

**TO:** CHAIR AND MEMBERS  
ENVIRONMENT COMMITTEE

**DATE:** 2021 March 10

**FROM:** DIRECTOR PLANNING AND BUILDING

**FILE:** 76500 20  
*Reference: Green Building Policy*

**SUBJECT:** PROPOSED AMENDMENT TO GREEN BUILDING POLICY FOR NEW  
PART 9 RESIDENTIAL BUILDINGS

**PURPOSE:** To propose a process and timeline for advancing the Energy Step Code requirement for Part 9 buildings to Step 3.

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**RECOMMENDATION:**

1. **THAT** Council approve the proposed process and timeline for advancing to Step 3 of the Energy Step Code for new Part 9 residential buildings, as outlined in this report.

**REPORT**

**1.0 INTRODUCTION**

On 2021 February 8, Council received an update on the status of Burnaby's Green Building Policy, including for Part 9 residential buildings.<sup>1</sup> The report indicated that staff would prepare a subsequent report in 2021 reporting on feedback and compliance outcomes and proposing a process and timeline for advancing the Energy Step Code (ESC) for Part 9 buildings, with implementation in 2021. The report also indicated that future work would include low carbon requirements as part of a green building policy update for Part 9 buildings, using either a two-pathway compliance model or potential new authority to regulate carbon performance, if granted by the province.

Accordingly, this report presents feedback and outcomes from implementation of Step 1 of the ESC and seeks Council's approval of a process and timeline for advancing to Step 3 in 2021 for Part 9 buildings, as a basis for stakeholder consultation. Pending feedback from stakeholders, a second report with implementation recommendations and proposed amendments to the Building Bylaw would be advanced for Council's consideration later this year.

In support of the City's intention to also advance low carbon energy requirements for Part 9 buildings to meet the City's greenhouse gas reduction targets, potential options for regulating carbon performance in Part 9 buildings and regional alignment in this area is presented in this report for information.

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<sup>1</sup> Part 9 residential buildings are comprised of 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>.

## 2.0 POLICY SECTION

Updating the Green Building Policy for Part 9 buildings to improve energy efficiency and reduce carbon pollution aligns with the following City policies:

- **Climate Action Framework**, Big Move 6, Zero Emission Net Zero New Buildings, envisions a zero emissions pathway for new Part 9 building as soon as possible. Quick Start 1 under this Big Move calls on the City to accelerate the roadmap to net zero emissions using low-carbon compliance, in addition to updating the Energy Step Code, for Part 9 buildings.
- **Environmental Sustainability Strategy (ESS) and Community Energy and Emissions Plan (CEEP)**. Development of the City's Green Building Policy was identified from the ESS and the CEEP, supporting the *Breathe, Build and Manage* goals and specific strategies and actions to improve the environmental performance of buildings (see specifically ESS Build strategies 6.1 - 6.2 and 6.6 and CEEP Build strategies C3.1 – C3.2 and C3.6).
- **Social Sustainability Strategy**, including opportunities to improve affordability with reduced energy costs, and improve occupant comfort and health through more efficient building design and heating, ventilation and air conditioning systems.
- **Economic Development Strategy**, including the goal of Striving for a Greener Community with green building technology, and supporting the Environmental Technology and Services sector.

In addition to the policies noted above, updating the Green Building Policy for Part 9 buildings supports a number of goals and sub-goals of the *Corporate Strategic Plan*:

- **A Healthy Community**
  - Healthy life – Encourage opportunities for healthy living and well-being
  - Healthy environment – Enhance our environmental health, resilience and sustainability
- **A Dynamic Community**
  - Economic opportunity – Foster an environment that attracts new and supports existing jobs, businesses and industries
  - Community development – Manage change by balancing economic development with environmental protection and maintaining a sense of belonging

## 2.1 Province of British Columbia

The City of Burnaby is an early adopter of the BC Energy Step Code (ESC), a performance-based framework introduced within the BC Building Code in 2017 for improving energy efficiency, in order to move toward the Province's goal of net zero energy ready buildings by 2032, in accordance with BC's climate plan, Clean BC.<sup>2</sup> Local governments currently have the regulatory powers to require Steps 1-5 of the ESC for Part 9 buildings.

