financing programs.
- Help to support employer-based mentorship training for supervisors and forepersons.

d. Support efforts to grow and diversify the workforce through evidence-based inclusion practices

Recruitment is improving, but retention remains low due to culture, task gatekeeping, harassment, travel requirements, and lack of support. Key actions by employers, unions, provincial training authorities, Indigenous organizations, and immigrant-serving agencies could include:

- Considering the embedding of inclusion requirements in public procurement.
- Supporting the funding of structured, paid mentorship programs.
- Expanding support for supervisor training focused on psychological safety.
- Exploring reforms to apprenticeship systems to reduce mobility and scheduling barriers.
- Supporting the creation of advancement pathways for underrepresented workers into supervisory roles.

These measures could help address the primary drivers of retention.

Education and Training Providers Actions

Academia, apprenticeship and training providers can:

a. Align training with decarbonization timelines and project demand

Education and training institutions can:

- Coordinate training schedules with public and private retrofit pipelines and identify critical skill gaps.
- Support modular, flexible training delivery tied to live projects.

b. Expand awareness and on ramps into green trades

To broaden participation in decarbonization careers, providers can:

- Invest in early-exposure programs, pre-apprenticeships, and school-to-site pathways.
- Communicate clear career pathways into green and decarbonization trades.
- Continue community-based recruitment and outreach, particularly for underrepresented groups.

The Canada Green Building Council's role

CAGBC will advance market transformation through targeted, industry-aligned education, workforce development, and national leadership on regulations and standards. We will convene industry, governments, and institutional partners to support alignment of performance standards and provide the evidence base needed to create predictable retrofit pipelines across Canada.

Grounded in established frameworks — including LEED® and the Zero Carbon Building Standards — and aligned with *CAGBC's policy guide*, we will translate system-level decarbonization goals into clear market signals. This includes expanding learning pathways that equip professionals with practical competencies in green building design, construction, and retrofits, and includes supporting SMEs.

To ensure Canada's workforce is positioned to meet growing market demand, CAGBC will:

- Identify critical skill gaps through industry consultation and labour market information (LMI).
- Develop targeted, evidence-based training that addresses identified workforce gaps and equips professionals with the competencies required to advance low-carbon building practices.
- Ensure learning pathways align with current and projected industry needs, live project demand, and decarbonization timelines.
- Partner with educational institutions, industry associations, and employers to align curricula with real-world project requirements.
- Publish periodic LMI briefs to inform policy development, workforce planning, and industry investment decisions.
- Advocate for greater harmonization of municipal and provincial green building policies to provide clarity, consistency, and a coordinated approach across jurisdictions.

Through sector leadership in advocacy, engagement, research, and training, CAGBC will help ensure Canada's green building workforce and regulatory environment are aligned to accelerate low-carbon building adoption at scale.

CONCLUSION

Strategic policy support, innovation, and targeted investment can unlock nearly $150 billion in GDP and create over a million green jobs by 2030, while also accelerating decarbonization, improving housing affordability, and strengthening community resilience.

Canada's green building sector is at a decisive inflection point, uniquely positioned to drive the nation's transition toward a prosperous, net-zero future. This report confirms that strategic policy support, regulatory improvements, innovation, and targeted investment can unlock nearly $150 billion in GDP and create over a million green jobs by 2030, while also accelerating decarbonization, improving housing affordability, and strengthening community resilience.

Achieving these economic outcomes is not guaranteed. A stable, long-term green building investment environment is necessary to facilitate market transformation. It also demands immediate action to strengthen the capacity of the green building workforce. Workforce training, inclusive mentorship, stable funding streams, and integrating inclusion into hiring and project delivery must be prioritized to close persistent labour gaps and ensure a just transition for all Canadians.

With broad alignment on technological pathways and a rising momentum for sustainable building practices, the magnitude of impact now rests on Canada's collective resolve to coordinate regulatory, financial, and workforce reforms. By embracing these recommendations, Canada's green building industry will not only meet its climate and housing obligations but also anchor sustainable growth and opportunity for generations to come.

