

Written Submission for Federal Pre-Budget Consultations in Advance of the 2023 Budget

By Passive House Canada

Recommendations

Recommendation #1: Create a \$50 million High-Performance, Net Zero Building Training Fund to develop and integrate high-performance building training into existing education programs across Canada. Currently a major barrier to achieving emissions reductions in buildings, integrating training into existing education will more effectively prepare the building sector to build and retrofit to the level required to achieve Canada's emissions reductions targets.

Recommendation #2: Fund \$500,000 for the creation of standardized training for building owners, operators and occupants on how to operate and live in high-performance, net zero buildings, across Canada. This will ensure energy savings are realized and mitigate risks from improper operation or use, which can be severe.

Recommendation #3: Create a \$500 million Municipal Green Building Training Fund to support municipalities to train staff on net zero, high-performance building construction and to develop green building strategies.

Recommendation #4: Establish and fund the creation of a Net Zero, Climate Resilient Buildings code committee with a mandate to modernize the model codes to ensure they align with the goals and timelines of the Green Buildings Strategy, and current and future emission reduction plans stated in Canada's Net-Zero Emissions Accountability Act. Individuals with high-performance building expertise must be at the table.

Recommendation #5: Amend the code development processes by increasing the frequency of updates, transparency of decision making, and broadening the expertise at the table.

Recommendation #6: Create A \$500 million Accelerating Green Building Manufacturing Fund to support innovative manufacturers looking to produce and scale low-carbon, high-performance building components and prefabrication to ensure net-zero buildings are built and retrofitted fast, at affordable costs, and with Canadian-made materials.

Rapidly Increase Skills Capacity in the Building Sector

Recommendation #1: Create a \$50 million High-Performance, Net Zero Building Training Fund to develop and integrate high-performance building training into existing education programs across Canada. Currently a major barrier to achieving emissions reductions in buildings, integrating training into existing education will more effectively prepare the building sector to build and retrofit to the level required to achieve Canada's emissions reductions targets.

It is well known that the current capacity of the building sector to construct net-zero and zero-emissions buildings is one of the most significant barriers to reducing emissions in buildings. Without a rapid increase in capacity, Canada will be unable to achieve its long-term targets for buildings. We recommend incentivizing and funding high performance building training to be integrated in building sector education programs in every province and territory in Canada. This training should take an envelope first, whole building approach to design and should target 90% heating energy reduction in new builds and at least 70% heating energy reduction in retrofits. This training must be available to building sector and trades professionals and become standard practice. Training programs do not need to be lengthy. For example, Passive House Canada's training for trades professionals typically takes three days. Training for building designers typically requires just 72 hours of training to learn energy modeling and design principles for Passive House and other low energy, low carbon buildings.

The federal government has a key role to play in prioritizing and incentivizing workforce capacity building to deliver net zero, climate resilient new buildings and retrofits. Doing so will drive the growth of the supply chain needed to support industry.

Recommendation #2: Fund \$500,000 towards the creation and roll out of standardized training for building owners, operators and occupants on how to operate and live in high-performance, net zero buildings, across Canada. This will ensure energy savings are realized and mitigate risks from improper operation or use, which can be severe.

One important and under-discussed area is educating building owners and occupants on how to operate and live, respectively, in high-performance buildings. This education is critical for new buildings and retrofits to realize energy savings. Unlike regular buildings, when operated improperly, serious issues can occur that not only decrease energy efficiency, but also pose health risks to occupants. Indoor air quality could be compromised if the ventilation system is not operated or maintained properly. Fresh air ventilation keeps indoor air pollutant levels down as air tightness is increased. It also prevents moisture build up that can lead to mold. Furthermore, improper operation can lead to durability issues with a building. If a building is pressurized due to imbalanced ventilation, moisture can be driven into the wall system. In addition to the mold growth, moisture buildup can lead to corrosion and decay of building materials. We recommend that funding be made

available to create a standardized training program that can be easily rolled out to building owners and operators, and tenants and residents on how to operate and live in a high-performance building. This will allow for more effective measurement and verification to ensure energy savings are realized and mitigate risks from improper operation or use.

Recommendation #3: Create a \$500 million Municipal Green Building Training Fund to support municipalities to train staff on net zero, high-performance building construction and to develop green building strategies.

Many municipalities are taking the lead to drive high performance, net zero buildings through the planning process, while some are being left behind due to funding challenges. All municipalities should be afforded the opportunity to upskill their staff and be supported to develop green buildings strategies so they can more effectively work towards emission reductions in buildings.

Modernize the National Codes Process to Accelerate Net Zero, Climate Resilient Building Construction

Recommendation #4: Establish and fund the creation of a Net Zero, Climate Resilient Buildings code committee with a mandate to modernize the model codes to ensure they align with the goals and timelines of the Green Buildings Strategy, and current and future emission reduction plans stated in Canada's Net-Zero Emissions Accountability Act. Individuals with high-performance building expertise must be at the table.

