



Canadian
Construction
Association

Climate resilience in construction: **Building for a sustainable future**

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1.0 Introduction

The past few years have witnessed a remarkable surge of activity towards achieving greater sustainability. In a bid to confront the urgent challenges posed by climate change, Canada's construction industry is embracing innovative strategies and technologies to mitigate its environmental impact while fostering resilience and strength in infrastructure maintenance and development.

From the heightened adoption of renewable energy sources to the widespread implementation of green building standards and the use of new technology and materials, the Canadian construction sector has thoroughly demonstrated a commitment to reducing its carbon footprint and enhancing environmental performance.

We have also experienced greater collaboration aimed at accelerating the transition to a carbon-neutral built environment. Governments, industry associations, academia, and corporations have joined forces to promote knowledge sharing, incentivize sustainable practices, establish ambitious emissions reduction goals, and improve energy efficiency.

In 2021, the Canadian Construction Association (CCA) released "Strength, Resilience, Sustainability,"¹ a first of its kind report for the industry, shedding light on the challenges and opportunities facing the sector in its journey towards environmental stewardship. It also outlined the requisite partnerships and policy changes needed to reach Canada's emissions targets for 2030 and 2050, while making the case for essential investments in resilient infrastructure to ensure its protection.

This new report builds upon the previous discussion, highlighting where progress has been made by both industry and governments. It surveys national and international research and data to explore the linkages between climate risk and infrastructure decisions; the cost of addressing the issue; how other jurisdictions are responding to the same challenges; and efforts already underway in the Canadian construction industry.

While the research demonstrates that the construction industry has made substantial strides in aligning its practices with domestic and global climate objectives, challenges persist. The ongoing effects of climate change, combined with the imperative to meet growing infrastructure demands despite inadequate funding and long-term planning, underscore the need for continued adaptation within the construction sector as well as the essential role of ongoing partnerships with governments.

This report aims to provide a comprehensive overview of the construction industry's journey in addressing climate change, highlighting key developments, best practices, and areas for future growth. By examining the successes and lessons learned, we seek to inspire further collaboration and drive transformative change toward a more sustainable and resilient built environment. We will also provide updates on new steps taken, the collaborative work done to date, and highlight areas where improvement is still needed.

As the construction industry charts its course towards building a greener, more sustainable future for Canadians, the collaboration of all stakeholders will be crucial as we work towards building a resilient environment that can withstand the challenges of climate change for generations to come.

2.0 Our industry, our footprint, our potential

CCA is the national voice for the construction industry in Canada, representing over 18,000 member firms in an integrated structure of 64 local and provincial construction associations. Construction employs over 1.6 million people in Canada and generates roughly \$165 billion to the economy annually, accounting for 7.5 per cent of Canada's gross domestic product (GDP). It is truly the backbone of the Canadian economy.

With buildings representing almost 40 per cent of global greenhouse (GHG) emissions, in addition to the impact of the heavy civil industry, the Canadian construction sector has been taking bold steps towards sustainability in the years preceding and since the release of CCA's original report in 2021. Considerable work is underway on innovative solutions to climate challenges by our diverse membership. As the industry's national advocate, CCA has also been highlighting the direct linkages between consistent investment by all levels of government in sustainable infrastructure and the resultant decrease in GHG emissions country-wide.

CCA has been providing guidance and industry insight on this at increasing volume, providing submissions to the National Building Code, Greening Government Strategy, National Infrastructure Assessment, the Canada Green Buildings Strategy, and a myriad of other federal consultations in recent years. CCA has also done a number of collaborative projects in tandem with a large group of partners, such as the Canada Infrastructure Report Card² in 2012, 2016, and 2019, which looked at the state of Canada's public infrastructure across seven core public infrastructure asset categories: roads and bridges; culture, recreation and sports facilities; potable water; wastewater; stormwater; public transit; and solid waste using the data of the voluntary federally administered Canadian Core Public Infrastructure Survey (CCPIS) through Infrastructure Canada and Statistics Canada.³ The key takeaways of that report are that a significant amount of public infrastructure in Canada was aging and in poor condition—reinforcing the urgent need for long-term investments in infrastructure renewal to meet the needs of Canadians, a need that has only been exacerbated by the sharp uptick of extreme weather events in the years since, as well as Canada's increasing population and housing needs.

