

Achieving Canada's climate and housing goals through building retrofits

Recommendations on green stimulus and platform commitments

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Summary

Refurbishing 2–3% of our buildings per year to protect housing supply, improve climate resilience, and reduce carbon pollution will require clear policy signals and sustained public investments over decades. The Pan-Canadian Framework on Clean Growth and Climate Change (PCF) and Canada's National Housing Strategy (NHS) have set important goals for existing homes and buildings, which need to be amplified by implementation of the 2019 platform and upcoming economic recovery investments.

In particular, Canada's retrofit market is in need of a clear policy signal that sets expectations for the decarbonization of buildings. Codes and regulations remain the most cost-effective signals for market transformation. Carbon-focused standards should be telegraphed well in advance to give the real-estate industry time to prepare and integrate these costs in investment decisions, and to ensure supply chains are poised to deliver these services efficiently.

Economic stimulus investments can accelerate this transition by funding training and incentive programs. These programs must be rolled out quickly for economic recovery, but should be designed to last over the next two decades to meet our climate and housing goals. To this end, we provide 20 recommendations to the seven cabinet ministers whose mandate letters mention policies directly relevant to the growth of a successful retrofit economy.

Five pillars of a retrofit economy

To meet their Paris Agreement climate commitments, Canada and other industrialized countries need to eliminate carbon pollution from homes and buildings by mid-century. To this end, Canada should achieve a 40–50% reduction by 2030. This will require major investments in refurbishing existing buildings to (1) get them off fossil fuels, (2) improve energy efficiency, and (3) make them more responsive to fluctuating demand on the electrical grid via storage, on-site generation, and load shifting. To protect occupant health and real estate assets, these upgrades should also include climate adaptation measures to enable buildings to better withstand extreme weather.

Markets today lack the signals to drive demand for such integrated “deep” retrofits. Intervention by senior levels of government is needed to create five key conditions for market transformation:

1. **Regulatory clarity:** Set a clear timeline and regulatory process for the phase out of fossil fuels as a heat source in buildings. This should include: (a) clear sectoral targets for reducing carbon pollution in buildings by 2030, 2040, and 2050; (b) carbon intensity limits for new buildings so they are connected to low-carbon heating systems from day one; (c) carbon intensity limits for existing buildings to be phased in over the next decade, allowing for variability across building types and regions; and (d) efficiency standards requiring the end-of-life replacement of fossil-fuel heating equipment by high-efficiency, low-carbon systems, such as heat pumps.
2. **Affordability and equity:** Create a long-term, outcome-focused program providing loans and grants to bridge the business case for deep retrofits. Public funds should *not* be used to further incent fossil fuel systems, but rather should focus on fuel switching and whole-building retrofits delivered in one step or over time. Leverage private capital for market segments where the business case for upgrades can already be made, and ensure regulations support housing affordability through subsidies and low-interest financing for housing societies. Design subsidy programs so they can be adjusted over time based on market response and the phasing in of regulations.
3. **Data access and transparency:** Mobilize provinces and territories to implement the universal labelling, benchmarking, and disclosure policies needed to inform and motivate investments in climate resilience and mitigation. Facilitate innovation and market creation by facilitating access to energy data via open-data policies for local, provincial, and federal databases; the implementation of data quality standards; and ensuring customers and public institutions can access utilities’ electronic data.
4. **Industry capacity:** Provide funding and resources to support standard development, training delivery, local manufacturing, and certification of high-performance components not yet available in the Canadian market.

5. **Demonstration projects and public procurement:** Prime market transformation through demonstration projects of deep retrofits and public procurement policies covering buildings owned or leased by federal, provincial, and territorial governments and public investments in social housing.

Ministers' mandate letters mention several new policies that could contribute to these objectives. However, the need to roll out these programs quickly raises some challenges, which we discuss below. These challenges can be mitigated through program design, co-ordination across ministries, and stakeholder engagement.

Retrofits in homes (Green Homes program)

“Operationalize a plan to help Canadians make their homes more energy efficient and climate resilient. This will include providing free energy audits to homeowners and landlords, up to \$40,000 in interest-free lending for retrofits that will save Canadians money on their energy use, a cash incentive for borrowers to maximize their energy savings, and creating a Net Zero Homes Grant of up to \$5,000 for newly built homes that are certified net zero-emissions.”