The ESC does not specifically address carbon pollution, and higher levels of energy efficiency do not guarantee reduced emissions. To date, local governments have not been given the power to regulate buildings to meet low-carbon or greenhouse gas intensity (GHGI) limits: low-carbon energy systems and greenhouse gas intensity limits may be used as options only, such as through rezoning and alternate

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<sup>2</sup> <https://cleanbc.gov.bc.ca/> Accessed February 26, 2021.

compliance pathways.<sup>3</sup> However, this may change. Following the provincial election in 2020, the Mandate Letter for Attorney General and Minister Responsible for Housing David Eby included direction to ‘support local governments to set their own carbon pollution performance standards for new buildings’.<sup>4</sup> Local governments are currently awaiting further clarification from the province as to whether local governments will be given powers to require low-carbon or zero-carbon building energy systems and or specify GHGI limits.

### 3.0 BACKGROUND

The Part 9 residential buildings green building policy, approved in June 2019, took effect 01 September 2019, following stakeholder engagement and an update to the Building Bylaw. The policy requires all new Part 9 buildings be constructed to meet Step 1 of the ESC with compliance demonstrated by energy modeling, air tightness testing and an energy label displayed on the electrical panel.

In developing the policy, starting at Step 1 was viewed as an interim step “to allow for familiarization by builders with these new practices, and to improve future compliance levels.”<sup>5</sup> Future policy direction was also anticipated: “After approximately one year, Step 3 of the Energy Step Code is anticipated to be required, pending reporting back to Council based on findings and feedback of Step 1 implementation.”<sup>6</sup>

Whereas Step 1 does not include specific performance targets for energy efficiency and air tightness, the higher steps (Steps 2 – 5) define targets for annual energy consumption of a buildings mechanical systems (defined as *Mechanical Energy Use Intensity* – MEIU), annual heating energy needs to maintain a building’s stable interior temperature (defined as *Thermal Energy Demand Intensity* – TEDI), and air tightness (discussed in more detail in the following section). Higher steps require improved building performance based on these measures.

#### 3.1 Step 1 Implementation, Feedback and Compliance

Since the Step 1 requirement took effect on 2019 September 1, 293 Building Permit applications have been received for Part 9 buildings, nearly all for single-family dwellings and some two-family dwellings. Of those, 32 projects are complete, having received an Occupancy Certificate and completing all components of Step 1, 143 projects have been issued a permit, 8 projects have permit issuance pending, and 110 projects are in review, as outlined in *Table 1*.

**Table 1**  
**Summary of Building Permit Applications for Part 9 Buildings (September 1, 2019 to March 3, 2021)**

<b>Total Number of Building Permit Applications Received</b>	<b>293</b>
In Review	110
Permit Ready to be Issued	8

<sup>3</sup> Low carbon building systems in Energy Step Code Requirements, best practices bulletin and technical report. 2020. Prepared by Brendan McEwan with AES Engineering.

<sup>4</sup> [https://www2.gov.bc.ca/assets/gov/government/ministries-organizations/premier-cabinet-mlas/minister-letter/eby\\_mandate\\_2020\\_jan.pdf](https://www2.gov.bc.ca/assets/gov/government/ministries-organizations/premier-cabinet-mlas/minister-letter/eby_mandate_2020_jan.pdf) Accessed March 3, 2021.

<sup>5</sup> Proposed Approach for Part 9 Green Building Requirements (2019.03.28).

<sup>6</sup> Green Building Requirements for New Part 9 Residential Buildings (2019.05.29).

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Permit Issued	143
Occupancy Certificate Issued	32

Feedback from Building Department staff suggests that Step 1 ESC requirements have been generally well received by builders, architects, designers, and energy consultants. Staff report that most applicants have familiarity working with energy advisors and modellers to meet ESC requirements from projects in other municipalities. No significant challenges were noted, although with any administrative and regulatory change, minor issues, for example showing the correct details on building plans and additional time required early on for some inspections, arose and were addressed. Staff also report that many applicants inquire if Burnaby has advanced to Step 3, as this Step is already required in a number of other municipalities in Metro Vancouver (see *Section 3.2*).

