

# CANADA'S GREEN BUILDING ENGINE

Market Impact and Opportunities in a Critical Decade



## ACKNOWLEDGMENTS

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## About Canada Green Building Council

The Canada Green Building Council ([cagbc.org](http://cagbc.org)) is a leading national non-partisan not-for-profit organization dedicated to accelerating the transformation to high-performing, healthy green buildings, homes, and communities throughout Canada. CaGBC is a leading green building education provider and conducts extensive research on key environmental and economic issues associated with green building. CaGBC helps governments identify and lower barriers to green building, owners and operators adapt to change, and companies identify and leverage opportunities in the green building marketplace.



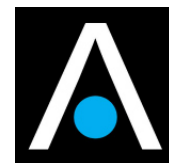
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## About the Consultants

The Delphi Group ([delphi.ca](http://delphi.ca)) produced the quantitative research data and analysis at the core of this report. The Delphi Group is a Canadian strategic consultancy providing innovative solutions in climate change and corporate sustainability. As a pioneer in sustainability and environmental risk management, The Delphi Group has more than 30 years of experience helping some of Canada's best-known companies improve the sustainability of their organizations – as well as the local and global communities in which they operate.

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## Executive Summary

This report serves as the definitive account of the impacts of – and opportunities offered by – Canada’s green building industry today and in the coming critical decade. It quantifies the industry’s growth and significant and far-reaching economic, environmental, and social contributions. It also outlines how a COVID-19 pandemic recovery plan centred on green buildings could create almost 1.5 million jobs all across Canada by 2030 while helping to ensure our nation meets its climate targets. Finally, this report spotlights key market trends and drivers that are already enabling and accelerating the country’s shift to high efficiency, zero-emissions buildings, and examines how each could impact Canada’s green building industry.

For a 90-second video summary of this report’s top findings, please visit: [CaGBC.org/greenrecovery](https://CaGBC.org/greenrecovery)

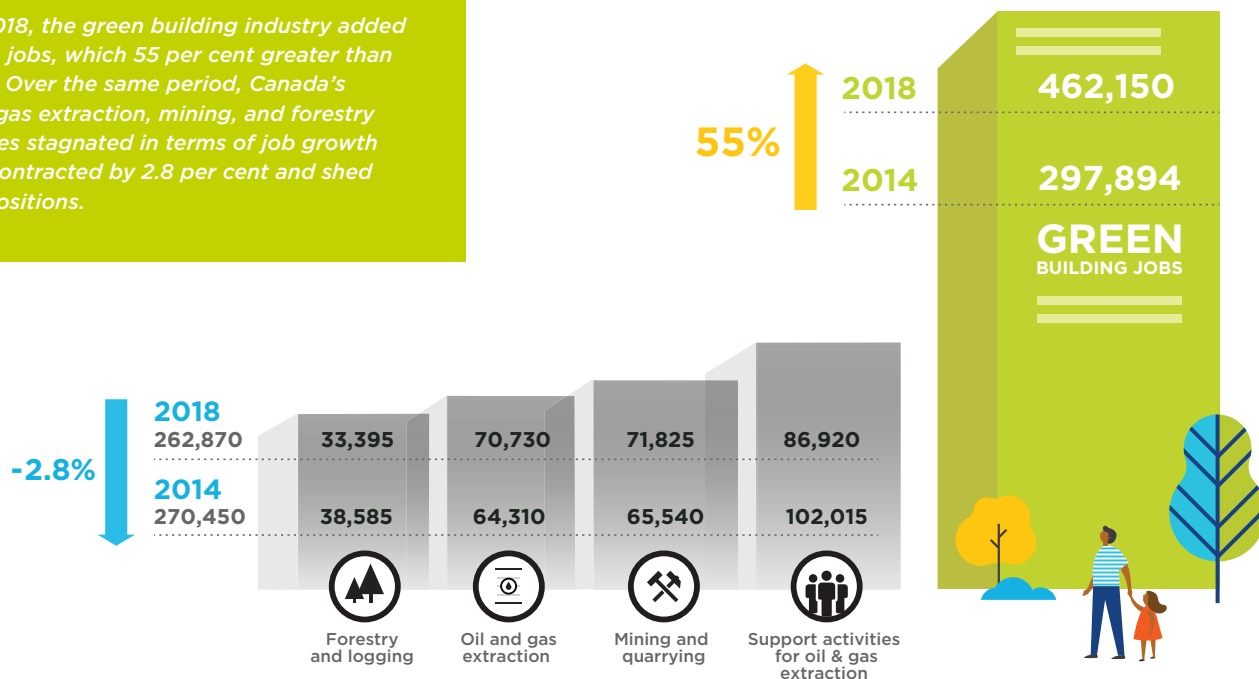
### Canada’s Green Building Sector Today

