City of Richmond

Report to Committee

To:	General Purposes Committee	**Date:**	October 26, 2020
From:	James Cooper, Director, Building Approvals Peter Russell, Director, Sustainability and District Energy	**File:**	10-6125-07-02/2020-Vol 01
Re:	**Energy Step Code Requirements for Part 9 Residential and Part 3 Hotel Buildings**		

Staff Recommendation

1. That Building Regulation Bylaw No. 7230, Amendment Bylaw No. 10205, which updates existing Step Code requirements for Part 9 residential buildings and introduces Step Code requirements for Group C occupancy hotels, from the Director, Building Approvals, and the Director, Sustainability and District Energy, be introduced and given first reading; and

2. That for Part 3 Hotels and Motel buildings, and for Part 9 buildings currently required to build to Step 1 and requiring a Development Permit (e.g. duplexes), notwithstanding the adoption of Building Regulation Bylaw No. 7230, Amendment Bylaw No. 10205:

   (a) If a Development Permit has been issued prior to December 15, 2020, the owner may, while their Development Permit remains valid, apply for a Building Permit in compliance with energy efficiency requirements applicable prior to the adoption of Bylaw 10205; or

   (b) If an acceptable Development Permit application has been submitted to the City prior to adoption of Bylaw 10205, is considered and endorsed by the Development Permit Panel prior to December 15, 2021, and has a complete Building Permit application acceptable to the City submitted prior to December 15, 2021, the owner may apply for a Building Permit in compliance with energy efficiency requirements applicable prior to adoption of Bylaw 10205.

James Cooper, Architect AIBC
Director, Building Approvals
(604-247-4606)

Peter Russell, MCIP RPP
Director, Sustainability and District Energy
(604-276-4130)

Att. 7

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Law Development Applications Policy Planning	☑ ☑ ☑	
SENIOR STAFF REPORT REVIEW	**INITIALS:** CJ	**APPROVED BY CAO**

6506519

Staff Report

Origin

In July 2018, Council adopted energy efficiency requirements of the BC Energy Step Code for new Part 9 residential buildings, and for Part 3 multi-unit residential, office and commercial buildings. At the same meeting, Council also approved amendments to the Official Community Plan (OCP) to include a schedule detailing new future Building Regulation Bylaw amendments in early 2020, 2022 and 2025 respectively, subject to future Council approvals to support the City's greenhouse gas (GHG) reduction targets.

This report includes a proposed amendment to City of Richmond's Building Regulation Bylaw 7230 that references higher Step Code requirements for new Part 9 residential buildings (single-detached, duplex and townhouse homes), and adds Step Code requirements for the additional "Group C occupancy" of Hotel and Motel uses. The Bylaw amendments introduce a 'two-option' Step Code format, where homebuilders and developers have the choice of meeting the prescribed Step Code performance requirement or a one-Step relaxation for installing (or connecting to) a low-carbon building energy system (LCES).

This report supports Council's Strategic Plan 2018-2022 Strategy #2 A Sustainable and Environmentally Conscious City:

> *2.1 Continued leadership in addressing climate change and promoting circular economic principles.*

The implementation of Part 9 building requirements were originally scheduled to be considered earlier in 2020 but were delayed in consideration of the current COVID-19 pandemic. Staff undertook extensive online consultation with local homebuilders and developers from May to July 2020, engaging over 250 participants in total, which signaled industry support for the proposed Bylaw amendments. The report discusses financial considerations for developers; given the broadening of choices for builders and the minimal financial impact, staff believe the introduction of the bylaw changes are appropriate at this time.

Analysis

The Province's 2018 CleanBC Plan signaled that a "net zero energy-ready" level of energy efficiency will be required of all new buildings in the 2032 BC Building Code, specifically:

> *Compared to the current base BC Building Code, new homes will be:*
>
> - *20 per cent more energy efficient by 2022,*
> - *40 per cent more energy efficient by 2027, and*
> - *80 per cent more energy efficient by 2032, the net-zero energy ready standard.*

The above increases in minimum BC Building Code requirements are equivalent to Steps 3, 4 and 5 respectively for new Part 9 residential buildings, and Steps 2, 3 and 4 respectively for new Part 3 "Group C occupancies" (i.e., multi-unit residential buildings, including hotels and motels).

City of Richmond Energy Step Code Requirements and Timing

The current OCP schedule (Table 1) of forecasted increases in Energy Step Code requirements indicates that new buildings in Richmond will be required to build to the highest level of the Step Code beginning in 2025, seven years in advance of Provincial requirements. The City's aggressive schedule was justified because the City already had 'above code' rezoning requirements and had invested heavily in capacity building with local builders, including providing subsidized air tightness training and testing. Given the sea-change in building design and construction now underway, catalyzed by the BC Energy Step Code, ongoing support for builders will be key to the City's continued success in reducing GHGs on this timeline. Further acceleration of the schedule set out in the OCP is expected to create non-compliances with energy performance requirements resulting in delayed approvals and expensive remedial actions.

Table 1 – Schedule Showing Current OCP, Proposed and Future Step Code Requirements

	Adopted Bylaw	**Proposed Bylaw Amendment**	**Subject to future Council approval**	
Time of Building Permit Application	***Sept. 2018***	***Dec. 2020***	***Jan. 2022***	***Jan. 2025***
Part 9 Residential				
Townhomes & Apartments	Step 3	**Step 3** OR **Step 2 + LCES** [(a)]	**Step 4** OR **Step 3 + LCES** [(b)]	**Step 5** OR **Step 4 + LCES** [(b)]
Single Family, Duplex & Other Residential	Step 1	**Step 3** OR **Step 2 + LCES** [(a)]	**Step 4** OR **Step 3 + LCES** [(b)]	**Step 5** OR **Step 4 + LCES** [(b)]
Part 3 Development				
Office & Retail Buildings	Step 2	Same as 2018	Step 3 [(c)]	Step 3 [(c)]
Residential Wood frame Low/Mid-Rise	Step 3	Same as 2018	Step 4 [(c)]	Step 4 [(c)]
Residential Concrete Towers	Step 3 OR Step 2 + LCES	Same as 2018	Step 3 [(c)]	Step 4 [(c)]
Hotels & Motels	n.a.	**Step 3** OR **Step 2 + LCES**	**Same as 2020** [(c)]	***Step 4*** OR ***Step 3 + LCES*** [(c)]

(a) *– Greenhouse Gas Intensity no more than 6 kg CO_2e / m^2/ year [or] ≤ 1.2 tCO_2e / year*

(b) *– Greenhouse Gas Intensity no more than 3 kg CO_2e / m^2/ year [or] ≤ 0.6 tCO_2e / year*

(c) *– LCES targets for 2022-2025 Part 3 residential and commercial to be developed in 2021*

Attachment 1 includes further detail on Provincial Code direction and Council-endorsed climate action targets.

