

**TO:** CHIEF ADMINISTRATIVE OFFICER **DATE:** April 26, 2023

**FROM:** GENERAL MANAGER **FILE:** 76500 20  
PLANNING AND DEVELOPMENT *Reference: Green Building Policy*

**SUBJECT: NEW ENERGY EFFICIENCY AND CARBON POLLUTION STANDARDS IN THE BCBC**

**PURPOSE:** To inform Council of regulatory amendments to the BC Building Code (BCBC) for energy efficiency (Energy Step Code) and carbon pollution (Zero Carbon Step Code) and their relation to Burnaby's Climate Action goals, green building policy and bylaws, and for staff to be authorized to engage with interested parties to prepare strategies for implementing Zero Carbon Step Code.

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**RECOMMENDATIONS:**

1. **THAT** staff be directed to engage with interested parties on an implementation strategy for aligning Burnaby's Part 3 Green Building Rezoning policy and Building Bylaw with the Energy and Zero Carbon Step Codes.
2. **THAT** staff be directed to engage with interested parties on an implementation strategy for adopting Zero Carbon Step Code and new carbon pollution standards for Part 9 buildings, beginning with Moderate Carbon Performance by January 1, 2024.
3. **THAT** a copy of this report be forwarded to the Environment Committee for information.

**REPORT****1.0 INTRODUCTION**

The purpose of this report is to inform Council of regulatory amendments to the BC Building Code for energy efficiency (Energy Step Code) and the creation of a new Zero Carbon Step Code that establishes carbon emission standards for many of the most common types of new Part 3 ("complex") buildings new Part 9 ("simple") residential buildings. The report summarizes how the amendments relate to Burnaby's existing green building policy and bylaws, future district energy, and the City's climate action goals. As directed by Council, staff will undertake further engagement with interested parties to prepare strategies to implement Zero Carbon Step Code in alignment with Energy Step Code to meet the City's climate action goals.

## **2.0 POLICY CONTEXT**

Requiring new buildings meet standards for higher energy efficiency and lower carbon emissions aligns with the following Council-adopted plans and strategies: *Climate Action Framework* (2020), *Corporate Strategic Plan* (2022), *Environmental Sustainability Strategy* (2016), *Community Energy and Emissions Plan* (2016), *Social Sustainability Strategy* (2011), and *Economic Development Strategy* (2007).

The City of Burnaby was an early adopter of Energy Step Code (Energy SC) for Part 3 buildings and Part 9 residential buildings for improved energy efficiency, and for low carbon provisions for Part 3 buildings to reduce greenhouse gas emissions. Supporting policies and bylaws were advanced to Council in 2018 and 2019. Council adopted the Climate Action Framework (CAF) in 2020. Through the CAF and a subsequent report to Council in 2021 on Part 9 buildings, Council demonstrated support of advancing low carbon requirements and eventually established compliance pathways to zero carbon emissions for the most common types of new Part 3 and Part 9 residential buildings.

The updated requirements for Energy SC and the creation of a new Zero Carbon Step Code (Zero Carbon SC) are enacted by the Province (Ministry of Housing, Building and Safety Standards Branch), by amending the Building Act General Regulation (Ministerial Order No. M40) and the BCBC (Ministerial Order No. BA 2023 8). These amendment allow local governments to regulate directly carbon emissions from new buildings for the first time. Before this amendment, many local governments, including the City of Burnaby, regulated carbon emissions using an incentive based approach that linked a carbon performance requirement to one of two Energy SC options.<sup>1</sup>

## **3.0 BACKGROUND**

### **3.1 Effective date for amendments**

The regulatory amendments discussed in this report are effective as of May 1, 2023.

The amendments are for higher standards of building energy efficiency (Energy SC) so that buildings use less energy, and a new Zero Carbon SC so that the most common types of new Part 3 and new Part 9 residential buildings emit less greenhouse gas emissions.

Zero Carbon SC is available on or after the effective date for voluntary opt-in by local governments. The Province has signalled that in the future, carbon performance will be included in the BCBC as requirements (rather than voluntary) in more stringent increments over time, similar to the implementation of the Energy SC, but has not signaled an exact timeframe. For Burnaby, this means existing carbon policies for Part 3 buildings remain in effect, until such time that the City adopts the provisions of Zero Carbon SC, or when the provisions are made requirements of the BCBC.

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<sup>1</sup> Burnaby's Part 3 Green Building Rezoning Policy is an example of this approach, commonly referred to as a 'step up / step down' approach.

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For Part 9 residential buildings, this means that Zero Carbon SC is available for opt-in by Burnaby to regulate carbon performance of new Part 9 residential buildings for the first time.