APPENDICES

Appendix 1: Research overview and summary methodology

Research overview and methodology

This ***Decarbonization Pathways for the Green Building Workforce*** research project provided an assessment of the economic, environmental, and social impact of Canada's green building sector, with a primary focus on measuring the economic contribution of green building in Canada (GDP) and on sustainable jobs (job creation). The project builds on previous versions of this research, including the foundational methodology established in the 2020 edition, the original market assessment in 2016, and the 2022 *Green Retrofit Economy Study*. The 2025 research expanded on the scope to reflect emerging sector priorities, particularly the need for an inclusive workforce and the job potential and labour requirements for low carbon growth in the construction and building sectors. The research is designed to support decision-makers with timely insights into how the green building sector can contribute to Canada's climate objectives while also fostering equitable workforce development and economic opportunity.

At the heart of this work is an exploration of how likely decarbonization pathways will shape the supply and demand for skilled trades within Canada's green building sector. As CAGBC and its industry partners lead the transformation of the built environment, there is a growing need to understand the sector's evolving labour requirements - including the specific occupations, skills, and demographic considerations that will define a future-ready workforce. This is particularly relevant as Canada seeks to increase its housing supply and advance the construction industry.

The study was designed to answer the following research questions:

1. What is the growth potential for Canada's green building industry over the next 5 years?
2. What are the economic, environmental, and social contributions of Canada's green building industry, and what factors must be considered to optimize impact?
3. How can Canada's green building industry increase participation of underrepresented groups in the workforce and support a just transition?
4. How can Canada's green building industry help Canada meet its climate targets?
5. What are the key market trends and drivers accelerating Canada's shift to high-efficiency, zero-emissions buildings?
6. What are the decarbonizing pathways in Canada that affect demand for and supply of skilled tradespeople?

To address the six research questions, this study applied a mixed methods approach that integrated quantitative economic and GHG emissions modeling, structured and semi-structured qualitative research (interviews, surveys, and focus groups), and secondary research. Each method was aligned to a specific topic of inquiry. A secondary research review will inform the basis for all questions, ensuring that all methods build upon an extensive body of relevant research.

A quantitative economic model was built to answer Question 1 (*What is the growth potential for Canada's green building industry over the next 5 years?*) by applying green building intensity ratios to clean and environmental products through Statistics Canada's input-output macro-economic model and the related supply and use tables (see Appendix 2 for detail).

A baseline forecast for 2030 was developed, along with two additional "medium" and "high decarbonization" scenarios created in consultation with CAGBC. These scenarios incorporate assumptions related to policy, technology adoption, and market trends derived from secondary research, key informant interviews, and the project team's expertise.

A secondary research review informed the basis of questions 2 (*What are the economic, environmental, and social contributions of Canada's green building industry, and what factors must be considered to optimize impact?*), 4 (*How can Canada's green building industry help Canada meet its climate targets?*), and 6 (*What are the decarbonizing pathways in Canada that affect demand for and supply of skilled tradespeople?*), augmented by primary qualitative research (interviews, survey, and focus groups) and the project team's analysis to generate new insights. Question 2 drew exclusively on existing literature to summarize the sector's economic, environmental, and social benefits.

To explore themes of inclusion and equitable transition, Question 3 (*How can Canada's green building industry increase participation of underrepresented groups in the workforce and support a just transition?*) was addressed through industry-expert focus groups and anonymous surveys, co-designed with CAGBC. These highlighted opportunities and challenges faced by underrepresented groups within the green building workforce. Question 4 was addressed via secondary research and technical analysis. To support Questions 5 (*What are the key market trends and drivers accelerating Canada's shift to high-efficiency, zero-emissions buildings?*) and 6 (*What are the decarbonizing pathways in Canada that affect demand for and supply of skilled tradespeople?*), targeted interviews were conducted with industry experts. These interviews validated and enriched the findings from the literature review and contributed to creating the assumptions used in the decarbonization scenarios (modeled in Question 1). A focus group was also used to support Question 6 (*What are the decarbonizing pathways in Canada that affect demand for and supply of skilled tradespeople?*) to help understand the needs of the green building workforce under the decarbonization scenarios.

The stakeholder interviews aimed to gather valuable insights and feedback from key stakeholders in the building sector on existing pain points, opportunities, and hindrances that affect: 1. Canadian decarbonization pathways and related skilled tradespeople; and 2. underrepresented groups participating in the green building workforce in Canada. The data collected was used solely for the Project's research purposes and to prepare resulting research products/outputs (e.g. related report(s)) that aim to improve and address the challenges faced by: 1. decarbonization and related skilled tradespeople; and 2. underrepresented groups' representation, participation, and uptake in the green building sector.