Incenting GHG Emission Reductions Using a Low Carbon Energy System Policy

The BC Energy Step Code has been highly effective as a performance-based framework that reduces the total amount of thermal and mechanical energy used in a new building. The Step

Code does not however directly limit carbon emissions via a specific metric, since it is 'fuel agnostic' as to the source of energy used in a building.[1]

The City of Richmond has pioneered a novel method of incenting low carbon mechanical systems in new buildings using the Step Code. This approach provides homebuilders and developers with two options to satisfy minimum energy performance requirements in Richmond's Building Regulation Bylaw. As proposed, this 'two-option' or 'Step down' framework would provide applicants with the following choices:

(a) Meet the current minimum Energy Step Code performance level as set in Building Regulation Bylaw No. 7230 for that building type (e.g., Step Code level 3); or,

(b) Meet a one Step lower performance level (e.g., Step Code level 2) with installation of, or connection to, a low carbon energy system, in accordance with the requirements in Building Regulation Bylaw No. 7230.

The trade off between a higher investment in the building envelope to meet the Step Code requirement, versus meeting a one Step lower requirement, provides an incentive to install a low carbon energy system that provides energy efficient heating and cooling services powered by low-carbon BC grid electricity and/or renewable natural gas.

Engaging the Construction Industry on Proposed Bylaw Amendments

City staff organized and facilitated extensive online engagement of local homebuilders and developers from May to July 2020, using a series of 'virtual Builder Breakfasts' for Part 9 residential buildings, as well as two developer webinars for Part 3 hotels and motels. The City's online engagement was amongst the most extensive to date, with over 250 participants in total (homebuilders, developers, contractors, Energy Advisors and building officials) from six online webinar and workshop sessions. See Attachment 2 for details on the City's engagement process and feedback results.

Proposed Bylaw Amendments for Part 9 Residential Buildings

At present, new detached and duplex houses in Richmond must meet Step 1 of the Energy Step Code. Current bylaw requirements for townhouses requires that they meet Step 3, in terms of energy performance. These requirements entered into force on September 1, 2018. However, projects with 'in stream' Development Permits were allowed to build to the previous requirements, as long as an acceptable Building Permit application was submitted to the City prior to the end of 2019. Step Code requirements have been applied to new townhouse developments submitting Building Permit applications since January 1, 2020.

To date, Richmond homebuilders have successfully transitioned to the Energy Step Code, easily meeting airtightness and building envelope performance metrics (see Attachment 3), in part because of subsidized training and airtightness testing provided by the City.

Proposed Bylaw Amendment

The proposed Building Regulation Amendment would align Energy Step Code requirements for all Part 9 residential buildings. With Council approval, these requirements would enter into

[1] New buildings built to the top level of the Step Code (effectively near the Passive House standard), have ultra low thermal energy demand and tend to use all-electric heating systems.

force on December 15, 2020. In order to maximize GHG reductions, while providing local homebuilders with two options for energy performance, a one-Step relaxation would be available to applicants installing a low carbon energy system, as shown in Table 1.

For Part 9 buildings, staff propose that the definiton of an LCES be tied to achieving an absolute carbon performance level to qualify for a one-Step relaxation. For 2020, a 6 kg / m^2 carbon target allows industry an easier transition toward lower carbon mechanical equipment in new homes, relative to a more stringent 3 kg / m^2 requirement that staff is considering recommending for 2022, subject to future Council approval. At 6 kg / m^2, builders still can install a mix of energy efficient gas and electric heating systems, while growing the market for electric heat pump systems. The 2020 requirements also include a 1.2 tonne limit, ensuring that smaller homes (under 200 m^2 in floor area) are not penalized relative to larger homes, given the higher energy use of smaller homes on a per square metre basis. See Attachment 4 for staff's presentation to local builders on proposed requirements, including live polling results on timing options for the Step Code framework, and preferred LCES carbon intensity metric.

Based on the performance of local homebuilders in implementing beyond-Code energy performance to date, staff are confident that builders will be able to successfully construct to the proposed schedule of Energy Step Code requirements, set out to 2025.

Regarding financial considerations, staff relied on the Province's 2018 costing study assessing the additional capital cost of building to Energy Step Code requirements relative to minimum prescriptive code requirements. The study reported that the lowest identified incremental costs of building a smaller detached house of 237m^2 (2,551 ft^2) to Steps 2 and 3 were just 0.2% and 0.7% respectively above that for a minimum code compliant building, while the lowest identified incremental capital costs for building a 511m^2 (5,500 ft^2) house to Steps 2 and 3 were 1.0% and 1.1% respectively.

Because townhouses are already required to achieve Step 3, the addition of the new Step 2 + LCES option may reduce total capital costs for these projects. The Province's 2018 costing study indicated that for a townhouse building comprised of six units of 1,720 ft^2 each, the lowest identified capital cost for building to Step 2 was 0.2% lower than building to Step 3. Townhouse builders would want to assess the further cost of implementing a low carbon energy system in a Step 2 building when deciding which compliance option to select.

Proposed Bylaw Amendments for Part 3 Hotels and Motels

There are no Step Code performance requirements for new hotels and motels in Richmond at present. When Council adopted the Energy Step Code into local regulation in July 2018, the Province of BC had not yet created Step Code requirements for new hotels and motels, which were later added to the BC Building Code. New hotels currently have to meet current prescriptive energy requirements within the BC Building Code of either ASHRAE 90.1 (2016) or the National Energy Code for Buildings (2015). Within the City Centre Area, new hotel projects would need to consider LEED™ Silver sustainability measures at the time of rezoning.

Proposed Bylaw Amendment

The proposed Building Regulation Amendment introduces Energy Step Code requirements for new Part 3 Hotels and Motels, with Energy Step Code requirements coming into force on December 15, 2020. In order to maximize GHG reductions, a one-Step relaxation in Step Code

requirements will be available to applicants installing an LCES, or connecting to the City's district energy system (Table 1), similar to options available for concrete frame multi-unit residential buildings. See Attachment 5 for City staff presentation on proposed requirements.

Regarding financial considerations, the Province's 2018 costing study found that the most cost-effective approach for building a 9,520 m^2 ten-story hotel to Step 3 would increase overall capital costs by only \$1/m^2, or less than 0.1% relative to minimum prescriptive code requirements. The study also calculated that the 33% improvement in energy efficiency would result in a simple cost payback within half a year of building occupancy. The lowest assessed incremental cost of building this hotel to a Step 2 performance level actually reduced total capital expenditures by 0.2% (\$57 per m^2) below that of building to minimum code requirements.

