

TO: CHAIR AND MEMBERS
ENVIRONMENT AND SOCIAL PLANNING
COMMITTEE

DATE: 2019 March 12

FROM: DIRECTOR PLANNING AND BUILDING

FILE: 76500 20
Reference: Green Building Policy

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

PURPOSE: To seek Council's approval for a proposed approach for green building requirements in new Part 9 residential buildings, as a basis for stakeholder consultation.

RECOMMENDATION:

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

REPORT**1.0 INTRODUCTION**

On 2018 November 19, Council approved green building requirements for new large (Part 3) buildings. As outlined in the Sustainable City Advisory Committee (SCAC) report dated 2018 November 7, requirements for smaller (Part 9) residential buildings would subsequently be developed and advanced for Council's consideration in 2019. Accordingly, the purpose of this report is to seek Council's approval to initiate stakeholder consultation on a proposed approach for green building requirements in new Part 9 residential buildings. Pending feedback from stakeholders, a subsequent report would be advanced with the new requirements and implementation details, for Council's consideration.

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 600m².

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 –
Encourages 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 2032¹.

2.0 OBJECTIVES

The proposed approach for Part 9 homes would address the following objectives.

2.1 Encourage best practices for healthy, durable, efficient homes

The proposed approach is founded on simple practices that can improve energy efficiency, such as improved air and moisture barriers, and that can also help to address problems such as moisture ingress or build-up in the building envelope. Reducing moisture also helps to avoid

¹ Additional background about the BC Energy Step Code is included in previous reports to the SCAC on this topic, including the report titled “[Green Building Requirements for New Part 3 Buildings](#)” dated 2018 November 07, and the report titled “[Development of Green Building Policy for Burnaby](#)” dated 2018 February 06.

mold problems and improves the longevity of the structure, while the installation of efficient systems such as heat recovery ventilation can ensure the delivery of fresh air in a consistent manner throughout a home. All of these practices are well proven, simple, and do not require adoption of complex approaches or technologies.

2.2 Reduce energy costs to residents

Many new homes do not currently perform efficiently, and the costs of heating and cooling can be significant, disproportionately affecting lower income households. Addressing energy efficiency during design, and applying best practices during construction, can greatly improve performance and reduce costs. Even today, leading builders can build homes that use up to 90% less energy for heating compared to a standard design. While this level of performance would not be mandatory in Burnaby at the outset since not all builders have the necessary expertise, it illustrates what could eventually become the norm. The approach proposed for Burnaby would aim to introduce new standards for energy efficiency that would gradually increase over time, in order to reduce energy costs while ensuring that industry can respond.

2.3 Manage costs of development

Concurrent with improving energy efficiency, it is also important to balance the costs of designing and building a home. For this reason, the proposed approach would phase in higher standards of efficiency over time, and is based on a comprehensive study² as well as “real-world” case studies³ that indicate that building up to Step 3 for Part 9 buildings is currently achievable at a modest additional cost. Costs of building are influenced by a variety of market factors, and technical requirements of the Building Code, which also change over time to address a range of emerging issues. Higher performing homes can also be positioned for a market advantage to savvy buyers who factor the costs of ownership. The objective of the proposed approach would be to manage costs at a level that would be unlikely to affect the price of a home.

2.4 Support industry learning and transformation

The proposed approach entails shifting from a “prescriptive” approach (for example, referencing specific types/standards of insulation, wall assemblies and windows), to a “performance” based approach that involves modeling a building’s energy use to achieve a given target. This will require builders to work with an energy professional to model the building’s performance, and to conduct a blower door test for air tightness. While the techniques are quite straightforward, they do represent a significant change in practice. Therefore, the proposed approach would include starting at a level (Step 1) that allows builders to become familiar with the necessary practices, but without immediate penalty for failing to meet a performance standard. An extra test for air tightness mid-way through the construction process would be required in order to provide

² Energy Step Code, 2018 Metrics Research, Full Report Update. Available at: www.energystepcode.ca

³ Energy Step Code, Case Studies: <https://energystepcode.ca/case-studies/>

feedback to the builder, and to the City, about opportunities to improve the final performance of the building.

A number of agencies have been delivering education, outreach and training for the building industry on the ESC since it was introduced in 2017, including hands-on workshops at the High Performance Building Lab at BCIT in Burnaby, and the City has publicly stated its intention to adopt ESC requirements for Part 9 buildings since early 2018. Through consultation in the coming months, builders will be informed of additional ongoing training opportunities in order to be well prepared in advance of meeting the proposed new requirements.

