PEMBINA institute

Getting Canada's homes in order

Opportunities for transformative action through the Canada Green Building Strategy

by Jessica McIlroy, Tom-Pierre Frappé-Sénéclauze, Betsy Agar | June 2023

Summary of recommendations

This paper offers the following recommendations on how the Canada Green Building Strategy can help create safer, healthier, more resilient buildings, and stimulate industry and market transformation through deep retrofits:

- Public investments in the form of incentive and subsidy programs should be significantly increased to leverage private capital and provide support for households that need it most.
- Retrofit funding programs should be consolidated into a net-zero-over-time offering that allows owners to make capital investments in phases.
- Indigenous communities and remote communities must be integrally connected in the transition and their unique needs and contexts addressed.
- The federal government should update its energy efficiency regulations to align with net-zero goals.
- Standards across all provinces and territories should be harmonized and enforced through creation of a federal backstop.
- A centralized authority should be responsible for setting retrofit and resilience targets for homes and buildings and be accountable for meeting them.

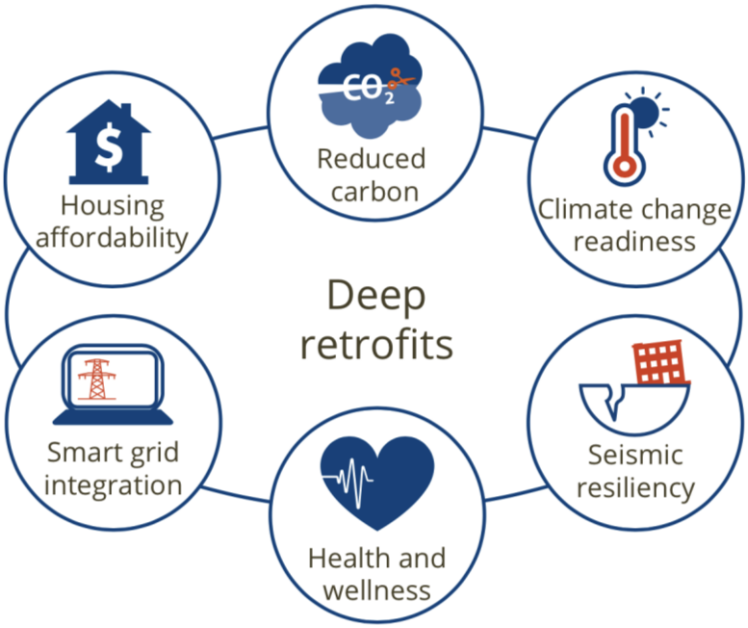
Introduction

Governments around the world are recognizing that building decarbonization is critical to meeting 2030 and 2050 net-zero emissions reduction commitments, and reducing dependence on fossil fuels. They are also realizing that improving the energy efficiency of buildings and therefore reducing the energy required to heat them will temper demand for clean electricity, enabling its use to decarbonize other sectors like transportation and energy production.

In Canada, the buildings sector represents the third-largest source of emissions, and it's estimated that 80% of the buildings that will exist in 2050 have already been built. Therefore, to meet Canada's net-zero commitments for the buildings sector, the country must upgrade the

heating systems, insulation, and ventilation of 600,000 existing homes, and 750 million square feet of existing commercial space each year between now and 2040.[1]

Building retrofits and electrification and net-zero new construction also represent key opportunities to ensure heating and cooling is affordable, and homes and buildings are safe, healthy, and resilient for their occupants. Deep retrofits reduce energy requirements and costs, upgrades can address health concerns related to building quality and performance, and electrification to heat pumps reduces emissions while allowing for cooling.



For existing buildings, we estimate the scale of federal, provincial, and utility investment needed to achieve the sector's net-zero targets to be in the range of $10 billion to $15 billion per year over the next 20 years. This investment will catalyze building retrofits at the pace and scale required to decarbonize the sector.

