City of Burnaby

Meeting 2019 June 4

COMMITTEE REPORT

TO:	CHAIR AND MEMBERS ENVIRONMENT AND SOCIAL PLANNING COMMITTEE	**DATE:**	2019 May 29
FROM:	DIRECTOR PLANNING AND BUILDING	**FILE:** *Reference:*	76500 20 *Green Building Policy*

SUBJECT: **GREEN BUILDING REQUIREMENTS FOR NEW PART 9 RESIDENTIAL BUILDINGS**

PURPOSE: To seek Council's approval for the proposed green building requirements for new Part 9 residential buildings.

RECOMMENDATIONS:

1. **THAT** Council approve the proposed green building requirements for new Part 9 residential buildings, as outlined in this report.

2. **THAT** Council approve the proposed Building Bylaw amendments for Energy Step Code as outlined in *Section 4.1* of this report.

REPORT

1.0 INTRODUCTION

On 2019 April 08, Council approved the approach for green building requirements for new smaller (Part 9) residential buildings, as a basis for stakeholder consultation. This followed Council's approval for green building requirements for large (Part 3) buildings on 2018 November 19, which are currently being implemented. The purpose of this report is to summarize the results of stakeholder consultation and implementation details, and to advance the proposed Bylaw amendments for Energy Step Code for Part 9 residential buildings.

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

1.1 Policy Context

Green building policy is aligned with the following strategic plans:

- **Environmental Sustainability Strategy** (ESS) and **Community Energy and Emissions Plan** (CEEP), including the *Breathe, Build* and *Manage* goals and specific strategies and actions to improve the environmental performance of buildings. The CEEP also includes adopted targets for reducing community greenhouse gas (GHG) emissions.

- **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.

- **Corporate Strategic Plan**, including the following goals and sub-goals:

  - 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

The proposed approach would implement the BC Energy Step Code (ESC), which is a performance based framework introduced within the BC Building Code in 2017 for improving energy efficiency that local governments can adopt, in order to move toward the Province's goal of net zero energy ready buildings by 2032[1].

2.0 PROPOSED GREEN BUILDING REQUIREMENTS FOR NEW PART 9 RESIDENTIAL BUILDINGS

2.1 Objectives and Components

As outlined in the previous report to the Environment and Social Planning Committee dated 2019 March 12, the proposed requirements address the following objectives:

- Encourage best practices for healthy, durable, efficient homes
- Reduce energy costs to residents
- Manage costs of development
- Support industry learning and transformation
- Enable informed decision making by homeowners
- Take action on climate change

[1] Additional background about the BC Energy Step Code can be found in previous reports to the Committee on this topic, and online at www.burnaby.ca/greenbuildings, and www.energystepcode.ca.

These objectives are proposed to be carried out with the following policy components, in support of Council's direction as articulated in the Environmental Sustainability Strategy and Community Energy and Emissions Plan, under the "Build" and "Breathe" goals.

- ✓ **Increasing energy efficiency performance over time** – This involves starting at Step 1 to allow for familiarization of builders with new practices of energy modeling and air tightness testing, and progressing to Step 3 after approximately one year, at which point specific performance standards would be required.

- ✓ **Energy modeling and air tightness testing** – As key strategies to ensure higher energy efficiency that are fundamental to the Energy Step Code, these practices would be required as components of the Step 1 approach, through engaging an energy advisor or energy modeler. An additional mid-stage air tightness test would also be required to allow for mitigation of excessive air leakage, to support improved compliance.

- ✓ **Communicate energy use** (energy labeling) – An energy label produced by the energy advisor or energy modeler would be required to be affixed to a prominent place in the home, to communicate the energy used and enable informed decision making by home buyers.

- ✓ **Investigate low-carbon energy policy options –** Taking action on climate change is important for meeting the goals and targets of the ESS and CEEP, however currently the City has limited authority to require low-carbon systems in new homes. Further work is needed in this area, as outlined in Section 5.2.

2.2 Summary of Proposed Part 9 Requirements

In support of the above objectives and components, ***Step 1 of Energy Step Code*** is proposed to be required as of 2019 September 01, applicable to all residential Part 9 Building Permit applications for new construction. Additional proposed administrative requirements include an extra mid-stage air tightness (blower door) test, building energy labeling, and a requirement to engage an energy advisor or registered professional. After approximately one year, ***Step 3 of Energy Step Code*** is proposed to be required, pending reporting back to Council based on findings and feedback of Step 1 implementation. The Energy Step Code requirements would be advanced in a proposed Building Bylaw amendment, shown in ***Section 4.1***, while administrative requirements would be communicated in technical bulletins issued by the Planning and Building Department, with documentation requirements as a condition of the issuance of required permits, as outlined in the following section.