2.5 Enable informed decision making by homeowners

With energy efficiency factors largely invisible to the average home buyer, and lacking any means to communicate a building's expected energy performance, home-buyers have no way to predict the cost of future energy bills. To allow them to make more informed decisions, the proposed approach would include a requirement to affix a home energy label to a prominent location in the new home. The label would convey information about a building's energy efficiency, and is similar in concept to a nutrition label on food, or fuel economy information for a new car. The *EnerGuide for Homes* system is tied to the energy model most commonly used for ESC compliance and can be used to produce a home energy label⁴.

2.6 Take action on climate change

Buildings account for 45% of Burnaby's community greenhouse gas (GHG) emissions. As emphasized in the Intergovernmental Panel on Climate Change (IPCC) Special Report issued in October 2018, in order to limit global warming to manageable levels at 1.5°C, there is a need for rapid de-carbonization of energy across all sectors, and net-zero emissions by mid-century. This means that new buildings will need to be fossil fuel free and near net-zero energy by 2030 or sooner, and that retrofitting existing buildings for low-carbon energy will also be necessary.

The BC Energy Step Code does not specifically address carbon, and while higher levels of energy efficiency have a number of benefits, they do not guarantee reduced emissions. For this reason, Burnaby's approved green building policy for Part 3 buildings includes provisions to encourage low carbon energy systems, for buildings that are subject to rezoning. For Part 9 buildings, since rezoning is typically not required, staff would undertake further review to explore regulatory and policy options for reducing GHGs in this sector that may be implemented in the longer term.

Improving resilience to climate change impacts is also important. Of relevance to building design is the increased demand for cooling to maintain comfort and health; this is already being observed in the market, and the need for cooling will likely increase along with anticipated hotter summers. Policies to encourage or require cooling systems that are efficient and low-carbon, in

⁴ See more information at: <https://efficiencybc.ca/wp-content/uploads/2018/05/Guide-to-the-Label.pdf>

particular for multi-family buildings that do not allow as much flexibility to retrofit, may also be explored as a part of Burnaby's approach in future.

3.0 PROPOSED APPROACH


Burnaby's ESS and CEEP include the long-term goal of "Buildings and infrastructure that have a positive impact on the environment", along with supporting strategies and actions that define achievable steps toward this goal. The preliminary proposed green building policy for Part 9 buildings consists of four key components, aligned with the objectives outlined above, that are supported by the applicable strategies and actions of the "Build" goal of the ESS and CEEP, as outlined below.

- ✓ **Increasing energy efficiency performance over time**
- ✓ **Energy modeling and air tightness testing**
- ✓ **Communicate energy use** (energy labeling)
- ✓ **Investigate low-carbon energy policy options**

Each of these components is described below.

3.1 Increasing energy efficiency performance over time

✓ **Increasing energy efficiency performance over time**

 **Build** - Green Buildings and Energy


ESS 6.2, CEEP C3.2 – New Big Move: Improve building design and construction to meet higher levels of environmental performance


CEEP suggested action and associated Quick Start:

b) *Consider policy approaches to encourage higher levels of energy efficiency than required in the BC Building Code, and reduced GHG emissions, in new smaller (Part 9 BCBC) buildings, including: alignment with provincial Building Act and Step Code; integration with existing City development application policy; incentives such as grants for innovative projects.*

Quick Start #15 – Develop policy recommendations for encouraging higher performing buildings through the City's development application process, based upon provincial Step Code or other appropriate performance-based criteria.

Supported by the ESS & CEEP

 Burnaby Environmental Sustainability Strategy

 Community Energy and Emissions Plan

The initial requirement for all Part 9 buildings would be to meet Step 1 of the ESC, requiring energy modeling and air tightness testing, but not mandating a specific level of performance. This interim step is recommended in order to allow for familiarization by builders with these new practices, and to improve future compliance levels. At higher steps, specific air tightness and energy performance would be required. Research and case studies show that Step 3 can be successfully implemented at no to small additional cost, with good attention to detail and a thoughtful design. Higher steps will also become more cost effective over time. Therefore, after

To: Environment and Social Planning Committee
From: Director Planning and Building
Re: Proposed Approach for Green Building
Requirements in New Part 9 Residential Buildings
2019 March 12 Page 6

an introductory period of about one year, consideration would be given to Step 3 or higher. The specific timeline for introduction of the higher step(s) would be confirmed based on review and consideration of other factors such as whether a low-carbon energy option is feasible.

