# Policy Considerations for Developing and Implementing Greenhouse Gas Emissions Provisions in the National Model Codes

*DRAFT VERSION FOR STAKEHOLDER CONSULTATION*

## Introduction

This paper identifies and examines policy considerations related to the development and implementation of code provisions related to a greenhouse gas (GHG) emissions objective for new houses and buildings in Canada ("GHG emissions codes"). Draft policy positions reviewed by the Canadian Board for Harmonized Codes (CBHCC) are presented, which will serve to inform code development.

An updated version of this paper will include the following, along with any additions to existing sections:

- interplay of other FPT policy and programs related to GHG emissions
- regional differences
- impact on affordability
- development and availability of data, and
- adoption and implementation considerations including market readiness, training, capacity-building, and developing tools to enable PTs to harmonize.

## Background

The National Model Codes currently contain an energy efficiency objective and related requirements for the design and construction of new buildings and houses. In the 2020 editions of the National Energy Code of Canada for Buildings (NECB) and National Building Code of Canada (NBC), energy efficiency tiers were introduced, containing measures that progressively increase energy efficiency and reduce the amount of energy needed to operate a building.

However, the National Model Codes do not presently address the type or quality of energy source used by buildings and houses nor do they address embodied GHG emissions.

In November 2022, the CBHCC adopted the direction set by Canadian Commission on Building and Fire Codes, including:

- developing objective(s) to address GHG emissions for inclusion in the 2025 National Model Codes;
- developing proposed technical requirements related to operational GHG emissions for inclusion in the 2025 National Model Codes;
- developing proposed technical requirements related to embodied GHG emissions for inclusion in the 2030 National Model Codes; and
- undertaking policy work, and objective and technical development in parallel.

## Draft Policy Positions

### *Definitions*

The CBHCC recommends the following working definitions be used to guide the development of code requirements:

A **net zero emissions building or house** has minimal operational and embodied GHG emissions, with remaining emissions offset through various mechanisms.

A **zero or near zero operational emissions building or house** is designed and constructed to minimize or eliminate operational GHG emissions through energy efficiency and energy source choice.

**Emission factors** represent the GHG emissions of energy sources ($CO_2e$ produced per unit of energy consumed).

**Operational GHG emissions** are related to the amount of energy consumed and the carbon intensity of the energy source used to operate a building. Operational GHG emissions are described as scope 1 or scope 2 emissions, per the below:

| Scope | Description | Equipment examples |
|---|---|---|
| 1 (direct) | GHG emissions that are produced from fuels that are combusted on site, primarily from combustion of hydrocarbons, e.g. fossil fuels | Natural gas / propane / oil and solid fuel appliances; CHP system; gas engine heat pump. |
| 2 (indirect) | GHG emissions that are produced from energy sources that are generated off site, e.g. purchased electricity | Electric equipment, equipment that uses purchased energy, district heating or cooling. |

### *Guiding principles and ultimate goals*

Goal, harmonization within a flexible framework

Code requirements for new houses and buildings towards zero or near zero operational GHG emissions solutions are needed in order to help support provincial, territorial and federal GHG emissions reduction targets and climate action plans.

Similar to the energy efficiency tiers, there are several advantages to a tiered approach as P/Ts move towards a low-carbon economy, including:

1. providing a flexible approach to address P/T-specific circumstances (e.g. cleanliness of electricity grids, availability of clean fuels), and
2. informing and moving the Canadian industry forward through the learnings and experience of early P/T adopters of the higher performance requirements as jurisdictions harmonize towards toward an ultimate goal of zero or near zero operational emissions.

**Recommendation:** That a tiered framework be developed in the NECB and NBC, with tiers progressing to zero or near zero operational GHG emissions, enabling P/Ts to follow a flexible pathway towards an ultimate end-goal of net zero emissions buildings or houses.

**Recommendation**: That GHG emissions requirements be separate from the NBC and NECB energy performance tiers but developed with the view to not preclude pairing the requirements in various ways.

### *Scope of Operational GHG emissions requirements*

The CBHCC considered the benefits and drawbacks of addressing only scope 1 emissions compared to addressing both scope 1 and scope 2 emissions in the National Model Codes and has considered the benefits and drawback of various approaches to establishing emissions factors that capture the variability of grid-level (scope 2) emissions.

**Recommendation:** That both scope 1 and scope 2 emissions (i.e. all fuel types) be addressed to give a more realistic assessment/more complete picture of the GHG emissions emitted by a building. Furthermore, addressing only scope 1 emissions could lead to design choices that do not reduce GHG emissions overall.

**Recommendation:** That a standardized and fixed emission factor for grid-level scope 2 emissions be set for each province/territory. This grid-level emissions factor would be based on Environment Canada and Climate Change data and, if available, data from the provinces/territories that is specific to each province or territory, with the potential to evolve the approach to consider the impact of other policies and programs on GHG-emission trends over time. Given the complexity and policy implications of grid-level emissions data, provinces/territories may need to engage several provincial/territorial ministries in determining a standardized, grid-level emission factor that is specific to each province/territory.

### *Compliance paths*

For any chosen target, compliance options could include:

- performance path(s) – using energy modelling software to demonstrate compliance to specific targets and/or;
- prescriptive path(s) – using acceptable solutions that are deemed to reach specific targets.

To continue to allow flexibility in design and construction for housing and small buildings, both a performance path and a prescriptive path could be made available in the NBC. Prescriptive requirements in the NECB would also be useful for buildings that are designed without undertaking energy modelling.

**Recommendation**: That both performance and prescriptive options be developed in the NBC and in the NECB.

### *Metrics*

A variety of metrics could be used to assess the operational GHG emissions associated with buildings. For example, the tiered framework could use reference-based metrics, intensity-based metrics, absolute metrics, or a combination of two or more metrics.

- A reference building metric sets a threshold for the allowable amount of GHG emissions for a proposed building compared to a reference building (expressed as a percent GHG emissions less than or equal to the reference building).
- An intensity-based metric sets a threshold for the amount of allowable GHG emissions per floor area of the building (expressed in $kgCO_2e/m^2/year$).

- An absolute metric sets a threshold for the amount of allowable GHG emissions per building (expressed in $kgCO_2e$ per building). An absolute metric does not normalize for building size, enabling designers/builders to decide on trade-offs between fuel sources/equipment, energy efficiency measures and building design/size.

**Recommendation**: That metrics be carefully considered to ensure alignment with P/T goals.