While COVID-era investments in infrastructure helped prevent a post-pandemic recession and kept the industry strong, a much longer-term pipeline of projects for stability and to ensure resilience will be required. A comprehensive federal infrastructure investment strategy is essential in order to provide confidence for our members to invest in new technology, convert to low-carbon materials, and train staff. CCA's Q4, 2023 edition of its ICIC Construction Sector Quarterly Insights expands on the connection between infrastructure investment and emission reduction.

Among its key findings:

- Since 2009, the rate at which emissions have increased is slower than the growth in the level of investment in infrastructure development.
- Emissions have decreased from 230 tonnes in 2010 to 140.9 tonnes in 2022 per every million dollars invested in infrastructure. This finding is consistent across all provinces.
- Investments in infrastructure during this period have increased by approximately 31 per cent from 2009 to 2023. Meanwhile, GHG emissions only grew 22 per cent during the same period.
- Investments in clean inputs assess whether an infrastructure asset was constructed using environmental and clean technology inputs. The ratio of clean input investments has nearly doubled from 2.3 per cent in 2009 to 4.3 per cent in 2023.

These findings indicate that Canada's construction sector can have a significant impact on emission reduction and climate resilience when operating with willing partners in a supportive policy environment.

3.0 The policy landscape and where we currently stand

Since October 2020, the Government of Canada has committed tens of billions of dollars to support green infrastructure via the Climate Plan, Budget 2021, long-term transit funding, the Canada Infrastructure Bank, the Emissions Reduction Plan, Budget 2022 and 2023, and most recently, Budget 2024. Notable programs include:

- \$5 billion in loan guarantees to provide access to capital for Indigenous communities.
- \$7.2 billion over five years for the Clean Electricity ITC, starting in 2024-25.
- \$776.3 million to extend the Clean Fuels Fund from 2024-25 to 2029-30.
- \$800 million over five years, starting in 2025-26, to launch a new Canada Greener Homes Affordability Program.

It is noteworthy that despite a Budget focused primarily on measures to achieve financial “fairness for every generation,” the Government continued to prioritize significant investments in key areas such as Canada’s clean energy transition, green infrastructure needs, labour market shortages, and climate resilience.

In addition to financial expenditures in support of green infrastructure, the Government of Canada invested \$50 million in the Foreign Credentials Recognition program. At least half of that amount “will be to streamline foreign credential recognition in the construction sector to help skilled trades workers build more homes.” Within the Budget, the Government also touts its recent commitment to support small- and medium-sized businesses to hire 55,000 first-year apprentices in construction and manufacturing Red Seal Trades through a grant of \$5,000

towards upfront costs, such as salaries and training. With respect to resilience, the Budget invests \$463 million to repair and maintain small craft harbours, including those damaged by Hurricane Fiona.

These investments build on the significant investments in green infrastructure and climate resilience made over the past eight years by the federal government and are made in support of Canada's climate policy framework, which aims to reduce economy-wide emissions by 40 to 45 per cent by 2023 and achieve a net-zero economy by 2050. Beyond funding, the policy approach includes a mix of regulations and partnerships across various sectors and levels of government. Key policy instruments include:

- **2030 Emissions Reduction Plan (ERP):** Launched in 2022, the ERP is Canada's roadmap to reduce emissions by 40 per cent from 2005 levels by 2030. It encompasses a sector-by-sector strategy, including significant investments and regulations focusing on buildings, vehicles, industry, and agriculture.
- **Clean Fuel Regulations:** These regulations aim to reduce carbon emissions by increasing the use of clean fuels across various sectors.
- **Oil and Gas Methane Regulations:** Canada plans to reduce methane emissions in the oil and gas sector by at least 75 per cent by 2030.
- **Net-Zero Emissions Accountability Act:** This act mandates transparent planning, reporting, and assessment to ensure that Canada meets its climate targets.
- **Clean Electricity Regulation:** To achieve net-zero emissions from electricity generation by 2035, Canada is implementing stringent measures to increase the share of renewables in its electricity mix.