In-stream provisions for new buildings subject to a development permit are detailed in Attachment 6. These accommodate the request from the Urban Development Institute (UDI) to extend the in-stream allowance beyond six months (Attachment 7).

Next Steps

During the first half of 2021, City staff will undertake technical analysis, and engage Richmond's builders / developers on proposed Step Code bylaw amendments for January 2022.

Financial Impact

None.

Conclusion

Implementing new BC Energy Step Code requirements for Part 9 Residential buildings and for Part 3 Hotels and Motels advances the City's policy objectives for energy efficiency and greenhouse gas emission reduction in new construction. The incremental increases in Part 9 Step Code requirements for 2020 have been anticipated by builders since the introduction of the Step Code in 2018. Extending Step Code requirements to Hotels and Motels brings consistency in applying the Step Code to Part 3 buildings. The recommended two-option framework for Step Code requirements offers builders increased choice and encourages use of low carbon energy through in-building low carbon systems, or connection to district energy.

Norm Connolly, MCIP RPP
Sustainability Manager
(604-247-4676)

Nicholas Heap
Sustainability Project Manager
(604-783-8050)

Att. 1: Provincial Direction on Step Code and Richmond's Climate Action Targets
2: 2020 Online Builder and Developer Engagement on the Energy Step Code
3: City of Richmond Progress on Step Code Adoption for Part 9 Residential Buildings
4: City of Richmond staff presentation at online Builder Breakfast workshop, May 20, 2020
5: City of Richmond staff presentation at online Hotel Developer workshop, June 24, 2020
6: Provision for In-Stream Development Permits
7: Letter from Urban Development Institute – Propose Energy Step Code Implementation for New Hotel Developments

Provincial Direction on Step Code and Richmond's Climate Action Targets

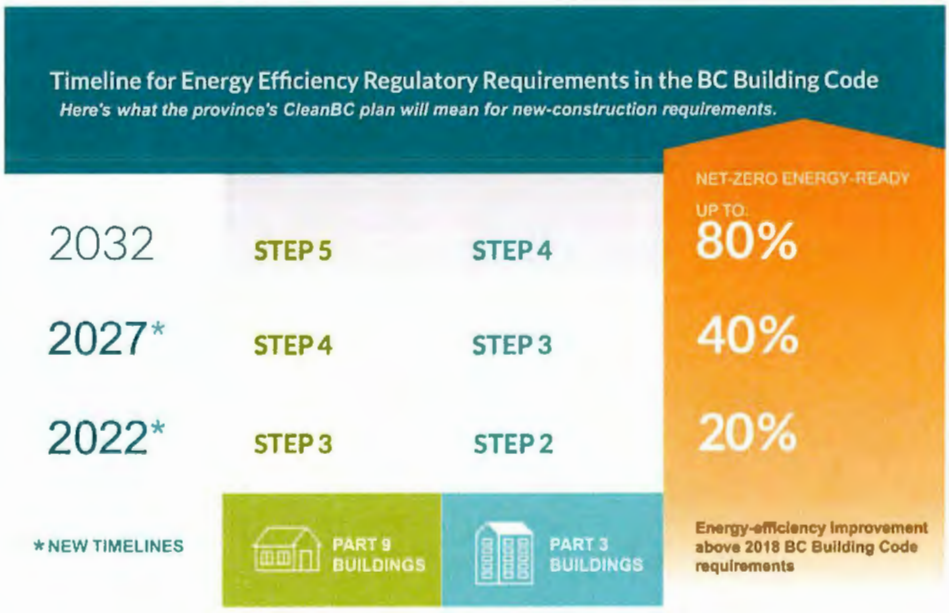
The BC Energy Step Code sets out graduated energy performance requirements for new buildings, and is a key policy and regulatory tool that local governments can utilize to achieve higher building energy performance than base requirements in the BC Building Code (BCBC). The Province of BC has signaled that a "net zero energy-ready" level of energy efficiency will be required of all new buildings in the 2032 BCBC.

The Province's CleanBC Plan (2018), states that:

> *Compared to the current base BC Building Code, new homes will be:*
>
> - *20 per cent more energy efficient by 2022,*
> - *40 per cent more energy efficient by 2027, and*
> - *80 per cent more energy efficient by 2032, the net-zero energy ready standard.*[2]

In line with the CleanBC commitment, the Province is now revising minimum performance requirements for the next edition of the BCBC, in order to achieve a 20% improvement in the energy efficiency for all new buildings. When adopted, these new regulations would come into force in the BCBC in December 2022, and would apply to new construction beginning in 2023. The following figure shows timing of future BCBC energy efficiency targets mapped against equivalent Step Code levels for both Part 9 and Part 3 residential buildings.

Timeline for Energy Efficiency Requirements in the BC Building Code



[2] "Net zero energy ready" is generally understood to mean reducing building energy requirements for heating, cooling, ventilation and hot water to a level where it becomes possible to meet all remaining building energy requirements by means of on-site renewable energy resource such as roof-top solar power or geo-exchange systems.

Richmond's community-wide GHG emission reduction targets, as stated in the Official Community Plan (2041) sets a reduction target of 33% below 2007 levels by 2020, and 80% below 2007 levels by 2050. The OCP also includes a separate energy efficiency goal of reducing building energy use by 10% below 2007 levels by 2020.

In March 2019, Council directed staff to identify measures capable of reducing Richmond's GHG emissions by 50% below 2007 levels by 2030, and achieving net zero emissions by 2050. In January 2020, following significant community engagement in 2019 on the City's revised Community Energy and Emissions Plan, Council endorsed eight strategic directions to achieve these deeper targets, including the following objectives for new buildings (see figure below).

Climate Action Direction #3 for New Buildings

CARBON NEUTRAL ENERGY FOR NEW BUILDINGS ***Major Move for 2020-2030***

DIRECTION 3

All new building applications will meet the applicable (for building type) top performance level of the BC Energy Step Code starting in 2025, and be powered by low carbon energy systems (in-building or district energy).

Carbon Reduction Impact by 2030:

- ✓ Achieve 80% low-carbon energy supply for heating and cooling district-energy-connected buildings in Richmond.
- ✓ All new buildings completed after 2025 (not connected to district energy) will consume 50% less energy and emit two-thirds less greenhouse gases than new buildings built in 2017.

