# Part 9 Step Code Solutions Lab Briefing Note

This document is intended to ensure that all participants in the solutions lab have a base level of information on the BC Energy Step Code, the Provincial Carbon Pollution Standards that are in development, and the options that are being considered by participating local governments to reduce carbon emissions from new construction.

## 1.0 Step Code Part 9 Adoption to Date in Participating Local Governments

The City of Victoria, District of Saanich and District of Central Saanich have adopted the BC Energy Step Code, their adopted Steps to date are outlined in Table 1 below. For a more detailed refresher on the BC Energy Step Code for Part 9 buildings, please see Appendix A and the Capital Region Step Code Industry Workshop Information Sessions presentations available here: www.saanich.ca/stepcode.

**Table 1: Step Code Adoption in Victoria, Saanich and Central Saanich**

| Building Type | Compliance Requirement |
|---|---|
| Part 9 Buildings | Step 3 |
| Part 9 – 111.5 m2 or less* | Step 2 |
| Part 3 – residential wood frame building six stories or less | Step 3 |
| All other Part 3 Buildings | Step 2 |

*Central Saanich does not have this relaxation for small buildings

## 2.0 Provincial Carbon Pollution Standards (in development)

The Province of BC is introducing greenhouse gas (GHG) reduction targets for new buildings into the BC Building Code, which local governments may reference in their building or zoning bylaws. These targets will enable local governments to regulate the emissions of new construction in their communities.

In February 2022, the Province released a policy bulletin, which provides an overview of the GHG targets, the Province's intentions and policies regarding the targets, and guidance for Authorities Having Jurisdiction who wish to implement the GHG targets. Local government staff in the Capital Region have been aware of this provincial work through participation in the Local Government Step Code Peer Network. The content in Sections 2.1 and 2.2 below, is a direct excerpt from the provincial bulletin.

### 2.1 About the greenhouse gas reduction targets

The CleanBC Roadmap to 2030 (the Roadmap) commits to zero-carbon new construction in B.C. by 2030, and commits to phasing in emissions targets into the BC Building Code starting in 2024. The Roadmap commits to enabling local governments to adopt GHG targets for new buildings. Minimum province-wide emissions requirements for new buildings will be phased in between 2024 and 2030. This works towards the goal of consistent, province-wide standards using an ever-rising 'floor' of minimum standards, similar to the BC Energy Step Code.

To accomplish this, new GHG targets will be introduced to the BC Building Code.

Local governments may apply different tiers of GHG reduction, which establishes maximum modeled emissions levels for new construction for different building types. The levels are as follows:

- Measure-only (requires measurement of a building's emissions *without* reductions, and is intended to build knowledge and capacity)
- Medium carbon (in most cases, will require decarbonization of *either* space heating or domestic hot water systems)
- Low carbon (in most cases, will require decarbonization of *both* space heating and domestic hot water systems)
- Zero-carbon

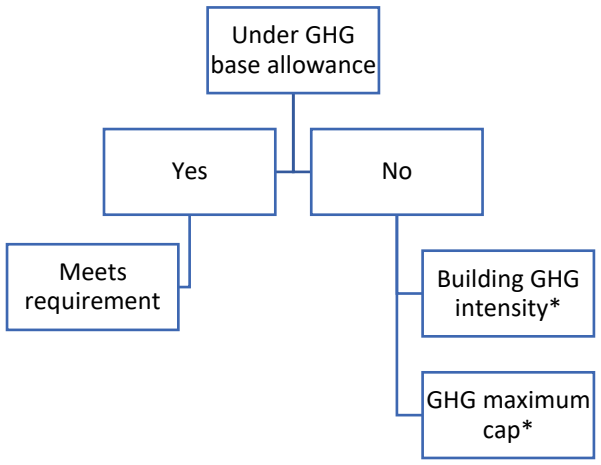
This initial set of targets is for the most commonly built buildings in B.C., which are small buildings (e.g.: single-family homes, duplexes, etc.), multi-unit residential buildings like apartments and condominiums, office buildings, and mercantile buildings (e.g. malls). Targets for other buildings may be established at a later date.

