Director	MM

COUNCIL AGENDA			
Date:	July 10, 2023	Item:	5.

5.

DISTRICT OF WEST VANCOUVER
750 17TH STREET, WEST VANCOUVER BC V7V 3T3

COUNCIL REPORT

Date:	June 28, 2023
From:	Heather Keith, Senior Manager, Climate Action & Environment
Subject:	Proposed Energy Step Code and Low Carbon Building Requirements
File:	0332-03

RECOMMENDATION

THAT the proposed changes to the Energy Step Code and low carbon requirements for new buildings as outlined in the report titled, "Proposed Energy Step Code and Low Carbon Building Requirements" be approved.

RECOMMENDATION

THAT the proposed "Building Bylaw No. 4400, 2004, Amendment Bylaw No. 5257, 2023" be read a first, second, and third time.

1.0 Purpose

The purpose of this report is to provide Council with an amendment bylaw to the Building Bylaw (**Appendix A**) to implement Step 4 of the BC Energy Step Code for Part 9 homes and align the District's existing low carbon energy system requirement with the Province's new Zero Carbon Step Code for all new buildings.

2.0 Legislation/Bylaw/Policy

Legislation

The *Local Government Act* (LGA) enables the District to regulate the construction, alteration, repair, or demolition of buildings and structures. The Province of British Columbia requires that local governments have targets, policies, and actions for the reduction of greenhouse gas (GHG) emissions in the community.

Bylaw

Building Bylaw No. 4400, 2004 provides for the health, safety, and protection of persons and property related to construction. In 2018, the District of West Vancouver adopted the BC Energy Step Code with these regulations coming into effect through the Building Bylaw.

Policy

The Housing and Land Use Strategies D1 and D2 in the 2016 Community Energy and Emissions Plan (CEEP) support the implementation of the BC Energy Step Code to reduce GHG emissions.

3.0 Council Strategic Objective(s)/Official Community Plan

Official Community Plan

The District's existing Official Community Plan (OCP) includes a community greenhouse gas emissions (GHGs) reduction target in accordance with LGA Section 473. Using 2010 emissions as the baseline, the District's OCP currently targets a 45% reduction by 2030 and carbon neutrality by 2050. The OCP includes a range of policies to mitigate GHGs, notably:

- Policy 2.1.23 - Advance community energy efficiency and reduce GHG emissions by increasing the percentage of efficient building forms; and requiring leading energy efficiency standards and considering site design and orientation.
- Policy 2.6.19 - Implement community energy and emissions initiatives to advance towards meeting the District's greenhouse gas emissions reduction targets of 45% below 2010 levels by 2030 and 100% by 2050 or sooner, notably through the land use, housing, transportation, low carbon energy and infrastructure policies contained in this plan.
- Policy 2.6.23 - Seek to incorporate renewable energy in public and private projects and support the development of renewable energy systems as opportunities arise.

Council Strategic Plan

Council's 2021-2022 Strategic Plan includes a goal to "Protect our natural environment, reduce our impact on it, and adapt to climate change" and includes various objectives to meet this goal.

4.0 Financial Implications

There are no financial implications with this report. If the proposed changes to building requirements for new homes are approved, the changes can be implemented by existing staff resources in the Permits & Inspection Department.

5.0 Background

5.1 Previous Decisions

At the October 3, 2016 Council meeting, the following motion was approved:

> *THAT staff commence Community Energy and Emissions Plan implementation through the Official Community Plan review and other key departmental work plans.*

At the July 8, 2019 Council meeting, Council recognized that climate change constitutes an emergency and affirmed West Vancouver's

commitment to meet the Intergovernmental Panel on Climate Change (IPCC) targets.

For the implementation of Step Code regulations for new homes, Council passed a motion to amend Building Bylaw No. 4400, 2004 with Energy Step Code requirements at the February 5, 2018 Council meeting and approved further amendments to the Building Bylaw to require low carbon energy systems for new homes on March 9, 2020.