2.3 Compliance

Compliance with the Energy Step Code involves builders engaging an energy advisor or energy modeler, who provides advice about how to meet the performance targets of the required step, models the building's performance, and conducts air tightness testing. Energy advisors are registered by Natural Resources Canada to deliver the EnerGuide Rating System and are trained to use HOT2000 software for building energy modeling. Energy modelers are registered professionals that are already required in the design of more complex multi-family buildings. Builders would be required to submit documentation at the various stages of permitting to demonstrate compliance, which include the following, also shown in ***Figure 1*** below:

1. At the design stage, the builder works with an energy advisor to ensure the building can meet the required Step.
    - *A pre-construction compliance form is submitted along with the Building Permit Application.*

2. At the mid-stage of construction, prior to installation of drywall (or equivalent), an air tightness test is undertaken, and results are reported to the City.
    - *A mid-construction compliance form is completed and submitted to the City.*
    - *The project would not be "passed" at this stage unless it is shown to be on track for compliance of the air tightness requirements.*

3. At building completion, a final airtightness test is undertaken.
    - *Results are reported in the as-built compliance form and submitted to the City.*
    - *The energy label is produced and displayed in the home.*

4. Providing that all documentation requirements demonstrate compliance, the Occupancy Permit is issued.

While Step 1 does not state specific performance targets for energy and air tightness, it requires that the house perform equal to or better than a modeled "reference house" as defined in the EnerGuide Rating system, or in accordance with Section 9.36.5 of the BC Building Code. Therefore, builders will need to pay close attention to proper installation of air barriers, and may need to incorporate additional energy efficiency measures such as improved insulation or higher performing windows[2]. In order to ensure final compliance, the City is also requiring a mid-stage airtightness test that would provide feedback at a stage of construction that permits air leaks to be more easily identified and rectified. The use of conservative air tightness assumptions, particularly for teams new to these practices, is also a recommended best practice that will be conveyed to builders.

Once higher steps (above Step 1) come into effect, specific energy performance targets will need to be met, along with increasing air tightness. Step 1 provides an opportunity for builders to practice air barrier installations and to undertake training, in anticipation of these higher steps.

3.0 STAKEHOLDER CONSULTATION

The approach as outlined in the previous report to the Environment and Social Planning Committee, dated 2019 March 12, was shared with the public and stakeholders in the home building industry in the following ways.

Information about the proposed approach was posted on the City's website at www.burnaby.ca/greenbuildings, including links to:

- a one-page summary of the proposed approach (provided in ***Appendix A***);
- an online stakeholder questionnaire;
- Council reports; and,
- resources with more information and training on Energy Step Code.

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2 Additional information about compliance can be found in the Technical Bulletins issued by the Province's Building Safety Standards Branch: https://www2.gov.bc.ca/gov/content/industry/construction-industry/building-codes-standards/forms-resources/technical-bulletins

