

Report

Date September 26, 2023

File:

Subject Building Amendment Bylaw No. 3932, 2023, for first three readings

PURPOSE

To introduce Building Amendment Bylaw No. 3932, which proposes to update Building Bylaw No. 3172 in order to harmonize it with the recent changes to B.C. Building Code, 2018 (May 1, 2023, update), implement the Zero Carbon Step Code and include the full range of building inspections undertaken during the building process.

BACKGROUND

Council's [2019-2022 Strategic Plan](#) contains actions to 'evaluate the merits of adopting the B.C. Energy Step Code' and "implement the Climate Action and Energy Plan." Council approved the B.C. Energy Step Code (the Step Code) implementation plan on March 4, 2020, which included a voluntary period of compliance coupled with incentives, and the Climate Action and Energy Plan on January 19, 2022.

Staff presented a report to Council on October 4, 2022, introducing upcoming provincial requirements for zero-carbon new construction. Staff received direction from Council to "conduct a review of Building Bylaw No. 3172 and the B.C. Energy Step Code Rebate Policy, once the B.C. Building Code update is released to ensure alignment with the updates and the Energy Step Code implementation schedule and Carbon Pollution Standard."

The Province of B.C. issued a Building Code update effective May 1, 2023, which bumped up the minimum Energy Step Code requirements and introduced an optional Zero Carbon Step Code (renamed from the Carbon Pollution Standard referenced in the 2022 consultation). The introduction of the Zero Carbon Step Code allows local governments to regulate greenhouse gas emissions with respect to new construction.

DISCUSSION

The B.C. Building Code is a provincial regulation outlining requirements for new construction, building alterations, repairs, and demolitions—the B.C. Building Code (2018) Revision 5 update was effective May 1, 2023, and has triggered the need to update and harmonize language in North Cowichan's Building Bylaw. Significant changes as a result of the B.C. Building Code update includes new minimum requirements in the B.C. Energy Step Code and the introduction of an optional Zero Carbon Step Code.

Council's approval of the Climate Action and Energy Plan (CAEP) established a goal to decrease the potential emissions of new buildings. Modelling for the CAEP demonstrated that in order to reduce North Cowichan's greenhouse gas emissions by 80% by 2050, all new construction must be zero emission by 2030. Fossil fuel space heating (64%) and water heating equipment (35%) produce the

majority of emissions from buildings; appliances and lighting play a smaller role¹. Through the *CleanBC Roadmap to 2030*, the province has committed to the highest efficiency standards to ensure all space and water heating equipment sold and installed in BC are at least 100% efficient (e.g., electric resistance heating, heat pumps, and hybrid electric heat pump-gas systems) and a 100% Clean Electricity Delivery Standard to ensure that the grid is zero emissions by 2030.

Staff reviewed Part 9 Building Permit applications submitted in 2023 (YTD) with respect to the type of space and water heating systems. Of the 23 applications, 43% have an electric hot water heating system, and 57% have an electric principal heating system. Projections supporting North Cowichan's Housing Accelerator Fund application indicate that 3,500 dwelling units could be added to North Cowichan's building stock by 2027. Around 400 of these units are projected to be new single-family buildings, and the balance of units is expected to be for townhouses and apartments (building numbers are unknown).

Adopting emissions standards for new buildings would avoid retrofitting these buildings to meet the CAEP goals at a later date. CAEP modelling estimated that North Cowichan residential building heating systems in 2016 consisted of 40% electrical resistant heat, 15% heat pumps, and 14% wood, with the balance of buildings supplied by oil, gas and propane. The Municipality currently provides incentive top-ups for residents accessing CleanBC Better Homes Program incentives for retrofit energy improvements. As of June 30, 2023, the Municipality has supported 230 households (2% of residential buildings) in converting to a heat pump, resulting in 745 tonnes of greenhouse gas emissions saved and \$1.4M in estimated economic benefit to local businesses undertaking retrofit work. While the average age of houses being upgraded is 41 years, 14% of the incentives have been issued for homes under five years old.

Generally, buildings fall under two sections of the BC Building Code: Part 9 residential buildings (three stories or less with a building area less than 600m² such as single-family dwellings, duplexes, townhouses) and Part 3 buildings (four stories or taller with a building area greater than 600 m² such as larger apartment buildings, commercial, mixed-use, office). The Energy Step Code and Zero-Carbon Step Code reference these building categories, as different levels of compliance are required for the different building types.