2020 Online Homebuilder and Developer Engagement on the Energy Step Code

City staff organized and facilitated extensive online engagement of local homebuilders and developers from May to July 2020, using a series of 'virtual Builder Breakfasts' for Part 9 residential buildings, as well as two developer webinars for Part 3 hotels and motels. These sessions provided attendees with backgrounds on proposed Step Code amendments to the City's Building Regulation Bylaw to be introduced in 2020, subject to Council approval.

The engagement process fully achieved City objectives to:

- Conduct a successful, COVID-19 appropriate, online engagement series with Richmond's design and construction community;
- Be consistent with previous Council policy on Step Code adoption and timing;
- Maximize options to reduce carbon emissions from new buildings;
- Where opportunities exist, seek consistency in Step Code requirements throughout the Metro Vancouver region; and,
- Maintain and build upon the City's excellent relationship with the development community.

Virtual Builder Breakfasts	Topic Summary	Participant Stats
May 6, 2020	• Update on Step Code market adoption in Richmond • December 2019 changes to BC Building Code (Step Code) • Overview on City's plan to adopt higher Step Code levels	**Attendees** 55 in total; with 45 homebuilders, four Energy Advisors, and 6 City staff
May 13, 2020	**Joint event** with City of New Westminster • Integrated design – essential tool for high performance buildings (Einar Halbig, E3 EcoGroup) • High performance, low-carbon HVAC mechanical systems (Rob Pope, Ecolighten) • High performance design and construction by Victoreric	**Attendees** 148 in total; with 115 homebuilders, designers, energy advisors and presenters; 13 staff from Richmond and New West; 20 from other local governments
May 20, 2020	**Virtual Workshop** with **Live Polling** on a proposed two-option Step Code framework: • Step Code relaxations for low carbon energy systems • Defining a two-option approach for Richmond • Timing of Step Code requirements in 2020 and 2022 • Defining LCES in our Building Regulation Bylaw • Supporting our construction community • LCES incentives for Part 9 (Roberto Pecora, ZEBx)	**Attendees** 76 in total; with 63 homebuilders, designers, energy advisors and presenters; and 13 staff from other local governments
July 15, 2020	• City staff presentation on proposed updates to Richmond's Building Bylaw, with new efficiency requirements for fall 2020 and January 2022. • Case study of high performance building envelopes, with several projects featured by Victoreric, including a Step Code level 4+ home in Terra Nova.	**Attendees** 73 in total; with 55 homebuilders, designers, energy advisors; and 13 staff from other local governments; and 5 City staff

Summary of Key Feedback – Part 9 Homebuilders, Contractors and Trades

The following points summarize feedback received during the 2020 Builder Breakfast series:

- Participants favour the 'two-option' Step Code proposal by the City, as it would provide two paths for applicants to satisfy the Building Regulation Bylaw requirement, with a one-Step relaxation available for installation of a low carbon energy system (LCES).
- Participants prefer that the LCES relaxation be limited to a single Step, as opposed to a two-Step relaxation approach (like West Vancouver has implemented).
- The current timing of expected Step Code increments in 2020, 2022 and 2025, as per current City of Richmond OCP schedule, is preferred, with participants signaling it would be achievable.
- Participants like an incremental approach to setting carbon intensity limits as a performance definition for LCES (i.e., 5.5 kg CO_2e / m^2 / year in 2020, dropping to 3 kg CO_2e / m^2 / year in 2022). This provides time for industry to transition to electric heat pump mechanical systems, while still allowing for mixed natural gas and electric heating systems to occur in new buildings in the near term. [Note the 5.5 kg limit was rounded to 6 kg in the eventual Amendment]
- Participants understood the point in the City staff presentation that the proposed Amendment may also include a fixed carbon limit (tonnes of carbon emitted annually) in the LCES definition, to ensure smaller floor area houses are not unintentionally penalized by a carbon intensity limit.
- Local construction community sees value the current Bylaw requirement that a mid-construction airtightness text be conducted (prior to drywall installation) to ensure the project is on track to meet the Step Code airtightness target, and they see continued value in this requirement.

Developer Webinars	Topic Summary	Participant Stats
June 24, 2020	• Update on Step Code market adoption in Richmond • Local governments with new Step Code requirements for hotels. and LCES relaxation option available • Proposed Bylaw Amendment with Step Code req's and how LCES relaxation applies within district energy areas	**Attendees** 14 in total; with 8 developers and architects; rep's from Urban Development Institute; and 6 City staff
July 8, 2020	• Treatment of in-stream hotel development applications • Expected timing of Bylaw Amendment in fall 2020, and Step Code requirements in 2022	**Attendees** 12 in total; with 7 developers and architects; rep's from Urban Development Institute; and 5 City staff

Summary of Key Feedback – Part 3 Hotel Developers

The following summarizes feedback received from hotel developers and UDI Pacific Region representatives during summer 2020 developer webinars:

- Participants favour extending the 'two-option' Step Code approach (currently only available to concrete-frame multi-unit residential buildings) to Hotels / Motels in the proposed Amendment.
- The current Part 3 LCES definition was viewed as sufficient for the proposed 2020 Building Regulation Bylaw Amendment. Participants understood that this definition would be reviewed in 2021, as part of developing proposed 2022 Bylaw amendments.
- City staff adjusted the in-stream allowance from six to 12 months for Hotels / Motels subject to a development permit, accommodating a request from the Urban Development Institute.

City of Richmond Progress on Step Code Adoption for Part 9 Residential Buildings

The BC Energy Step Code was adopted by the City of Richmond in July 2018, with Step Code requirements entering into force in September 2018.

Largely owing to policies implemented by the Province and federal government in response to housing affordability issues, the pace of construction in new detched housing was considerably slower than expected during late 2018 and 2019, and very few detached homes built to Energy Step Code requirements reached completion before the start of 2020. The slowdown in new detached house construction resulted in no homes built to Energy Step Code requirements from reaching final inspection until fall 2019. Lacking information on how well local homebuilders were able to comply with the new Step 1 requirements, staff postponed making recommendations on increased Energy Step Code requirements until the level of compliance achieved by homebuilders to Step 1 requirements was better understood.

As of July 2020, 59 single-detached and two-unit buildings containing 82 dwelling units have been built to Step 1 requirements and approved for occupancy. It is now clear that Richmond homebuilders have done very well in meeting the new requirements of the Energy Step Code. In addition to incorporating energy modelling in building design, and integrating energy efficient features, local homebuilders have achieved particular success in improving the airtightness (and thus, the comfort and indoor air quality) of these new homes relative to those built before Energy Step Code requirements were put in place. Council's direction to invest resources into an Airtightness Training Program appears to have played a significant role in helping local homebuilders gain the new skills necessary for success in building to the Energy Step Code.