Table A1: Research methods overview

Research Question	Secondary Research	Quantitative Analysis	Interviews	Focus Groups	Surveys
1	✓	✓	✓		
2	✓				
3	✓			✓	✓
4	✓	✓			
5	✓		✓		
6	✓		✓	✓	

Appendix 2: Quantifying the economic impact of green buildings – projecting green building job and GDP scenarios to 2030 (economic impact estimation)

Methodology overview

The statistical framework used in previous reports was refined to estimate the size and economic impact of Canada's green building sector. The underlying methodology used in this report is consistent with methods used in the 2020 *Canada's Green Building Engine*. Key updates were made including updating relevant NAICS codes to reflect new developments and expanding the analysis to include all provinces and territories. By leveraging intensity ratios and detailed data sources, the methodology quantifies green building activity, employment, and GDP across the value chain, while addressing regional and industry-specific characteristics.

Estimating the direct and indirect green building value chain

The statistical framework is based on defining relevant sub-industries that collectively comprise the 'Green Building Sector' based on North American Industry Classification System (NAICS) codes at the four-digit level. The green building economic model is built from Statistics Canada's supply and use tables, and estimated intensity ratios for each sub-industry, including:

Statistics Canada. Table 14-10-0220-01 Employment and average weekly earnings (including overtime) for all employees by industry, monthly, seasonally adjusted, Canada.

Statistics Canada. Table 36-10-0434-03 Gross domestic product (GDP) at basic prices, by industry, annual average (x 1,000,000).

Intensity ratios

Intensity ratios represent the estimated percentage of each industry that can be assumed as being dedicated to green building activity as defined in this research. The intensity ratios were estimated using green building and related engineering construction activities published by Statistics Canada clean and environmental product detailed tables. These Statistics Canada clean and environmental accounts are consistent with the NAICS terminology in the System of National Accounts (SNA) which facilitates the calculation of green intensity ratios for both employment and GDP.

The industry segments that are used in the Green Building Sector definition include:

- **Construction and Trades** (building construction, revocations, repair construction, and related construction engineering for land and municipal servicing)
- **Materials & Manufacturing** (wood products, plastics, cement, concrete, primary and fabricated metals, electronic equipment and machinery manufacturing.
- **Professional Services** (professional science and technical services, finance and insurance, architectural and engineering, administrative support and wholesale and retail services.)
- **Utilities** (electric power generation and sewage and other systems)
- **Waste & Recycling** (waste management and remediation services)
- **Policy & Education** (non-profit institutions, education services, federal, provincial, municipal and indigenous governments.

The following shows the average green intensity ratio for each industry segment. Individual ratios are used in the modeling for each sub-industry at NAICS code level.

Industry Segment	2024 Green Intensity Ratio
Utilities	14.66%
Construction & Trades	14.65%
Materials & Manufacturing	16.67%
Professional Services	4.91%
Waste & Recycling	22.06%
Policy & Education	2.68%

Growth scenarios

Three different growth scenarios were developed for green building jobs and GDP to quantify the potential for green building and related activity growth over the next five years to 2030.

Each scenario is constructed based on 5 key modeling factors, each estimated from industry and statistical sources:

- Green intensity ratio adjustment
- Investment growth
- Productivity gains
- GDP adjustment
- Labour adjustment

In each scenario, the model ramps up current intensity ratios and synthesizing medium term forecasts from sourced from key think tanks, research agencies, and government statistics. For example, construction data forecasts (building and engineering) are extracted from Build Force projections from 2024 to 2034. These forecasts were validated and compared to other leading forecast groups. These include construction forecasts prepared by the Canadian Occupational Projection System (COPS) model managed by Employment and Social Development Canada and the TD Bank.

Decarbonization pathways and anticipated policies are then factored in and refined for each scenario in the adjustment factors for green intensity ratio, investment and productivity.