Since the first edition of this market assessment was produced four years ago, Canada’s green building industry has grown and matured into a significant economic force.

As of 2018, the most recent year for which complete data is available, the industry employed 462,150 direct full-time workers. That number is substantially higher than job counts in the natural-resource sectors that many have long considered pillars of the economy. For example, the green building sector employs almost 200,000 more Canadians than the oil and gas extraction, mining, and forestry sectors combined.

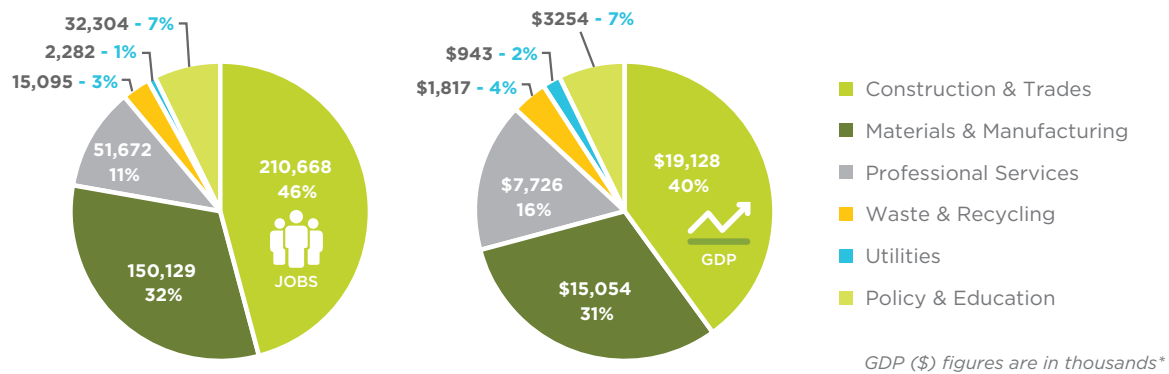
**Figure 1: Canadian Green Building Job Growth Compared to Other Key Industries**

*As of 2018, the green building industry added 164,260 jobs, which 55 per cent greater than in 2014. Over the same period, Canada’s oil and gas extraction, mining, and forestry industries stagnated in terms of job growth – they contracted by 2.8 per cent and shed 7,580 positions.*



While total job counts have grown across most industries, reflecting growth in the overall economy and labour force over that time period, the percentage of a given industry devoted to green building activity has soared. We attribute this to improved building codes, increased market penetration and adoption of energy-efficient products and materials, and to the somewhat recent sharp increase in awareness of the causes and impacts of climate change.

**Figure 2: Green Building Jobs and GDP by Sector (2018)**



On a dollars and cents basis, the green building industry more than doubled between 2014 and 2018, growing from \$23.4 billion to approximately \$47.9 billion in gross domestic product. Though every province and territory is reaping the benefits of green building, in descending order, Ontario, Quebec, and British Columbia employ the most green-building workers, and the green building sectors in those provinces contribute more to provincial GDP than their peers.

Ontario leads the nation in the green building industry's economic contribution, with 227,938 direct green building industry jobs and a \$22.7 billion direct contribution to GDP. Quebec follows, with 74,754 direct green building jobs and a \$7.5 billion direct GDP contribution. British Columbia rounds out the top three with 71,914 direct jobs and \$8 billion GDP.

We attribute variations in green building economic activity between provinces to the amount of investment and green-building certification activity as a percent of total construction activity in those jurisdictions. Provinces with more progressive building codes and municipal bylaws show a higher overall level of green building economic activity.

