



Green Buildings, Good Jobs

A National Green Homes & Buildings Strategy for Canada

Prepared by
The Green Economy Network (GEN)
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Table of Contents

Acknowledgments	2
Executive summary	3
Introduction	3
Gaps in Canada’s Green Homes and Buildings Strategy	4
A Plan for Green Homes and Buildings in Canada	9
Benefits of greening Canada’s homes and buildings	12
Conclusion	13
Endnotes	14

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Executive summary

Canada's homes and buildings are not energy efficient. This comes at a cost both to the planet and Canadians' wallets: emissions from the buildings sector have increased significantly in recent decades, while many struggle to keep up with the high costs associated with energizing their homes.

To reduce carbon emissions from the sector, the government must increase investments aimed at providing deep retrofits for the country's home and building stock.

The government must also ensure that Canada has the training capacity and building standards needed to ensure the industry is prepared for

We call for a \$65.5 billion-dollar investment over five years to accelerate the de-carbonization of Canada's home and buildings stock. These funds should go towards direct funding for deep retrofits for Canada's homes and buildings, as well as training to ensure we have the workforce needed to undertake this monumental task. Steps must also be taken to improve of Canada's building code, as well as its mass adoption across jurisdictions.

Adoption of this plan would reduce carbon emissions and make life more affordable for Canadians, all while creating thousands of good jobs.

Introduction

To meet its commitments to mitigate the growing impact of climate change, Canada must dramatically reduce its energy consumption. It must also adapt its buildings to cope with the increasing number and severity of extreme weather events. However, Canada's building stock was not designed to meet these new challenges.

Building energy use must be reduced substantially to meet mitigation and adaptation goals. Standards of new construction must be much higher, and the existing building stock must undergo deep retrofitting to achieve successful energy conservation objectives.

Our current housing and building stock waste an enormous amount of energy: when electricity-related emissions are accounted for, 18% of Canada's greenhouse gas emissions are attributable to the buildings sector.¹ It is even more when we include manufacturing, transportation and decommissioning activities associated with the construction process. Energy efficiency and conservation are our cleanest, cheapest, and most productive energy sources: the cheapest energy is the energy you don't use. Investing in energy efficiency and conservation boosts productivity, reduces costs, cleans our air and water, and creates jobs throughout the economy.

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An energy efficient economy is a strong, competitive economy. It has lower electricity bills due to energy savings, freeing up capital for investment and discretionary income for personal spending. Energy efficiency is also unique among energy sources in that it pays for itself through savings over time. While we tend to think of energy savings in relation to our housing stock, there are major savings to be made in commercial and public buildings across the country.

Canada needs a bold plan to transform this country's housing and building stock. This means expanding the federal approach so it can adequately meet the climate challenge.

Improving Canada's approach to energy efficiency must focus on two key areas:

1. **Green Homes:** providing deep retrofits to Canada's existing residential dwellings and ensuring future homes meet net-zero standards.
2. **Green Buildings:** Making our current and future commercial and institutional building stock carbon neutral.

In both areas, Canada must improve its various building and energy codes to speed-up the process of decarbonizing Canada's physical infrastructure.

Gaps in Canada's Green Homes and Green Buildings Strategy

Canada has committed to a net-zero economy by 2050. However, our current approach to energy efficiency falls short.

For the past decade, our annual retrofit rate has been below 1% for residential buildings and 1.4% for commercial buildings.² At that rate, it would take over 100 years for Canada to get its existing building stock to net-zero, even though the government has committed to a net-zero economy by 2050, consistent with the 2015 Paris Climate Accords.