Growth projections that informed our modelling

- Build Force Canada forecast that residential investment levels are projected to grow steadily between 2026 and 2034. Investment in residential renovations records a series of increases across the forecast period, with growth strongest in the later years.
- Non-residential construction investment, meanwhile, is projected to ebb and flow across the forecast period, in line with the timing of current and proposed major projects.
- The federal COPS model forecasts that construction real GDP is slated to grow at an average annual rate of 1.7 percent. On the non-residential side, investments in engineering structures are expected to be supported by energy and transportation projects.
- Employment is projected by COPS to increase by 1.5 percent annually. The housing shortage and the transition towards a greener infrastructure should provide “clean” job opportunities for the residential sector. Employment growth, however, will be limited by an aging workforce and a shortage of skilled workers.

Adjustment Factor	Low Growth	Moderate Growth	High Growth
Annual Intensity Ratio Adjustment	1.02	1.03	1.05
Annual Investment Growth	0.01	0.01	0.02
Annual Target Productivity Gains	0.002	0.025	0.035
Annual Adjustment Factor GDP	1.03	1.07	1.10
Annual Adjustment Factor Labour	1.03	1.04	1.07

Appendix 3: Green building industry NAICS

Industry code (NAICS), industry segment, and sub-industry

Utilities

- 2211 Electric power generation, transmission, and distribution
- 2212 Natural gas utilities

Construction & Trades

- 2361 Residential building construction
- 2362 Non-residential building construction
- 2371 Utility system construction
- 2372 Land Subdivision
- 2379 Other heavy and civil engineering construction
- 2381 Foundation, structure, and building exterior contractors
- 2382 Building equipment contractors
- 2383 Building finishing contractors
- 2389 Other specialty trade contractors

Materials & Manufacturing

- 3141 Textile furnishings mills
- 3211 Sawmills and wood preservations
- 3212 Veneer, plywood and engineered wood product manufacturing
- 3219 Other wood product manufacturing
- 3255 Paint, coating and adhesive manufacturing
- 3261 Plastic product manufacturing
- 3273 Cement and concrete product manufacturing
- 327 Non-metallic mineral product manufacturing (except cement and concrete
- 3323 Architectural and structural manufacturing
- 3324 Boiler, tank and shipping container manufacturing
- 3334 Ventilation, heating, air-conditioning and commercial refrigeration equipment manufacturing
- 3342 Communications equipment manufacturing
- 3344 Semiconductor and other electronic component manufacturing
- 3345 Navigational, measuring, and control instruments manufacturing
- 3351 Electric lighting equipment manufacturing
- 3353 Electrical equipment manufacturing
- 3359 Other electrical equipment and component manufacturing
- 3372 Office furniture (including fixtures) manufacturing
- 416 Building material and supplies wholesalers-distributors
- 444 Building material and garden equipment and suppliers dealers (retail)

Professional Services

- 5223 Activities related to credit intermediation (incl. mortgage brokers)
- 5241 Insurance carriers
- 5311 Lessors of real estate
- 5313 Activities related to real estate, including real estate agents and brokers
- 5413 Architectural, engineering and related services
- 5414 Specialized design services
- 5415 Computer systems design and related services
- 5416 Management, scientific and technical consulting services
- 5417 Scientific research and development services
- 561 Facilities services incl. services to buildings and dwellings

Waste & Recycling

4181 Recyclable material wholesaler-distributors
562 Waste management and remediation services

Policy & Education

6112 Community colleges and C.E.G.E.P.s
6113 Universities
6115 Technical and trade schools
813 Grant-making, civic, and professional organizations
911 Other federal services
912 Provincial and territorial public administration (9121 to 9129)
913 Local, municipal and regional public administration (9131 to 9139)
914 Aboriginal public administration

Appendix 4: Provincial results

The following shows the full results by Province for Jobs and GDP.

	Jobs (Low)		GDP (Low)	
Provinces	2024	2030	2024	2030
Canada	501,716	602,330	80,790,714	98,127,058
BC	80,818	97,025	$13,307,392	16,162,936
AB	57,715	69,289	$9,263,147	11,250,864
SK	9,854	11,831	$1,552,272	1,885,364
MB	14,525	17,438	$2,551,248	3,098,703
ON	217,419	261,020	$33,086,368	40,186,152
QC	94,512	113,466	$15,921,187	19,337,609
NB	8,217	9,865	$1,809,016	2,197,201
NS	10,376	12,457	$1,890,584	2,296,271
PEI	1,127	1,353	$186,981	227,104
NL	5,712	6,857	$959,479	1,165,367
YT	621	745	$119,594	145,257
NWT	539	647	$88,289	107,235
NU	281	338	$55,159	66,995