— *Mandate letters to Minister of **Natural Resources** Seamus O'Regan and Minister of **Families, Children and Social Development** Ahmed Hussen (responsible for the Canada Mortgage and Housing Corporation)*

Challenges

- If the eligibility criteria for accessing Green Home zero-interest financing include only minimal requirements for carbon pollution reductions, this program will result mostly in shallow retrofits and significant free-ridership. Picking only the lowest hanging fruit will not put these homes on track to zero-carbon, leaving the heavy lifting for another day. This will also hinder the business case for deep retrofits in the future, as the most cost-effective measures will have already been completed.
- A short-lived program could have a detrimental impact on the establishment of a mature retrofit economy. The introduction and withdrawal of federal and provincial programs created significant boom-bust cycles in the energy auditor workforce, to note just one example. Building awareness of programs among contractors and homeowners takes time and co-ordination with utilities, provinces, and other customer-facing institutions.
- A one-size-fits-all program is most likely to get uptake from well-off households with capacity to invest and take on additional debt, thus exacerbating, rather than alleviating, economic disparity.
- A zero-interest financing program could compete with the Property-Assessed Clean Energy (PACE) financing programs being developed by local governments with the support of the Federation of Canadian Municipalities (FCM).
- Energy audits based on walkthroughs with energy advisors are relatively expensive. Although they offer great value to homeowners seeking to pursue significant renovations, they may not be the most cost-effective way to proactively engage homeowners and the real estate industry to create awareness of energy efficiency and to facilitate its market valuation.

Recommendations

- 1. Increase the Greener Home retrofit target and pair loans with outcome-based grants:** Increase loan maximums for homes from \$40,000 to up to \$100,000 and provide grants to cover a significant portion of the retrofit cost. Offer homeowners a financing package (including loan and grant) that becomes more advantageous based on the depth of carbon reduction achieved and the reduction in peak electricity consumption. Use pre/post energy audits to assess outcomes.
- 2. Partner with retail banks and financial technology firms for program delivery:** Contractors and retail banks have unique opportunities to engage homeowners when investment decisions are made: when something fails, and when a home is being sold or remortgaged. The federal government should partner with retail banks and fintech firms that provide lending products to contractors to deliver government-backed financing programs. This public-private partnership model has been successfully used by the KfW development bank in Germany to roll out more than 27 billion euros in loans and grants.¹
- 3. Align with residential PACE programming:** FCM is working with several municipalities across the country to set up PACE financing programs. Co-ordination with these programs should be facilitated by ensuring that low-cost financing available through the federal government is accessible through the PACE programs. This might take some time to bring to fruition, and should be worked on in tandem with the partnership with retail banks discussed above. In the meantime, providing PACE participants with the option to access a top-up grant comparable to the value of the interest buy-back offered by the government would ensure these federally-backed pilot programs are not competing against another federal program.
- 4. Allow the formula to vary by market segment, region, and equity considerations:** The formula established to assess grant size and total allowable loan could be adapted to allow for regional variations in grid intensity, due to market contexts, and based on the level of economic stimulus sought. Top-ups should be provided for low-income, remote, and Indigenous communities based on geographic area and/or based on low-income thresholds.² Programs could be launched nationally relatively quickly with minimum incentives. Formulas for more advanced incentives could then be developed in collaboration with provinces and territories, each given access to a pool of funding to distribute based on regional considerations. Access to this incentive funding pool

¹ Tower Renewal Partnership, *German Retrofit Financing* (2016). http://towerrenewal.com/wp-content/uploads/2017/04/20170331_Case-Study_KFW.pdf

² For example, see the “low-income household” definition in B.C.’s Demand-Side Measures Regulation, Article 1. http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_326_2008

should be made conditional on the implementation of PCF objectives for building codes and labelling.