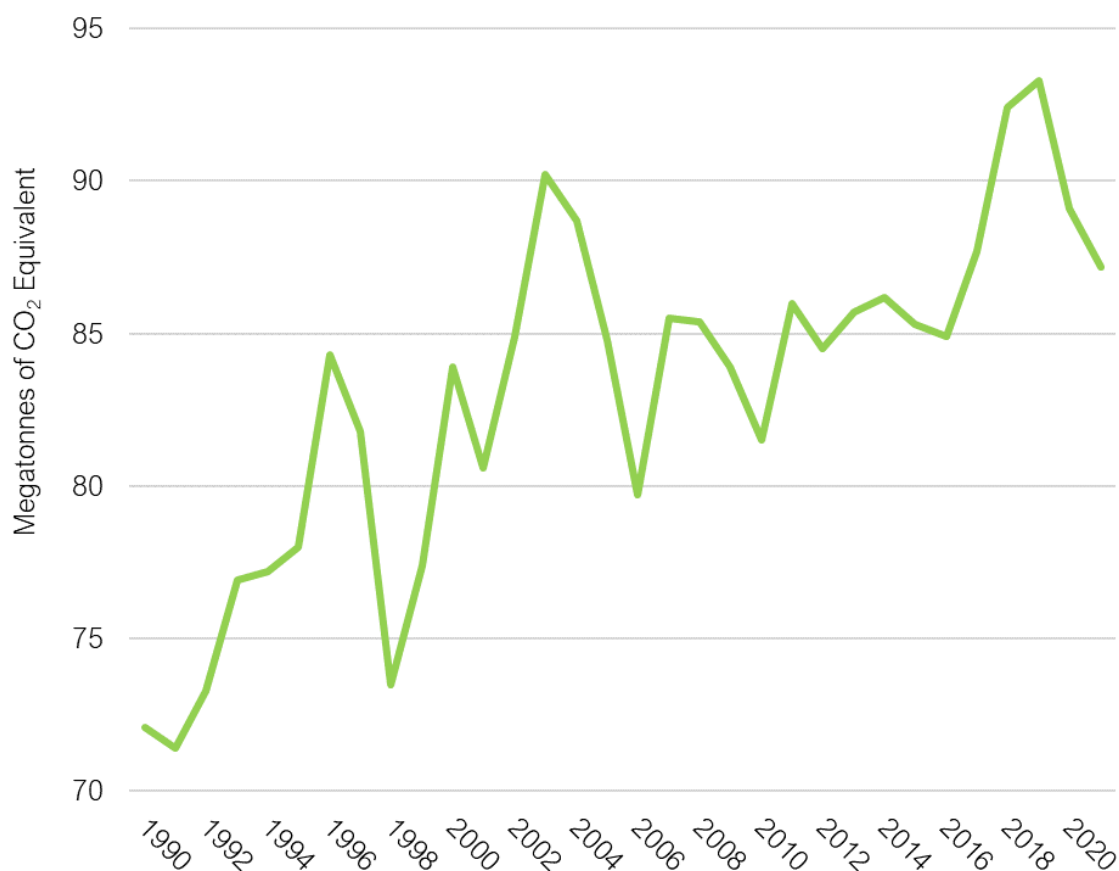
To reach net-zero emissions in the building sector on time, we will need to retrofit our building stock at a rate of 5% per year, at a minimum.³

The federal government introduced plans for a Green Buildings Strategy in 2021. But the funding it has provided for its initiatives is not nearly enough to decarbonize our building stock to meet the government's ambitious climate targets.

Gaps in Canada’s green infrastructure policy stems from a lack of funding for its current retrofitting programs, inadequate focus on the needs of low-income Canadians, too little attention to workforce training and a lack of a universal building code that is up to the challenge of meeting net-zero emissions.

Chart 1

Canada’s Buildings Sector Greenhouse Gas Emissions, 1990-2021 ⁴



Meanwhile, building sector emissions will continue to grow, despite a momentary decrease in emissions in recent years due to the pandemic, if action is not taken. As the buildings sector continues to be the third largest emitter of greenhouse gases and the second largest consumer of energy across Canada’s economic sectors, actions in this sector would have a substantial effect on emissions reductions.