Owing to the in-stream provisions noted above, no townhouse projects subject to Energy Step Code requirements have yet been completed, but many townhouse projects built over the past four years have been designed and constructed to meet beyond-Code EnerGuide 82 requirements. These townhouses have incorporated many of the energy efficiency upgrades that would also be effective in achieving Step 2 or Step 3 under the Energy Step Code. The biggest change in going from EnerGuide 82 to Step 2 or Step 3 of the Energy Step Code will be achieving the mandatory airtightness target, which is expected to result in a signifcant improvement in the overall energy performance of these buildings. As noted above, Richmond actively supports local builders to gain the required knowledge and skills through the Airtightness Training Program.

In sum, the ability of builders to build successfully to the City's new Energy Step Code requirements has exceeded expectations. Staff are confident that the local construction industry is gaining the skills and experience needed to meet the next increment of Energy Step Code requirements.

TODAY'S AGENDA:

Workshop on a Tiered Energy Step Code Framework

- Potential approaches for a two-option Step Code framework

✓ Feedback on Richmond's Two-Option Part 9 (TOP9) Energy Step Code framework

✓ Feedback on defining a "Low Carbon Energy System"

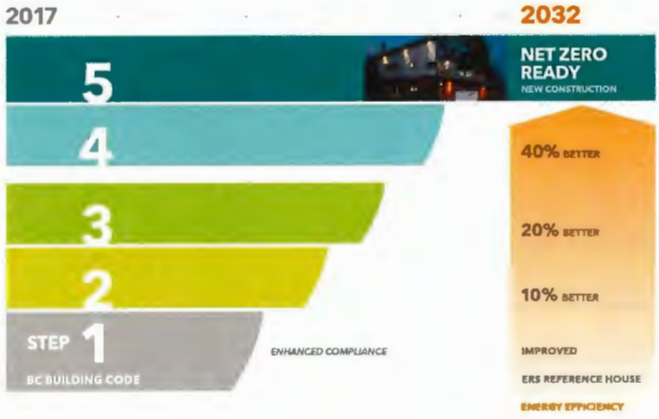
Live polling of participants via an easy-to-use survey tool.

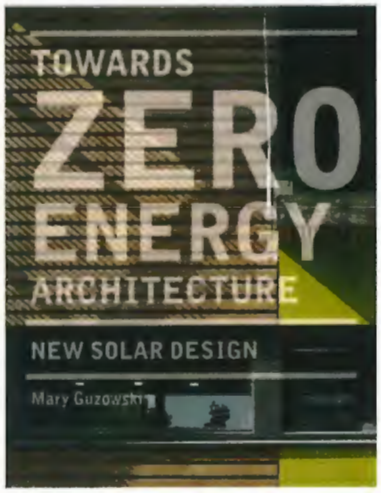
- New incentives for low-carbon mechanical systems

Richmond

Part 9 | Step 5: Net Zero Ready New Construction

BCBC Objective ➔ NZER by 2032





What Does the BC Energy Step Code Measure?

Performance Requirements For:

✓ **Building envelope**

What Does the BC Energy Step Code Measure?

Performance Requirements For:

- ✓ Building envelope
- ✓ **Equipment and systems**

What Does the BC Energy Step Code Measure?

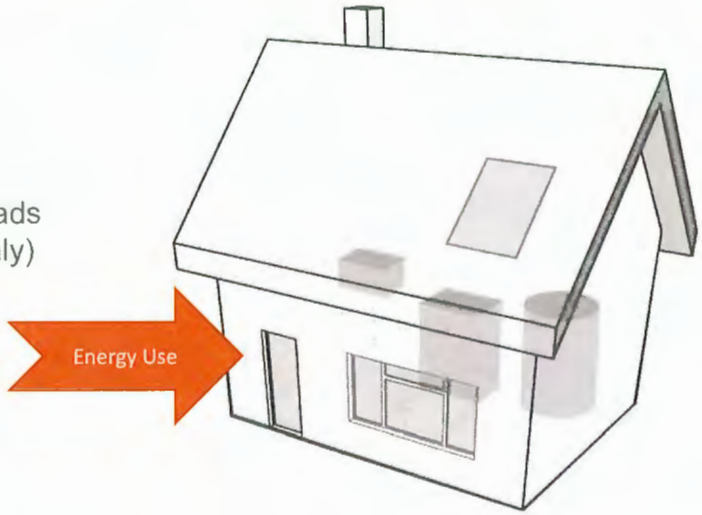
Performance Requirements For:

- ✓ Building envelope
- ✓ Equipment and systems
- ✓ **Airtightness (as-built)**

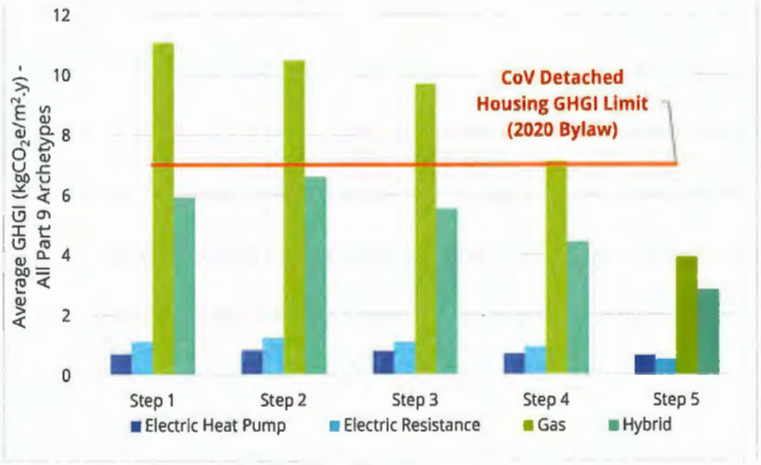
Equipment Efficiency Metrics

Energy Use

- Heat
- Water heating
- Ventilation
- Lights and plug loads (large buildings only)



GHG Emissions & BC Energy Step Code



Graph Source: Integral Group. June 2019. *Implications of BC Energy Step Code on GHG Emissions*

- Step Code on its own does not necessarily achieve very low GHG emissions
- Gas systems are being widely implemented as part of Energy Step Code Part 9 buildings

Richmond

City of Richmond

Report to Committee

To:	General Purposes Committee	**Date:**	November 29, 2019
From:	Peter Russell Director, Sustainability and District Energy	**File:**	10-6125-07-02/2019
Re:	**Community Energy and Emissions Plan 2020-2050 Directions**		

CARBON NEUTRAL ENERGY FOR NEW BUILDINGS *Major Move for 2020-2030*

DIRECTION 3

All new building applications will meet the applicable (for building type) top performance level of the BC Energy Step Code starting in 2025, and be powered by low carbon energy systems (in-building or district energy).