B.C. Energy Step Code:

The B.C. Energy Step Code is a compliance path required by the B.C. Building Code to meet energy efficiency requirements in new construction, and local governments can adopt higher steps of the Step Code ahead of mandated provincial requirements. The Province of B.C. has indicated it will update the B.C. Building Code to mandate higher steps of the Step Code to achieve the highest step levels by 2032 (Table 1). The first update of this occurred with the Revision 5 of the B.C. Building Code (2018) effective May 1, 2023.

¹ <https://energystepcode.ca>

Table 1 Province of BC Implementation Schedule for the Energy Step Code

Year of Provincial Requirement	Current Implementation Status	Part 9 Buildings	Part 3 Buildings	Energy-efficiency improvement above 2018 BC Building Code requirements
2023	Requirement in effect in B.C. Building Code (2018) Rev. 5	Step 3	Step 2	20%
2027 (anticipated)	Local government can voluntarily opt-in ahead of provincial requirement	Step 4	Step 3	40%
2032 (anticipated)	Local government can voluntarily opt-in ahead of provincial requirement	Step 5	Step 4	80% (net-zero ready)

The Energy Step Code takes a performance-based approach by identifying an energy-efficiency target that must be met and lets the building designer and developer decide how to meet it. Because the Code does not directly regulate fuel sources for heat and hot water, new buildings can have significant variations in total greenhouse gas emissions. Buildings with mechanical systems operating on gas or oil produce greater emissions than those operating on electricity, even at the highest steps of the Energy Step Code.

The Municipality of North Cowichan, as of May 1, 2021, required all Part 9 residential buildings to achieve Step 2, with no requirements for Part 3 developments other than where they have been made through requirements of zoning amendments. With the update of the B.C. Building Code: all new buildings in North Cowichan are now obligated to comply with higher Energy Step Code requirements. As a result of the B.C. Building Code changes: North Cowichan's Building Bylaw is outdated and requires updates to harmonize it with these new requirements. North Cowichan no longer requires higher levels of the Energy Step Code ahead of provincial implementation.

The Municipality currently offers rebates as incentives for projects that voluntarily achieve higher steps, funded through the Climate Action and Energy Reserve Fund and defined by the [North Cowichan Energy Step Code Policy](#). Current rebates offered include \$1,000 for Step 4 and \$1,250 for Step 5 buildings. Since introducing the Policy in 2020, \$11,500 in incentives have been provided to 13 developments, with three Step 4 and two Step 5 incentives issued.

B.C. Zero Carbon Step Code:

While the B.C. Energy Step Code addresses the energy-efficiency performance of new buildings; the Zero Carbon Step Code targets greenhouse gas emissions performance. They are two separate regulations within the B.C. Building Code and a local government may use either or both. Municipalities can voluntarily adopt the Zero Carbon Step Code ahead of future Building Code requirements, similar to implementing the Energy Step Code. The Province of B.C. will update the minimum requirements of the Zero Carbon Step Code with the ultimate goal of requiring Emissions Level 4 in 2030.

The Zero Carbon Step Code sets requirements for greenhouse gas emissions for buildings during their operation, with the highest step of “Zero” or “Emissions Level 4” and provides a flexible approach for developers to achieve these requirements. The requirements are defined in the B.C. Building Code in Tables 9.37.1.3 (Table 2) and 10.3.1.3 (Table 3). In the simplest terms, at the highest Emission Level for Part 9 buildings, this would require space heating, hot water, and auxiliary equipment (such as cooking appliances) to operate on an energy source equal to or less than 0.011 kg CO_{2e}/kWh. Part 9 building developers are also offered alternative pathways of compliance by meeting greenhouse gas maximum or intensity values. In these cases, developers have options on the type of heating system.

All GHG Emission Levels in the B.C. Building Code are currently optional. The Province of B.C. is anticipated to require EL-2 mandatory adoption in 2024, EL-3 in 2027 and EL-4 in 2030.

Table 2 B.C. Building Code's Part 9 building requirements for the Zero Carbon Step Code – This Table is referenced as Table 9.37.1.3 in the BC Building Code.