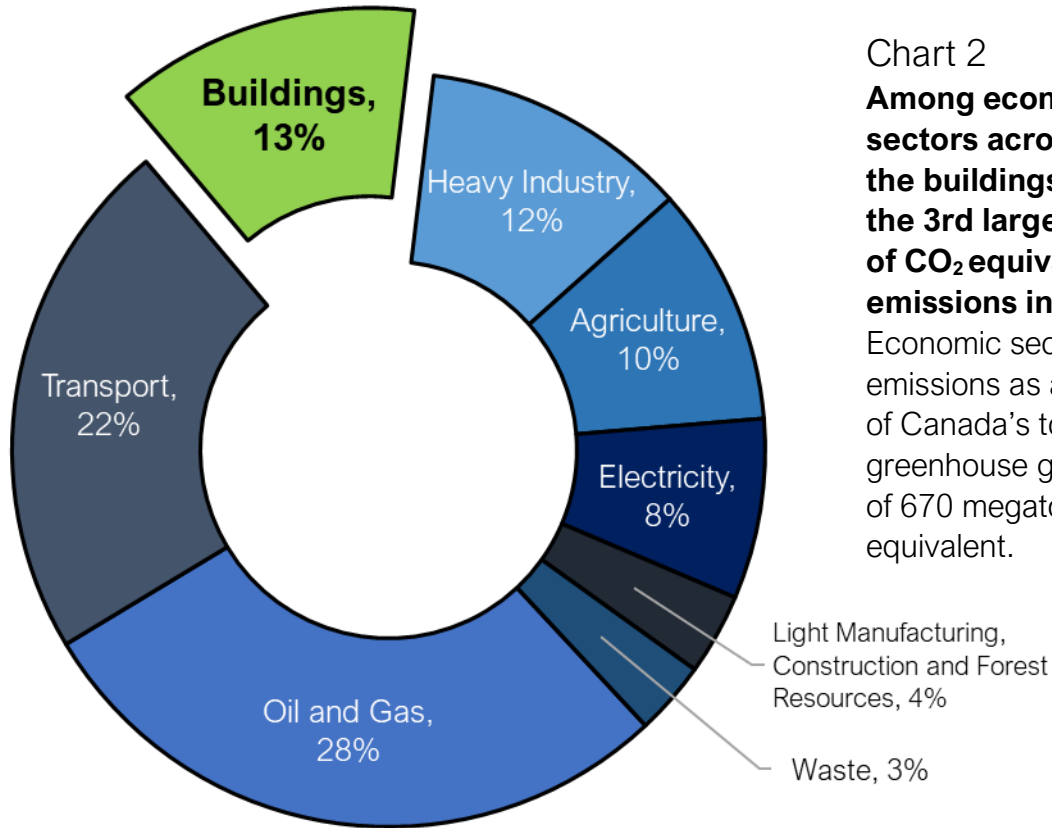
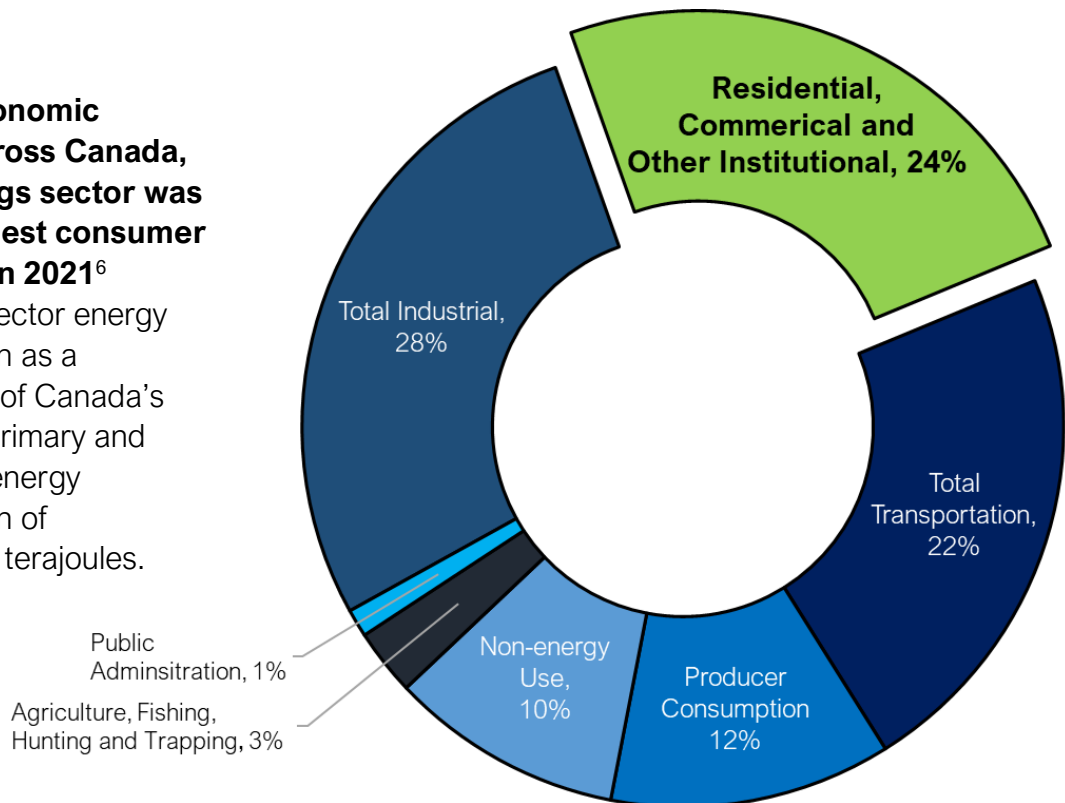


