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**SUBJECT BC ENERGY STEP CODE AND ZERO CARBON STEP CODE
IMPLEMENTATION**

OVERVIEW

Purpose of Report

To inform the Governance and Priorities Committee of engagement and present recommendations related to implementation of the Zero Carbon Step Code and acceleration of the BC Energy Step Code and seek Council direction to bring forward amendments to “Building Bylaw 2016 No. 7224”.

Recommendation

That the Governance and Priorities Committee recommend that Council direct Staff to prepare the necessary “Building Bylaw 2016 No. 7224” amendments in order to:

- a) adopt the Provincial Zero Carbon Step Code and require that all applicable building permit applications meet the Measure-only Level (EL-1) upon bylaw adoption;
- b) require all Part 3 and Part 9 applicable building types and occupancies meet the Zero Carbon Performance Level (EL-4) of the Zero Carbon Step Code by 2024-JUL-01; and,
- c) require all applicable Part 3 building types and occupancies meet the Step 3 of the Energy Step Code by 2026-JAN-01.

BACKGROUND

On 2022-AUG-29, Council directed Staff to prepare for industry consultation on implementation of the upper steps of the BC Energy Step Code and greenhouse gas emissions targets for new buildings. In early 2023, the City of Nanaimo engaged industry in partnership with the Regional District of Nanaimo (RDN), Town of Qualicum Beach, and District of Lantzville.

On 2023-JUL-10, Council endorsed the *Integrated Action Plan* to guide *City Plan's* implementation. It includes action C1.1.29: *Confirm final steps with respect to Nanaimo's Energy Step Code implementation strategy, to ensure higher Step Code compliance requirements come into effect before the Provincial mandated implementation timelines.*¹

BC Energy Step Code

The BC Energy Step Code (ESC) was introduced in 2017 and is a provincial building compliance path that focuses on energy efficiency in new construction for both Part 9 buildings (homes and small buildings) and Part 3 buildings (large, complex buildings).

¹ Note that this action was drafted before the Province released the Zero Carbon Step Code.

On 2018-JUL-09, Nanaimo City Council adopted a phased in approach to implement the lower steps of the Energy Step Code in 2019 as follows:

Effective Date	Building Types	BC Energy Step
2020-APR-21	Part 3 and Part 9	Step 1
2021-JAN-01	Part 9	Step 2
2022-JAN-01	Part 3	Step 2
2022-JAN-01	Part 9	Step 3

BC Zero Carbon Step Code

On 2023-MAY-01, the province added the Zero Carbon Step Code (ZCSC) to the BC Building Code to regulate greenhouse gas (GHG) emissions in new construction.

The four Emissions Levels (ELs) of increasing stringency are:

1. Measure-only (EL-1): requires measurement of a building's emissions without reductions, and is intended to build knowledge and capacity;
2. Moderate Carbon Performance (EL-2): in most cases, will require decarbonization² of either space heating or domestic hot water systems;
3. Strong Carbon Performance (EL-3): in most cases, will require decarbonization of both space heating and domestic hot water systems; and,
4. Zero Carbon Performance (EL-4): in most cases will require the full decarbonization of a building.

Provincial Policy Context

The Province has shared the implementation timeline for both ESC and ZCSC as follows:

	Building Type	2023-MAY-01	2024	2027	2030	2032
BC Energy Step Code	Part 9	Step 3		Step 4		Step 5
	Part 3	Step 2		Step 3		Step 4
Zero Carbon Step Code		Optional Compliance Path	TBD*	TBD*	Zero Carbon Performance Level (EL-4)	

*The province has indicated they plan to enact amendments to the BC Building Code in 2024 and 2027, but have not yet identified what level will be required.

The Province also made the following relevant commitments through *CleanBC Roadmap to 2030* climate plan:

- a) Highest efficiency standards, meaning that after 2030, all new space and water heating equipment sold and installed in BC will be at least 100% efficient (i.e. electric resistance heating, heat pumps, and hybrid electric heat pump-gas systems).
- b) 100% Clean Electricity Delivery Standard to ensure the grid is zero emissions.

² Decarbonization means reduction or elimination of carbon dioxide emissions.

In addition, the next BC Building Code, expected later this year, includes a proposed maximum summer design temperature of not more than 26°C in at least one living space in each dwelling unit to mitigate overheating in residential spaces. Residential building applicants will have to include mechanical cooling or by passive design measures where achievable to comply with overheating criteria.