GHG Emission Level	GHG Emission Compliance Options					
	Maximum GHG Emissions by House, Expressed in kg CO _{2e} /year	or	Maximum GHG Emissions by House ¹		or	Reduction of GHG Emissions by Energy Source of Building Systems ²
			Maximum GHGI of the House, Expressed in kgCO _{2e} /m ² /year	Maximum GHG Emissions by House, Expressed in kgCO _{2e} /year		
EL-1	Measure only		Measure only			n/a
EL-2	1050	or	6.0	2400	or	Energy sources supplying heating systems have an emissions factor of ≤ 0.011 kgCO _{2e} /kWh
EL-3	440		2.5	800		Energy sources supplying heating and service water heating systems have an emissions factor of ≤ 0.011 kgCO _{2e} /kWh
EL-4	265		1.5	500		Energy sources supplying all building systems, including equipment and appliances, have an emissions factor of ≤ 0.011 kgCO _{2e} /kWh

- (1) Compliance for this option is demonstrated by meeting both the GHGI and the GHG emission requirements for each house.
- (2) Redundant or backup equipment for the system and equipment are permitted to be excluded, provided it is equipped with controls and is not required to meet the space-conditioning load of the house.

Table 3 B.C. Building Code's Part 3 building requirements for the Zero Carbon Step Code – This Table is referenced as Table 10.3.1.3 in the B.C. Building Code.

GHG Emission Level	Maximum GHGI of the Building, Expressed in kgCO _{2e} /m ² /year			
	Residential Major Occupancy		Business and Personal Service and Mercantile Major Occupancies	
	Hotels and Motels	Other Residential Occupancies	Offices	Other Business and Personal Service and Mercantile Occupancies
EL-1	Measure only			
EL-2	9.0	7.0	5.0	6.0
EL-3	4.0	3.0	3.0	3.0
EL-4	2.0	1.8	1.5	2.0

Local Government Adoption

As the Zero Carbon Step Code is currently optional, the approach other local governments on Southern Vancouver Island have taken with it varies.

Several municipalities have adopted the Zero Carbon Step Code and intend to follow the provincial timeline for implementing the Energy Step Code with the following implementation schedules:

Local Government	Part 9	Part 3
City of Victoria	EL-4 (2023-NOV-01)	EL-4 (2024-JUL-01) 4 to 6-story residential EL-4 (2024-NOV-01) all other Part 3 buildings
District of Saanich	EL-4 (2023-NOV-01)	EL-4 (2024-JUL-01) 4 to 6-story residential EL-4 (2024-NOV-01) all other Part 3 buildings
View Royal	EL-4 (2023-NOV-01)	EL-4 (2024-JUL-01) 4 to 6-story residential EL-4 (2024-NOV-01) all other Part 3 buildings
District of Central Saanich	EL-4 (2023-NOV-01)	None
Resort Municipality of Whistler	EL-3 (2024-JAN-01)	EL-3 (2024-JAN-01)
City of North Vancouver	EL-3 (2023-NOV-01)	EL-3 (2023-NOV-01)
District of North Vancouver	EL-3 (2023-NOV-01)	EL-3 (2023-NOV-01)
District of West Vancouver	EL-3 (2023-NOV-01)	EL-3 (2023-NOV-01)
City of Nanaimo	EL-4 (2024-JULY-01)	EL-4 (2024-JULY-01)

The Cowichan Valley Regional District and the City of Duncan have indicated that they will wait for the provincial implementation schedule for the Zero Carbon Step Code, particularly as the provincial implementation schedule suggests that EL-2 will become a requirement in 2024.

Building Inspections

The B.C. Building Code requires additional seismic, radon, and insulation provisions that are reviewed and enforced through the building inspection process. These inspections include under slab insulation, radon, interior braced wall, exterior braced wall and second plane of protections (air barrier, rain screen and flashing). Staff are already performing these required inspections for provincial compliance, but the North Cowichan Building Bylaw needs to be updated to harmonize with the required inspections.

Summary and Conclusion:

North Cowichan's CAEP establishes ambitious targets for reducing community greenhouse gas emissions. However, local government's authority and influence on greenhouse gas emissions is limited, and many of the actions necessary to meet the CAEP targets are reliant on actions from senior governments, businesses, industry, and individuals. As a regulator of building and construction, local government can influence greenhouse gas emissions, to some degree, through development and building approval processes. Local governments are constrained by the *Building Act* and *B.C. Building Code* for establishing local building standards, but the B.C. Energy Step Code and Zero Carbon Step Code now provide a path for local governments to take a more aggressive approach for requiring energy-efficient construction and reduced emissions for new buildings.