Compliance with the ESC involves builders engaging an energy advisor or energy modeller, prior to making a building permit application, who provides advice about how to meet the performance targets of the required step, models the building's performance, and conducts air tightness testing. Air tightness testing is a foundational component of ESC that measures the rate of air leakage from a building (measured in Air Changes per Hour or ACH – a lower ACH value equates to higher performance). Air tightness is modeled at the design stage to meet an ACH value for a specific Step of the ESC and is physically measured mid-construction and post construction by undertaking a blower door test. As-built building performance is compared to modeled performance to determine if a building complies.

Burnaby's Step 1 administrative and review process for Part 9 buildings requires submission of three (3) compliance forms: Pre-construction Compliance Form at the time of building permit application, Mid-construction Compliance Form, and As-built Compliance Form submitted as part of an Occupancy Certification application. Note that a specific performance level is not required at Step 1. For Part 9 building permits, applicants are advised to choose an ACH value consistent with the experience and expected performance of the builder (for example, selecting a higher ACH value if less experienced with building to ESC requirements). Thus, for Step 1, measuring compliance consists of only receiving the As-built air tightness test result. However, comparing that result to the pre-construction design value provides valuable insight into the ability of the builders and energy advisors to meet an energy efficiency target.

Compliance monitoring of Step 1 implementation for Part 9 buildings is as follows:

- Pre-construction Compliance Forms were submitted with all building permit applications, confirming that designers and architects were working with energy advisors to design a building with consideration of best practices for meeting ESC requirements.
- At the time of this report, results of the mid-construction and as-built air tightness tests (as documented on the Mid-construction and As-built Compliance Forms submitted) were available for 24 buildings that were issued an Occupancy Certificate. This means that all 24 buildings complied with Burnaby's Step 1 administrative and review process for Part 9 buildings by following through the process and submitting the required documentation. Analysis of this data found that 23 of the 24 buildings recorded As-built ACH values equal to or better than the modeled building. The remaining building recorded an ACH value that was actually better than the average ACH As-built value of the data set. That the building did not

perform equal to or better than the design value is attributed to the selection of a design ACH inconsistent with the experience of the builder.

- A Mid-construction Compliance Form was received for 23 of the 24 buildings in this data set. The City of Burnaby requires a pre-drywall air tightness test at this stage to assess if the building is on-track to meet the modelled air tightness value. The objective of this step is to improve compliance rates by providing an opportunity for the builder, designer and energy advisor to mitigate any construction related issues if the building is not performing as modeled. Of the 23 buildings that recorded an As-built ACH value equal to or better than the modelled value, 9 of these buildings were not on target at the Mid-construction stage; thus, the mid-construction test was important for improving building performance to achieve compliance. Further, the remaining buildings that were on-target at the mid-construction point all showed modest to significant improvement in air tightness testing at the As-built stage.
- The air tightness performance target for Step 3 is 2.5 ACH. The average As-built air tightness performance of the 24 buildings receiving an Occupancy Certificate under Step 1 was 3.4 ACH (the average pre-construction design air tightness was 4.5 ACH). As noted previously, Burnaby's Step 1 implementation approach encouraged the use of a conservative air tightness value at the design stage, recognizing that the focus of Step 1 is to familiarize less experienced builders with the process of working with energy advisors and using new building techniques. However, this data also suggests that potential compliance issues with Step 3 requirements should be anticipated at least early on, and considered as part of Step 3 implementation.

### 3.2 Energy Step Code and Low Carbon Requirements in other Metro Vancouver Jurisdictions

Advancing to higher steps of the ESC for Part 9 buildings is consistent with approaches taken by other municipalities in Metro Vancouver that are early adopters of Energy Step Code. A survey of early adoptees finds that all are at Step 3 and that some have also advanced alternative compliance pathways in their building bylaws, requiring higher steps or lower steps with a Low Carbon Energy System (LCES). A summary of these municipalities and their present and future requirements for Part 9 buildings, publicly available at the time of this report, is presented in *Table 2*.

