



Canada Green Building Council
Every Building Greener
Conseil du bâtiment durable du Canada
Verdir tous les bâtiments



RAIC | IRAC
Royal Architectural Institute of Canada
Institut royal d'architecture du Canada

April 1, 2020

Codes Canada
National Research Council of Canada
Codes.publicreview@nrc-cnrc.gc.ca

**Re: Changes to National Model Energy Code for Buildings and the National Building Code
Proposed Changes 1527 (NECB17 Div.A and Div.B, various), 1617 (NBC15 Div.B 9.36.1.3), 1608
(NBC15 Div.B 9.36.5)**

To: Dear Canadian Commission on Building and Fire Codes:

The Canada Green Building Council (CaGBC) and the Royal Architectural Institute of Canada (RAIC) would like to thank the National Research Council for the important work of developing regulatory tools that will shape not only the future of Canada's construction industry, but also the livability of homes and buildings in the face of a climate crisis.

The National Energy Code for Buildings (NECB) and the National Building Code (NBC) are critical to achieve the Canadian Greenhouse Gas (GHG) reduction targets, and to advance the building sector's ability to provide energy efficient, low carbon and climate resilient buildings. We submitted technical feedback for proposed changes to Codes Canada on March 13th. Considering the potential impact of these changes we felt that it was also important to provide constructive feedback on the overarching approach and omissions on behalf of the green building industry in Canada.

Respectfully submitted,

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The **Canada Green Building Council (CaGBC)** is a not-for-profit, national organization that has been working since 2002 to advance green building and sustainable community development practices in Canada through market-based solutions. We are an industry-led organization providing value-added solutions that benefit the environment, economy, and public health. Our in-depth market research and analysis, building certification program (LEED, Zero Carbon Standard), and capacity building efforts have accelerated the transformation to high-performing green buildings, homes, and communities throughout Canada. Our reach is enhanced by the work of eight provincial Chapters that provide regionally tailored market education and advocacy.

The **Royal Architectural Institute of Canada (RAIC)** is a not-for-profit, national organization that has represented architects and architecture for over 100 years, in existence since 1907. The RAIC is the leading voice for excellence in the built environment in Canada, demonstrating how design enhances the quality of life, while addressing important issues of society through responsible architecture. The RAIC's mission is to promote excellence in the built environment and to advocate for responsible architecture. The organization national office is based in Ottawa with a growing federated chapter model. Current chapters and networks are based in British Columbia, Alberta and Nova Scotia.

Recommendations

1. Code must address carbon not just energy

The code requirements should address not only energy efficiency, but also the carbon emissions associated with construction and operations. If not all sources of carbon emission associated with buildings are reduced, the codes will not meet the government's objectives.

The building sector has a crucial role in effectively eliminating greenhouse gas (GHG) emissions leading up to 2030 and 2050. In Canada, building operations represent 17 per cent of carbon emissions, with construction and materials estimated to represent a further 11 per cent. Zero carbon buildings are designed to minimize carbon emissions and then offset any remaining emissions, which reduces life-cycle costs and mitigates exposure to carbon pollution pricing. The decisions made at the design stage of new construction fundamentally affect the ability to achieve low emissions in the long term. Given the lifespan of buildings, it is critical that design for low carbon operations occur today at scale since retrofitting these buildings before 2050 will be costly and difficult to achieve. Energy is often used as a proxy for carbon as a performance metric because it is more readily available, relates directly to costs and examples exist for energy efficiency requirements within code. However, energy efficiency and carbon emissions do not always move in lockstep. A building's energy performance alone fails to consider how carbon emissions vary between electricity grids across the country, and between fuels used on site. Precedents in Canada and the United States now exist demonstrating how building codes can effectively incorporate carbon metrics alongside energy thresholds. If the goal of the code improvements is to reduce carbon emissions, we must move towards terms such as "total carbon footprint" and "carbon performance" alongside "energy use intensity" or "energy performance".

2. Add operational GHG intensity metrics

The National Model Energy Code for Buildings (NECB) and the National Building Code (NBC) should include the addition of operational GHG intensity metrics in order to better align code outcomes with the objectives of the Pan Canadian Framework on Clean Growth and Climate Change.

Many of the proposed changes to the NECB will reduce the need for thermal energy to heat buildings, which is an important factor in enabling adoption of the clean energy heating solutions needed to significantly reduce operational carbon. By enabling the use of low-grade heat from clean energy sources through prescriptive requirements for all elements impacting thermal energy demand (heating load), a project's choice of a clean energy source is encouraged. The inclusion of a tiered approach for the NECB is also an important change that will create a more effective platform and line of sight for industry engagement and capacity building leading up to the higher performance thresholds. However, the singular focus on energy efficiency will not achieve the carbon reductions necessary in the next decade to

achieve the objectives of the federal government. More importantly, the current approach could create a liability of expensive future retrofits.

To encourage new buildings to connect to low-carbon heating sources, our energy code should compare the relative merits of different fuel uses based on their carbon intensity. This should be done alongside requirements for energy efficiency, to limit energy waste and protect consumers against future energy cost increases. Even as efficiency increases, the choice of heating fuel dominates the emissions outcome of building operations. There are several low-carbon options to heat buildings, and regulations should be adjusted to send a clear signal to building designers that these are preferable and also affordable. Setting a carbon intensity budget gives developers an incentive to connect to potential low-carbon heat sources (e.g. electricity, district energy systems) while still providing the flexibility to use carbon-intensive fuels for high-value uses like cooking, peak heating demand, or back-up heating.

Adopting a set of GHGI targets alongside energy efficiency metrics would provide local and provincial governments with the necessary tools to ensure emissions reductions are achieved when implementing the new version of the code.

3. Develop embodied carbon metrics

The next update to the code should include embodied carbon reduction targets using a comparative approach where proposed buildings are compared to a baseline version of the same building.

GHG emissions associated with the production, use, and end of life of construction materials contribute significantly to the limited global carbon budget and must be addressed as quickly as possible in order to be eliminated by 2050. Studies indicate that optimizing procurement processes can provide a 20-40% reduction of embodied carbon today. To achieve more significant reductions will require the development of new products and materials and the evolution of the entire product value chains – a important reason to begin signaling to the market its importance.

The NCB could start by incorporating reporting requirements for Part 3 buildings, in order to help build the knowledge and capacity to assess and minimize embodied carbon emissions. This reporting should follow established international standards, such as EN 15978 and ISO 14040/14044, enabling a quantification of impacts at different life-cycle stages. The upfront carbon associated with production and construction is particularly important given the timescale for eliminating emissions; many construction materials being used today can be expected to still be in service beyond 2050.

To ensure assessment quality and consistency, the National Building Code should give direction regarding what assessment methodology and standard needs to be followed, and what databases and tools are acceptable to use for building projects. The National Research Council's Low Carbon Assets through Life Cycle Assessment initiative will contribute significantly to meeting these needs.