### 3.2 Building Energy Efficiency (Energy Step Code)

#### *Amendments:*

Effective May 1, 2023:

- **for Part 3 buildings<sup>2</sup>**, the minimum standard in the BC Building Code rises to Step 2 of the Energy SC, from Step 1; and
- **for Part 9 residential buildings<sup>3</sup>**, the minimum standard in the BC Building Code rises to Step 3 of the Energy SC, from Step 1

These amendments are to meet the Province's 2022 target deadline for 20% energy efficient improvement above 2018 BC Building Code requirements. Additional background on Energy Step Code is in *Attachment 1* (see *Appendix A*).

#### *Relation to Current City Policy and Bylaw:*

Nearly all new Part 3 buildings in Burnaby are subject to the City's Part 3 Green Building Rezoning Policy, which specifies two compliance pathway options:

- Step 3 of the Energy SC, or
- Step 2 of the Energy SC with a Low Carbon Energy System (LCES) and a defined greenhouse gas emissions cap.

The amendment to the BCBC to raise the minimum requirement to Step 2 for Part 3 buildings therefore still aligns with the City's Green Building Rezoning Policy<sup>4</sup>. For Part 9 buildings, the amended BCBC supersedes the Building Bylaw as of the effective date, making Step 3 of the Energy SC the base requirement for new Part 9 residential building construction in Burnaby.

In the past year, staff have engaged with the development community about advancing to Step 3 for Part 9 buildings. The feedback has been highly positive with the development industry signalling confidence that builders are prepared to meet the more stringent air tightness testing and construction methods required of Step 3.

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<sup>2</sup> Part 3 buildings include buildings over three storeys or 600m<sup>2</sup> in footprint, including those with residential, business, personal services and mercantile occupancies, as well as public sector occupancies.

<sup>3</sup> Part 9 residential buildings include single family homes, duplexes, and multi-family buildings that are three storeys or less and have a footprint of less than 600m<sup>2</sup>.

<sup>4</sup> 'Alignment' here means that the step code requirement in the City's Green Building Rezoning Policy cannot be less than the minimum standard in the BC Building Code.

### 3.3 Zero Carbon Step Code

#### *Amendment:*

Effective May 1, 2023, this amendment introduces a new voluntary opt-in Zero Carbon SC with staggered performance tiers (similar to Energy SC) to cap and reduce greenhouse gas (GHG) emissions for the most common types of new Part 3 buildings and new Part 9 residential buildings, as shown in Figure 1.

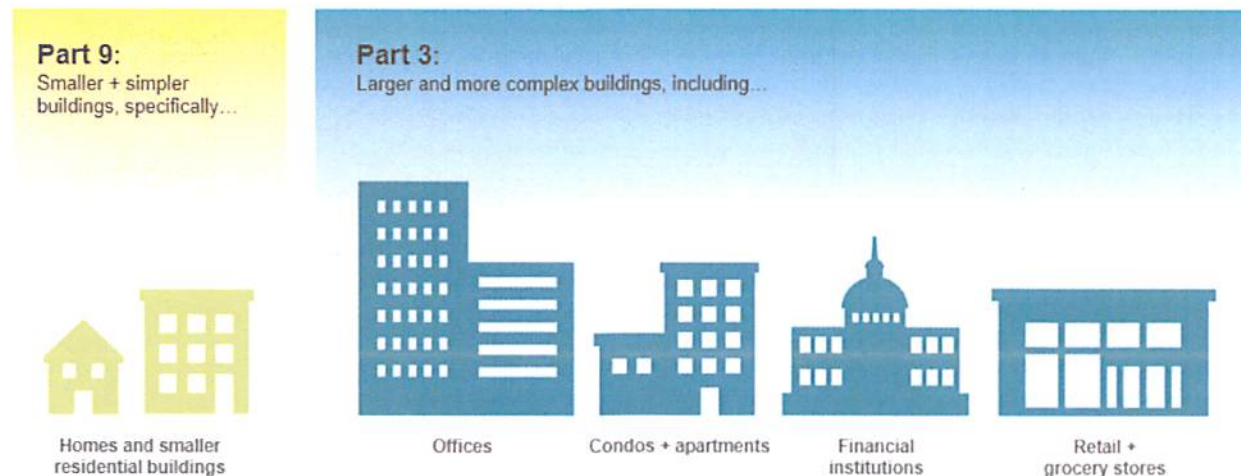


Figure 1. Types of Part 3 and Part 9 buildings available for regulation under Zero Carbon SC (BSSB, March 2023).

Zero Carbon SC and Energy SC are separate but complementary regulations in the BCBC. Energy SC addresses the energy-efficiency performance of new buildings, whereas Zero Carbon SC targets the carbon performance. The Province has signalled that over time increasingly stringent requirements will integrate into the BCBC as minimum base requirements, such that by 2032 for Energy SC and 2030 for Zero SC, new buildings in BC will meet the highest standards for energy efficiency and operational carbon performance.