	Jobs (Moderate)		GDP (Moderate)	
Provinces	2024	2030	2024	2030
Canada	501,716	634,831	80,790,714	117,885,148
BC	80,818	102,260	$13,307,392	19,417,378
AB	57,715	73,028	$9,263,147	13,516,249
SK	9,854	12,469	$1,552,272	2,264,985
MB	14,525	18,379	$2,551,248	3,722,633
ON	217,419	275,104	$33,086,368	48,277,719
QC	94,512	119,588	$15,921,187	23,231,277
NB	8,217	10,397	$1,809,016	2,639,612
NS	10,376	13,129	$1,890,584	2,758,631
PEI	1,127	1,426	$186,981	272,832
NL	5,712	7,227	$959,479	1,400,016
YT	621	785	$119,594	174,504
NWT	539	682	$88,289	128,827
NU	281	356	$55,159	80,485

	Jobs (High)		GDP (High)	
Provinces	2024	2030	2024	2030
Canada	501,716	748,518	80,790,714	146,237,265
BC	80,818	120,573	$13,307,392	24,087,379
AB	57,715	86,106	$9,263,147	16,766,992
SK	9,854	14,702	$1,552,272	2,809,729
MB	14,525	21,671	$2,551,248	4,617,950
ON	217,419	324,371	$33,086,368	59,888,813
QC	94,512	141,004	$15,921,187	28,818,545
NB	8,217	12,259	$1,809,016	3,274,455
NS	10,376	15,480	$1,890,584	3,422,098
PEI	1,127	1,681	$186,981	338,450
NL	5,712	8,521	$959,479	1,736,729
YT	621	926	$119,594	216,474
NWT	539	804	$88,289	159,810
NU	281	420	$55,159	99,842

Appendix 5: Focus groups, interviews and surveys

To capture a diversity of perspectives across stakeholder groups and inform the analysis, the project included three qualitative methods: focus groups, interviews and surveys.

Qualitative Research Methods: We expected to recruit up to 40 Participants for the focus groups (we ended up recruiting 11 participants), and we included a wide range of experiences from key green building workforce sectors, such as:

- The public sector;
- The private sector;
- Design and construction sectors;
- Sustainable development sectors;
- Decarbonization sectors;
- Workforce development;
- Skilled-trade sectors; and
- Researchers.

Participants were selected based on their professional experience and/or affiliation(s). Although Participants may identify as part of an underrepresented group (which can helpfully inform their contributions), this research did not require Participants to have that or another analogous personal characteristic.

We were specifically looking for Participants who fell into one of two groups of industry professionals for the focus groups:

Group 1: Decarbonization pathways in construction. The central topic of discussion for this focus group was decarbonization pathways in Canada, and the goal was to seek recommendations and professional insight on the externalities that affect demand for, and supply of, skilled tradespeople. This group looked holistically at factors affecting decarbonization of the building sector, including: updates to the National Building Code and provincial adoption of the 2025 version; investor expectations related to environmental performance in the commercial real estate sector; other provincial and municipal building policies and incentives; and market demand for green building.

Group 2: Underrepresented groups in construction. The central topic of discussion for this focus group was on documenting existing strategies to support underrepresented groups in the green building workforce. The goal was to discuss existing and potential strategies and make recommendations for how to increase the participation and representation of underrepresented groups in the green building industry.

Focus groups

The research procedure included the following:

1. We conducted a focus group interview that lasted about one (1) hour. This session included questions focusing on the general questions/themes of the research. This allowed us to assess and propose ways forward for decarbonization pathway issues and the inclusion and participation of underrepresented groups in the green building workforce.
2. The focus group was conducted via Zoom. Zoom had implemented technical, administrative, and physical safeguards to protect the information provided via their internet services from loss, misuse, and unauthorized access, disclosure, alteration, or destruction. However, please be aware that no internet transmission can ever be fully secure or error free.
3. The focus group interview was audio recorded through Zoom to ensure an accurate capture of the information provided. If technical issues prevented a good quality recording of the session through Zoom, the interviewer(s) was to obtain the Participants' consent for using an alternative method instead.
4. The audio recordings were transcribed, with the final version de-identified to maintain confidentiality. Once a recording's transcription and de-identification was complete, the raw audio recording was deleted. The final de-identified versions of the focus group interview transcripts will be kept for at least six years as part of the Project's research data (as discussed below in the "Privacy and confidentiality" section).