New construction remains almost 80 per cent of all green building activity. However, existing buildings represent a critical growth opportunity for the industry. The increasingly urgent climate challenge will drive this work; according to Natural Resources Canada and Environment and Climate Change Canada, Canada has approximately 2.9 billion square metres<sup>1</sup> of largely inefficient building and homes that contribute 17 per cent to the nation's overall greenhouse gas (GHG) emissions,<sup>2</sup> but closer to 30 per cent when construction and materials are considered.<sup>3</sup>

1 Natural Resources Canada. "Residential Housing Stock and Floor Space." Retrieved from <https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=HB&sector=res&juris=00&rn=11&page=0#sources> and "Commercial/Institutional Energy Prices and Background Indicators." Retrieved from <https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=HB&sector=com&juris=00&rn=7&page=0#sources>

2 Environment and Climate Change Canada (2016). "Pan-Canadian Framework on Clean Growth and Climate Change: Canada's Plan to Address Climate Change and Grow the Economy," p. 14.

3 United Nations Environment Programme (2019). 2019 Global Status Report for Buildings and Construction: Towards a Zero-Emission, Efficient and Resilient Buildings and Construction Sector, p. 9.

As of 2018, green retrofits yielded only one in five jobs in green building construction and trades, or 45,053 positions. To prosper in the coming critical decade while meeting the climate challenge, Canada will need to develop a strong retrofit economy – a prosperous ecosystem of private, public, and non-governmental actors.

## Role of Certifications and Building Codes

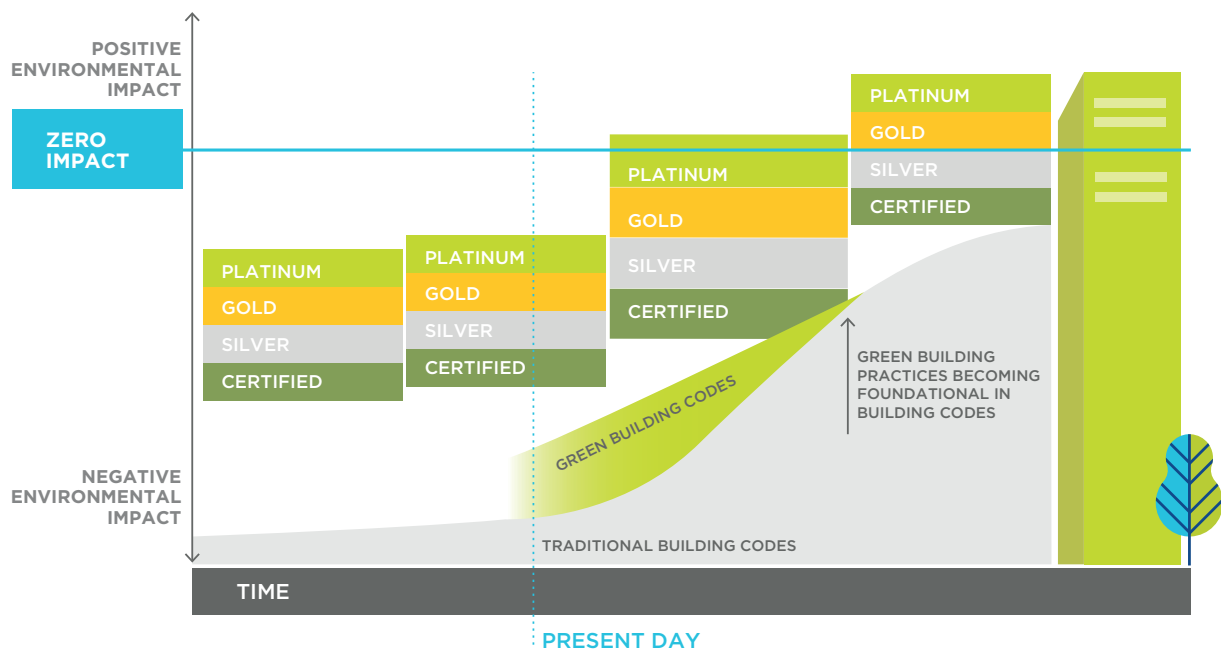
Green building certification programs are not only growing increasingly stringent, but also broadening in scope. Over the past decade, they have raised the bar on energy efficiency, renewable energy, and sustainability practices. By extension, they have changed the way Canadians design, construct, maintain, and operate buildings.