Canada is continually updating and refining its policies to meet its climate goals. The Government is exploring additional strategies like a broader application of border carbon adjustments and enhancing the national strategy on environmental learning to increase public engagement in climate action. This dynamic approach, involving a mix of regulatory measures, financial incentives, and collaborative governance, illustrates Canada's commitment to addressing climate change comprehensively and inclusively.

At the heart of the strategy lies the construction sector. Canada must build out the infrastructure today that will support a cleaner and more resilient tomorrow. To do so requires financial inducements, skilled worker training programs, and continuous innovation within the sector.

4.0 Innovation is happening, more needs to be done

Innovation within the construction sector to boost the climate resiliency of existing and newly built structures is occurring. However, more must be done in Canada to ensure the built environment can adequately adapt and mitigate the effects of the changing climate. This section explores several innovative strategies that are being taken to bolster resiliency in the built environment.

4.1 Creating buildings more resistant to climate change

Climate change demands adaptation in Canada's built environment to improve resilience. Experts propose three key strategies: structural changes that increase the resilience of infrastructure components, climate change informed planning and assessment, and enhanced monitoring and maintenance.⁴

Building design plays a critical role in bolstering resilience to changing environmental conditions. Interdisciplinary collaboration across various professional practices within the design and planning, environmental and climate sciences, risk management and assessment, and construction sectors is key to developing informed strategies.⁵ Based on the current knowledge of climate variability and change in Canada, future building design should account for emerging climate change risks such as temperature increases, extreme precipitation, and driving rain wind pressure.⁶ Resilience options for such risks include ventilation system upgrades, window shades and thermally reflective material, backwater valves, and protective structures.⁷

Incorporating emerging technologies equips the construction sector with valuable tools for climate-resilient decision-making. Climate risk assessments, climate modelling and simulation, Building Information Modelling (BIM), and smart city systems offer accurate evaluations and data.⁸ Leveraging insights from these technologies enables informed decision-making, ensuring buildings are designed to effectively adapt to and withstand the impacts of climate change.

4.2 Driving energy efficiency into building planning and retrofits

Buildings are a significant source of energy consumption, with overall electricity demand for heating and cooling expected to increase across Canada by 2100 due to climate change.⁹ Over 13 per cent of Canada's GHG emissions stem from the buildings sector, making it the third-largest source of emissions in the country. New and existing buildings must take concerted efforts to improve energy consumption to reduce GHG emissions and achieve net-zero goals.¹⁰

Guidelines and certification programs are pivotal in ensuring new buildings meet energy efficiency standards. At the federal level, the National Energy Code is the benchmark for building energy performance.¹¹ Provincially, initiatives such as British Columbia's Energy Step Code¹² and Ontario's ENERGY STAR Multifamily High-Rise Pilot Program provide standards and certifications for energy efficiency.¹³ At the local level, municipalities such as Toronto have set building sustainability standards through initiatives like the Toronto Green Standard to achieve lower energy use and GHG emissions, among other environmental priorities.¹⁴ Design approaches like the Integrated Design Process (IDP), a collaborative and holistic method for building design, can ensure energy efficiency is prioritized throughout the design process.¹⁵

Retrofitting involves structural or systemic modifications to an existing building and can lead to increased energy efficiency.¹⁶ Retrofits range from minor to deep upgrades, varying in cost, disruptiveness, and energy efficiency outcomes.¹⁷ Other tactics include energy benchmarking, an assessment of a building's energy consumption and

subsequent development of goals for improvement,¹⁸ and recommissioning, a re-optimization process to save energy.¹⁹

4.3 Integrating different building materials

Selecting strategic construction materials is crucial for improving a building's resilience to the escalating impacts of climate change. Appropriate material selection is a proactive way to influence a structure's environmental impact.

Mass timber is a sustainable material with growing popularity, offering environmental benefits such as carbon sequestration and lower energy use during manufacturing.²⁰ Methods for greener production of materials such as concrete are also being explored.²¹

Life Cycle Assessments (LCA) are a tool to comprehensively assess the environmental impacts associated with construction materials throughout their entire life cycle.²² Common parameters and indicators used in an LCA include energy consumption, GHG emissions, water usage, material consumption, waste generation, ecotoxicity, and resource depletion.²³ LCAs provide insights to enable informed decision-making and highlight areas of improvement, helping decision-makers optimize the environmental effects of construction projects.²⁴

4.4 Measuring progress

There is increasing demand in the construction sector for transparency and accountability, with a growing emphasis on sustainability reporting and adherence to Environmental, Social, and Governance (ESG) principles.