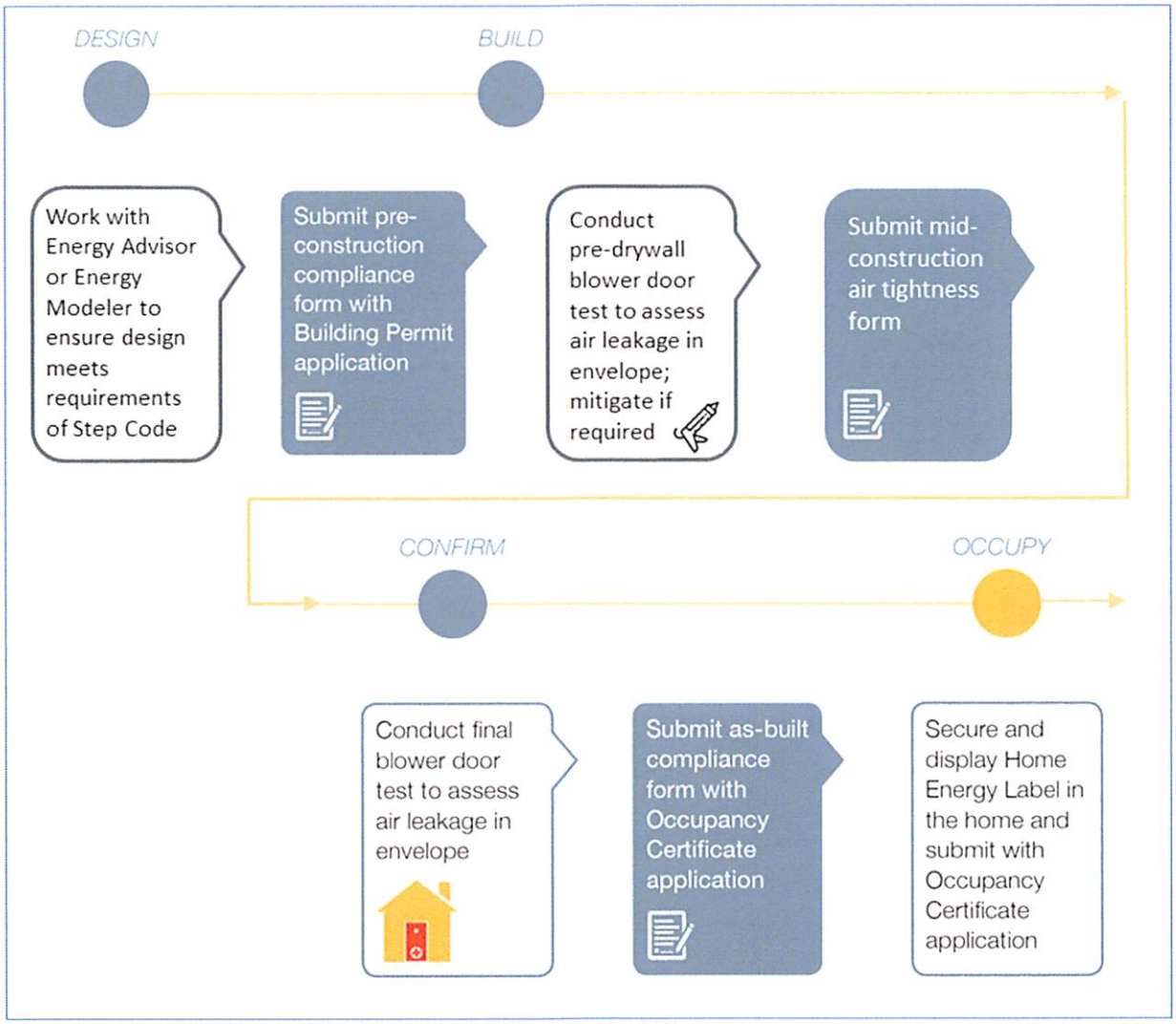

Figure 1- Application and review process for new Part 9 projects

The City's communications team issued updates on Facebook and Twitter to announce the proposed approach and invite stakeholders to provide input. The one-page summary and hard copies of the questionnaire were provided at the front counters of the Planning and Building divisions, and offered to people applying for a Building Permit or inquiring about building a Part 9 residential building.

A mail-out was sent to 153 home builders who had recently applied for a new residential Part 9 Building Permit at the City, including the one-page summary and an invitation to attend an in-person information session and to complete the online questionnaire. An email was also issued to stakeholders[3] with the above-listed information.

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3 Including: Home Builders' Association of Vancouver; Urban Development Institute; BC Hydro; FortisBC; Condominium Home Owners Association of BC; BC Ministry of Municipal Affairs and Housing; BCIT; neighbouring municipalities; and individual builders and developers who had previously inquired about Burnaby's policy.

An information session was held on 2019 May 01 at the Shadbolt Centre for the Arts, and included presentations by staff and industry professionals. Presentations outlined the proposed City requirements, provided an overview of Energy Step Code, described the process of engaging and working with an energy advisor, and included a testimonial from a builder experienced in building to higher energy efficiency standards. It was attended by 43 participants, including architects/designers, builders and tradespeople, and energy professionals.

The online questionnaire included questions about respondents' background and familiarity with Energy Step Code, and asked whether they supported each of the key components of the proposed approach. Twenty six responses to the online questionnaire were received.

Comments received at the information session and via the online questionnaire were positive and generally indicated a very high level of support for the proposed approach. No serious concerns were raised and responses in the questionnaire were favorable in response to the specific components of the proposed approach, including:

- Starting at Step 1;
- An effective date of 2019 September 01;
- Energy labeling requirement;
- Progressing to Step 3 after one year at Step 1; and,
- Investigating future policies to encourage or require low-carbon heating and cooling systems.

In summary, the consultation indicates that the building industry is informed and prepared to respond to these new requirements.