DISCUSSION

Staff are recommending applicable new buildings meet the highest emissions reduction level – Zero Carbon Performance Level (EL-4) in about one year, and Part 3 buildings meet Step 3 of the Energy Step Code in about two years, after taking into account the following considerations:

Meeting City's Climate Goals

Zero Carbon Performance Level (EL-4) is a key step to achieving the City's community-wide emissions targets to be 50% to 58% below 2010 levels by 2030 and 94% to 107% below 2010 levels by 2050, given that buildings accounted for 31% of 2017 community emissions (approximately 500,000 tonnes a year). Being a growing city, Nanaimo will have a challenge achieving net emissions reductions from buildings if new buildings continues to add new emissions at a rate that outpaces the rate of emissions reductions from the existing building stock.

Emissions Modeling Results

The impact of different code adoption pathways on Nanaimo's community-wide emissions between 2023 and 2050 was modelled based on projected floor area growth. Modelling of scenarios involving implementation of EL-4 level in early 2024, indicates that the City could avoid up to 3,800 tonnes of GHG emissions by 2030 and up to 24,800 tonnes by 2050 compared to the baseline scenario, which follows the provincial timeline. The accelerated Energy Step Code adoption has a negligible impact on emissions reductions. More details on the modeling results and method can be found in Attachment A.

Recent Building Trends

Analysis of the buildings permitted in Nanaimo since the adoption of the Energy Step Code in April 2020 confirmed that buildings which use electricity for their space and water heating could easily meet EL-4, whereas buildings which primarily use natural gas for those systems were generally unable to meet EL-4 and in most cases unable to meet EL- 3 either.

The majority of Part 3 buildings (47 buildings) permitted since April 2020 are already using electric systems for space heating (73%) and hot water (69%). A detailed analysis of these buildings indicates that the majority are using electricity for both space and hot water heating in the absence of ZCSC.

The opposite is true for Part 9 buildings (approximately 700 buildings) where natural gas systems are still the primary space heating (65%) and water heating (74%) choices. This means on average, 160 new homes built every year continue to contribute to emissions in the city despite having met Energy Step Code requirements. Based on current provincial direction, when the provincial Highest Efficiency Standards come into effect in 2030, homes that primarily rely on fossil fuel heating equipment would have to be retrofitted to electric or hybrid electric heat pump with gas back up equipment at the time of the equipment's replacement or failure.

Engagement Results

The project team focused on a group of over 150 industry stakeholders, including builders, architects, energy advisors, developers, contractors, and industry and professional associations. Responses were received from 48 different industry stakeholders at an online engagement session, and 26 from completed online surveys. Staff interviewed four representatives from the non-profit social housing sector and received 30 email responses primarily from builders and developers as well as FortisBC and the Canadian Home Builders' Association – Vancouver Island. A detailed summary of the workshop is included in Attachment A, survey results in Attachment B, equity stakeholder interviews in Attachment C, and the verbatim email responses to the draft policy pathway in Attachment D.

The project team heard:

1. overall support to reduce emissions and improve energy efficiency;
2. incremental step changes every few years are challenging to continually adapt to;
3. preference for fewer changes even if it means accelerating the ESC and ZCSC timelines;
4. a desire for consistency in regulations among jurisdictions both within and outside the RDN; and,
5. a need for homeowner awareness and education.

The concerns related to the feasibility of reaching EL-4 of the ZCSC are mostly about grid capacity and power reliability, and less about industry capacity or cost. Builders have the ability to build all electric homes.

As for the feasibility of reaching the top step of the ESC by 2025-NOV-01 as a potential pathway in the original draft policy (presented in Option 2), greater concerns were raised in terms of industry capacity and cost. A notable number of developers for large residential projects (primarily Part 3 buildings) are already building to Step 3, one step higher than required, due to BC Housing funding requirements and/or generous financing from Canadian Mortgage and Housing Corporation (CMHC) but few indicated support for achieving the top step. A number of local energy advisors who have been involved in conducting energy modelling and airtightness testing for hundreds of new homes (primarily Part 9 buildings) suggested that many homebuilders struggle to meet the current ESC requirements and will likely have difficulty meeting the upper steps of ESC in the near future. In addition, currently there is little financial incentive for builders to build to the top step.

Cost Implications

For ZCSC, costing studies estimate the incremental capital cost increase for implementing EL-4 is minimal – up to 0.6% for single-family homes and -0.1% to 2.2% for Multi-Unit Residential Buildings (MURBs) compared to buildings built to current Energy Step Code requirements heated with conventional natural gas (see Table 9 in Attachment A).