**Table 2**  
**Energy Step Code Requirement for Part 9 Buildings for Select Municipalities in Metro Vancouver**

	<b>Current</b>	<b>Future</b>
<b>City of Richmond</b>	Step 3 or Step 2 with LCES	Considering higher steps and lower GHGI* for 2022
<b>City of Surrey</b>	Step 3	Step 4 (2023/24) and Step 5 (2025/26) are anticipated for future adoption
<b>City of New Westminster</b>	Step 3	Consulting with building community on alternative compliance with LCES
<b>City of North Vancouver</b>	Step 3 and Step 1 (depending on size of house)	Step 5 or Step 3 with LCES, July 2021

<b>District of North Vancouver</b>	Step 3	Step 5 or Step 3 with LCES, July 2021
<b>District of West Vancouver</b>	Step 5 or Step 3 with LCES	--
<b>City of Port Moody</b>	Step 3	Step 4 (2025) and Step 5 (2030)
<b>City of Port Coquitlam</b>	Step 3	--
<b>City of Coquitlam</b>	Consulting on implementing ESC requirements	--
<b>Township of Langley</b>	Step 3 (Development Permit Areas) Step 2 (all other areas)	Step 3 all areas, 2022

\*GHGI stands for Greenhouse Gas Intensity, measured in kg/CO<sub>2</sub>e/year and used to characterize the performance of energy systems in buildings.

### 3.3 Summary

The previous public consultation, undertaken to support adopting Step 1 requirements, included the following components: 1) progressing to Step 3 after one year at Step 1, and 2) investigating future policies to encourage or require low-carbon heating and cooling systems. At that time, the consultation with building community stakeholders found no serious concerns with this approach and responses were favorable to these specific components.<sup>7</sup> Phasing in higher steps of energy efficiency over time is purposeful to meet one of the objectives of the Green Building policy: to manage costs of development. Research cited in a previous committee report noted that building up to Step 3 for Part 9 buildings is currently achievable at a modest additional cost.<sup>8</sup>

Another objective of Burnaby's Green Building policy is to support industry learning and transformation.<sup>9</sup> Starting at Step 1 was intended to help the building community become familiar with new practices without a requirement to meet specific energy performance and air tightness standards. Feedback and Step 1 compliance findings presented in *Section 3.1* of this report indicates that the building industry working in Burnaby has had sufficient time to prepare to meet higher ESC requirements, which are already in place in many other municipalities in Metro Vancouver. Further, they will have had experience with Burnaby's application and review process and will have become more familiar with new building practices and compliance approaches. But, to mitigate potential compliance issues with Step 3 requirements, for air tightness testing specifically, the proposed consultation for Step 3 implementation should focus on assessing what support the building community needs to meet Step 3 requirements, identifying gaps or issues with the City's proposed administrative and compliance process and identifying opportunities for the City to provide support.

Meeting the City's greenhouse gas reduction targets requires new Part 9 buildings transition to net zero emissions as soon as reasonably possible. This will require not only more efficient buildings, but also a transition to low carbon energy systems that consume electricity rather than fossil fuels. Staff plan to undertake additional policy research before making a recommendation in a subsequent report to the Environment Committee and Council on how to regulate GHG emissions for new Part 9 buildings in Burnaby. For consideration by staff will be a legal review of the alternate compliance pathway (see

<sup>7</sup> Green Building Requirements for New Part 9 Residential Buildings (2019.05.29).

<sup>8</sup> Energy Step Code, 2018 Metrics Research, Full Report Update. Available at: [www.energystepcode.ca](http://www.energystepcode.ca)

<sup>9</sup> Proposed Approach for Part 9 Green Building Requirements (2019.03.28).

**Table 2** for examples of this option in practice), more information from the Province of BC on their proposal and schedule for granting authority to local governments to regulate GHG performance, which could potentially be used in place of the alternate compliance pathway option, and consideration of a recently released best practices bulletin for integrating low carbon building systems with energy step code requirements.

#### **4.0 PROPOSED PROCESS AND TIMELINE FOR STEP 3 IMPLEMENTATION**

Based on the findings of the previous consultation and the feedback and compliance monitoring presented in *Section 3.0* of this report, the proposed process and timeline for Step 3 implementation will consist of issuing a technical bulletin to stakeholders, which will contain detailed information about the application and review process, new compliance forms and information requirements, providing a period for questions and comments, and providing opportunity for in-person dialogue.