Council, at its February 27, 2023, regular meeting, passed the following resolutions:

THAT

1. *Staff be directed to consult with the building community on moving to Step 4 of the BC Energy Step Code for Part 9 homes.*
2. *Staff be directed to utilize $4,750 from the Environmental Reserve Fund, to support the consultation process with the building community.*

5.2 History

BC Energy Step Code

The BC Energy Step Code was introduced in 2017 to: (i) support market transformation towards higher performance buildings through progressive energy efficiency targets and (ii) provide consistency in building requirements across the province. The Energy Step Code regulation establishes a set of performance targets for new construction and groups them into “steps” that apply across various building types. This approach requires performance metrics (e.g., total energy use intensity) to be verified through energy modeling as well as on site testing (air tightness testing), providing flexibility to builders to pursue innovative and cost-effective solutions while ensuring high-performance new construction.

The Step Code also communicates the intent of Building Code requirements whereby all new buildings will be “net zero ready” by 2032 (Figure 1). Over time, the minimum requirements of the Building Code will be increased according to the steps with the target of all buildings achieving the highest step by 2032.

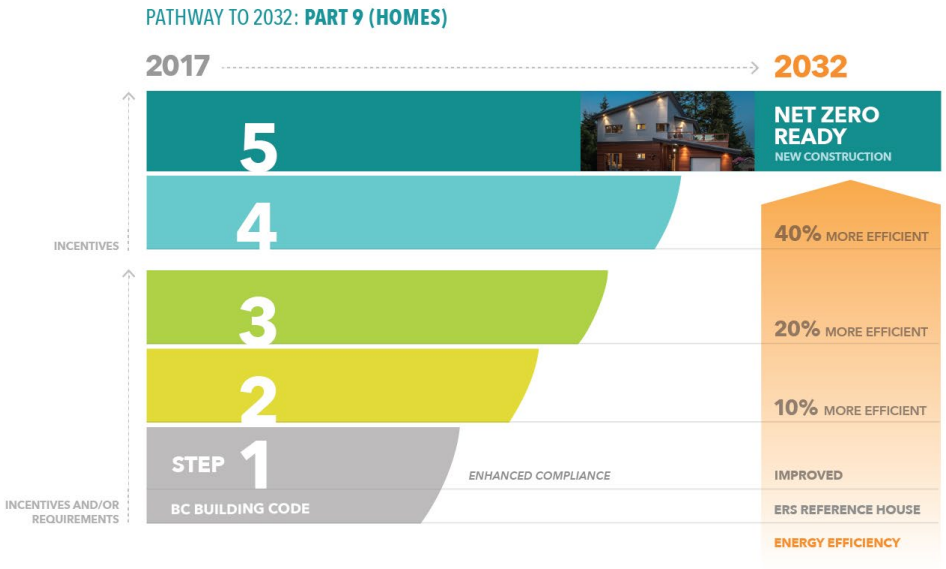

Figure 1 The BC Energy Step Code for new Part 9 homes.

Building Types in the BC Building Code

The BC Building Code regulates buildings in two main categories:

- Part 9 Buildings (Homes) - Smaller (three stories and under) buildings, with the most common use being residential (e.g., single family dwellings, townhouses).
- Part 3 Buildings - Larger and taller (over three stories) buildings with a variety of uses including multi-family buildings, commercial buildings, and institutional buildings.

This report focuses on the District's regulation of Part 9 residential homes as well as some housekeeping changes to Part 3 building requirements to align with the provincial updates to the Building Code, as discussed below.