Paired appropriately with regulations, deep retrofit incentives can support access to safer, healthier, more resilient buildings — especially for people with low incomes — and stimulate industry and broad market transformation. This could take the form, for example, of setting greenhouse gas reduction targets or carbon pollution standards for buildings while focussing financial support for retrofit and electrification upgrades on low-income households. Such support could be channeled through key actors along the supply chain and/or directly to building owners.

[1] Madi Kennedy and Tom-Pierre Frappe-Seneclauze, *Canada's Renovation Wave: A plan for jobs and climate* (Pembina Institute, 2021). https://www.pembina.org/reports/canadas-renovation-wave.pdf

To transform the sector and drive technology development that builds capacity for rapid delivery, governments need to establish clear systems of internal government coordination and public accountability.

Over the last two years, Natural Resources Canada (NRCan) has undertaken extensive public and industry engagement to develop the Canada Green Buildings Strategy (CGBS) with the aim to "mobilize national action to transform markets and reduce costs" to meet building sector carbon reduction targets.

The Pembina Institute welcomes the opportunity to provide input on the CGBS and has a number of recommendations to strengthen the strategy to maximize impact.

Recommendations

Maximizing the impact of public supports

Deep retrofitting residential buildings currently costs more than can be recuperated over time through the operational cost savings they offer. This impedes market transformation and will create an affordability challenge when regulations requiring these upgrades come into effect unless they are subsidized through government funding, grants, and tax credits.

Significant public funding will also be needed to alleviate the challenges experienced by low-income and non-market households. Such large public investments can often be politically challenging; however, there is clear evidence that these investments will have positive impacts on housing affordability and occupant health, as well as provide significant economic returns (GDP and job growth) on these investments.

Conversely, there is evidence of the significant risks to our economy if governments do *not* invest in upgrading our building stock. The Insurance Institute of Canada reported that severe weather claims paid by Canada's insurance industry have doubled every 5 to 10 years.[2] These dollar values do not capture the costs to human health and life, or the costs not covered by insurance. According to a study from Queen's University's Institute of Finance, without intervention climate change could cost Canada $5.5 trillion by the end of the century.[3]

Public policies and subsidies are needed to stimulate that market transformation. Without public investment, the building sector lacks the clear signal needed to invest in the labour and supply chain development required to deliver deep retrofits at the necessary rate of 4% to 5% of

[2] Insurance Institute of Canada, *Climate Risks: Implications for the Insurance Industry in Canada* (2020). https://www.insuranceinstitute.ca/en/resources/insights-research/Climate-risks-report

[3] Institute for Sustainable Finance, *Partial Disclosure: Assessing the state of physical and transition climate risk disclosure in Canada* (2022). https://smith.queensu.ca/centres/isf/pdfs/ISF-partial-disclosure-paper.pdf

the stock per year. Similarly, owners are unlikely to mobilize the private capital needed to decarbonize their homes and buildings if they cannot guarantee a return on their investments. Strategic allocation can simultaneously direct supports to households that need financial support and to buildings with the greatest need for improvements. To maximize impact, investments must leverage resources and programs, such as those through utility demand-side management programs or provincial emissions reductions program, and open opportunities for private investors.

Use incentives to drive market transformation and ensure fair access to retrofits

Until regulations are in place, the flow of private capital dedicated to retrofits needs to increase dramatically to scale the retrofit economy at the pace required to set all homes on a net-zero path. This includes the expansion of skilled labour, services and the supply chains for heat pumps, ventilation, insulation, and other products required to upgrade buildings.

Without public incentives, private capital within the residential building sector is very unlikely to mobilize because the business case just is not there. In the rental market, for example, tenancy acts are designed to keep rents affordable and prevent owners from downloading investment costs to tenants who are most likely to directly benefit from home improvements and energy savings.

European deep retrofit programs, such as Energiesprong, are successful in part because of energy plans that rebalance the ratio of rent to utility costs based on energy savings while maintaining total cost of the tenancy. Tenants agree to continue paying the same monthly amount for rent and utilities, even while utility costs decline, because their living costs do not increase but their homes improve. In Canada, where such agreements are not permitted, targeted incentive programs are needed to motivate building owners to invest in building upgradeswhile still ensuring housing is affordable and supporting low-income households and those struggling with energy poverty.