Investors and other stakeholders place importance on a company's values. ESG principles offer insights into a company's environmental, social, and governance standards, and reporting on ESG and sustainability allows companies to communicate their risks and opportunities with stakeholders.²⁵ However, companies have faced barriers to producing accurate ESG reporting, including confusion over which reporting standard to adhere to, a lack of in-house expertise, and greenwashing.²⁶ The release of the International Sustainability Standards Board's (ISSB) climate disclosure standards is hoped to reduce challenges and offer greater clarity. Certification programs establish standardized criteria for evaluating the sustainability of buildings. This ensures consistency in assessing environmental performance across different projects and assurances that buildings have met environmental requirements. The Canada Green Building Council offers several certification programs for sustainability in the construction sector. These include the Zero Carbon Buildings Standard, a framework for carbon-centric building, Leadership in Energy and Environmental Design (LEED), a global green building rating system, Investor Ready Energy Efficiency (IREE), a retrofit proposal assessment program, and Total Resource Use and Efficiency (TRUE), a waste management program.²⁷ Other certification programs include ENERGY STAR, which recognizes energy efficient commercial and institutional buildings, and BOMA BEST, which certifies sustainable commercial buildings.²⁸

4.5 Managing costs of taking these actions through collaboration

Achieving climate resilience in construction involves additional costs. Collaborative approaches are pivotal to addressing the financial implications of climate resiliency. Federal procurement strategies need to adapt to

encourage productivity and innovation, account for long-term value and sustainability, promote the use of alternative delivery models, and support shared risk. Engaging with contractors earlier and moving away from the lowest bid model will encourage the use of new processes, better practices, alternative energy, and more sustainable materials.

Partnerships between the governments, academia, research institutions, and industry actors offer venues for knowledge and resource exchange. Combining expertise can foster innovative and cost-effective solutions that effectively respond to the challenges presented by climate change in the construction industry.

Organizations such as CCA play an important role in promoting collaboration and identifying and discussing the financial challenges associated with climate-resilient construction. Through its services, CCA empowers its members and industry partners to create a unified industry approach and work towards innovative practices with positive impacts while managing costs effectively. The CCA also aims to be a trusted partner of the Government, eager to work together to achieve common goals of climate resiliency and sustainability within the built environment.

4.6 Case studies

Horizontal and vertical construction initiatives across Canada are adapting to climate challenges and building for resiliency. The projects mentioned below are examples practical applications of the strategies explored earlier in this paper.

Toronto's Waterfront Revitalization initiative is one of the world's largest waterfront revitalization efforts ever taken and is an example of a horizontal construction project building for resiliency.²⁹ With climate resilience and sustainability as key priorities,³⁰ features of the initiative include flood protection measures, which help control water flow and adapt to rising water levels and extreme weather events, contributing to the city's overall climate resilience strategy.³¹

Vancouver's Telus Garden is an office and retail building serving that serves as an example of a vertical construction project built for resiliency. With a myriad of sustainability features, including a district energy system, solar panels, and 100% outside-air supply, the building offers energy saving solutions and is designed to reduce over 1,000,000 kgs of CO2 emissions annually. The building was also the first in the city to receive a LEED Platinum certification and has one of the highest LEED score cards in the nation.