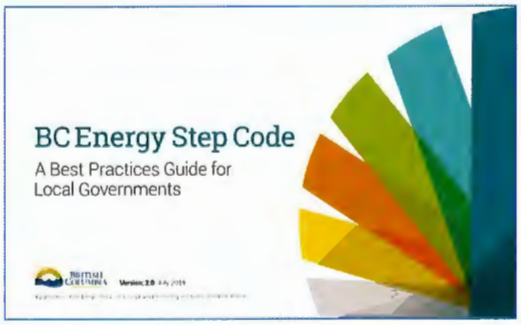
Carbon Reduction Impact by 2030:

- ✓ **Achieve 80% low-carbon energy supply for heating and cooling district-energy-connected buildings in Richmond.**
- ✓ **All new buildings completed after 2025 (not connected to district energy) will consume 50% less energy and emit two-thirds less greenhouse gases than new buildings built in 2017.**

Richmond

"Two Option Part 9" (TOP9) Energy Step Code Framework

- A two-option Energy Step Code framework offers builders choice, while encouraging low-GHG development:
  - Option A: **Step X**
    [or]
  - Option B: **Step (X – n) with a low-carbon energy system**
- This two-option approach is already used for **Part 3** construction in **Richmond**, Burnaby, Surrey, Vancouver, New Westminster and UBC
- Included in the *Best Practices Guide for Local Governments v.2*



"Offering industry a relaxation clause that will also reach climate objectives"

Richmond

WORKSHOP: Setting the direction for our Building Bylaw update

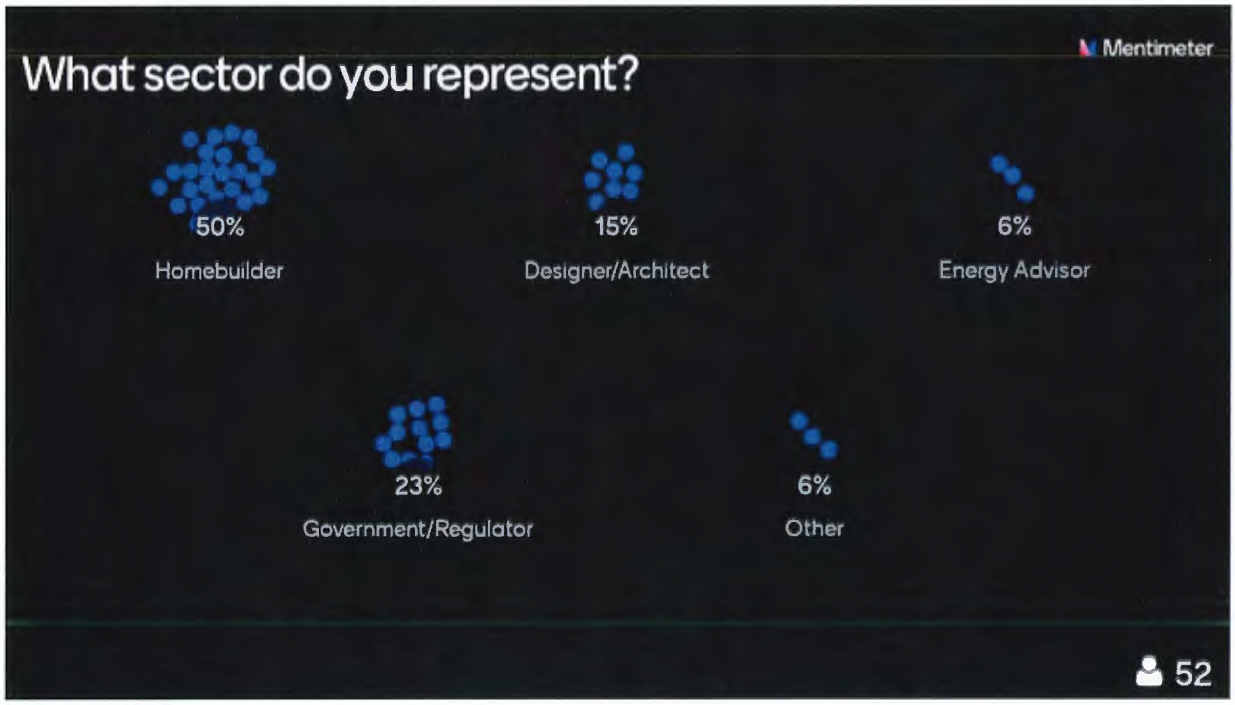
- ✓ Feedback on Richmond's Two-Option Part 9 (TOP9) Energy Step Code framework
- ✓ Feedback on defining a "Low Carbon Energy System"

Open your web browser to the following URL:

https://www.menti.com/1zdyfqkmcm

The digit code is: 37 40 41

Richmond



Energy Step Code schedule in Official Community Plan

Bylaw 9771
2018/07/16

Building Type	Building Permit Application			
	Estimated Timetable for Future Consideration			
Smaller Part 9 Residential	**September 1, 2018**	**September 1, 2020**	**January 2022**	**January 2025**
Townhomes and Apartments	Step 3	*Revise to include step-down low carbon energy system options*		
Single Family, Duplex and Other Residential	Step 1			

Staff propose that there would be
<u>two</u> Energy Step Code compliance options
for all Part 9 buildings

Richmond

Two-Option Part 9 (TOP9) ESC: Key Implementation Issues

1. Defining the TOP9 ESC framework (requirements and timing)
2. Defining "low carbon energy system"
3. Supporting the transition to high-performance low-carbon homes

Richmond

Defining the TOP9 ESC framework (requirements and timing)

Objectives:

1. Develop recommendations in accord with Council decisions and priorities
2. Maximize GHG emission reductions in new construction
3. Maintain or improve consistency between local governments
4. Maximize compliance with ESC requirements in force
5. Maintain and build upon the City's good relationship with local builders

Richmond

Defining the TOP9 ESC framework (requirements and timing)

Objectives:

1. Develop recommendations in accord with Council decisions and priorities

Bylaw 9771
2018/07/16

Building Type	Building Permit Application			
	Estimated Timetable for Future Consideration			
Smaller Part 9 Residential	**September 1, 2018**	**January 2020**	**January 2022**	**January 2025**
Townhomes and Apartments	Step 3	Same as 2018	Step 4	Step 4 or Step 5
Single Family, Duplex and Other Residential	Step 1	Step 3	Step 3 or Step 4	Step 4 or Step 5

Richmond

Defining the TOP9 ESC framework (requirements and timing)

Objectives:

2. Maximize GHG emission reductions in new construction

CARBON NEUTRAL ENERGY FOR NEW BUILDINGS *Major Move for 2020-2030*

DIRECTION 3

All new building applications will meet the applicable (for building type) top performance level of the BC Energy Step Code starting in 2025, and be powered by low carbon energy systems (in-building or district energy).