One-fifth of Canadian households access housing through financially supported, non-market mechanisms, such as government or non-profit owned housing.[4] Similarly, more than 2.8 million Canadian households struggled in 2019 to meet their heating, cooling, lighting, and appliance energy needs, representing up to 18% of Canadian households.[5] Whereas the average Canadian household spends less than 3% of its after-tax income on home energy needs, some households spend twice that and are defined as living with energy poverty. Not only does this

[4] Canada Mortgage and Housing Corporation, *About Affordable Housing* (2022). https://www.cmhc-schl.gc.ca/en/professionals/industry-innovation-and-leadership/industry-expertise/affordable-housing/about-affordable-housing/affordable-housing-in-canada

[5] CUSP, *Energy Poverty in Canada: a CUSP Backgrounder* (2019). https://www.energypoverty.ca/backgrounder.pdf

put low-income households at risk of energy insecurity, energy poverty has also been identified as an overlooked determinant of health and climate resilience: "Cross-sectoral interventions aiming to reduce energy poverty and improve energy security by targeting the energy efficiency of dwellings have been shown to improve a range of health and well-being outcomes in varied population groups."[6]

An incentive model based on ability to pay would help differentiate household needs based on ownership models, household incomes and energy poverty metrics, all while helping stimulate market growth. The CGBS should provide the analysis needed for governments, and the public, to understand how the cost of these essential retrofits should be distributed fairly based on the ability to pay. Incentive programs should support low-income households and rental building owners who do not have access to upfront capital or the capacity to carry loans without increasing the monthly rent their tenants pay. The recently launched Canada Greener Affordable Housing program is a positive development, supporting publicly funded affordable housing units, but still does not represent the scale, pace, and accessibility of funding needed.

Introduce net-zero-over-time programs

Heat pumps are a clear near-term building decarbonization solution; besides their climate advantages, they also bring important health and comfort benefits by providing much-needed cooling in summer months. Modern heat pumps can reduce greenhouse gas emissions by at least 20% compared with gas boilers when running on emissions-intensive electricity, but this reduction can be as large as 80% when coupled with cleaner sources of electricity.[7] Their high efficiency also helps mitigate the costs of purchasing a more expensive piece of equipment and switching from gas to electricity.

The point when furnaces and boilers reach end-of-life is a critical decision point. This is when home and building owners need quick entry into a long-term, net-zero-over-time program that facilitates access to a pool of grants and loans that enable them to quickly replace their furnace with a heat pump, and sets them further down a deep retrofit journey by enabling distribution of funding at each subsequent retrofit phase.

While failing furnaces are one of the more common opportunities to begin the retrofit process, entry into this journey needs to be flexible to best suit the needs of the building and the owner. Other key moments could include the point of needing cooling, or when envelope or window upgrades are needed because of age or desire for comfort.

---

[6] Mylène Riva et al., "Energy poverty: an overlooked determinant of health and climate resilience in Canada." *Canadian Journal of Public Health* 114 no.3 (2023). https://doi.org/10.17269/s41997-023-00741-0

[7] International Energy Agency, *The Future of Heat Pumps* (2022), 13. https://iea.blob.core.windows.net/assets/4713780d-c0ae-4686-8c9b-29e782452695/TheFutureofHeatPumps.pdf

The current Greener Home Initiative offers homeowners a grant up to $5,000, or a combined grant and loan up to $40,000 for retrofits and resiliency measures. To access the funds and to be eligible for reimbursement, homeowners must complete an EnerGuide evaluation pre- and post-retrofit. To help those owners unable to front the initial capital of the total project cost, the program allows homeowners to apply for immediate dispersal of up to 15% of the eligible cost of planned retrofits. However, this can limit owners to a single retrofit phase as neither the grant nor loan pathways provide a deep enough financial support for a wholistic approach to retrofits. This also does not consider equipment life-cycles or other key decision points, thereby creating barriers to homeowners taking a coordinated approach to the natural home upgrade cycle.