Chart 3
Among economic sectors across Canada, the buildings sector was the 2nd largest consumer of energy in 2021⁶

Economic sector energy consumption as a percentage of Canada's total 2021 primary and secondary energy consumption of 10,452,604 terajoules.



Inadequate spending and standards

The federal government has made progress in recent years regarding its approach to decarbonizing the country's building infrastructure. However, these programs lack the funding and regulatory stringency needed to achieve net-zero emissions in the sector by 2050.

Over the next 5 years, the government plans to spend \$4 billion to retrofit Canada's housing and building stock. Part of this spending is allocated to the Greener Homes Initiative, which was introduced in 2021 and provides grants for homeowners making energy-efficient investments in their residences. The Canada Infrastructure Bank (CIB) has also allocated \$2 billion for large-scale buildings in both the private and public sector.

However, the amount of funding provided by the Greener Homes program and the CIB is inadequate, a fact acknowledged by Natural Resources Canada. The government estimates that retrofitting Canada's entire building stock by 2050 would cost between \$20 and \$32 billion per year, far more than the \$4 billion currently allocated.⁷

On the regulatory front, Canada's national building performance standards are not stringent enough. This means that many new buildings have suboptimal insulation, outdated HVAC systems, and limited energy conservation measures.

In 2022, the National Research Council published its latest *National Model Building Codes* for new buildings. This new code features a tiered performance model, with the highest tier of building being one that is "net-zero energy ready," meaning buildings can supply their own needs with renewable energy. Because codes are set at the provincial and municipal levels, it is up to these jurisdictions, voluntarily, to adopt the federal standard, meaning standards vary widely across Canada.⁸

Moreover, Canada's current approach to building codes is primarily focused on ensuring new building stock will be net-zero. However, focusing on the low hanging fruit leaves out the challenge of our existing buildings, most of which will still be in use in 2050. Without a comprehensive retrofit program, it will not be possible to make Canada's total building stock truly carbon-neutral within the government's climate timeframe.

Inadequate training

Currently, training in the buildings trades is not adequate to provide the workforce with the skills needed to decarbonize the sector.

In 2023 the government introduced a sustainable jobs stream under its Union Training and Innovation Program, which provides resources to union-led job training programs for workers in the building sector.