While local governments now have the option to implement higher Steps and Emission Level targets than the province has mandated in the B.C. Building Code, doing so, will have implications for the local construction industry. Amendments to North Cowichan's Building Bylaw to require a minimum Step 2 for Part 9 buildings were largely intended to help the local industry adjust to the performance-based standards of the B.C. Energy Step Code in advance of pending changes to the B.C. Building Code that would make higher Steps mandatory. Implementing Step 2 in North Cowichan in advance of the Province's mandatory requirements seems to have been successful in that the local building industry did adjust without obvious disruption or hardship.

Staff recommend a similar approach to the Building Bylaw amendments adopted in 2021. Invoking a Zero Carbon Step Code Emissions Level in advance of the mandatory requirements expected in 2024 but keeping the requirement on the lower end of the Zero Carbon Step Code scale will help the local industry transition to the new requirements in a graduated way while still advancing the goals of CAEP and reducing GHG emissions for new construction. It is recommended that the Building Bylaw be amended to make Zero Carbon Step Code Emissions Level 2 mandatory.

Staff are not recommending adopting higher levels of the Energy Step Code (i.e., beyond Step 3) ahead of the provincial implementation schedule due to the higher costs for implementation highlighted in Table 2 and the complexities for the building sector that come with changes to building design requirements. Roll-out in line with the provincial implementation schedule would allow the Province to appropriately resource the necessary support for municipal and industry engagement, templates and training, and enforcement.

If Council wishes to proceed with the recommended amendments to the Building Bylaw, an implementation date of January 1, 2024, and public communication at the 'Inform' level on the IAP2 spectrum is recommended. This would involve communicating with the local building industry and the general public to inform them of the pending changes and share information about the new standards.

If Council prefers a higher Emissions Level step than what is recommended (EL-3 or EL-4), an engagement process with the local builders and other stakeholders is recommended at the 'Consult' or 'Involve' level on the IAP2 spectrum.

OPTIONS

1. **(Recommended Option)** THAT Council:
 - (1) Give first, second and third readings to Building Amendment Bylaw No. 3932, 2023; and,
 - (2) Direct staff to communicate with the building industry about pending changes to Building Bylaw No. 3172.
 - This option will advance the goals of the CAEP while being moderately ahead of the provincial implementation schedule expected in 2024. Adopting this ahead of provincial implementation removes the risk that the provincial schedule is delayed and the need to retrofit new buildings. Achieving Emissions Level 2 will also offer climate resiliency in that if electric heat pumps are installed, this technology also offers cooling during summer heat events.
2. This option requires three separate motions.
 - (1) THAT Council give first and second reading to Building Amendment Bylaw No. 3932, 2023.
 - (2) THAT Council amend section 3 of Building Amendment Bylaw No. 3932, 2023 by deleting subsection 19.1(c) in its entirety.
 - (3) Give third reading, as amended, to Building Amendment Bylaw No. 3932, 2023.
 - This option will align with the Provincial minimum requirements as they are implemented by the future updates to the BC Building Code and provide gradual adjustment to achieve provincial targets. This option would not require additional resources to implement, but it would not achieve reductions in GHG emissions from new construction beyond B.C. Building Code requirements.
3. THAT prior to considering amendments to Building Bylaw No. 3172, Council direct staff to commence engagement with industry on proposed amendments to implement Zero Carbon Step Code Emissions (*Council to choose Level 3 or 4*).
 - Engagement on proposed changes in the Building Bylaw to implement Emission Levels 3 or 4 of the Zero Carbon Step Code would allow stakeholders potentially impacted by the change to have input and enable Council to consider that input before considering implementing the higher Emission Level steps. It would also delay potential implementation, as the engagement process with a report back to Council would take approximately three months.

IMPLICATIONS

Financial

Higher Emission Level standards (EL-3 or 4) can increase the incremental cost of construction to accommodate the electrification of the building's energy systems. This incremental cost will be incurred eventually regardless of North Cowichan's adoption of the Zero Carbon Step Code as the Province

phases in its implementation schedule by 2030 for the Zero Carbon Step Code and 2032 for the Energy Step Code.