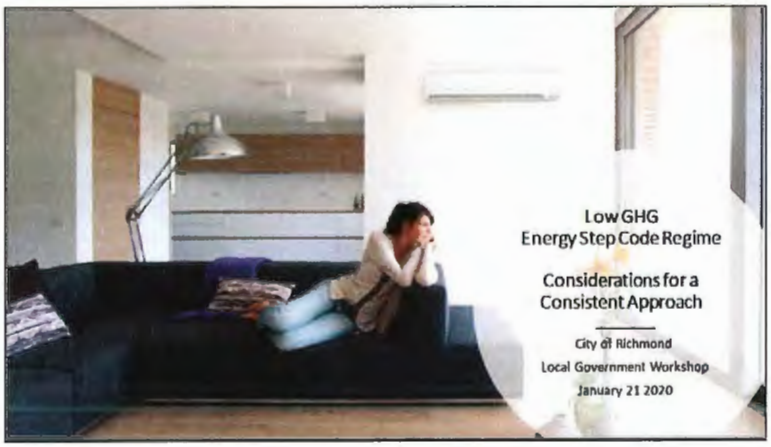
50% 30 ADVANCING RICHMOND'S CLIMATE LEADERSHIP

Richmond

Defining the TOP9 ESC framework (requirements and timing)

Objectives:

3. Maintain or improve consistency between local governments



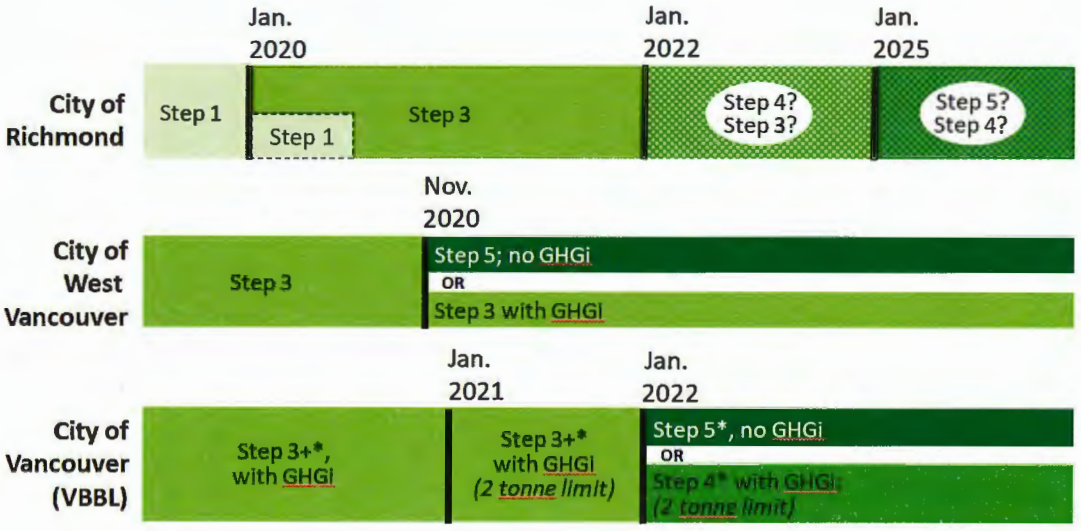
Richmond

Defining the TOP9 ESC framework (requirements and timing)

Objectives:

3. Maintain or improve consistency between local governments

Richmond

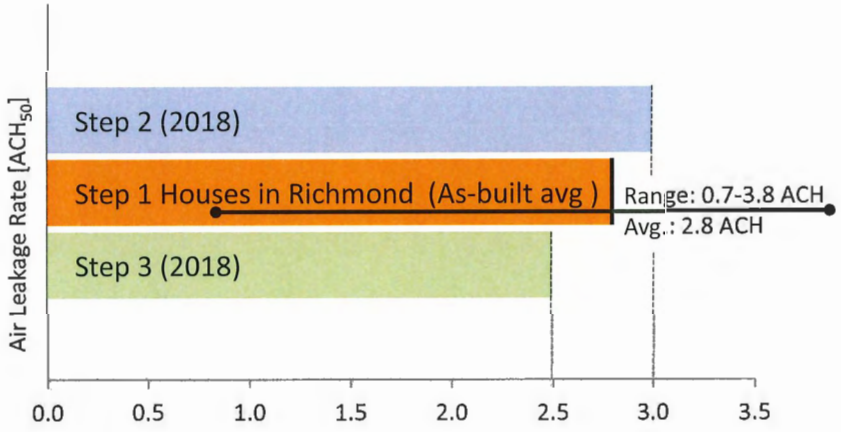


Richmond

Defining the TOP9 ESC framework (requirements and timing)

Objectives:

4. Maximize compliance with ESC requirements in force

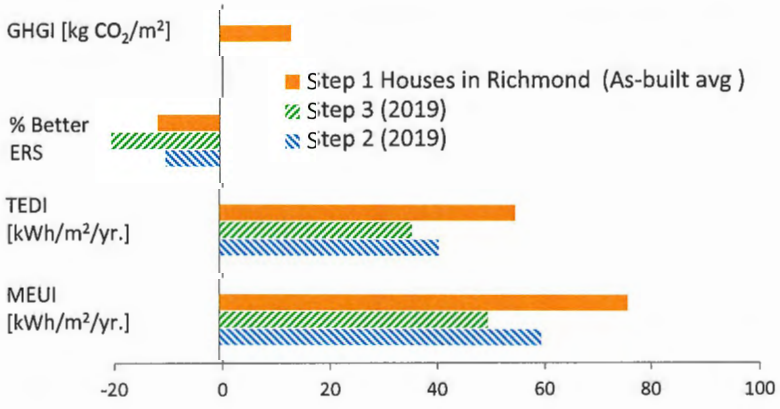


Richmond

Defining the TOP9 ESC framework (requirements and timing)

Objectives:

4. Maximize compliance with ESC requirements in force



Richmond

Defining the TOP9 ESC framework (requirements and timing)

Objectives:

5. Maintain and build upon the City's good relationship with local builders

Building Type	Building Permit Application *Estimated Timetable for Future Consideration*			
Smaller Part 9 Residential	**September 1, 2018**	**January 2020**	**January 2022**	**January 2025**
Townhomes and Apartments	Step 3	Same as 2018	Step 4	Step 4 or Step 5
Single Family, Duplex and Other Residential	Step 1	Step 3	Step 3 or Step 4	Step 4 or Step 5
Larger Part 3 Developments				
Residential Concrete Towers	Step 3 or Step 2 for buildings with low carbon energy system	Same as 2018	Step 3	Step 4
Residential Woodframe Low/Mid-Rise	Step 3	Same as 2018	Step 4	Step 4
Office & Retail Buildings	Step 2	Same as 2018	Step 3	Step 3