For ESC, the expected capital cost increase for buildings to achieve the top step ranges from 1% to 6.6% for single-family homes and 1.3% to 3.1% for MURBs (see Table 8 in Attachment A). Historically, the cost premiums of high-performance building components have gone down over time, as the technology develops and the market matures. Experienced high-level step code builders noted cost increases are generally the result of early mistakes made during learning new building techniques.

Utility costs can vary widely, due to the type of equipment installed, fluctuating energy costs, and user preferences. Modeling studies published in 2022 suggests utility costs could decrease 9% to 24% for MURBs and range from a decrease of 12% to an increase of 7% for single-family dwellings when built to EL-4 and upper energy steps (see Table 7 in Attachment A).

The cost of future retrofits could be significant for both homeowners and governments. The City has supported 403 existing building retrofits (\$149,450 in rebates) to switch from fossil fuel systems to electric systems through the CleanBC Better Homes Program since April 2020. Even with the rebates from all levels of government, homeowners could be spending thousands of dollars to complete the retrofits and invest significant energy and time managing their projects.

Electrical Capacity

On 2023-MAY-01, BC Hydro staff presented to Council and confirmed BC Hydro is currently in an energy surplus position and is developing long term plans to meet projected demand from accelerated electrification. BC Hydro also issued a Local Government Electrification Bulletin in June 2023 to address how they plan to support the implementation of the ZCSC (Attachment E).

Renewable Natural Gas (RNG)

While Renewable Natural Gas (RNG)³ can be used to reduce emissions in buildings, there is currently no mechanism to ensure that a building continues using RNG after it is occupied and does not switch to conventional natural gas. There is also a limited amount of RNG produced in BC. In the BC Building Code, RNG is not listed with an emission factor, which makes it challenging for local governments to determine its emissions reduction potential. In June 2023, Pembina Institute released a publication on the role of RNG in the Zero Carbon Step Code and cautioned the risks of locking in gas infrastructure with the intention of continued use of RNG.

Other Local Governments

A number of local governments in BC have already taken action to restrict carbon emissions from new buildings. The District of Saanich and the City of Victoria worked collaboratively to become the first municipalities to enact regulations referencing the ZCSC. Top level EL-4 is required for Part 9 buildings in both cities by 2023-NOV-01, for Part 3 residential buildings (4-6 storey) by 2024-JUL-01, and for the remaining Part 3 buildings by 2024-NOV-01.

On 2023-MAY-23, the District of Central Saanich Council supported the move to implement EL-4 for Part 9 buildings by 2023-NOV-01. A list of local governments taking actions on step code adoption is included in Attachment F.

Next Steps

Should Council direct Staff to proceed with the recommended pathway, Staff plan to do the following:

³ Renewable Natural Gas or RNG refers to biomethane derived from captured and cleaned biogas. Biogas is produced from decomposing organic waste from landfills, agricultural waste and wastewater from treatment facilities.

- Bring the Building Bylaw amendments to implement ZCSC forward for Council's consideration;
- Continue to work with the industry to support education, training, and capacity building on developing the knowledge and skills necessary to successfully deliver zero carbon and upper steps compliant buildings;
- Educate homeowners about the benefits of low carbon space and hot water heating options;
- Work with industry stakeholders to review and update the BC Step Code Rezoning Policy, references to the BC Energy Step Code within Schedule D (bonus density) of the City of Nanaimo Zoning 2011 Bylaw No. 4500, and the General Development Permit Area Design Guidelines;
- Monitor emissions reductions in new construction through building permit applications;
- Continue to promote low carbon energy systems through rebate and education programs; and,
- Work with BC Hydro to conduct a grid capacity analysis and incorporate Nanaimo's land use policies and targets into BC Hydro's distribution capital planning process.

OPTIONS

1. That the Governance and Priorities Committee recommend that Council direct Staff to prepare the necessary "Building Bylaw 2016 No. 7224" amendments in order to:
 - a) adopt the Provincial Zero Carbon Step Code and require that all building permit applications meet the Measure-only Level (EL-1) upon bylaw adoption;
 - b) require all Part 3 and Part 9 applicable building types and occupancies meet the Zero Carbon Performance Level (EL-4) of the Zero Carbon Step Code by 2024-JUL-01; and,
 - c) require all applicable Part 3 building types and occupancies meet the Step 3 of the Energy Step Code by 2026-JAN-01.
 - The advantages of this option: By adopting the Zero Carbon Performance Level early and accelerating to Step 3 for Part 3 buildings, the City can significantly reduce GHG emissions from new buildings after 2026 while minimizing the impact on both capital and utility costs of new development. The 2024 ZCSC implementation timeline is in alignment with leading municipalities such as Saanich, Victoria, and Central Saanich, creating cross-regional consistency and building a critical mass for market transformation on Vancouver Island. The 2026 ESC timeline will likely not affect large development projects currently in early design stage, but is still one year ahead of the provincial timeline. Allowing more time to determine the implementation schedule of the upper energy steps for the remaining building types will support the City's collaboration with the building industry to be prepared for upcoming changes and help mitigate unintended consequences.
 - The disadvantages of this option: While the proposed option will reduce GHG emissions in new buildings and improve efficiency in Part 3 (large and complex) buildings, it does not address overall building performance and comfort in Part 9 (homes and small) buildings. Decarbonizing heating systems without advancing efficiency requirements for homes could result in increased utility bills for some homeowners and tenants. In the short-term,