The new St. Paul's Hospital and health campus, to be located in the False Creek Flats area of Vancouver and completed in 2027, is a redevelopment project that serves as an example of a vertical construction project built for resiliency.³² At the outset of the project, a comprehensive evaluation of the climate hazards, risks, and resiliency was completed.³³ Heat waves, high winds, flooding, and disruptions to connectivity were climate risks identified by the assessment, driving the design team to ensure design strategies mitigated these risks.³⁴ The project will withstand the identified climate risks through design elements such as seismic and structural soundness, access

to fuel capacity, flood barriers, and strategic placement of critical equipment.³⁵

5.0 Implementation challenges

5.1 Need for updated procurement models

CCA has long worked in close cooperation with the Government of Canada, culminating in a bi-annual engagement between our Board and senior representatives from Public Services and Procurement Canada, Treasury Board, National Defence, Defence Construction Canada, Infrastructure Canada, and a number of other federal departments and agencies that spans back over a half century.³⁶

One of the issues of paramount importance to us that has been a part of these discussions for a few years now is the ongoing modernization of how infrastructure projects are tendered by the federal government. Our industry is eager to build sustainably and to be a partner in climate action. The Government can accelerate this by updating its current procurement process to one that supports fair competition, innovation, and shared risk. Our organization has recently engaged our broader membership in a survey that indicated engaging with contractors earlier and moving away from the lowest bid model will encourage the use of new processes, better practices, alternative energy, and more sustainable materials. We also need reliable climate data, updated standards, and codes which the industry and suppliers can work toward.

Natural Resources Canada (NRCan) has recently introduced The Canada Green Building Strategy (CGBS), and CCA is eager to collaborate on the outlined priorities and actions. The strategy emphasizes the urgent need to construct green and affordable buildings while prioritizing “green retrofits” to enhance resiliency and achieve environmental targets. The strategy also includes key components, such as standards, clean energy capacity, skilled workforce, and legislation.

5.2 Governments want green materials used, but promised guidelines remain outstanding.

Governments across Canada should embrace sustainable procurement as an opportunity to support the industry and firms of all sizes. As outlined in the Canada Green Buildings Strategy’s initial discussion paper³⁷, the Government of Canada sought to put forward a Buy-Clean Strategy. Two pieces of the Government’s broader plan towards this came into effect in 2023 via the Treasury Board’s Standard on the Disclosure of Greenhouse Gas Emissions and the Setting of Reduction Targets that outlined that federal government procurements over \$25M should incentivize suppliers to disclose their GHG emissions and set reduction targets. The second was the Standard on Embodied Carbon in Construction³⁸, which requires the reporting and reduction of the embodied carbon footprint of all new major government construction projects, initially starting with concrete.

CCA is supportive of these efforts as larger members of the association are more likely to have the capacity to comply with the reporting requirements. However, the greater Buy-Clean strategy is still pending, preventing the full complement of our membership from being able to participate fully. Net-zero targets and practices must be aligned between owners and contractors to facilitate transformative change in the industry.

5.3 Alignment between federal, provincial, and municipal governments lacking, and insufficient consultation with the construction industry to date.

Collaboration between governments and industry ensures that policies are informed by practical insights from the private sector, leading to more effective and agile governance. By working closely with government counterparts, industry leaders can contribute to the design of policies that strike a balance between fostering innovation and protecting the public interest. Furthermore, industry-driven initiatives can spur the development of best practices and standards, enhancing efficiency across sectors. Embracing a shared responsibility for advancing data, technologies, tools, and standards allows Canada to harness the full potential of digital innovation while upholding principles of transparency, accountability, and inclusivity.

Though we know more work is underway to harmonize federal and provincial building codes and standards, Canada needs policies and approaches that support better data, technologies, tools, and practices. A number have been announced and named in previous years but have yet to go fully operational. We shall further address this point in the report's recommendations.

6.0 International examples

Jurisdictions worldwide, including the United Kingdom (UK), Australia, and the state of California, have exhibited leadership in incorporating climate resilience into the built environment. These jurisdictions offer valuable insights and lessons learned for Canada, which can inform the future of Canada's climate resilience strategy.

6.1 United Kingdom

In the UK, the government has demonstrated a commitment to building climate resilience through the introduction of resilience frameworks, such as *Climate Resilient Infrastructure: Preparing for a Changing Climate*,³⁹ *The UK Government Resilience Framework*,⁴⁰ and *The Construction Playbook*.⁴¹ These frameworks outline key strategies and policies to help prepare for and respond to the impacts of climate change on infrastructure, including buildings.