Step Code Requirements for Part 9 Homes on the North Shore

In 2018, the District adopted the highest community-wide Energy Step Code standards, at that time, in alignment with the other North Shore municipalities (Table 1). In 2021, the District's Step Code requirements were updated to a tiered approach to either build to the highest step (5) or build at Step 3 with the requirement of a low carbon energy system (LCES) to incentivize low carbon space and water heating systems, primarily electric heat pumps. Heat pumps not only achieve the efficiency and low carbon objectives, but also provide mechanical cooling to increase the resiliency of homes to higher summer temperatures and heat events. The differences between the options (e.g., Step 3 low carbon versus Step 5) allow applicants the choice of building new homes to the current efficiency standard required by the District, but with a LCES in support of the community's GHG reduction goals or build a net-zero energy ready home but without the LCES.

Building Type	July 2018	February 2021
Residential buildings (single family, townhouse)	Step 3	Pathway 1: Low Carbon Step 3 + Low Carbon Energy System[1] Pathway 2: Highest Step Step 5
Small residential buildings (Coach House)	Step 1	Pathway 1: Low Carbon Step 2 + LCES Pathway 2: Highest Step Step 5

Table 1 Part 9 residential homes Step Code requirements.
[1]Low Carbon Energy System (LCES) means a mechanical system providing all thermal conditioning and all domestic hot water heating for a building primarily from low-carbon energy sources with the following characteristics: (a) system average coefficient of performance greater than two; (b) modelled Greenhouse Gas Intensity of no more than 3 kg $CO_2e/m^2/yr$; and (c) any natural gas-fired peak demand heating equipment is appropriately sized to augment the primary low carbon system under peak demand conditions.

BC Building Code Changes (May 1, 2023)

As of May 1, 2023, updates to the Provincial Building Code included increasing the minimum requirement for all new buildings to be 20% more energy efficient to support cleaner, more energy efficient new construction. For Part 9 homes, this means requiring Step 3 province-wide as the minimum standard, which is already the minimum requirement for the North Shore.

The updates to the Building Code also included the introduction of the Zero Carbon Step Code (ZCSC). The ZCSC is a new regulation to meet the Province's commitment under the "CleanBC Roadmap to 2030" for all new buildings to be zero carbon by 2030. For clarify, the ZCSC directly regulates GHG emissions from new buildings whereas the Energy Step Code regulates the energy efficiency of new buildings. The ZCSC has four levels of carbon performance, from which a local government can select from in their pathway to zero carbon new buildings by 2030:

- Measure-only (Emission Level 1) - requires measurement of a building's emissions without reductions and is intended to build knowledge and capacity.
- Moderate Carbon Performance (Emission Level 2) - in most cases, will require electrification of space heating, but fossil fuel water heating and cooking likely still possible/allowed.
- Strong Carbon Performance (Emission Level 3) - in most cases, will require electrification of both space heating and water heating, but fossil fuel water heating could still be allowed dependent on design and fossil fuel cooking still possible/allowed.

- Zero Carbon Performance (Emission Level 4) - in most cases, will require the full electrification of a building.

The "Strong Carbon Performance" level of the ZCSC is most closely aligned with the District's current LCES pathway and considers GHG emissions only from space conditioning (i.e., heating) and hot water, but not for cooking, fireplaces, swimming pools, etc.

6.0 Analysis

6.1 Discussion

Proposed changes to Energy Step Code and Low Carbon Building Requirements

The proposed change to the District's Energy Step Code requirements is an increase from Step 3 to Step 4 for the current low carbon compliance pathway for Part 9 homes. The current requirement of Step 5 in the District's tiered approach will remain the same. In addition, the proposed changes also include the alignment of the District's current LCES with the Province's new ZCSC for all new buildings (Part 9 and Part 3) to simplify the building permit process and provide consistency with the updated Building Code.

An additional housekeeping change to meet the updated Building Code includes the requirement for coach houses to be built at Step 3 compared to the current Step 2. Recognizing that step code compliance can be more challenging for smaller buildings, staff are recommending that coach houses continue to meet just the minimum code with the low carbon pathway to alleviate any barriers in building more diverse and affordable housing in West Vancouver.