A net-zero-over-time approach would allow owners to make capital investments in phases as they follow a roadmap of retrofit actions. Taking this longer-term look at the building as a system can help owners sync up with the lifecycles of home energy systems and building envelope components while maximizing the financial return on their value. For example, by supporting heating equipment replacement as part of the natural end-of-life cycle, heat pump-focused programs could be delivered quickly by installers who are qualified in system design and understand how fuel-switching impacts other systems, without having to wait for an EnerGuide evaluation — a delay that is particularly unrealistic when a furnace suddenly quits in the middle of winter. The need for energy advisors and more comprehensive assessments of home retrofit upgrades could be deferred until complementary efficiency measures, such as envelope upgrades which require evaluation of interactions with other energy systems, are due.

To be successful, a phased retrofit approach requires low-burden, timely access to grant funds without requiring a pre-retrofit energy audit. Lengthy assessment and approval processes to access funds or energy advisor guidance are deterrents to meaningful retrofits, resulting in continued like-for-like replacements, missing timely opportunities, and preventing Canada from meeting its net-zero targets on time.

The CGBS should aim to transition and expand current retrofit funding programs into a consolidated net-zero-over-time offering, ideally holding a large pool of funds that are easily stackable with provincial and municipal funding for homeowners to access at each phase of deep retrofit.

Recognize Indigenous and remote community needs

With one-size-fits-all solutions, federal, provincial, and territorial governments will fail to meet their commitments to reconciliation. Meeting the housing gap persistent throughout Indigenous communities means prioritizing funding, capacity-building and support for program implementation. It is paramount that solutions be driven by and co-developed with

Indigenous people and organizations to ensure Indigenous communities are integrally connected in the transition to more efficient, affordable and sustainable housing.

The CGBS must recognize that the housing and energy efficiency needs of Indigenous communities vary — from on-reserve housing to rural First Nation, Inuit, and Métis communities to remote Indigenous communities located across the country. CGBS opens an opportunity to ensure governments work together to develop community capacity and strategies that both ensure all new buildings are low-carbon and culturally appropriate and address the major repair needs in existing buildings. At the same time, governments need to work to decarbonize the electricity supply system in remote communities and balance local grid needs through thoughtful implementation of heating electrification, renewable energy, and building energy efficiency measures.

Programs should have funding amounts and application requirements specifically tailored to northern and remote communities, considering the high cost of both energy and retrofits in the north. The current $5,000 grant portion of the Greener Home Initiative cannot achieve outcomes here comparable to more urban residences considering the high material costs and limited access to the skills and services needed. Similarly, upfront lending for low-income or northern homeowners and housing operators that are unable to carry the initial capital of the total project cost should be structured to support a much higher portion than the 15% currently available.

Retrofit solutions need to be tailored to consider climate, remoteness, technology, supply-chain availability and market differences unique from the rest of Canada. These needs present opportunities for local economic growth and skill development among Indigenous People and should be prioritized through the CGBS, by directing resources like energy audit capacity-building to Indigenous businesses and organizations to deliver these services.

Maximize the impact of regulatory tools

While financial subsidies and support mechanisms are needed to create demand that stimulates supply as well assupports low-income households, regulations are critical for driving market transformation. The 2021 national building codes and pending carbon intensity and resilience requirements are steps in the right direction for new construction. However, provinces have historically been slow to adopt federally drafted regulations like new building codes. Moreover, building codes only apply to new buildings and some major renovations. Market transformation is needed to meet the significant scale and pace at which upgrades must occur to decarbonize Canada’s building stock.

Political ownership by the provinces is critical as they have jurisdiction over most building regulations, but there also needs to be a strong federal incentive for action and harmonization

of these policies. With provinces constituting small dispersed markets, a patchwork approach will be detrimental to national-scale market transformation and labour development. To drive market transformation, we recommend development of a federal decarbonization backstop and establishing a single authority responsible and accountable for setting, tracking, and meeting building retrofit targets.