Third-party certifications also play a quality-assurance role because the bodies that oversee these certifications are, by definition, independent of a project team, and can spot issues in construction documentation that others may overlook.

Canadians have grown conscious of a broader range of social and environmental challenges. This shift, and resulting public pressure, have in turn, spurred policy-makers and industry leaders to raise the bar on sustainability – leading to increased government activity and higher standards for both building codes and industry certifications. Both mandatory and voluntary green building programs have proliferated across the country and are increasingly becoming mainstream industry standards and practices, especially in Class A commercial buildings.

Voluntary certifications have demonstrated what is possible, and given governments the confidence to embrace higher levels of regulation. They will continue to push the envelope of possibility.

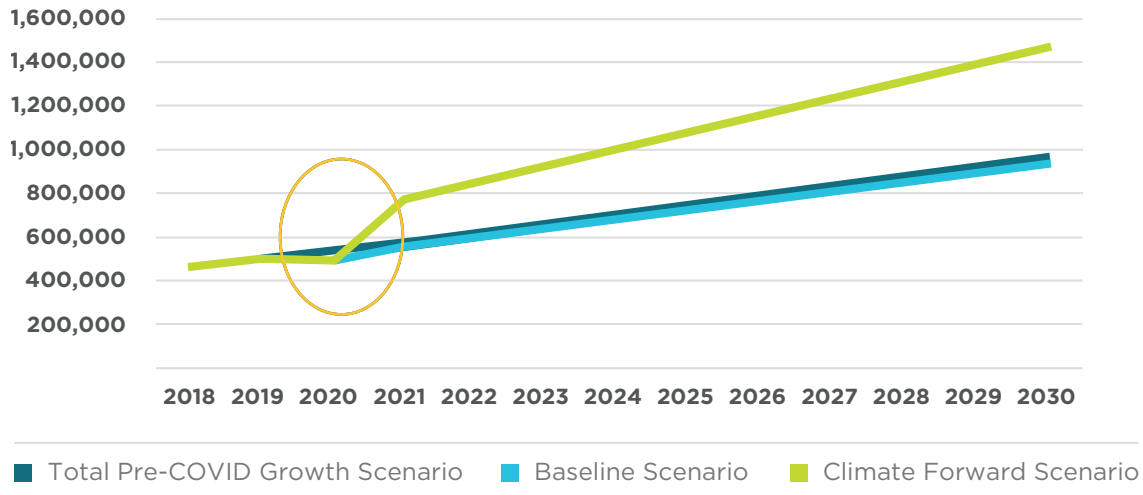
**Figure 3: Impact of Green Building Certification and Building Codes over Time**



## The Critical Decade

CaGBC commissioned the scenario modelling work underpinning this report to gain fresh insights into the size and growth of Canada's green building industry. However, the onset of the COVID-19 pandemic – and the prospect of potentially unprecedented public stimulus investments – spurred a revisit and a broadening of the scope of inquiry. The following scenarios were eventually arrived at:

**Figure 4: Green Building Job Growth (2018-2030)**



### *Pre-COVID-19 Scenario*

This scenario is based on economic and industry growth projections as of January 2020, considering existing and announced climate strategies, targets, and building code updates. Assumptions include that provinces and local governments will continue to implement their plans to move to zero carbon construction practices and green building retrofits.

### *Baseline Scenario*

This scenario considers existing and announced climate strategies, targets, and building code updates, but adjusts them for the impacts of COVID-19 and the subsequent oil price collapse. It assumes that the movement toward zero carbon construction and green building retrofits slows to some degree in certain provinces.

### *Climate Forward Scenario*

This scenario assumes governments adopt a green-building-focused recovery program that serves to both reboot the economy while ensuring Canada meets its 2030 climate target. It includes accelerated investments in net zero carbon new construction and increased investment into green building retrofits. It also assumes governments focus any future pandemic response stimulus packages on green building while making significant investments in climate mitigation and adaptation.