As with the previous consultation, stakeholders to be engaged include (but are not limited to):

- Individual home builders active in Burnaby
- Greater Vancouver Home Builders Association
- Condominium Home Owners Association
- Urban Development Institute
- Landlord BC
- Architectural Institute of BC
- Engineers and Geoscientists BC
- Energy professionals
- BC Housing
- BC Hydro
- FortisBC
- BC Institute of Technology (Zero Energy Buildings Learning Centre)
- Metro Vancouver
- Province of BC (Building Safety Standards Branch; Climate Action Secretariat)

These stakeholders would be sent a summary of the Step 3 requirement, including links to supporting resources and information for Burnaby's application and review process for Step 3 (Part 9), and would be invited to provide comments via email (an online survey may also be considered by staff). An online information session with City staff would also be offered for home builders and other industry professionals during the consultation period, and staff would meet with other stakeholders upon request. Updates and information, including the information session, would also be posted on the City's website at: [www.burnaby.ca/greenbuildings](http://www.burnaby.ca/greenbuildings).

Through the consultation, the City of Burnaby would also continue to signal its intent to address GHG emissions in future policy updates and would further gauge support for the consideration of low carbon energy system approaches for Part 9 buildings.

#### **4.1 Timeline and Next Steps**

Pending Council's approval of this report, the stakeholder bulletin would be issued in early May, 2021 and consultation would take place in May and June, 2021. Following consultation, the approach would be confirmed or updated as necessary, which may include additional policy components, as well as

details regarding implementation and compliance. These findings and recommendations would be outlined in a report to Committee and Council in September 2021. This timeline proposed is summarized in **Table 3** below, noting the dates are “target” and subject to change depending on Council direction and staff resources.

**Table 3**  
**Proposed Timeline for Advancement to Step 3 of the Energy Step Code for Part 9 Buildings**

Phase	Action/Step	Target Date
<b>Consultation</b>	1. Committee Report – stakeholder consultation	March 18, 2021 (Environment Committee) March 29, 2021 (Council Meeting)
	2. Issue stakeholder bulletin, post info on website.	May, 2021
	3. Comment period.	May – Mid-June, 2021
	4. Information session.	Mid-May, 2021
	5. Stakeholder follow-up, as required.	June, 2021
<b>Approval and Implementation</b>	6. Develop implementation and communication resources	June – August 2021
	7. Environment Committee report Council Report	September 23, 2021 October 4, 2021
	8. Bylaw amendment process; Effective date for Step 3 and admin requirements.	December 2021 (tentative)
<b>Future Steps</b>	9. Committee Report: recommendation for consulting on LCES requirements.	November, 2021 (or later)
	10. Potential earliest effective date of updated requirements (higher steps and/or low-carbon policy), pending outcomes of policy review.	To be determined

The proposed consultation process may identify a need for additional staff and or support resources to implement higher steps of the Energy Step Code. This potential outcome and implications would be reported to the Environment Committee and Council in a future report, for consideration.

The two ‘Future Steps’ in Table 3 (Steps 9 and 10) are envisioned to take place after Step 3 is implemented and refer to consideration and potential implementation of additional changes to Part 9 ESC requirements, specifically the inclusion of an approach to regulate greenhouse gas emissions by requiring low carbon energy systems.

## 5.0 CONCLUSION

This report outlines a proposed process and timeline for advancing to Step 3 of the Energy Step Code for smaller (Part 9) residential buildings, including single and two-family homes, and multi-family buildings less than three storeys and 600 m<sup>2</sup> in footprint. Improving the energy efficiency of this building type will have many potential benefits, including improving health and comfort for occupants, reducing energy costs and taking action on climate change. Advancing to higher steps of the Energy Step Code is well supported by City policies. Feedback and compliance monitoring for Step 1



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implementation suggests the building community in Burnaby is sufficiently prepared to meet the higher requirements. The consultation on Step 3 implementation proposed in this report will aim to identify what additional support the building community may need to achieve compliance.

Proposed Step 3 requirements would be shared with stakeholders in the coming months, prior to advancing proposed requirements and Building Bylaw amendments for Council's consideration in the fall of 2021. Staff will also continue to investigate various options to regulate carbon performance in Part 9 buildings with the goal of recommending a roadmap to net zero emissions for this building type in a subsequent report to the Environment Committee and Council for consideration.



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