5. **Develop low-cost labelling tools aligned with EnerGuide, and work with provinces and territories to implement labelling requirements at point of sale or rental:** An alternative to a full audit can be generated based on available databases and through a simple questionnaire to be filled in by homeowners.³ Natural Resources Canada could develop such a tool and integrate it with the EnerGuide home energy rating system as a pre-assessment tool. The pre-assessment could be used to comply with point-of-sale and point-of-rental labelling requirements, allowing provinces and territories to move faster toward adoption of this PCF commitment. As well, this pre-assessment could be paired with customer-centric web interfaces, be used to upsell incentive and loan programs, and facilitate access to contractors. Such pre-assessments could be sufficient to create a market signal and could be upgraded to a full audit by owners who plan to conduct retrofits. Such remote-based pre-assessment would benefit from a structured energy data strategy (see Recommendation 15).
6. **Create an ongoing funding mechanism for low-carbon finance programs distinct from general revenues:** Outcome-based programs as outlined above offer the advantage that the funding levels can be adjusted over time based on political priorities while maintaining the continuity of the program. Another way to increase the resiliency of these programs is to fund them through a dedicated fund replenished through the issuance of green bonds, similarly to what Germany is doing in partnership with the KfW bank. In this successful public-private partnership, the government sells bonds on capital markets to fund a mix of low-interest (1–3%) loans and grants which local retail banks can offer to their customers. The economic activity resulting from the investment has been shown to return four to five times more money to the public coffers than the costs the program demands, which is more than sufficient to repay the bonds.⁴

³ Madi Kennedy, Betsy Agar, and Tom-Pierre Frappé-Sénéclauze, *Tools for Building Energy Labelling: Options for a universal energy labelling policy in B.C.*, prepared by the Pembina Institute for the B.C. Ministry of Energy, Mines and Petroleum Resources and Natural Resources Canada (2019).

⁴ KfW Bankengruppe, *Impact on Public Budgets of KfW Promotional Programmes in the Field of “Energy-Efficient Building and Rehabilitation”* (2011). <https://www.kfw.de/migration/Weiterleitung-zur-Startseite/Homepage/KfW-Group/Research/PDF-Files/Energy-efficient-building-and-rehabilitation.pdf>

Retrofits in affordable housing

“Building on our historic investment of \$13 billion, including the creation of 41,800 new units and the repair of another 229,600 units, continue to build and renovate housing through the National Housing Strategy.”

— *Mandate letter to Minister of **Families, Children and Social Development** Ahmed Hussen (responsible for the Canada Mortgage and Housing Corporation)*

“Work with the Federation of Canadian Municipalities through the Green Municipal Fund, the Municipalities for Climate Innovation Program and the Municipal Asset Management Program to build climate resilience, reduce greenhouse gas emissions, make better decisions, and monitor investments and ensure they reduce emissions from residential, commercial and multi-unit buildings.”

— *Mandate letter to Minister of **Infrastructure and Communities** Catherine McKenna*

Challenges

- Despite the technical capacity to do so, few housing societies go beyond the 25% energy and carbon pollution reduction required by the National Housing Co-Investment Fund. This minimum requirement can be easily achieved through basic control upgrades and switching to a more efficient natural-gas powered heating plant. While they may reduce operational costs, these upgrades do *not* significantly improve the resiliency of these buildings, nor do they wean them from carbon-intensive fuels. From a climate perspective, these are costly missed opportunities.
- There are currently no federal programs supporting the refurbishment of aging market-rental housing and co-op housing. In many cities, rent increases are capped, making it difficult for owners to recuperate investments in refurbishment. In the absence of requirements to do so, these buildings are not being renovated and are degrading.

Recommendations

7. **Create a top-up fund for NHS-funded retrofits and new construction projects that achieve deep carbon reductions:** Right now, projects accessing NHS funding must achieve at least a 25% reduction in carbon pollution; this leaves many opportunities for carbon reduction unfunded. Adding a top-up fund to enable societies to go directly to deep retrofits (60–80% GHG reductions) would seize opportunities that would otherwise be missed for increased resiliency, carbon reductions, and economic activity in projects that are scheduled for design and construction in the coming years.
8. **Require stronger climate resiliency in NHS-funded projects:** Decarbonization of the social housing sector by 2050 should be an explicit objective for the Canada Mortgage

and Housing Corporation (CMHC); co-investment funding should be guided by these outcomes and the minimum carbon reductions expected from these investments should be increased. The co-investment fund also needs a clearer framework to assess and require integration of climate adaptation measures in these once-in-a-generation upgrades. Many synergies between deep retrofits and climate risk protection are routinely being missed; they should be seized to ensure the long-term health and viability of our social housing sector.