The proposed changes are recommended to provide the following benefits:

- Maintains the District's leadership in advancing high performance construction by requiring energy efficiency standards above minimum Building Code requirements and aligns with the District's policies to continue to meet GHG emissions reduction targets.
- Continues to align the District's building requirements with the Provincial Building Code with a low carbon compliance pathway for mechanical systems, especially electric heat pumps, which reduces emissions and increases resiliency through mechanical cooling.
- Recognizes that delaying any action would mean that more buildings would be built to operate on high-carbon systems, which would then be in place for decades to come.
- Ensures that homes built on the North Shore will be built to a high standard of energy efficiency and low GHG emissions.

- Prepares the building community for net zero energy ready homes by taking another incremental step towards this goal.
- Harmonizes proposed approach with the City and District of North Vancouver to maintain consistency across the North Shore.

To implement the proposed Energy Step Code and Zero Carbon Step Code requirements as outlined above, the following amendments to the Building Bylaw are proposed and summarized in Table 2:

- Removal of any reference to the “Low Carbon Energy System” requirements.
- Addition of the definition for the Province’s “Zero Carbon Step Code” requirements.
- Requiring that all buildings meet the 'Strong Performance’ (Emission Level 3) of the Zero Carbon Step Code.
- New sections to specify:
  - The new required step for Part 9 buildings.
  - The new required level of the “Zero Carbon Step Code” for Part 3 and Part 9 buildings (to transition from the District’s current LCES and align with the Provincial Building Code).

Building Type	Current	Proposed
Part 9 residential (single family, townhouse)	Pathway 1: Step 3 + LCES Pathway 2: Step 5	Pathway 1: Step 4 + ZCSC EL-3 Pathway 2: Step 5
Part 9 (Coach House)	Pathway 1: Step 2 + LCES Pathway 2: Step 5	Pathway 1: Step 3 + ZCSC EL-3 Pathway 2: Step 5
Part 3 residential (multi-family)	Pathway 1: Step 2 + LCES Pathway 2: Step 4	Pathway 1: Step 2 + ZCSC EL-3 Pathway 2: Step 4
Part 3 commercial	Step 2	Step 2 + ZCSC EL-3

Table 2 Proposed change to Step Code requirements for Part 9 homes and housekeeping changes for Part 3 residential buildings.

ZCSC (zero carbon step code) means the level of greenhouse gas (GHG) emissions and the greenhouse gas intensity (GHGI) permitted for a building as defined in sections 9.37 and 10.3 of the Provincial Building Code.

EL-3 (Emissions Level 3) is the low carbon level of emissions allowed through the decarbonization of both space heating and domestic hot water systems, with a maximum total GHG emissions of 800 $kgCO_{2e}$/year and a maximum greenhouse gas intensity of 2.5 $kgCO_{2e}/m^2$/year.

Building Bylaw No. 4400, 2004 Amendment Bylaw No. 5257, 2023 (**Appendix A**) reflects the proposed changes, to be in effect on November 1, 2023.

Zoning Bylaw Accommodations

The Zoning Bylaw allows for adjustments to floor area, site coverage, height, and setbacks for homes built at Step 4 or 5 to accommodate the required increase in insulation and other features to achieve high-performance building standards of the Energy Step Code. Staff are proposing to maintain these adjustments to continue to ensure this barrier to building high-performance buildings is addressed and that permit intake does not increase prior to the effect date of the above proposed changes to the Building Bylaw. Once the building community has adjusted to the proposed changes, a review of the Zoning Bylaw accommodations for homes built to higher steps will be completed.

6.2 Climate Change & Sustainability

In British Columbia, GHG emissions from buildings are directly correlated with fuel type used to heat homes. In West Vancouver, the majority of the GHG emissions from the building stock come from Part 9 single family homes. The continuous turnover of older homes heated by natural gas to the construction of high-performance homes with lower GHG emissions (i.e., with electric heat and hot water sources) represents a significant opportunity to reduce emissions from the building stock to support the District in achieving our GHG emission reduction targets.