Figure 5: Impact of the Climate Forward Scenario

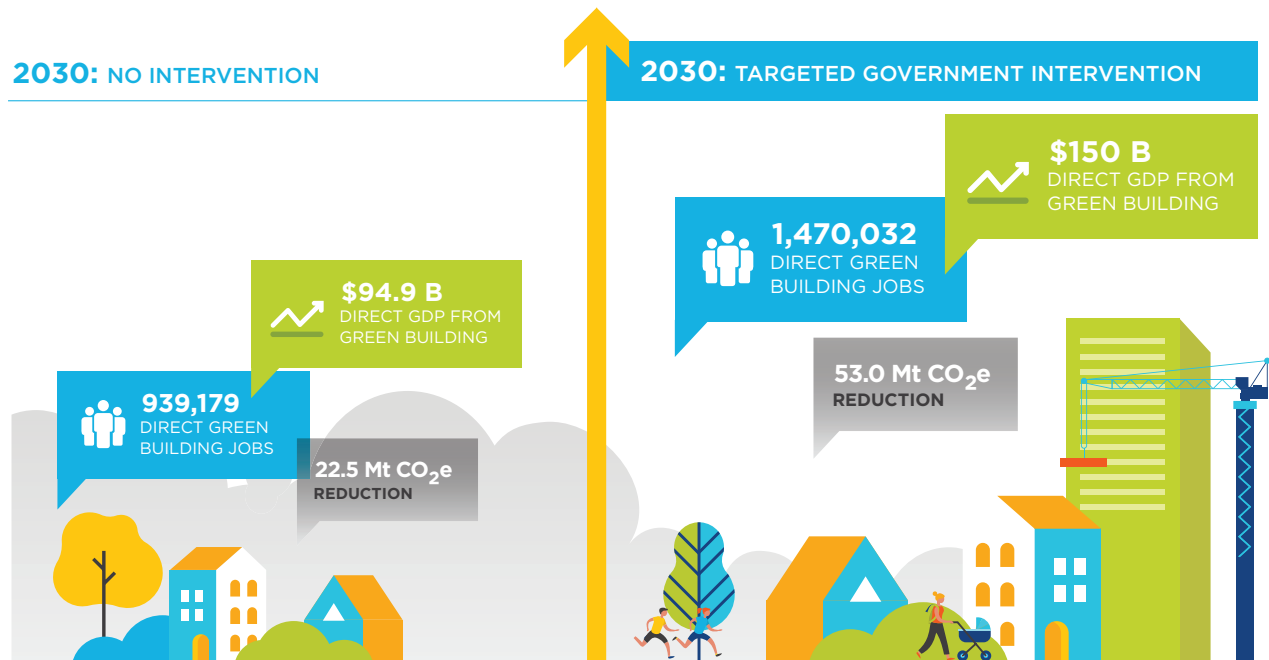
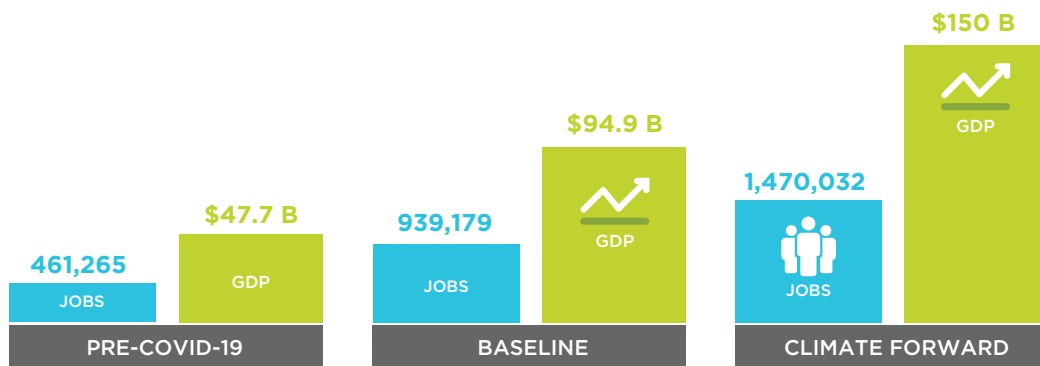


Figure 6: Green Building GDP and Job Growth (2030)



The results demonstrate that the sector can and must play a leading role in this critical decade for climate action. Without targeted government intervention, by 2030, Canada can expect 939,179 direct jobs in green building, a reduction of 22.5 megatonnes of carbon-dioxide equivalent (Mt CO<sub>2</sub>e) that year compared with 2018 levels, and \$94.9 billion in direct GDP from green building investments.