The purpose of the model code must be expanded, beyond requiring industry to meet base levels of safety standards in building, to one that meets standards that protect Canadians from climate change as well. Advances in building practices now demonstrate that both safety standards and high-performance approaches to design and construction can coexist and, in fact, support each other. Furthermore, data shows that high-performance, resilient buildings offer better health, comfort and quality of life for occupants, as well as greater protection from climate impacts such as extreme weather events. To that end, we recommend the model code be modernized by adopting performance-based outcomes at or adjacent to the Passive House standard for new builds and retrofits (90% heating energy reduction and at least 70% heating energy reduction, respectively), to deliver science-based outcomes rooted in verifiable metrics of success for energy efficiency, cost, and resilience. A committee with a mandate to implement these changes will accelerate progress.

Recommendation #5: Amend the code development processes by increasing the frequency of updates, transparency of decision making, and broadening the expertise at the table.

The National Building Code process is on a five-year cycle. The cycle should be reduced to three years to ensure new technologies, materials and methods, as well as better approaches to health and safety, can be

incorporated into the next generation of buildings with sufficient time for proof of performance. Ongoing updates should be made available to all interested parties, particularly those working in climate change protection.

Canada's National Building Code process is opaque. The process needs to be opened to include the public and business, not just those involved in code development. In Canada, the Provincial/Territorial Policy Advisory Committee on Codes (PTPACC) meets in-camera where it can veto the recommended suggestions put forward by the expert Standing Committees. Further, the Executive Committee can be lobbied to remove suggestions put forth by the expert Standing Committees. This process should be transparent and open to input from the public but avoid getting bogged down in public consultation.

The National Building Code process does not have sufficient high-performance building and infrastructure experts at the table. If the code development process is to remain a volunteer-driven process dominated by the development industry and construction product manufacturers, the government should use its power to fund and require the involvement of high-performance, net-zero, resiliency and circularity building experts in code development.

Support Canadian producers of high-performance building components and prefabrication

Recommendation #6: Create A \$500 million Accelerating Green Building Manufacturing Fund to support innovative manufacturers looking to produce and scale low-carbon, high-performance building components and prefabrication to ensure net-zero buildings are built and retrofitted fast, at affordable costs, and with Canadian-made materials.

Manufacturers play a critical role in developing and producing products needed for net-zero, climate resilient buildings. Currently, a gap exists in the market for high-performance building components, requiring builders to look internationally to source materials. This reduces affordability and is slowing market advancement. We recommend incentivizing the local production and manufacture of all high-performance building components including prefabricated components and panelized construction systems within Canada.

In the federal 2021 budget, reduced corporate tax rates were made available for manufacturers of zero-emissions technologies via a new tax credit. In the federal 2022 budget, this incentive was extended to manufacturers of air source heat pumps. However, the list of eligible products still excludes many components that are integral to the construction and retrofit of net-zero emissions buildings. They include:

- Air source heat pumps with low GWP refrigerants for space heating and DHW applications
- HRVs and ERVs above 80% heat recovery efficiency and 70% humidity recovery efficiency

- High performance windows requiring 0.8 W/(m²K) for cool-temperate climate zones, 0.6 W/(m²K) for cold climate zones, and 0.4 W/(m²K) for arctic climate zones.
- High performance doors that have a U-value below 0.8 W/(m²K) for cool-temperate, 0.6 W/(m²K) for cold climate, and 0.4 W/(m²K) for arctic climate.
- Low embodied carbon insulation
- Smart membranes for air tightness
- Air tightness testing equipment such as blower doors
- Testing and monitoring equipment such as build-ing automation systems and energy monitoring sensors to monitor energy use
- High efficiency appliances
- Prefabricated components
- Panelized construction systems for the following climate zones: cool-temperate, 0.15 W/(m²K), cold, 0.12 W/(m²K) and arctic, 0.09 W/(m²K).
- Vacuum insulating glass
- Vacuum insulated panels

The government is not yet effectively signaling to manufacturers that high performance building components need to be produced on a larger scale nationally. Incentivizing the production of these products will encourage current manufacturers to prioritize these components and create opportunities for new manufacturers to enter the market. It will spur job creation and enable the scaling up of high-performance buildings.

Furthermore, prefabrication is essential to addressing the current labour shortage, reducing labour costs, increasing productivity gains and resource efficiency, cutting carbon emissions, and accelerating the construction and retrofit of buildings. It also allows for efficient design and lower carbon impact of disassembly.



About Passive House Canada

Passive House Canada is a national non-profit professional association that advocates for and educates on the Passive House high-performance building standard that sharply reduces greenhouse gas emissions and provides resilient structures that can withstand extreme weather related to climate change.

Passive House is recognized by the United Nations as the optimal way to build healthy, climate-resilient, affordable, and energy-efficient residential, institutional, and commercial buildings through all stages of design, construction, and livability. Our mission is to make the International Passive House standard of building performance understood, achievable, and adopted by government, industry, professionals, and the public across Canada through education, advocacy, events, and building projects.

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