6.3 Public Engagement and Outreach

District staff coordinated an engagement process with the District of North Vancouver and the City of North Vancouver, which included formal correspondence and outreach to the Homebuilders Association of Vancouver (HAVAN), Urban Development Institute (UDI), and professionals within the North Shore building community, a virtual webinar with an online survey, and informal outreach through the District's Energy Step Code webpage.

Approximately 75 stakeholders (general contractors, architects, designers, energy advisors, mechanical contractors, and engineers) attended the virtual workshop hosted on April 20, 2023, or completed the survey. The majority of respondents indicated a high level of readiness to achieve Step 4 (over 50%) and prior experience in working on homes at higher step levels (e.g., Step 4 or Step 5) (69%). Potential challenges that were identified during the engagement included:

- the need for additional training on measures needed to achieve Step 4 (e.g., techniques to improve energy efficiency and airtightness);
- the importance of an early and integrated design process involving Energy Advisors; and
- potential cost implications.

The engagement workshop involved a presentation from BCIT's Zero Emissions Building Learning Centre. This presentation provided education on how to achieve Step 4 building requirements and outlined discounted training programs that are available to achieve higher levels of energy performance in new construction.

In response to concerns regarding costs of building to higher steps, the Provincial Building Safety and Standards Branch (BSSB) completed a Step Code Metrics report in 2022 to look at the average incremental capital cost impacts of meeting all Steps in all climate zones for the simulated archetypes for Part 9 buildings. For a large SFD (5,500 sqft), for example, the report indicated that the increase in capital costs in moving from Step 3 to Step 4 is relatively low at 0.4%. It is important to note that the relatively small increase in cost to build a new home at Step 4 is potentially offset by the lower operating cost of a more energy efficient home.

Additional outreach and communication will be provided to the relevant stakeholders prior to the proposed November 1, 2023 effect date, to ensure readiness for the transition. The proposed changes outlined in this report provide a balance in meeting the District's GHG reduction targets and aligning with the CleanBC initiatives and providing support in building high performance and energy efficient buildings using incremental changes to ensure that the building community can transition accordingly.

6.4 Other Communication, Consultation, and Research

Staff reviewed existing building permit data to determine industry readiness in the ability to meet Step 4. Since the Energy Step Code was introduced in 2018 in the District, 67 single family homes have been completed, with available step code data. The majority of these homes have been built to Step 3 (78%). Since February 2021, these homes would have also had an associated low carbon energy system. Four houses have been built to Step 4. Although most of the homes have been built at Step 3, the building energy performance measures of these homes were near or meeting Step 4 requirements indicating that the building community should have the ability to transition to Step 4 without considerable challenges.

7.0 Options

7.1 Recommended Option

That Council approve the changes to the Energy Step Code and low carbon requirements for new buildings as detailed in the report.

That Council give three readings to the proposed amendment to the Building Bylaw.

7.2 Considered Options

Defer the changes to the Energy Step Code and Low Carbon requirements for new buildings and readings of the proposed bylaw amendment pending the receipt of additional information (to be specified).

8.0 Conclusion

Continuing to advance high performance construction and ensuring quality installation of low carbon mechanical systems are critical strategies in reducing emissions from buildings. The proposed changes to building requirements for new buildings will continue to advance performance and energy efficiency in buildings as the next step towards net zero new homes, a key strategy in meeting the District's climate action targets.

Author: Heather Keith

Heather Keith, Senior Manager, Climate Action & Environment

Concurrence

Kevin Spooner, Senior Manager, Permits & Inspections

Appendices:
A – Building Bylaw 4400, 2004 Amendment Bylaw 5257 2023

Appendix A

District of West Vancouver

Building Bylaw No. 4400 2004, Amendment Bylaw No. 5257, 2023

Effective Date:

5628612v1

District of West Vancouver

Building Bylaw No. 4400, 2004, Amendment Bylaw No. 5257, 2023

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District of West Vancouver

Building Bylaw No. 4400, 2004, Amendment Bylaw No. 5257, 2023

A bylaw to provide for health, safety and protection of persons and property, and the reduction of greenhouse gases.