In 2021, the government announced a four-year research program aimed at informing the nation's resilience strategy against climate change. The program received £5 million in government funding, underscoring a commitment to evidence-based policies and planning.⁴²

At the local level, municipalities such as the City of London commissioned a Climate Resilience Adaptive Pathways Study to better understand the anticipated impacts of climate change. The findings of the report will be leveraged to account for climate change in the decision-making process.⁴³

The UK government collaborates with the UK Green Building Council (UKGBC), a membership-led industry network that aims to influence policy and identify ways to position sustainability and climate change at the forefront of processes used in the built environment development process.⁴⁴ The UKGBC has proposed policies to increase climate resiliency, such as standards for new buildings and a national retrofit campaign.⁴⁵ In 2023, the UKGBC announced the development of a Climate Resilience Roadmap, which will be crafted by sector experts

and will outline measurable metrics, recommend industry actions, and propose government policies to boost climate resilience in the construction sector.⁴⁶

6.2 Australia

In Australia, the municipalities of Melbourne, Sydney, and Wellington have taken proactive measures to fortify climate resilience.

The City of Melbourne's "Prepare Melbourne" initiative aims to equip residents and communities with enhanced climate resiliency.⁴⁷ It encompasses six program streams addressing disadvantaged communities, vulnerability assessment, increasing staff capacity, raising community awareness, technological solutions, and heat modelling.⁴⁸

Released in 2018, Resilient Sydney is the culmination of a three-year collaborative effort between Greater Sydney's metropolitan councils to develop and implement a resilience strategy.⁴⁹ Resilient Sydney outlines five key strategic pillars focused on centring people and inclusion, adapting to and preparing for environmental changes, and unified actions alongside the challenges, outcomes, and actions associated with each.⁵⁰ The strategy is being updated for 2025-2030 in consultation with stakeholders and community members, receiving funding from the Disaster Risk Reduction Fund, a joint effort between the New South Wales and Australian governments.⁵¹

The Wellington Resilience Strategy was launched in 2017 and is a roadmap to foster climate resilience within the region.⁵² The strategy highlights three goals centred around community, decision-making, and the built and natural environment, alongside an implementation plan.⁵³ Green Building Council Australia, a membership organization working towards sustainability within the built environment, released a report in 2023 titled *Resilience in the Built Environment* that spotlights industry achievements in building climate resilience and provides recommendations for government action to inform future strategies.⁵⁴

6.3 California

In California, the government mandated the development of a statewide strategy for climate change adaptation triennially.⁵⁵ The most recent iteration, titled the California Climate Adaptation Strategy, was released in 2021 and provides a comprehensive framework with six key priorities, goals, and actions for addressing climate vulnerabilities.⁵⁶ The priorities centre around vulnerable communities, protecting public health and safety, evidence-based decision-making, a climate-resilient economy, nature-based solutions, and opportunities for partnerships and collaboration.⁵⁷ Embedded within the priorities are actions focused on improving resilience in the built environment.⁵⁸

In 2023, the government unveiled new proposals to streamline permitting and project review timelines. This initiative is geared towards expediting clean infrastructure projects and is accompanied by a \$180 billion investment by the state over the next 10 years in clean infrastructure.⁵⁹ The initiative is in alignment with broader economic, climate, and social goals.

7.0 Recommendations and final observations

In addition to the global examples cited and the improvements in innovative technologies and practices mentioned earlier, our industry and membership believe the following additional key recommendations are crucial in making meaningful progress on adaptation:

7.1 The creation of an independent advisory body to undertake evidence-based long-term infrastructure planning.

Our previous report was released in the months prior to the consultations on Canada's National Infrastructure Assessment process, in which several recommendations were made on its format, scope, mandate, and budget. Once it was live, our membership participated in this initiative with great enthusiasm in our formal submission to Infrastructure Canada in June 2021, recognizing its potential to revolutionize project funding in our country, establish a long-term vision, and enhance resilience in materials as part of program rollouts. The cornerstone belief of our submission was that the establishment of an independent body, similar to the UK Construction Hub⁶⁰ that was a direct result of that country's own national assessment, would be the most practical way to align federal, provincial, municipal and Indigenous needs to address infrastructure deficits and undertake evidence-based long-term planning toward a net-zero emissions future.