Develop a federal buildings decarbonization backstop

A flexible yet consistent approach is needed to encourage provincial governments to adopt policies and regulations for emissions reduction in the building sector that meet minimum benchmark requirements but suit regional needs and conditions. The carbon pricing backstop approach from the Pan-Canadian Framework on Clean Growth and Climate Change provides an example of a federal policy instrument that could be a model for driving provincial action on reducing building emissions. The national carbon price backstop is recognized as essential to fulfilling Canada's international commitments as a signatory to the Paris Agreement and critical to enhancing Canadian competitiveness and ability to compete in the emerging low-carbon global economy.

In the event a province does not implement these regulations, a set of criteria should be developed for when and how the federal backstop would apply. The mechanism available to enforce a federal backstop for building decarbonization would likely differ across building types. For example, the federal Energy Efficiency Act and associated Energy Efficiency Regulations apply to energy-using products in Canada, including heating and air-conditioning equipment. Regulated products must meet federal energy efficiency standards to be imported or shipped across domestic borders, sold, leased, or manufactured. B.C., Manitoba, Ontario, Quebec, New Brunswick, and Nova Scotia also have provincial energy efficiency regulations that apply to products manufactured within their borders, but these are not consistent across provinces or with the federal act.

The Canada Green Building Strategy should include plans for updated Federal Energy Efficiency Regulations that set a standard that aligns with the most ambitious provincial commitments to net-zero goals, such as B.C.'s, and aim for harmonization across all provinces and territories through creation of a federal backstop. The backstop could require space heating equipment to perform at a minimum of 100% efficiency, which could include equipment ranging from electric baseboards to heat pumps.

For larger buildings that require more complex mechanical energy systems, the federal government needs to explore opportunities to leverage the Canadian Environmental Protection Act (CEPA) or the Greenhouse Gas Pricing Act to set maximum carbon emission intensity thresholds for buildings by recognizing building carbon emissions in similar way to how vehicle emissions are regulated. Allowances could be made for provinces still working toward less

carbon-intensive grids by adjusting the threshold in these provinces for electric-heated buildings and complementing the regulations with incentives to further decarbonize building operations through on-site renewables.

Consolidate responsibility and accountability in a single authority

The Canada Green Buildings Strategy opens an opportunity to drive down building carbon emissions, stimulate a retrofit economy, and provide Canadians with climate-safe homes. These goals cannot be achieved without setting building improvement and performance metrics and targets and putting in place necessary accountability measures.

At present, responsibility for ensuring plans and programs on housing, building codes, energy-efficiency, retrofits, and infrastructure is scattered across multiple federal departments, including NRCan's Office of Energy Efficiency, the Canada Mortgage and Housing Corporation, and the National Research Council. Instead, a centralized authority is needed that is responsible for setting retrofit and resilience targets for homes and buildings and is accountable for meeting them. This authority should also oversee coordinated annual reporting and accountability on how well Canada is achieving building performance standards, building capacity and developing supply chains; retrofitting to meet net-zero emissions targets; and adapting homes and buildings to future climate impacts.

There is also a need to integrate other federal departments that oversee investment, federal real estate management and technology development into this strategy. These include but are not limited to Canada Infrastructure Bank's role in commercial retrofit investment, Public Services and Procurement Canada's role in decarbonizing federal buildings — and possibly the real estate aspects of the Greening Government Strategy — and Science and Economic Development Canada in stimulating clean technology development, including building energy systems.

Conclusion

The development of a CGBS presents an opportunity to dramatically shift the retrofit and construction sector towards rapid market transformation, ensuring Canadians live in climate resilient homes, while meeting carbon emissions targets and driving clean economy growth. This includes consideration of the unique needs of Indigenous Peoples such as climate and market differences that are unique from the rest of Canada.

The Pembina Institute looks forward the release of the CGBS and is eager to see tools designed to maximize the impact of public investment dollars and regulations that create opportunities to leverage the investment of private capital.