3.2 Energy modeling and air tightness testing

✓ **Energy modeling and air tightness testing**

 **Build** - Green Buildings and Energy

ESS 6.1, CEEP C3.1 – Big Move in Progress: Meet updated energy performance building code requirements for new buildings

ESS suggested action and associated Quick Start:

b) *Explore working with designers, builders, energy professionals, industry and the province to identify opportunities to optimize building code compliance.*

Quick Start #14 – Review issues and possible opportunities to improve compliance, such as with requirements for review of development proposals by an energy professional.

Supported by the ESS & CEEP

 Burnaby Environmental Sustainability Strategy

 Community Energy and Emissions Plan


Energy modeling and air tightness testing are foundational components of the proposed approach. Builders would engage the services of an energy professional, either a licensed Energy Advisor or a registered professional depending on the building type. The energy professional would work with the builder to model the expected energy performance using a software tool (most commonly Hot2000, provided free of charge by Natural Resources Canada). The energy professional would also undertake both a mid-stage test of air tightness, and a final test to confirm energy performance. Testing involves placing a specialized fan assembly in an external doorway, blowing air into or out of a house, and measuring the rate at which the air is replaced. The mid-stage test would be done before drywall is applied, allowing for more easily fixing excessive leaks. Air tightness testing would cost approximately \$600 to \$800 for a single family home and up to about \$3000 for a small apartment⁵. The results of the modeled energy efficiency, informed by the final air tightness test, would be used to complete an energy label, as described below.

⁵ Energy Step Code 2018 Metrics Research, Full Report Update. Prepared for BC Housing and the Energy Step Code Council. Page 25. Available at www.energystepcode.ca

To: Environment and Social Planning Committee
From: Director Planning and Building
Re: Proposed Approach for Green Building
Requirements in New Part 9 Residential Buildings
2019 March 12 Page 7

3.3 Communicate energy use (energy labeling)

✓ **Communicate energy use (energy labeling)**


 **Build** - Green Buildings and Energy


CEEP C3.3: Develop policies and programs to measure and communicate how much energy a building uses, for example using energy audits and EnerGuide labels (...)

CEEP suggested action:

a) Explore requiring energy audits and reporting, for example EnerGuide labels, as part of the permitting process for new houses and smaller buildings (Part 9 BCBC).

Supported by the ESS & CEEP


 Burnaby Environmental Sustainability Strategy

 Community Energy and Emissions Plan

As noted above, communicating a building's energy performance to prospective buyers supports informed decision making, and may also encourage better performing homes before higher targets are mandated. The energy professional would use the final modeled energy use and air tightness testing to complete and submit a compliance form to the City, and also use this information to produce an energy label that would be affixed to the home's electrical panel. The energy label would report the energy used by a home, broken down by fuel type and in comparison with a similar typical home. It is considered a communication tool, and not a certificate of compliance with the BCBC or City Bylaws. Since this information is already being collected, there would be no additional cost associated. This requirement is proposed to take effect alongside Step 1 implementation, as a City administrative requirement.


3.4 Investigate low carbon energy policy options

✓ **Investigate low carbon policy options for future implementation**

 **Build** - Green Buildings and Energy

CEEP C3.5: Encourage using renewable energy in buildings (...)
CEEP suggested action:

- Consider developing policies and incentives, and supporting research, to encourage renewable energy.
- Encourage and support leading practices in buildings, like Living Building Challenge, Passive House and net zero energy.


 **Breathe** - Climate and Air Quality


ESS 3.1: Reduce community GHG emission rates, including in the areas of transportation, buildings, district energy and waste.

ESS 3.2: Improve resilience to climate change effects (...)

ESS 3.4: Reduce dependence on fossil fuels such as oil and gas.

Supported by the ESS & CEEP

 Burnaby Environmental Sustainability Strategy

 Community Energy and Emissions Plan

As discussed above, reducing GHG emissions from buildings is a priority in order to take action on climate change and to meet the City's adopted targets in the CEEP. For Part 3 buildings, the City's policy sets an option for meeting a lower Step if the project utilizes a low carbon energy system meeting a defined GHG intensity (GHGI) limit. For Part 9 buildings, further review would be required to explore the potential suitability of an analogous 'tiered' approach, and/or other policies⁶ to achieve GHG reduction. Clarification and/or regulatory changes from the Province may be required to support such policies, therefore it may not be possible to advance such measures immediately. Nevertheless, consultation on the proposed approach for Part 9 offers an opportunity to gauge stakeholder support for this proposed area of action, which may inform future policy.