While this remained a priority commitment in the latest round of ministerial mandate letters, our membership is deeply concerned by lack of progress since the Fall of 2021. We are eager to advance this crucial initiative in collaboration with the federal government and have continuously raised it in meetings with officials and Members of Parliament, as well as through our own publications. We remain optimistic that progress will be made in the months ahead.

In a speech delivered by Infrastructure and Communities Minister Catherine McKenna at the time of its rollout, *"the Assessment will use data and evidence to identify Canada's long-term infrastructure needs and priorities, linking government investments with desired policy outcomes, and ensuring a plan for pandemic recovery that creates jobs, competitive advantage, and long-term growth, while building a cleaner, more inclusive future for all Canadians."*⁶¹

A long-term plan would bring the clarity our sector needs to make informed decisions on the investments they need to make in materials, resources, training and labour. It would also further highlight the importance of data and evidence as tools for long-term tracking. Both the Government and the industry can use these tools collaboratively to inform their decisions.

7.2 Policies and approaches that support better data, technologies, tools, and standards. This is a joint responsibility of governments and industry.

We were encouraged by the recent announcement that the Government of Canada is launching a hub tracking internal trade and labour data⁶², as breaking down interprovincial trade barriers has also been a long-standing focus of CCA's national advocacy work. Canada's own internal tracking of emissions goals through programs like the Greening Government Initiative is a template worth extrapolating upon for the goals and aims outlined within this plan.

The Codes Accelerator Fund, announced by NRCan in the Green Buildings Strategy and rolled out in last year's budget was a good start⁶³ as an incentive for provinces and industry to standardize. However, the parameters of the program were not wide enough to ensure further buy-in. The Government does not need to reinvent whole cloth new tracking systems for this purpose. The Climate Data Canada portal⁶⁴ that launched in 2019 has been immensely helpful in tracking geo-specific trends across the country, and its specifics on building resilience have been much promoted by our organization to members internally and externally, though it does not capture the whole scope of our sector.

We believe there is an urgent need for the prompt establishment of the Low-Carbon Building Materials Innovation Hub, as promised during the 2021 election and re-introduced in the Green Buildings Strategy discussion paper. We also seek the timely implementation of the National Life-Cycle Inventory Database. These initiatives would go a long way in helping us amplify the scope and coordinate fully across the sector.

7.3 Funding and incentivizing the industry to pilot new technologies

As alluded to in our 2021 white paper⁶⁵, there is a cost to resilience, however this roughly 10 per cent additional investment yields significant long-term benefits for society. Governments at all levels must ensure that procurement and project design are aligned with the national vision for infrastructure resilience.

While we can and should expect companies to compete to deliver the desired level of resilience at the least cost, requiring resiliency must be clearly stated by governments at the tendering stage. Through repayable and non-repayable contributions, governments should help to defray costs directly related to the improving the climate resilience of an asset.

Projects that include innovative materials and concepts should be given priority during procurement, despite resulting in higher upfront costs. Programs are also needed to financially incentivize businesses of all sizes, particularly small and medium-sized enterprises (SMEs), to access and embrace emerging and sustainable technologies, materials, and processes. Having a federal government list of certified green products and materials will give confidence to the sector to invest in developing these new products and materials and to use them in buildings.

Moreover, whether a project is being tendered to address a specific climate-related concern or an unrelated infrastructure need, the project scoping must deliberately make room for resiliency considerations. In a competitive landscape, it is unrealistic to think that construction companies will add costs to their bids to consider long-term resilience if the client, whether within the public or private sectors, does not explicitly consider it a requirement of the bid.

7.4 Further policy solutions needed to addressing key challenges in construction

Throughout this report, we have stressed the need to support the Canadian construction sector so that it is robust enough to get ahead of this changing landscape. Contactors have long shouldered the majority of

project risk. This model is untenable, particularly for many smaller companies that navigate an even longer list of challenges, such as supply chain issues, high interest rates, tighter timelines, and labour shortages. The reluctance to bid on federal projects because of this heightened risk is becoming a real issue and impacting progress on important public projects.