The Building and Safety Standards Branch of the Provincial Government has studied the potential cost implications of electrifying a building's energy system in alignment with the Zero Carbon Step Code. Incremental capital costs for all building types in southern Vancouver Island fell within a range of 0.1% cost savings and 2.2% cost increases. Operating costs varied from 7% savings to 2.2% increase. Incremental costs to achieve higher levels of the Energy Step Code were higher than the Zero Carbon Step Code due to substantial changes in building design, layout, framing techniques, system selection and materials.

Table 4 Incremental Construction Costs to Achieve the Zero-Carbon Carbon Pollution Standard and Step Code Steps 4 and 5 (Source: City of Victoria: Technical Review – Step Code and Carbon Pollution Standards)

	Incremental Construction Costs		
	Zero Carbon (at Step 3)	Energy Step Code Step 4 (% from Step 3)	Energy Step Code Step 5 (% from Step 3)
Small single-family dwelling	0.6%	1.8%-2.8%	7.1%-8.8%
Medium single-family dwelling	0.6%	1.0%	2.8%
Large single-family dwelling	0.4%	1.1%	2.9%-3.7%
Multi-family (6 storey or less)	-0.1%-2.2%	2.6%	n/a

Utilities

In a [presentation to the City of Nanaimo](#), BC Hydro indicated that they can meet the needs of Vancouver Island municipalities looking to adopt the Zero Carbon Step Code. The BC Utility Commission mandates utilities to engage in long-term planning processes. There is currently a surplus of electricity until 2030. BC Hydro is about to issue a call for new renewable electricity and anticipates that solar and wind will add supply when greater electricity demands are required. This call for power was previously anticipated in the Integrated Resource Plan to avoid overbuilding underutilized infrastructure. The transmission cables to Vancouver Island were replaced 20 years ago, and 40% of Vancouver Island's electricity demand is generated on Vancouver Island.

The Municipality has an agreement with Fortis BC, which requires Fortis BC to pay a portion of gross revenues received by Fortis BC for the provision and distribution of all gas consumed within the boundaries of the Municipality, as well as revenue in lieu of property tax on the pipelines themselves. Introducing EL-2 would currently require new construction to achieve greenhouse gas intensity values or zero carbon space heating requirements but does not mandate a fuel supply restriction. Fortis BC also has an application in front of the BC Utilities Commission (Biomethane Energy Recovery Charge Rate Methodology and Comprehensive Review of a Revised Renewable Gas Program). If Fortis BC is successful at the BC Utilities Commission, new construction would receive 100% renewable natural gas with no financial premium.

While utility operators identify no reliability issues, locally, there is concern of outages and concern that a changing climate will exacerbate these outages. The BC Building Code articulates that redundant or back-up equipment are permitted to be excluded, provided the equipment is equipped with controls

and is not required to meet the space-conditioning load of the house. BC Hydro has also indicated that the future electrical grid will differ from today's grid as they continue to implement technological advances and experiment with large-scale battery storage.

Personnel

Some training will be required to ensure staff are competent to answer questions from the community and administer the new requirements. Additional inspection time may be needed to confirm compliance with Energy Level requirements.

Environmental & Social

Transitioning new and existing buildings to low-carbon and renewable energy sources is an action identified in the CAEP. Taking a more aggressive implementation schedule (EL-2) would signal North Cowichan's leadership approach to climate action, avoiding retrofits of building energy systems as the CAEP is implemented while not requiring burdensome requirements on the building sector. To meet EL-2, heat pumps would likely be the primary space heating technology, which also offers cooling relief during summer heat events.

Communications

Continued engagement with the building community is a foundation of all options. Adopting EL-2 would not require significant building changes from the current Building Permit process and industry trends toward electrification. It is also supported by provincial tools and templates and existing requirements for the B.C. Energy Step Code for energy advisors to model building energy systems. Staff propose that the recommendation be supported by an 'Inform' level of engagement on the IAP2 spectrum with industry. If Council advances Option 3, staff recommend that a Consult level of engagement on the IAP2 spectrum be pursued.

RECOMMENDATION

THAT Council

- (1) Give first, second and third readings to Building Amendment Bylaw No. 3932, 2023; and,
- (2) Direct staff to communicate with the building industry about pending changes to Building Bylaw No. 3172.

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Attachments:

1. Building Amendment Bylaw No. 3932, 2023