4.0 CONSULTATION AND TIMELINE

Consultation on the proposed approach would consist of issuing a bulletin to stakeholders, providing a period for questions and comments, and including an opportunity for in-person dialogue.

Stakeholders to be engaged through the process include (but are not limited to):

- Individual home builders active in Burnaby

⁶ For example, the City of Vancouver* has a carbon "cap" on homes larger than 3500 square feet, in addition to prescriptive requirements for energy efficiency. <https://council.vancouver.ca/20170207/documents/rr3.pdf>

*It is noted that Vancouver has more flexibility for such requirements due to having its own building code.

To: Environment and Social Planning Committee
 From: Director Planning and Building
 Re: Proposed Approach for Green Building
 Requirements in New Part 9 Residential Buildings
 2019 March 12 Page 9

- 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 proposed approach, including links to supporting resources and information, and would be invited to provide comments via email and/or an online questionnaire. An 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.

4.1 Timeline and Next Steps

Pending Council’s approval of this report, consultation would take place in April and May, 2019. 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 the Environment and Social Planning Committee, targeting June 2019, in which case the new requirements would likely take effect 2019 September 01. Pending review over approximately a one year timeframe, recommendations for further requirements would be advanced for Council’s further consideration. This timeline proposed is summarized in **Table 1** below, noting the dates are “target” and subject to change depending on Council direction and staff resources.

Table 1. Proposed timeline for advancement of proposed Part 9 green building requirements

Phase	Action/Step	Target Date
Consultation	1. Committee Report – stakeholder consultation	2019 Mar. 28 (ESPC meeting) 2019 Apr. 8 (Council meeting)
	2. Issue stakeholder bulletin, post info on website	April, 2019
	3. Comment period	April – May 2019
	4. Information session	Early May 2019
	5. Stakeholder follow-up, as required	May 2019
Approval and Implementation	6. Committee Report – proposed requirements	2019 June 4 (ESPC meeting) 2019 June 10 (Council meeting)
	7. Develop implementation and communication	June – Sept. 2019

To: Environment and Social Planning Committee
From: Director Planning and Building
Re: Proposed Approach for Green Building
Requirements in New Part 9 Residential Buildings
2019 March 12 Page 9

further consideration. This timeline proposed is summarized in **Table 1** below, noting the dates are “target” and subject to change depending on Council direction and staff resources.

Table 1. Proposed timeline for advancement of proposed Part 9 green building requirements

Phase	Action/Step	Target Date
Consultation	1. Committee Report – stakeholder consultation	2019 Mar. 28 (ESPC meeting) 2019 Apr. 8 (Council meeting)
	2. Issue stakeholder bulletin, post info on website	April, 2019
	3. Comment period	April – May 2019
	4. Information session	Early May 2019
	5. Stakeholder follow-up, as required	May 2019
Approval and Implementation	6. Committee Report – proposed requirements	2019 June 4 (ESPC meeting) 2019 June 10 (Council meeting)
	7. Develop implementation and communication resources	June – Sept. 2019
	8. Effective date – Step 1 and admin requirements (mid-stage airtightness testing; labeling)	2019 Sept. 1
Future Steps	9. Committee Report: progress report and recommendations	September 2020 (or later)
	10. Potential earliest effective date of updated requirements (higher steps and/or low-carbon policy), pending outcomes of policy review	December 2020 (or later)

5.0 CONCLUSION

Improving the energy efficiency of buildings has many potential benefits, including improving health and comfort, reducing energy costs, and taking action on climate change, and is well supported by approved City policies. Following on Council’s approval of requirements for larger (Part 3 buildings) in late 2018, this report outlines a proposed approach for green building requirements for smaller (Part 9) residential buildings, including single and two-family homes, and multi-family buildings less than three storeys and 600 m² in footprint. This approach would be shared with stakeholders in the coming months, prior to advancing proposed requirements for Council’s consideration, targeting June 2019.


Lou Pelletier, Director
PLANNING AND BUILDING

LT/sla/sa

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