4.0 IMPLEMENTATION

4.1 Proposed Building Bylaw Amendments

The proposed requirements would come into effect as of 2019 September 01, and would apply to all new Part 9 residential Building Permit applications, for new construction only.

The City's Building Bylaw is proposed to be amended with the addition of the following **bold text**:

- In Definitions: "Energy Step Code" means the system of energy performance requirements set out in Division B, **Parts 9 and 10** of the Building Code;

- Under Section 9A. Energy Step Code, the following sub-section is added:
  (2) A building regulated by Part 9 of the Building Code and containing residential occupancies, as defined in the Building Code, shall be designed and constructed to meet the minimum performance requirements specified in Step 1 of the Energy Step Code.

4.2 Administrative Requirements

Requirements for a mid-stage air tightness test, building energy labeling, and engaging an energy advisor or registered professional, would be considered approved with Council's approval of this

report, and would be communicated to builders online and in the Planning and Building Department in the form of bulletins and related compliance documents and forms.

4.3 Next Steps

Pending Council's approval, the new requirements for Energy Step Code will be communicated to builders via the City's website, social media, and at the Planning and Building Department front counters in response to development inquiries and permit applications. Technical bulletins will also be drafted and made available to applicants as necessary to convey the required documentation and best practices to ensure compliance. Internal training and communication will be undertaken to ensure staff are familiar with the new requirements.

5.0 FUTURE POLICY

5.1 Higher Energy Efficiency Levels (Step 3 and Above)

As outlined above, Step 3 of the Energy Step Code is anticipated to be required after approximately one year. Feedback and compliance outcomes from the first year would be reported to Council, along with recommendations for the next step of energy efficiency, and possibly GHG reduction if possible, at the end of 2020.

For context, it is noted that the Province has indicated that the minimum BC Building Code requirements would target Step 3 by 2022, Step 4 by 2027 and Step 5 (net-zero-energy ready) by 2032.

5.2 Low Carbon Energy Systems

The Energy Step Code focuses on improving efficiency and reducing overall energy use, but does not directly regulate GHG emissions. Although reducing energy demand can help to save costs and resources, it may not necessarily reduce overall GHG emissions, as a high-efficiency home that uses natural gas will still emit significantly more carbon compared to a home that uses electricity for heating and cooling, regardless of the efficiency step achieved. A variety of low-carbon systems are available on the market today, and many can also provide cooling, which is likely to be increasing in demand with climate change.

Since new buildings can last many decades, building them to be low-carbon from the outset can avoid significant cumulative emissions and avoid the need for costly and disruptive retrofits. Such retrofits would likely be needed to achieve net zero emissions by 2050, a goal aligned with the IPCC Special Report on limiting global warming to 1.5 degrees[4]. For these reasons, the City of Port Moody is leading a local government initiative via a draft UBCM resolution this fall, asking the Province to include greenhouse gas limits in the building code and to set a goal for new buildings to be net zero emissions, as well as net zero energy ready, by 2032[5]. Burnaby staff have provided input to this initiative, as it supports the City's green building policy approach.

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4 In response, a number of cities worldwide are implementing goals to transition to 100% renewable energy by 2050 or before, and some also have policies for net zero carbon new buildings by 2030.
5 http://www.portmoody.ca/modules/showdocument.aspx?documentid=18847

Therefore, concurrent with implementation of Energy Step Code, it is proposed that Burnaby continue to investigate opportunities to require or encourage low carbon energy systems in the future, and to advance resulting recommendations for Council's consideration.

5.3 Retrofits of Existing Buildings

Existing buildings represent a significant amount of energy use, cost and GHG emissions in the community[6]. Following implementation of the requirements outlined in this report for new Part 9 residential buildings, approaches to encourage improved energy and carbon performance in existing buildings would be investigated, as provided for in Burnaby's ESS and CEEP. Approaches implemented in other jurisdictions that could be considered may include energy performance requirements for major renovations, low-carbon alternatives for furnace and boiler replacements, financing programs to assist homeowners in making energy improvements, providing additional incentives, and would include measures to ensure equitable implementation in low income housing. Specific recommendations resulting from this review would be advanced for Council's consideration at a future date.

5.4 Other Green Building Objectives

In addition to reducing GHG emissions from heating and cooling buildings, in order to achieve zero carbon buildings it will also be necessary to reduce the carbon "embodied" in building materials. This is a higher priority in Part 3 (larger) buildings, since they typically contain a large amount of carbon-intensive concrete, whereas Part 9 residential buildings are usually framed with wood which, if sustainably produced, can be carbon-negative. Further work is needed to quantify embodied emissions in various building types and to develop appropriate targets and measures to reduce these emissions.