## 2.2 How it works: Part 9 buildings

For Part 9 buildings, the new approach is a combination of the familiar GHGI approach from the City of Vancouver with some additional minimum and maximum emissions values, which is meant to combine the benefits of the intensity and total cap approaches.

Each dwelling unit gets a minimum carbon allowance associated with the Medium, Low, and Zero-Carbon target. If the dwelling unit exceeds the allowance, it must meet either a GHG or GHGI, whichever emits *the least total GHG.*

**Figure 2: Decision tree for Part 9 builders**




Real world and modelled analysis showed that small homes greatly exceeded 6/3/1 GHGI targets yet have lower total GHG emissions than larger homes by nature of their small size. Some large homes could also meet those targets without the intended level of decarbonization. By combining both an absolute GHG and GHGI approach, both types of homes can meet targets and maintain consistent decarbonization approaches.

Finally, a prescriptive path to decarbonize buildings is being proposed as a third option, in part due to its relative simplicity and practicality for the Fort Nelson electricity grid, which as of 2022 has significantly higher emissions than the integrated grid.

## Path 1

| | **GHG Base Allowance** *(ideal for small houses)* |
|---|---|
| | kg CO2e per unit |
| **Medium** | 1050 |
| **Low** | 440 |
| **Zero Carbon Ready** | 265 |

## Path 2 (if building exceeds base allowances above)

| | **Whichever emits less total GHG** | | |
|---|---|---|---|
| | **Building GHG Intensity** *(ideal for medium-sized houses)* | **OR** | **GHG Maximum Cap** *(limits emissions of the largest houses)* |
| | $kgCO_2e/m^2/year$ | | kg CO2e per unit |
| **Medium** | 6 | | 2400 |
| **Low** | 2.5 | | 800 |
| **Zero Carbon Ready** | 1.5 | | 500 |

## Path 3 (being considered)

| | **Action** |
|---|---|
| | |
| **Medium** | Decarbonize heat |
| **Low** | Decarbonize both heat and hot water |
| **Zero Carbon Ready** | Fully decarbonized building |

# 3.0 Provincial Timelines

The CLeanBC Roadmap to 2030 indicates the following timelines:

- Timeline for regulatory low carbon pollution standards requirements:
  - 2022 – measure GHGs & local government "opt-in"
  - 2024 – medium carbon
  - 2027 – low carbon
  - 2030 – zero carbon
- Timeline for energy efficiency regulatory requirements in the BC Building Code:
  - 2022 – Step 3 (Part 9), Step 2 (Part 3)
  - 2027 – Step 4 (Part 9), Step 3 (Part 3)
  - 2030/32 – Step 5 (Part 9), Step 4 (Part 3)
- After 2030, all new space and water heating equipment sold and installed in BC will be at least 100% efficient

# 4.0 Current Council Direction Based on Community Engagement

Based on considerable engagement and GHG modelling completed in the development of their respective climate plans, the Councils in the City of Victoria, District of Saanich and District of Central Saanich have set direction to staff to meet the following targets:

- Highest steps of the BC Energy Step Code by 2025
- 100% renewable energy and/or net-zero carbon in new construction by 2030
- 50% community-wide GHG emission reductions by 2030

The City of Victoria and District of Saanich have also directed staff to:

- Accelerate adoption of net-zero carbon new construction/quickly decarbonize new construction
- Integrate a carbon/GHG emissions cap into Step Code adoption
- Adopt the highest Steps of the Step Code by 2025 (in the City of Victoria this is for most buildings and then 2027 for some part 3 buildings)

For more detail on local Council direction related to GHG emissions in new construction, please see the following:

- City of Victoria Climate Leadership Plan, 2018, (specifically p24-27), available online here: City of Victoria Climate Action Plan.pdf and 2019 Climate Action Strategy - Proposed Programs and Initiatives (p. 192-218)
- District of Saanich Climate Plan, 2020 (specifically p24, p51-52), available online here: www.saanich.ca/climateplan and the recent report to Council on this engagement available here: https://saanich.ca.granicus.com/GeneratedAgendaViewer.php?view_id=1&clip_id=609

- District of Central Saanich Climate Leadership Plan, 2020, (specifically p19), available here: climate_leadership_plan_2020_update2021.pdf (centralsaanich.ca)

# 5.0 Draft Options for Accelerating GHG Reductions from Part 9 new Construction – for Engagement

This section outlines draft options for accelerating GHG reductions from new construction for Part 9 buildings (Table 2). It has been based upon; alignment with direction from local Councils, information related to forthcoming provincial legislation, analysis of best practice from adoption by other local governments in BC and feedback from the first phase of engagement with industry in March 2022, including survey results. Note, key findings from the industry survey results will be presented in the solutions lab and a summary will be made available shortly after.