However, this program currently only has tens of millions of dollars allocated to it, which pails in comparison to the funding that would be needed to meet the demand for new jobs in the industry if Canada's building stock is going to see a successful decarbonization in the coming decades.⁹

Another barrier to providing high-quality training to retrofit workers is the fact that significant portion of the current work in the construction sector falls into the category of the “underground economy.” The BC Federation of Labour estimates that approximately 20% of the workforce in the industry are employed in the underground economy. Beyond skills learned on the job, workers in the underground economy have virtually no opportunity to participate in apprenticeships and receive no formal training. This exclusion diminishes the potential of this workforce to provide net-zero retrofits. Without a major push to include these workers as acknowledged members of the industry, it is unlikely that they will be able to contribute effectively to net-zero construction.

Additionally, the residential construction industry is largely unregulated. This means that homeowners are vulnerable to paying for renovation work from unqualified providers. Without regulations that establish the qualifications of those who work in this sector, this problem will persist.

A lack of focus on low-income Canadians

Additionally, there are significant weaknesses in Canada’s approach to giving persons on low-income access to its retrofit programs. Under the current federal Green Homes Program, homeowners are required to pay upfront for retrofitting upgrades to their properties before they receive any grants. This model is a barrier to low-income Canadians who do not have enough disposable income to cover these expenditures.¹⁰

Lack of access to energy efficient upgrades for low-income households limits the government’s ability to tackle energy poverty, which Efficiency Canada defines as “a condition where households face significant challenges meeting their essential home energy needs, paying for their energy costs or accessing other life necessities due to disproportionate spending on energy costs or obtaining energy efficiency upgrades necessary to reduce their energy costs.” It has been estimated that energy poverty affects 3.9 million Canadian households.¹¹

The government has made some strides in recognizing these barriers. In 2022, it announced \$250 million in federal funding over 4 years to help low-income Canadians switch from oil-based home heating systems to energy-efficient heat pumps. However, this pales in comparison to the amount needed to ensure all low-income Canadians have access to these cost saving technologies.¹²

What is energy poverty?

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A Plan for Green Homes and Buildings in Canada

To reach net-zero carbon emissions by 2050, Canada must implement a unified Green Homes and Buildings program, expanding the progress it has already made through its recently implemented initiatives.

To ensure Canada's approach to decarbonizing our housing and commercial infrastructure effective, we will need to spend big. We call for a \$65.5 billion dollar investment over a 5-year period.¹³

- \$10 billion per year for deep retrofits on Canada's residential building stock (\$50 billion total).
- \$2 billion per year for a *Low-Income Housing Retrofit Grant Program* retrofit program that would see the government cover 100% of upfront costs for eligible candidates upgrading housing units (\$10 billion total).
- \$1 billion for a *Non-Profit Sector Retrofit Grant Program* to support the retrofitting of buildings and residences within the non-profit sector
- \$100 million per year to a federal agency dedicated to improving retrofitting productivity (\$500 million total).
- \$4 billion to support the development of retrofits for commercial infrastructure and making our domestic supply chains for energy efficient
- \$1 billion for a program that would train the workers needed to provide the large quantity of retrofits needed to get to net-zero.

As appropriate, elements of this investment should also be used to improve Canada's federal building code and to provide incentive mechanisms for provinces and municipalities to adopt these standards.

This program would aim to achieve the following objectives:

1. Expanding retrofit funding and improving financing mechanisms
2. Augmenting and universalizing Canada's building codes
3. Enhancing industry-level training
4. Improving industry effectiveness by promoting public sector development

Expanding funding and improving financing mechanisms

One major barrier preventing households and businesses from purchasing retrofit upgrades is the high upfront costs associated with these projects, even when the government provides grants to home and building owners. Under current federal arrangements, retrofit grant programs require applicants to assume the full cost of the retrofit, then apply for grants to be partially reimbursed after the project has been completed. This is especially cumbersome for low-income homeowners, but also creates hesitation on the part of middle class and high-income earners, as well as firms who want certainty that they will not be stuck footing the whole bill.