In contrast, under the Climate Forward scenario, by 2030, Canada could expect 1,470,032 direct jobs in green building and a 53 Mt CO<sub>2</sub>e reduction compared with 2018 levels. The green building industry would also contribute \$150 billion in direct GDP.

Should governments take targeted action to support green building efforts and directly link stimulus spending to climate change mitigation and adaptation, they would lead the country to a green

recovery. That approach would both revitalize the economy and ensure we meet our 2030 climate target. Canada's construction and infrastructure development sectors will be at the forefront of the low-carbon transition, as the sectors represent more than seven per cent of our GDP and almost 30 per cent of our GHG emissions when operations, construction and materials are considered.

To ensure Canada is prepared for the future with a strong economy that benefits everyone, new funding allocations must provide a sustainable benefit for diverse, future generations. Prioritizing public investment in green buildings will help alleviate the nation's economic burden while decreasing unemployment rates. Developing a comprehensive investment pipeline of shovel-worthy projects will maximize the opportunity. Shovel-worthy projects will also provide a positive return on investment and ensure a speedy and safe recovery.

A green recovery would lead to 530,853 more direct green building jobs in 2030 and an additional \$55 billion in direct GDP. It would also avert the release of over 30 Mt CO<sub>2</sub>e by 2030 when compared with 2018. By making smart investments in the green building sector today, the federal government could help meet its 2030 climate target while adding more than \$100 billion in direct GDP to the economy over and above 2018 levels.

## Status Quo and Outlook for Green Building Jobs and GDP

The green building industry is active in all provinces and territories. In our modelling, Ontario and British Columbia (both at around three per cent) show the greatest share of green building jobs as a percentage of total employment across the economy – as well as the highest percentage of green activity within construction and trades. In Ontario, 23 per cent of construction jobs are green-building related; in British Columbia the corresponding figure is 19 per cent. Overall, 17 per cent of Canada's construction jobs in 2018 were green building related, which equals 210,668 construction jobs.

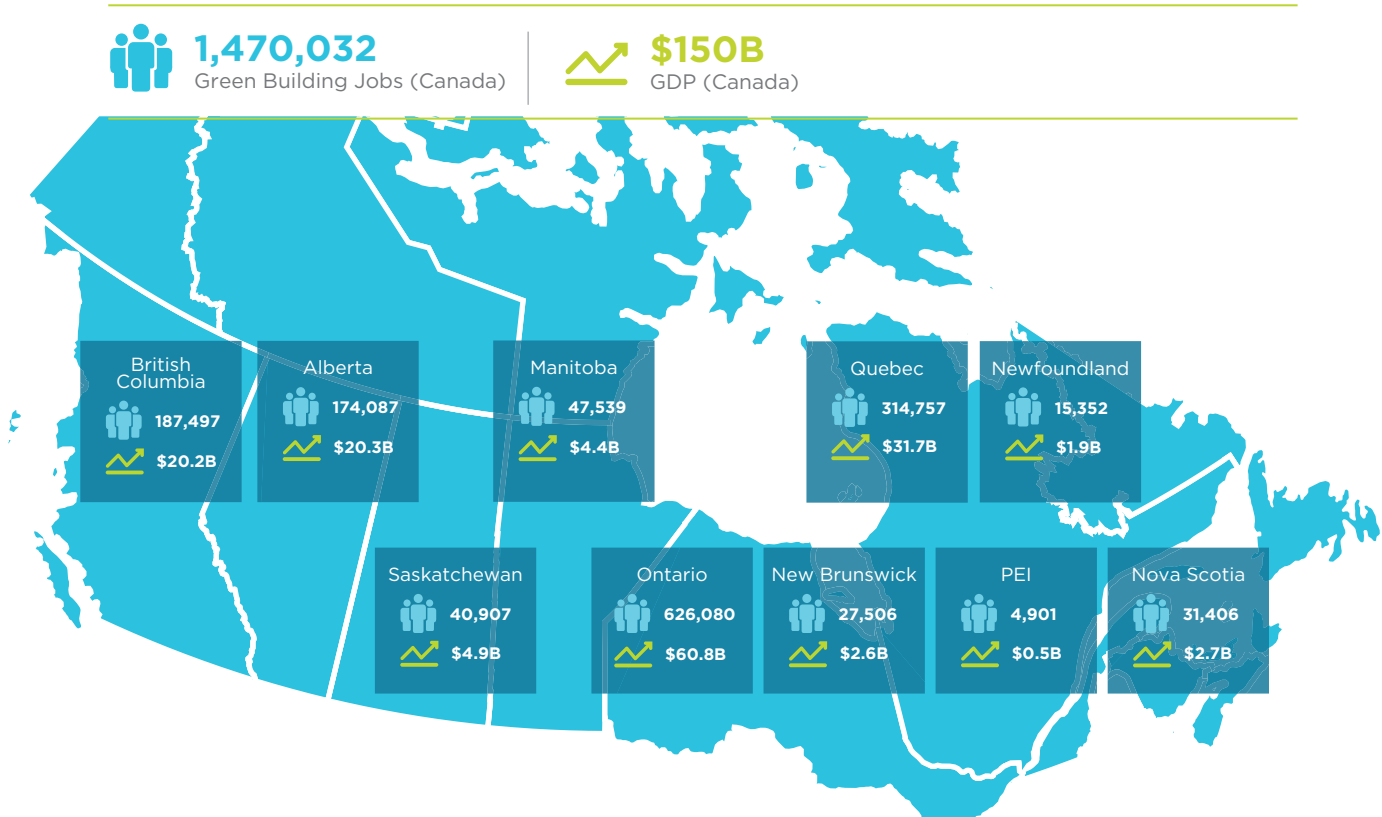
It is expected that the percentage of green building construction jobs to total construction jobs will grow dramatically in all provinces between 2020 and 2030. Nationwide, growth is expected from 17 per cent to 57 per cent.