Zero Carbon SC references different levels or tiers of emissions performance as described below and in Figure 2, as follows:

- **Measure-only**, requires measurement of a building's emissions without reductions, and is intended to build knowledge and capacity;
- **Moderate Carbon Performance**, in most cases, will require decarbonization of either space heating or domestic hot water systems;
- **Strong Carbon Performance**, in most cases, will require decarbonization of both space heating and domestic hot water systems; and
- **Zero Carbon Performance** will typically require decarbonization of all systems.



Figure 2. Zero Carbon SC consisting of carbon performance tiers (BSSB, March 2023)

The carbon performance tiers in Figure 2 align with specific modelled performance values for an upper limit to greenhouse gas emissions from a new building, measured as total emissions annually (GHG per year) or an intensity of emissions on a floor area basis (GHGi). Qualified professionals use energy models to determine how a building should perform based on a building's energy source, design, and technologies used for space heating, cooling, domestic hot water, and cooking. The higher performance tiers are achieved by decarbonizing energy sources for heating, cooling, domestic hot water, and cooking. More information on Zero Carbon SC is in *Attachment 2* (see *Appendix B*).

#### *Relation to current City Policy and Bylaw*

To date, **Part 9 buildings** in Burnaby have not been subject to carbon emissions regulation. Zero Carbon SC provides the regulatory tool for Burnaby to begin regulating carbon emissions from Part 9 residential buildings.

For **Part 3 buildings**, the City of Burnaby already regulates an upper limit of carbon emissions through its Part 3 Green Building Rezoning Policy, Step 2 / low carbon compliance pathway, which requires the developer to demonstrate through energy modeling that their building(s) will meet or perform better than a specified upper limit of greenhouse gas emissions. For the most common type of low carbon energy system, Burnaby's current upper limit is 4 GHGi (kgCO<sub>2e</sub>/m<sup>2</sup>/year).

Figure 3 shows Zero Carbon SC performance metrics of Moderate (orange), Strong (green), and Zero Carbon (blue) for two common types of Part 3 buildings. Overlaid is Burnaby's current performance requirement of 4 GHGi for comparison.





Figure 3. Comparison of Zero Carbon SC performance requirements (GHGi) with the optional low-carbon compliance pathway requirement of 4 GHGi in Burnaby's Part 3 Green Building Rezoning Policy.

A review of recent rezoning applications subject to the Green Building Rezoning policy finds more projects opting for the optional low carbon compliance pathway. Analysis of preliminary energy modelling reports for a sub-sample of five development applications and comparison with the Zero Carbon Step Code performance tiers found the following:

- all five projects would comply with the Moderate Carbon Performance tier by achieving a GHGi of 4 or less as required by the current policy;
- three of the five projects would comply with the Strong Carbon Performance tier by reporting a GHGi of 3 or less; and
- two of the five projects would comply with Zero Carbon Performance.

### 3.4 Burnaby Climate Action Framework

The Climate Action Framework sets targets for achieving zero emission new buildings, as follows:

- Part 3 buildings: zero carbon requirement in place by **2025** so that by 2030 most of these new buildings are net-zero emissions at Occupancy, and
- Part 9 buildings: zero carbon requirements in place by **2027 (or earlier)** so that most new buildings are zero emissions at Occupancy by or before 2030.

Both targets above reference achieving zero emissions at Occupancy, meaning after construction is complete.

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For Part 3 buildings, the 2025 date assumed the Part 3 green building rezoning policy as the implementation tool, which requires lead-time for development projects to complete rezoning and building permit processes and construction by 2030.<sup>5</sup>

For Part 9 buildings, the Climate Action Framework did not consider lead-time and specify an implementation date. However, the Building Bylaw would be the regulation that specifies carbon performance standards required at the time of building permit application. Considering time for permit review, permit issuance and construction, an implementation date of 2027, or earlier, is necessary to meet the goal in the Climate Action Framework.

### **3.5 Relation to Burnaby District Energy Utility (DEU)**

On March 27, 2023, Council adopted the draft Burnaby District Energy policy and authorized staff to continue advancing this policy. Burnaby's DEU will help meet Burnaby's greenhouse gas reduction targets as part of the City's green building strategy for reducing emissions from buildings. New buildings connected to the DEU will have to demonstrate compliance with the Zero Carbon SC performance tier in effect at that time using the same performance-based approach and energy modelling guidelines applicable to buildings in areas not served by district energy. District energy service areas are shown in *Attachment 3* (see *Figure 1*). City staff working on DEU and green building policy will continue to collaborate to ensure alignment, following guidance from the Province and local government authority to determine a suitable emissions factor for the Burnaby DEU for use in energy modeling. Technical analysis completed to date has demonstrated that Burnaby DEU will be a viable compliance pathway to meet the performance standards of Zero Carbon SC and that energy efficient buildings will complement the feasibility of district energy.