Addressing this challenge also includes supporting an adequate labour force. Construction employs 1.6 million people, and our industry will need to fill nearly 350,000 jobs by 2033, brought on by shifting demographics and a spate of retirements.⁶⁶ There is also the need to address growth to tackle the other challenges outlined throughout this report, in addition to the incentives for innovation. The industry requires engineers, project managers, project coordinators, skilled trades, and construction labourers – but an even more recent phenomenon is a sharp increase in the need for city planners to stem a blockage of projects at the municipal level.

Expediting the recognition of training and credentials for newcomers entering the workforce would help alleviate some labour choke points. The federal government needs to continue working with provinces and territories to ensure skills matching is well-aligned between jurisdictions and that programs are appropriately funded and supported.

Our association and members have sought for a number of years to address this through their own recruitment efforts and our Talent Fits Here industry campaign⁶⁷, launched in 2020, which seeks to attract and retain new talent to construction from traditionally underrepresented groups. We also believe that Canada's immigration system plays a vital role in helping solve these systemic issues.

8.0 Conclusion

Understanding Canada's true infrastructure needs, backed by evidence, will help get all levels of government and industry stakeholders on the same page around future investment needs and help to unlock the potential of the sector in mitigating the impacts of climate change.

Much as when we began an industry-wide discussion on building sustainably in 2021, this new report is meant to serve as the next chapter of a critical national conversation around ensuring infrastructure resilience in the face of a changing climate. Through it, we have attempted to fulfill four core objectives:

- Underscore the importance of climate change adaptation within the construction sector and showcase our significant efforts in this field to date;
 - Provide insights into current perspectives and practices in the sector;
 - Highlight updated figures to demonstrate the positive cost-benefit analysis of investing in resilient infrastructure; and
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- Propose a fresh set of key recommendations for consideration by governments, industry, and other stakeholders.

Shifting our approach from traditional procurement practices to a resilience-centred paradigm demands time, effort, and collaboration. While meaningful progress has been made, the timelier implementation of the methods laid out will require contributions from governments, builders, procurement officers, innovators, and many others.

The principles of sustainable development are fundamental to how governments, industry, and society will successfully address critical societal needs, environmental pressures, and climate change impacts.

Our infrastructure is representative of who we are and what we aspire to be. Canada is a world-class nation that provides a superior quality of life to our citizens. We are high-tech, forward-looking, agile, innovative, and diverse. We believe in sustainability and inclusivity.

CCA and its members remain steadfast in our commitment to the work ahead and are confident this document reflects the strides we have made since 2021. We stand ready to play a constructive and collaborative role in building infrastructure that supports a better, greener, and more resilient Canada.

Endnotes

- 1 [Canadian Construction Association - Strength, Resilience, Sustainability \(2021\)](#)
 - 2 [2019 Canada Infrastructure Report Card \(CIRC\)](#)
 - 3 [Canadian Core Public Infrastructure Survey – Infrastructure Canada](#)
 - 4 [Advancing the Climate Resilience of Canadian Infrastructure: A review of literature to inform the way forward \(2021\)](#)
 - 5 [Advancing the Climate Resilience of Canadian Infrastructure: A review of literature to inform the way forward \(2021\)](#)
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 - 11 [NRCan - Canada's national energy code](#)
 - 12 [BC Gov - Energy Efficiency](#)
 - 13 [NRCan - ENERGY STAR® Multifamily High-Rise Pilot Program](#)
 - 14 [City of Toronto - Toronto Green Standard: Overview](#)
 - 15 [PSPC - Integrated Design Process](#)
 - 16 [BDC - Retrofit your building to reduce its energy use](#)
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 - 22 [Life Cycle Assessment of construction materials: Methodologies, applications and future directions for sustainable decision-making](#)
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 - 25 [PwC - ESG reporting and preparation of a Sustainability Report](#)
 - 26 [Globe & Mail - Pressure is growing on companies to better disclose their ESG activities. Is a reporting standard finally on the horizon?](#)
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- 33 [St Paul's Hospital Climate Assessment](#)
 - 34 [St Paul's Hospital Climate Resilience](#)
 - 35 [St. Paul's Hospital Fact Sheet](#)
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 - 43 [City of London - Climate resilience](#)
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 - 47 [City of Melbourne - City resilience](#)
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 - 54 [GBCA - Resilience in the built environment](#)
 - 55 [California - Climate Adaptation Strategy Fact Sheet](#)
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