Additional opportunities to improve the environmental performance of new and existing buildings, as defined in Burnaby's ESS, include water conservation and re-use, managing rainwater on site, encouraging the use of recycled and non-toxic materials, and diverting construction and demolition waste. Policy approaches to address the above opportunities will be further explored as resources permit, and advanced for future Council consideration.

6.0 CONCLUSION

This report outlines the proposed requirements for implementation of Energy Step Code for Part 9 residential buildings as the first phase of green building policy for this building sector. The proposed approach entails starting at Step 1 of the ESC, and progressing to Step 3 after approximately one year. Additional measures to enable compliance and informed decision making by home buyers include an extra air tightness test, building energy labeling, and engaging an energy advisor or registered professional. These requirements are aligned with the City's city-wide and corporate policies for sustainability, and are anticipated to have benefits including preparing the industry for upcoming Building Code changes, and energy cost savings for home owners and tenants. Future

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6 Burnaby's GHG inventory completed for the CEEP estimated that ground oriented residential buildings accounted for 38% of the city's building emissions in 2010 (all building types together accounted for 45% of the community's total emissions, transportation for 50% and solid waste for 5%).

policy approaches are proposed to address opportunities for achieving more significant GHG emissions reduction, and additional green building outcomes.

E.W. Kozak, Director
PLANNING AND BUILDING

LT/sa
Attachment

cc: City Manager
Director Engineering
Director Corporate Services
Chief Building Inspector
City Solicitor
City Clerk

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Appendix A – One-Page Summary of Proposed Approach, Shared with Stakeholders

Part 9 Green Building Requirements for BC Energy Step Code

Information Bulletin for Builders of New Part 9 Residential Buildings

- 3 storeys or less and a building area less than 600m^2; e.g. single and two-family dwellings, rowhouses, townhouses and small apartments)

Council Direction

- In February 2018 Council approved the process for development of green building requirements for both Part 3 and Part 9 buildings.
- In November 2018 Council approved requirements for new Part 3 buildings.
- In April 2019 Council approved stakeholder consultation on the proposed approach for Part 9 residential buildings.

What is the BC Energy Step Code?

The BC Energy Step Code is a provincial standard that establishes progressive performance steps in energy efficiency for new buildings, to make all new buildings net zero energy ready by 2032.

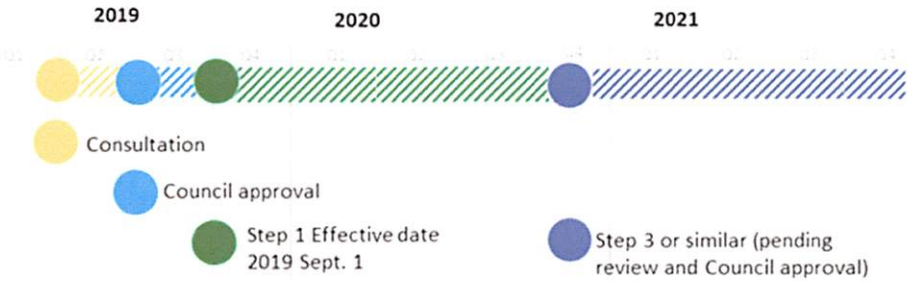
Learn more: www.energystepcode.ca

What is proposed?

The following requirements are proposed initially, targeting an effective date of **2019 September 1**.

- **Step 1** of Energy Step Code would be required initially, to familiarize builders with practices.
- An **Energy Advisor** would need to be engaged early in the design process, to **model** the building's anticipated **energy performance**.
- **Air tightness testing** would be required, both prior to installation of drywall, and after completion.
- The home's energy performance would need to be reported on a **home energy label**, and affixed to the home's electrical panel.
- After a familiarization period of **approximately one year**, the City will likely look to require **Step 3** of the Energy Step Code or another similar standard.

Proposed Part 9 Energy Step Code Timeline



Provide Your Comments and Learn More

Complete our online questionnaire by May 24th 2019: www.burnaby.ca/part9

For more information about Burnaby's requirements, visit www.burnaby.ca/greenbuildings or email ecoplanning@burnaby.ca

For information and resources on the BC Energy Step Code, including the implementation guide, costing study, training, incentives and FAQs, visit energystepcode.ca.