This issue can be obviated by an approach that would see the government assume the costs of retrofits and pre-retrofit energy evaluations at the onset, thus lowering the financial burden on individuals. For low-income earners, this would mean that the government would cover 100% of the cost at no charge to the applicant. For everyone else, the government would also pay 100% of the costs at the onset, but 50% of the total cost would be paid by the applicant over the long-term.

Through a “pay-as-you-save”¹⁴ program, this payback program would create no financial burden for the home/building owner. Energy efficient homes cost less to heat and cool. This means that when a person retrofits their property, the difference between what their monthly energy bill is post-retrofit versus what it was pre-retrofit is high enough that much of it can be used to pay back the government for the cost of the job, while still providing the owner with savings during the payback period.

Improving building codes

Additionally, speeding up the retrofit rate can be driven by incentives through funding bonuses for provinces that have (1) a plan to adopt the upper performance tiers of the federal building codes, (2) a plan to achieve compliance with these standards, and (3) the introduction of mandatory energy performance labels and reporting for both residential and commercial buildings.¹⁵ Federal building performance standards would also be improved if they took into account “embodied carbon”—that is, the carbon emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials.¹⁶

Once standards around embodied carbon are set at the federal government, funding incentives could be implemented to increase the rate at which those in the building and retrofit industry buy from domestic suppliers, since domestically-purchased building materials typically have lower rates of embodied carbon than their international counterparts.¹⁷

An Example of “Pay as You Save”

On-Bill Repayments with Manitoba Hydro’s Home Energy Efficiency Loan provides financing of a minimum of \$500 up to \$7500 for energy efficiency improvements with no down payment required. The on-bill repayment system allows residents to pay instalments on their hydro bill for a maximum loan period of 5 years and starts at just \$15/month.

Providing better industry-level training

Making it easier for home and building owners to access retrofitting funding by reducing costs will create demand for thousands of tradespeople associated with the buildings industry. These new jobs will require new forms of training, as retrofitting requires a high degree of knowledge, skills and competencies, given the significant variation in buildings across Canada. As such, funding for training should take the form of significant investments in vocational education and training programs, as well as the expansion of building trade union training centres, which already play a significant role in providing workers with green construction methods.

The government should also more stringently regulate training standards in a push towards moving training away from a focus on narrow skills and towards one that provides workers with the tools they need to excel in their long-term careers in the industry. Training that focuses on theoretical knowledge and a broad range of on-the-job skillsets has been shown to be more effective in producing a workforce capable of developing infrastructure that is in-line with climate friendly building standards.¹⁸ There should also be a focus on providing workers in the industry with an understanding of how their jobs connect with the fight against climate change.¹⁹

To tackle the issue of the underground economy and the barriers it poses to developing effective training, the federal government should work collaboratively with the provinces to establish provincial registration systems for construction workers. Such systems already exist in Quebec, the EU, and the United Kingdom. Bringing construction workers currently in the underground economy into the formal economy would help ensure all workers in the industry can be provided with the training needed to provide high-quality, net-zero construction.

In addition to registering workers, it is necessary for provincial governments to expand the list of compulsory trades and enforce this requirement so that residential property owners can have greater assurance that the people contracted to do work have the skills needed.

The power of public sector leadership: the EnergieSprong approach

EnergieSprong, which translates to “energy leap,” is a model of building retrofits developed in the Netherlands and is picking up steam globally.²⁰ Through this program, suppliers and contractors work collaboratively to provide deep retrofits in an integrated, large-scale basis. This collaboration is facilitated by an independent entity, which augments supply chain efficiency through demand aggregation: a large number of similar buildings are pooled into a single project, which increases the scale of demand and provides an incentive for previously atomized service providers and contractors to work together in an integrated fashion, rather than on a project-by-project basis. The program has proved highly successful in the Netherlands, where it is being implemented in the social housing sector to help the country fulfil its goal of making its entire housing stock net-zero by 2050.