- 9. Provide more flexibility on meeting accessibility targets in retrofit situations:** Co-investment fund requirements for accessibility upgrades are very costly in retrofit situations. Accessibility goals of the NHS could more effectively be met by ensuring a greater share of units in new construction projects meet accessibility criteria, and by allowing more flexible tests for accessibility upgrades in existing buildings.
- 10. Create a market-rental preservation program:** Apartment buildings built in the 1960s, '70s, and '80s form the backbone of affordable rental housing in Canada and are an essential part of our economic infrastructure: workers having a place to call home is as necessary as roads and bridges to a competitive economy. The federal government should create a market-rental preservation program incenting landlords to repair and retrofit relatively affordable units without increasing rents beyond inflation — discouraging tenant-displacing measures such as “renoviction,” improving housing quality, and reducing carbon pollution.⁵

⁵ Federation of Canadian Municipalities, *Building better lives together: First 100 days of federal government: A municipal call to action* (2019). <https://data.fcm.ca/documents/resources/building-better-lives-together.pdf>

Retrofits in commercial buildings

“Launch a national competition to create four long-term funds to help attract private capital that can be used for deep retrofits of large buildings such as office towers.”

— *Mandate letter to Minister of **Natural Resources** Seamus O'Regan*

“Ensure the Canada Infrastructure Bank has the support it needs for its core purpose of attracting private sector and institutional investment to expand the scope of public infrastructure investment in Canada, in line with the Government’s public policy objectives.”

— *Mandate letters to Minister of **Infrastructure and Communities** Catherine McKenna and Minister of **Finance** Bill Morneau*

Challenges

- Energy efficiency investments in buildings are too small and have too high transaction costs to be of interest to most private investors. An intermediary is required to pool projects and bundle these investments to be sold as securities. This requires a level of expertise in assessing the business case for building retrofits, real estate risk assessment and valuation, loan underwriting, etc. Any funds aiming to attract private capital in this sector should be administered by an entity with the resources and mandate to retain that expertise.
- Split incentives: owners of commercial buildings have limited incentive to refurbish buildings if the energy cost savings and other non-energy benefits are accrued by tenants.

Recommendations

11. **Develop an arm of the Canada Infrastructure Bank (CIB) dedicated to the identification, underwriting, and securitization of commercial retrofit loans:** The federal government can build a green finance practice within the CIB, with the initial intent of aggregating energy efficiency loans (e.g. loans made by emerging financing programs across Canada), securitizing them and selling them on secondary markets (e.g. to institutional investors). As the market matures, this green building finance centre may expand its efforts to other areas, in line with green bank-like institutions around the world.⁶
12. **Collaborate with CMHC and FCM on the development of a national commercial PACE program:** Through its community energy financing program, FCM is tasked with

⁶ Équiterre and the Pembina Institute, *Federal Policies for Low-Carbon Buildings: A blueprint to implement the Pan-Canadian Framework buildings strategy* (2017), 21. <https://www.pembina.org/pub/federal-buildings-blueprint>

supporting energy financing programs in municipalities, many of which are looking into PACE. Given the significant learning curve in understanding the risks and value of PACE financing for building owners, portfolio managers, underwriters, and CFOs, it is critical that eligibility criteria and terms be harmonized across the country to justify mobilization of resources to understand this new financing mechanism. Canada is a small market as it is, and further fragmentation will not allow the structural changes needed for PACE to succeed.

- 13. Launch a loan guarantee program for high-performance retrofit projects:** The federal government can launch and manage a large-scale loan guarantee program to backstop investments in key building retrofit initiatives. Modelled after the U.S. Department of Energy's successful program, Canada's program can focus on guaranteeing private loans to energy efficiency, renewable energy, and other projects.⁷

⁷ *Federal Policies for Low-Carbon Buildings*, 22.

Integration with Pan-Canadian Framework commitments and other policies

“Implement the Pan-Canadian Framework on Clean Growth and Climate Change, while strengthening existing and introducing new greenhouse gas reducing measures....Working with the Minister of Innovation, Science and Industry and the Minister of Natural Resources to position Canada as a global leader in clean technology.”

— *Mandate letter to Minister of **Environment and Climate Change** Jonathan Wilkinson*

“Operationalize a plan to help Canadians make their homes more energy efficient and climate resilient.”

— *Mandate letters to Minister of **Natural Resources** Seamus O'Regan and Minister of **Families, Children and Social Development** Ahmed Hussen (responsible for CMHC)*

“Invest in skills training to ensure that there are enough qualified workers to support energy audits, retrofits and net zero home construction.”

— *Mandate letter to Minister of **Employment, Workforce Development and Disability Inclusion** Carla Qualtrough*

“Work with the Federation of Canadian Municipalities through the Green Municipal Fund, the Municipalities for Climate Innovation Program and the Municipal Asset Management Program to build climate resilience, reduce greenhouse gas emissions, make better decisions, and monitor investments and ensure they reduce emissions from residential, commercial and multi-unit buildings.”