Companies active in green building **Construction and Trades** account for the largest percentage (46 per cent) of Canada's green building employment – close to one fifth – of Canada's total construction workforce. Green building business activity in Construction and Trades contributes about \$19.13 billion dollars, or about 40 per cent, of total green-building GDP.





Figure 7: 2030 Direct Green Building Jobs and GDP by Province in the Climate Forward Scenario



## Leading Trends and Drivers

A number of trends and drivers are accelerating and informing the shift to high-performance green buildings in Canada. They include:

**Climate Change:** Green buildings will play a leading role in both reducing GHG emissions and responding to the new challenges of a warmer world. Builders and developers will look to new technologies and strategies to reduce the energy required to build their projects. Canada's buildings will also play a role in responding to the impacts of climate change. Buildings will need to keep cool through summer heatwaves, protect their occupants from extreme wind and rain, and be hardened against potential structural damage from soil subsidence.

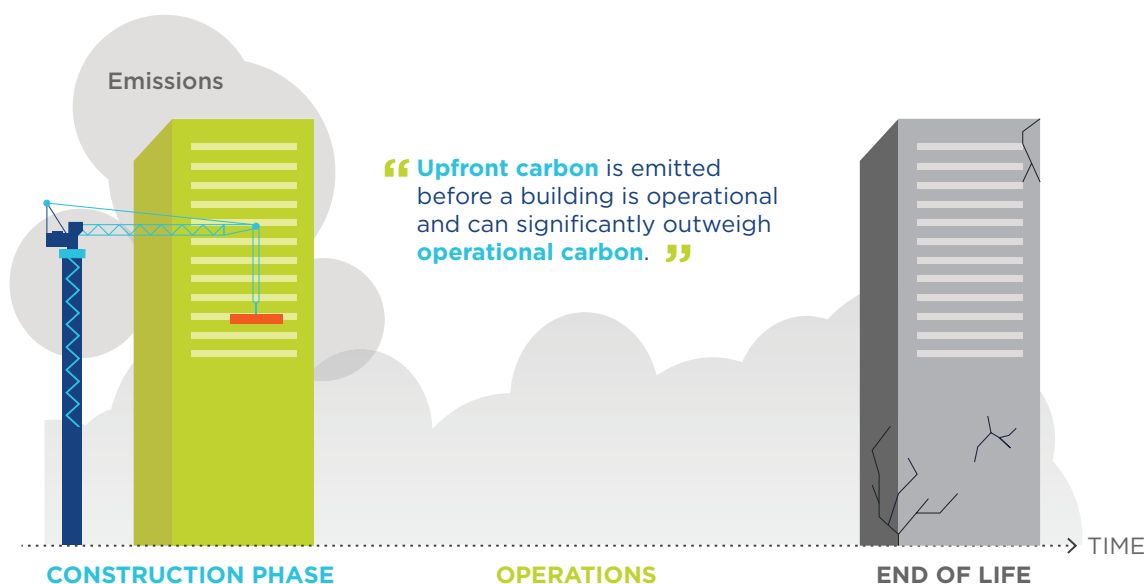
**The Circular Economy:** The "take-make-dispose" economic model is fundamentally at odds with a low- to zero carbon energy and material efficient society. Circular economy advocates support a model that designs out waste and pollution, keeps products and materials in circulation, and regenerates natural systems.