## **4.0 NEXT STEPS**

### **4.1 Implementation Strategies**

Energy SC and Zero Carbon SC are designed by the Province for local governments to move ahead faster than scheduled amendments to the BCBC if they so choose in order to meet their own targets for building energy efficiency and greenhouse gas reduction. To meet the emission reduction goals for new buildings and to minimize retrofitting of existing buildings in the future, an accelerated implementation schedule is necessary to meet Burnaby's climate action goals. An implementation strategy will consist of schedules and timelines for moving to higher tiers of Zero Carbon SC, and Energy SC, in a coordinated manner, for Part 3 buildings and Part 9 residential buildings.

The Province recommends a minimum of six months advanced notification before adopting a higher performance tier, although more lead-time may be necessary. Accelerated adoption of Energy SC and Zero Carbon SC should also consider such factors as local government experience, regional alignment with other municipalities, developer and builder readiness, and equipment availability, such as electric heat pumps. The purpose of engagement with interested parties will be to gather input and feedback on draft implementation schedules, technical and administrative

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<sup>5</sup> Climate Action Framework (2020). Big Move 6: ZE Buildings – Net Zero New

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challenges and opportunities, as well as to educate and grow knowledge amongst all involved parties.

As authorized by Council, staff will refine engagement plans, undertake engagement and report back to Council on policy options and implementation strategies for Zero Carbon SC, in alignment with Energy SC, for further consideration. Additional details are provided in the following sections.

#### **4.2 Part 3 Buildings**

The City's Part 3 Green Building Rezoning policy has provided a strong foundation for regulating carbon performance for new buildings with the 'Step 2 / Low Carbon' pathway requiring a minimum carbon performance standard that falls in between the Moderate and Strong tiers of the Zero Carbon SC (as outlined in Section 3.3 of this report). Building off this policy, staff are currently drafting implementation schedule options for public engagement. Detailed plans for engagement are under development by staff. Existing regular meetings between the development industry and staff from the Planning and Development department provides an opportunity to engage with the public.

From an administrative perspective, the implementation strategy will consider the merits of transitioning from regulating Part 3 green building requirements with a rezoning policy to using the Building Bylaw as the primary regulatory tool. The strategy will also consider whether to retain a 'step up / step down' compliance approach, which could provide flexibility by incentivizing a higher tier of the Zero Carbon SC with a lower tier of the Energy SC (both compliance pathways link to a Zero Carbon SC performance tier in this approach).

#### **4.3 Part 9 Residential Buildings**

Staff have begun preparing an implementation schedule that pairs an Energy SC level with a Zero Carbon SC performance tier applicable at time of Building Permit application for further public engagement. Burnaby's climate action goals, regional alignment and approaches established by other leading local governments will be considered when preparing policy options for the pace of implementation.

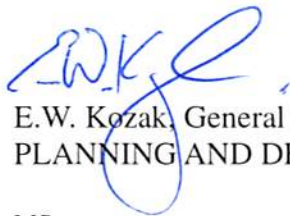
In the past year, through staff engagement with the Part 9 building industry for Energy SC, a high level of support was received for the City to consider new policies to encourage or require low carbon energy systems in new Part 9 development. However, in advance of further public engagement, this report recommends a starting point for implementation as adoption of the 'Moderate Carbon Performance' effective January 1, 2024, for Part 9 residential building permits received on or after this date. With Council authorization of this position, staff will draft the necessary amendments to the Building Bylaw. Taking this position sends a strong signal to the Part 9 building community to build their knowledge, capacity, and prepare for low carbon solutions based on technologies like electric air source heat pumps for space heating, electric water heaters, and induction stoves. Subsequent Part 9 engagement would aim to establish a timeline for advancing to the higher performance tiers.



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## 5.0 CONCLUSION

Effective May 1, 2023, amendments to the BCBC require higher standards of energy efficiency for new buildings and give local governments the authority to directly regulate operational carbon emissions. This report introduces the amendments, including Zero Carbon SC, and reports on relation with the City's policies and regulations for green buildings, climate action and district energy. This report recommends Council authorize staff to prepare strategies to implement Zero Carbon Step Code for Part 3 buildings and Part 9 residential buildings and to engage with all relevant interested parties in the drafting of these strategies. The report further recommends that strategies and policy options be brought back to Council for further consideration. For Part 3 buildings, Burnaby's existing Green Building Rezoning policy provides a foundation for planning a transition to Zero Carbon SC. For Part 9 residential buildings, regulating carbon emissions is new. Along with preparing an implementation schedule this report recommends a starting point of Moderate Carbon Performance for Part 9 buildings effective January 1, 2024, for consideration of Council.



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Attachment 1 – Appendix A  
Attachment 2 – Appendix B  
Attachment 3 – Figure 1 (Detailed Map)