— *Mandate letter to Minister of **Infrastructure and Communities** Catherine McKenna*

“Improve the quality of publicly available data in Canada. This will require working with Statistics Canada, the President of the Treasury Board and other departments and agencies to develop an Open Data initiative that would consider big data and make more of the data paid for by Canadians available to the public....Support the Ministers of Environment and Climate Change and Natural Resources in making strategic investments in our clean technology sector.”

— *Mandate letter to Minister of **Innovation, Science and Economic Development** Navdeep Bains*

“Cut tax rates by 50 per cent for companies that develop and manufacture zero-emissions technology.”

— *Mandate letter to Minister of **Finance** Bill Morneau*

Challenges

- Codes and regulations remain the clearest and most cost-effective market signals for market transformation. Yet, three years after the signing of the PCF, no clear mechanism ensures provincial and territorial commitments related to building decarbonization are implemented. This includes commitments to adopt national building codes, implement code requirements for existing buildings, and implement universal labelling.⁸
- Without ready access to comparable, verified energy performance data, the real estate industry lacks the information required to value retrofit investments and provide evidence to consumers on the benefits of energy retrofits.
- Data sources on energy efficiency technologies, potential, and building performance are fragmented across levels of government, utilities, and stakeholders, and not structured to enable access and use.
- A comprehensive retrofit strategy requires co-ordination across seven federal ministries.

Recommendations

14. **Invest \$500 million in workforce development and training:** The transition to low-carbon buildings requires professionals, contractors and trades that understand best practices for the design and construction of high-performance buildings and retrofits. The current slowdown in various sectors provides an opportunity to provide distance education programs to upgrade and retool more workers with skills that are in high demand in the green building sector. We support the Canada Green Building Council and Efficiency Canada's recommendation to provide \$500 million for training for Canada's low-carbon building workforce.⁹
15. **Make access to a portion of funds for incentives and capacity building conditional on advancing regulatory roadmaps for a zero-carbon building sector by 2050:** Without these policies in place, incentive programs will remain ineffective. The federal government should provide capacity-building funding for provincial code adoption, local code enforcement, and implementation of universal home-energy labelling. This funding should be conditional on provinces adopting the 2020 model codes and developing roadmaps to prepare the construction industry for enforcement of the net-zero energy ready code by 2030, as committed in the PCF. Similarly, a dedicated fund should be created to support provincial development of retrofit roadmaps leading to net-zero carbon buildings by 2050.

⁸ *State of the Framework*.

⁹ Canada Green Building Council, *Market Impact Report Update* (forthcoming).

16. **Add an explicit climate objective in codes:** Create a set of stepped performance-based metrics for operational carbon intensity, embedded carbon intensity, and peak electricity demand, and work with provincial, territorial, and local governments to establish regional roadmaps toward these goals and a staged implementation of these requirements for existing buildings. Include prescriptive requirements for other resiliency objectives (e.g. climate adaptation, seismic, and accessibility).
17. **Adopt high-performance regulations sooner:** Accelerate the switch to heat pump technology by setting a target for all heating equipment on sale in Canada to meet an energy performance greater than 100% before 2030. The “aspirational goals” set at the 2018 Energy and Mines Ministers’ Conference¹⁰ should be firmed up and advanced in consideration of the current climate emergency. Additional support should be provided to initiatives underway to support training, certification, and supply chain development.
18. **Facilitate access to building data by citizens, governments, and companies:** Task the Canadian Centre for Energy Information to develop a building data framework to support policy development, energy and land-use planning, asset risk evaluation, market development, web-based applications, and big-data tools. This framework should include open-data policies for local, provincial, and federal building-related databases, implementation of data quality standards, and standardization of data exchange protocols.
19. **Include low-carbon heating equipment, grid-interactive building components, and other high-performance building components when defining zero-emission technologies eligible for tax cuts.**
20. **Form a cross-ministerial working group for the co-ordination of a retrofit building strategy.**

¹⁰ “By 2035, all space heating technologies for sale in Canada meet an energy performance of more than 100%.” Energy and Mines Ministers’ Conference, *Paving the Road to 2030 and Beyond: Market transformation road map for energy efficient equipment in the building sector* (2018), 32.
<https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/emmc/pdf/2018/en/18-00072-nrcan-road-map-eng.pdf>