**Healthy, Equal, and Inclusive Buildings:** Green buildings can deliver social sustainability and physical and mental health benefits. They either reduce or eliminate a range of indoor pollutants and contaminants and encourage better physical and mental health. In the coming years, we expect green buildings will more consistently and reliably support diversity, equity, inclusion, and justice to truly welcome everyone.

**The Retrofit Economy:** The process and practice of retrofitting existing buildings offers the building sector a cost-effective opportunity to meet its GHG targets. Governments should establish the appropriate market infrastructure to create a self-sustaining retrofit economy that would yield industry-trusted standards, methodologies, and certifications, as well as access to financing.

**Embodied Carbon and Sustainable Materials:** Embodied carbon emissions arise from the manufacture, transport, installation, use, and end-of-life processing of the materials that collectively constitute a building. Calculations of a given material's embodied carbon typically considers the carbon intensity of its manufacturing process, the modes and distances by which it is transported to the job site, and the processes by which it is constructed, maintained, and ultimately removed and handled at the end of the building's life.

**Figure 8: Impact of Upfront and Operational Carbon Emissions**



**Digitization and Smart Buildings:** Digitally controlled mechanical and electrical systems will grow both more sophisticated and more intuitive to use in the years ahead. Building automation helps improve occupant comfort, ensure efficient building systems are performing as expected, and can reduce energy consumption and operating costs. These technologies will also give building operators the tools and information they'll need to make smarter choices.

**Energy Storage and Resiliency:** Energy storage not only smooths out the inherent variability of wind and solar generation, it serves as a backup energy supply in the event of a severe storm or extremely hot or cold weather. Thermal energy storage allows excess thermal energy to be accessed hours, days, or even months after it is produced. As for chemical storage, lithium ion batteries are becoming increasingly accessible and available to the building industry thanks to an innovation push from the electric car industry.

## Opportunities to Build a New Economy – Call to Action

In summary, Canada's green building industry is creating healthier and more comfortable places to work, live, learn, and play. It is also creating opportunity. The green building industry today contributes approximately \$48 billion in GDP to Canada's economy. It directly employs almost twice as many full-time workers as the country's oil and gas extraction, mining, and forestry sectors combined. However, despite significant improvements in building codes and policies, as well as the strong market uptake of LEED® and similar certification programs, green building still has a long way to go to become mainstream.

A large percentage of Canada's buildings continue to be constructed without green building practices or third-party certification. Building codes and municipal bylaws in provinces such as British Columbia are driving market transformation via new construction. Still, the existing building market remains the most significant untapped opportunity for economic development, job creation, and GHG reductions.

The building sector can lead the way through a green recovery by creating skilled jobs and driving innovation that will grow the low-carbon economy within the coming years, yielding significant emissions reductions and job creation as part of the economic recovery. Investments in green building can be a key driver of the COVID-19 pandemic recovery and could provide a return on investment that would uniquely benefit Canadians.

Green building investment would create a great deal of good in this country: Skilled job creation, an increase in low-carbon innovation, and buildings and homes that are healthier, less expensive to operate, and more resilient and responsive to our shared environmental and climate change challenges.



If you support this vision, please join the growing chorus of green building professionals who are calling for a green recovery focused on green buildings, via [CaGBC.org/greenrecovery](https://CaGBC.org/greenrecovery)



For more information, please visit:  
[CaGBC.org/greenrecovery](https://CaGBC.org/greenrecovery)