It is important to note that the options and associated timelines outlined in Table 2 are intended as a starting point for discussion with stakeholders in the solutions lab. A mix of options may also be considered.

**Table 2: Part 9 Draft Options for accelerating GHG reductions from new construction**

| Option | | Requirement | Adoption Date |
|---|---|---|---|
| **Option 1** | **Efficiency Pathway** | Step 4 | June 2023 |
| | | Step 5 | January 2025 |
| **Option 2** | **Hybrid Efficiency / Low Carbon Pathway** | Step 4 **OR** BCBC Step 3 with Low Carbon Construction* | June 2023 |
| | | Step 5 **OR** BCBC Step 3 with Zero Carbon Construction* | January 2025 |
| **Option 3**** | **Low Carbon Requirement Pathway**** | BCBC Step 3 **AND** Low Carbon Construction* | June 2023 |
| | | BCBC Step 3 **AND** Zero Carbon Construction* | January 2025 |

* The definition of Low and Zero Carbon will relate to either the corresponding/required GHGi or GHG maximum cap in Path 2 of the Provincial Policy Bulletin or the extent of decarbonization outlined in Path 3 of the Provincial Policy Bulletin. We wish to get feedback on both within the solutions lab.

**This option is not available today but is expected to be provided as an option with the release of the 2022 BCBC update, which is anticipated to integrate the provincial low carbon pollution standards.

# Appendix A – BC Energy Step Code Refresher

## What is the BC Energy Step Code?

The BC Energy Step Code is a provincial standard that establishes progressive performance steps in energy efficiency for new buildings from the current BC Building Code level to net zero energy ready buildings by 2030. More information on the Step Code is available here: Energy Step Code and in Section 9.36.6 and 10.2 of the BC Building Code.

The Step Code is organized into Lower and Upper Steps according to building types as shown in the Figure 2 below.


**Figure 2: Definition of Lower and Upper Steps by Building Type**

To achieve the Lower Steps, building and design professionals and trades can rely on conventional building designs with careful air-sealing practices. They should engage an energy modeller early to select the most cost effective way to meet the performance requirements.

To achieve the Upper Steps, builders and designers would need to adopt a more integrated approach to building design and may need to incorporate more substantial changes in building design, layout, framing techniques, mechanical system selection, and materials.

## Part 9: Residential

To meet the requirements of a given step of the BC Energy Step Code, a whole-building energy model of the proposed building design must be completed prior to construction to demonstrate to local government building officials that the building's modelled design meets or exceeds a set of required metrics. After construction, the responsible party must submit a compliance report to confirm that the building meets the specifications set out in the energy model.

The Step Code for Part 9 residential buildings has three primary metrics to regulate compliance:

1. Air Changes per Hour ($ACH_{50}$) – which measures the airtightness of the building (or how much air leaks through the building envelope) at a specific air pressure (50 Pa differential). The key elements of a high-performance building envelope from an airtightness perspective include a continuous air barrier where possible and sealing around seams such as windows, doors, balconies and other protrusions.

2. Thermal Energy Demand Intensity (TEDI) – which measures the thermal performance of the building envelope. This is the amount of annual heating energy needed to maintain a stable interior temperature, taking into account heat loss through the envelope and passive gains (i.e., the amount of heat gained from solar energy passing through the envelope or from activities in the home like cooking, lights, and body heat). The key elements of a high-performance building envelope include insulation; building orientation; positioning of the windows and doors; and minimized thermal bridges.

3. Mechanical Energy Use Intensity (MEUI) – which measures the mechanical equipment efficiency. This is the modelled amount of energy used by space heating and cooling, ventilation, and domestic hot water systems, per unit of area, over the course of a year.