Previous amendments: *Amendment Bylaws 4521, 4542, 4663, 4685, 4698, 4704, 4720, 4729, 4798, 4933, 4961, 4970, 5056 and 5088.*

AND WHEREAS the Province of British Columbia has adopted a *Building Code* to govern standards in respect of the *Construction of Buildings* in the Province;

WHEREAS it is deemed necessary to provide for the administration of the *Building Code*;

NOW THEREFORE, the Council of the District of West Vancouver enacts as follows:

Part 1 Citation

1.1 This bylaw may be cited as Building Bylaw No. 4400, 2004, Amendment Bylaw No. 5257, 2023.

Part 2 Severability

2.1 If a portion of this bylaw is held invalid by a Court of competent jurisdiction, then the invalid portion must be severed and the remainder of this bylaw is deemed to have been adopted without the severed section, subsection, paragraph, subparagraph, clause or phrase.

Part 3 Amends Definitions

3.1 Deleting the following definition in Section 4.1:

> "Low Carbon Energy System" means a mechanical system providing all thermal conditioning and all domestic hot water heating for a building primarily from low-carbon energy sources with the following characteristics:

a. system seasonal average co-efficient of performance greater than two;

b. modelled Greenhouse Gas Intensity of no more than 3 kg CO2e/m2/yr; and

c. any natural gas fired peak demand heating equipment is appropriately sized to augment the primary low carbon system under peak demand conditions;

3.2 Adding the following definitions to Section 4.1:

"Energy Step Code" means the performance requirements for building equipment and systems and building envelopes specified in Division B, Subsections 9.36.6 and 10.2.3. of the *Building Code*.

"Greenhouse Gas" means greenhouse gas as defined in sections 9.37 and 10.3 of the *Building Code*.

"Greenhouse Gas Intensity" means greenhouse gas intensity as defined in sections 9.37 and 10.3 of the *Building Code*.

"Zero Carbon Step Code" means the level of greenhouse gas (GHG) emissions and the greenhouse gas intensity (GHGI) permitted for a building as defined in sections 9.37 and 10.3 of the *Building Code*.

Part 4 Amends Part 9 Building Permits

Building Bylaw No. 4400, 2004 Part 9 Building Permits is amended by:

4.1 Replacing Subsection 9.1.16 with the following:

Sufficient documentation to demonstrate compliance with the level of the *Energy Step Code* and *Zero Carbon Step Code*, respectively, specified by S. 9.7 and S. 9.8 of this Bylaw, to the satisfaction of the *Building Inspector*;

4.2 Replacing Subsection 9.7 in its entirety with the following:

A new *Building* shall be designed to meet the specified requirements of the *Energy Step Code* and *Zero Carbon Step Code*:

9.7.1	Part 9 Building (Residential)	Step 5	Or	Step 4 at EL-3 of the *Zero Carbon*

				Step Code
9.7.2	Notwithstanding section 9.7.1 of this Bylaw, for a detached secondary suite as defined by the Zoning bylaw	Step 5	Or	Step 3 at EL-3 of the *Zero Carbon Step Code*
9.7.3	Part 3 Building (Residential)	Step 4	Or	Step 2 at EL-3 of the *Zero Carbon Step Code*
9.7.4	Part 3 Building (Business and Personal Services or Mercantile Occupancies)			Step 2 at EL-3 of the *Zero Carbon Step Code*

4.3 Deleting Section 9.8 in its entirely.

Part 5 Effective Date

5.1 Building Bylaw No. 4400, 2004, Amendment Bylaw No. 5257, 2023 will be effective on November 01, 2023.

READ A FIRST TIME on [Date]

READ A SECOND TIME on [Date]

READ A THIRD TIME on [Date]

ADOPTED by the Council on [Date].

Mayor

Corporate Officer

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