Interviews

Semi-structured interviews were conducted with subject matter experts, industry leaders, government representatives, and academics. These interviews were designed to explore specific themes in greater depth—such as decarbonization scenarios, workforce projections, or training innovation—and to validate or challenge preliminary findings from the economic modelling and literature review.

Surveys

The survey gathered perceptions on labour market challenges, inclusion of underrepresented groups, best practices, and emerging trends. Most questions were closed-ended (e.g., multiple choice, scales), with a limited number of open-response questions to allow for deeper insight.

GLOSSARY

Decarbonization

In the context of buildings, this term refers to reducing or eliminating carbon dioxide emissions and other GHGs produced by a building.

Decarbonization Pathways

As defined in the participant consent forms: “Decarbonization pathways refer to shifting technology and energy systems from fossil fuels to renewables, aiming to meet emissions targets in construction.”

A more detailed definition used in this report is as follows: Decarbonization pathways are trajectories for different levels of low carbon activity in the green building sector over time that contribute to lowering the total greenhouse gas emissions of Canada’s building sector (‘decarbonization’). Pathways entail a holistic examination of factors affecting decarbonization of the building sector, including polices and market conditions such as: updates to the National Building Code and provincial adoption of the 2025 version; investor expectations related to environmental performance in the commercial real estate sector; other provincial and municipal building policies and incentives; and market demand for green buildings. These pathways in turn affect demand for, and supply of, skilled tradespeople.

Deep Energy Retrofit

A comprehensive and extensive renovation or upgrade of a building’s systems, equipment, and enclosure with a focus on energy efficiency and emission reduction.

Electrification

The replacement of systems that use fossil fuels (natural gas or fuel oil) with those that use electricity as their energy source.

GDP

A standard macroeconomic indicator representing the total monetary value of all final goods and services produced within a country’s borders over a specified period. In this report, GDP refers to the aggregate value of economic output in a given country or region over a set time period, expressed in monetary terms, and used to compare market size and growth.

Green Building

A green building is any new or existing building that is designed, constructed and/or renovated and operated to achieve clearly defined environmental and other sustainable objectives that are measurably above code, often adhering to industry standards (e.g., LEED®), stepped or tiered codes, and green building policies. Further, a new or existing green building typically has one or more of the following attributes:

- Reduced GHG emissions from building construction and operation
- Efficient use of energy, water and other resources
- Use of renewable energy, such as solar energy
- Pollution and waste reduction measures, and the enabling of re-use and recycling
- Excellent indoor air quality
- Use of non-toxic, ethical, and sustainable materials
- Consideration of occupant quality of life in design, construction, and operation
- Adaptable to a changing environment
- Consideration for additional environmental outcomes.

Induced Impact

Induced impact refers to economic effects, including job creation, that occur in the broader economy as a result of household spending by workers employed in the green building industry. These impacts arise from wages spent on goods and services such as housing, food, transportation, and healthcare, and are distinct from direct impacts associated with green building jobs and indirect impacts generated through the green building supply chain.

Intensity Ratios

Intensity ratios represent the estimated percentage of each industry that can be assumed as being dedicated to green building activity as defined in this research. These intensity ratios were developed for each industry that comprise Canada's full green building sector value chain according to its North American Industry Classification System (NAICS111) code at the three- or four-digit level. Provincial nuances were factored into the intensity ratios. Intensity ratios were then applied to each of these NAICS codes to estimate green building jobs and GDP by province or territory from total employment for each subsector.

Net-Zero Energy-Ready (NZER)

Refers to buildings designed and constructed to achieve net-zero energy performance. They rely on a strong envelope – tight air sealing, better insulation, and efficient windows and doors – to cut heat loss and make it possible to use smaller, more efficient heating and hot water equipment, and typically have infrastructure ready for on-site renewable energy integration like solar panels.

SME

Denotes Small and Medium-sized Enterprises (between one to 499 paid employees) – key players in green building supply chains.

Underrepresented Groups

For the purposes of this study, underrepresented groups consist of women, youth, LGBTQ2S+ individuals, Indigenous peoples, racialized communities, and newcomers to Canada.

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