Expanding public-led growth

While the approach to retrofitting currently is reliant on the private sector to provide retrofitters and appraisers, the scope of upgrades needed to reach net-zero will require more active government intervention. In addition to providing funding for training for workers in this industry, the government should also create an agency dedicated to directly facilitating the providing of Canada's building stock with deep retrofits.²¹ This agency would directly employ workers who would connect home and building owners with suppliers and contractors in the building retrofit industry in order to scale-up retrofit projects and make sure the industry runs as effectively as possible.

Benefits of greening Canada's homes and buildings

Achieving the target objectives for the Green Homes and Green Buildings Strategy will result in a substantial increase in the energy efficiency of Canadian buildings and ensure that our building stock gets to net-zero by 2050. An investment of this magnitude will result in thousands of jobs being created in the Canadian economy while saving Canadian money on their utilities bills.

By the government's own admission, its current approach to greening Canada's home and building stock falls short. To get Canada's homes and buildings to net-zero by 2050, spending upwards of between \$580 and \$972 billion will be required.²² This means that, GEN's 5-year plan for Green Homes and Green Buildings will require renewal after its initial period of implementation. Nonetheless, the benefits of avoiding climate catastrophe will outweigh the costs of this spending programme in the long run.

Additionally, saving Canadians money on their energy bills will relieve the financial burden for millions at a time when cost-of-living has drastically increased on an economy-wide scale. Some estimates put the rate of energy poverty in Canada as high as between 18-19%.²³ Meanwhile, Canadians are experiencing all-time high prices when it comes to purchasing their other necessities. Reducing the cost of heating and cooling homes would counter-balance these trends and allow Canadians to spend more and spend on what matters most.

Spending on building retrofits and construction creates between 7.63 and 9.76 jobs per \$1 million. This means that a \$65.5 billion investment in greening Canada's home & building stock could create between 499,765 and 639,280 jobs over a 5-year period (see Table 1). By attaching incentive mechanisms that ensure jobs in this sector are well-paying and unionized—as the government has done with investment tax credits for the clean energy industry²⁴—the federal government can ensure that these green jobs are also good jobs.

Table 1

Economic Impacts of Proposed Green Homes and Buildings Plan²⁵

Proposed Spending						
	Year 1	Year 2	Year 3	Year 4	Year 5	Annual Average
\$ (Billions)	\$8	\$10.6	\$13.3	\$16	\$18.6	\$13.3
Projected Employment Impacts (Jobs Created)						
	Year 1	Year 2	Year 3	Year 4	Year 5	Annual Average
High Estimate	62,040	80,878	97,090	122,080	141,918	100,801
Low Estimate	78,080	103,456	129,808	156,160	181,536	129,808

Conclusion

A bold program to green Canada's homes and buildings will save Canadian's money and create good jobs, all while ensuring that we lower carbon emission to net-zero by 2050. This spending should coincide with an expanded National Housing Strategy which is focusing on expanding the scope of non-profit housing in Canada to mitigate the current affordability crisis.

In order achieve its net-zero goals, the government will need to dedicate far more money than is currently on the table to finance the retrofitting of Canada's building stock at all levels, whether it be residential, non-profit, or commercial. Financial barriers for individuals and organizations interested in decarbonizing their properties must also be minimized through a system that sees the government assume the upfront cost of energy audits and retrofits. To meet the demand for the skilled workforce this funding will create, there must also be a significant expansion of funding for training in the building sector, focused on providing the tools needed for lifelong careers in the sector.

Lastly, the government should also consider the benefits of taking a more active role in facilitating the retrofitting process beyond implementing guidelines and incentives for market actors. The formation of a federal agency that directly provides energy audits and connects property owners with retrofit providers would fill in the gaps that the market is currently unable to fill.

Endnotes

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