there may be a small influx of Building Permit applications ahead of the Step Code implementation that may result in processing delays.

- Financial Implications: Building and Permitting Staff note the proposed pathway will have a minimal impact on Staff capacity over the long term and will not result in the need for additional Staff or funding.
2. That the Governance and Priorities Committee recommend that Council direct Staff to prepare the necessary “Building Bylaw 2016 No. 7224” amendments in order to:
- a) adopt the Provincial Zero Carbon Step Code and require all building permit applications to meet the Measure-only Level upon bylaw adoption;
 - b) require all Part 3 and Part 9 applicable building types and occupancies to meet the Zero Carbon Performance Level (EL-4) of the Zero Carbon Step Code six months after bylaw adoption; and,
 - c) require all Part 9 buildings to meet Step 5, all Part 3 residential buildings to meet Step 4, and commercial buildings to meet Step 3 of the BC Energy Step Code by 2025-NOV-01.
- The advantages of this option: Advancing the BC Energy Step Code in conjunction with the adoption of Zero Carbon Performance Level as early as possible will likely lower energy bills for residents, reduce electrical load, increase resilience, and provide certainty for industry in addition to the emissions reductions. Establishing a single date for reaching the top levels of the ESC and ZCSC respectively reduces potential confusion and administrative burden.
 - The disadvantages of this option: The proposed changes could result in increased construction costs for some buildings. While the expected cost impact of implementing the Zero Carbon Performance Level is minimal, the cost premium and learning curve for implementing the top step of the Energy Step Code may be greater. Some of the cost premium may be passed on to homeowners and tenants. Adjusting to new building design approaches and construction techniques in a short timeframe can put a strain on industry capacity. In the short-term, there may be a significant influx of Building Permit applications ahead of the Step Code implementation that may result in processing delays.
 - Financial Implications: The proposed pathway is not anticipated to have any significant financial impact for the City of Nanaimo directly.
3. That the Governance and Priorities Committee recommend that Council direct Staff to follow the provincial implementation timelines for Zero Carbon Step Code and the upper steps of the Energy Step Code:
- The advantages of this option: This approach will allow more time for builders and developers who are less experienced with high performance buildings to gain necessary skills and capacity. New financing mechanism and incentives may become available to help strengthen the business case of low-carbon, high-efficiency building development.

- The disadvantages of this option: Without the early adoption of the ZCSC, new construction could add up to 3,800 tonnes of GHG emissions by 2030 and up to 24,800 tonnes by 2050 and continue to increase Nanaimo’s community emissions annually by more than 1,000 tonnes of GHG emissions even after EL-4 is implemented province wide in 2030. It may be challenging and expensive to eliminate these emissions through retrofits in order to achieve Nanaimo’s climate targets. This approach is not consistent with Council’s direction to accelerate Step Code implementation.
- Financial Implications: There are no financial implications. |

SUMMARY POINTS

- On 2023-MAY-01, the Province of BC introduced the Zero Carbon Step Code to regulate greenhouse gas emissions in new buildings.
- Staff are recommending Council adopt the Zero Carbon Step Code and require all applicable building permit applications to meet the Measure-only Level upon bylaw adoption and the Zero Carbon Performance Level by 2024-JUL-01.
- Staff are also recommending Council require Part 3 Buildings to meet Step 3 of the Energy Step Code by 2026-JAN-01.

ATTACHMENTS:

ATTACHMENT A: Link to “Net Zero Code Adoption: Report and Recommendations for the City of Nanaimo”

ATTACHMENT B: Industry Survey Responses

ATTACHMENT C: Equity Stakeholder Interviews

ATTACHMENT D: Link to “Industry Email Responses to Proposed Pathway” (To be distributed on Addendum)

ATTACHMENT E: BC Hydro’s Local Governments Electrification Bulletin June 2023

ATTACHMENT F: List of other Local Governments Taking Actions on Step Code

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