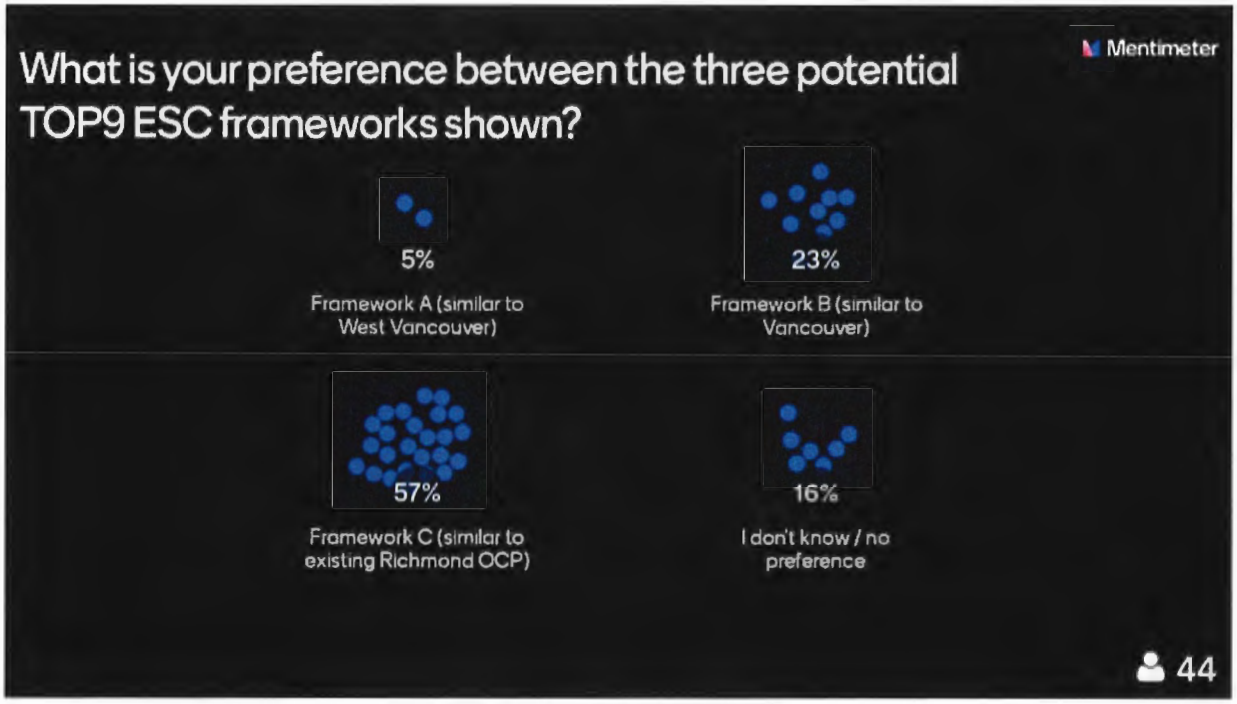
Richmond

Defining the TOP9 ESC framework (requirements and timing)

Staff consider framework "C" to be the best option for meeting the City's objectives

	September 2020	January 2022	January 2025 *(...or advance to 2024?)*	Bylaw Requirements
A	Step 5 *OR* Step 3 + LCES	Step 5 *OR* Step 3 + LCES	Step 5 *OR* Step 4 + LCES	• *Similar to North Shore (West Van) Requirements*
B	Step 4 *OR* Step 3 + LCES	Step 5 *OR* Step 3 + LCES	Step 5 *OR* Step 4 + LCES	• *Similar to City of Vancouver requirements*
C	Step 3 *OR* Step 2 + LCES	Step 4 *OR* Step 3 + LCES	Step 5 *OR* Step 4 + LCES	• *Similar to existing City of Richmond OCP schedule*

Richmond



Two-Option Part 9 (TOP9) ESC: Key Implementation Issues

✓ 1. Defining the TOP9 ESC framework (requirements and timing)

2. Defining "low carbon energy system"

3. Supporting the transition to high-performance low-carbon homes

Defining "Low Carbon Energy System"

Richmond: Current language in Building Regulation Bylaw No. 7230 :
(developed with Part 3 buildings in mind) :

"Low carbon building energy system" ... means a building's space heating, cooling and domestic hot water heating mechanical system that is supplied energy through:

*a) ... a **City owned district energy utility*** ...;*
or

** usually not economic for Part 9 buildings*

Defining "Low Carbon Energy System"

Richmond: Current language in Building Regulation Bylaw No. 7230
(developed with Part 3 buildings in mind) :

*b) **on-site** energy supply equipment designed to meet a **minimum 70%** of the building's annual heating, cooling and hot water energy demand from a **renewable energy** source... [including]*
- *air and ground source **heat pumps***
- ***solar** collectors*
- *waste **heat recovery***
- ***other**, as approved by the City*

Defining "Low Carbon Energy System"

Vancouver uses a **performance metric** for Part 9 residential buildings:

- *Building energy system (heating, cooling, hot water) is limited to GHG emissions of **5.5 kg CO_2e / m2 / year***
  - *i.e.: a 300 m^2 building cannot emit more than (300 x 0.0055 =) 1.65 tonnes GHG per year*
- *Will be reduced to **3 kg CO_2e / m2 / year*** in 2022.*

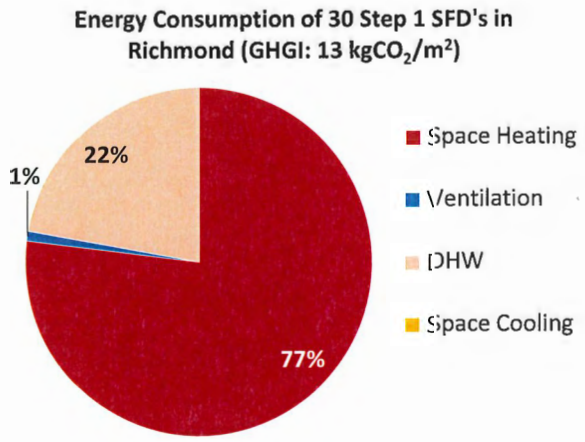
Vancouver will also be using a **fixed limit**:

- ***2 tonne GHG per year limit** on homes larger than 3,500ft^2 (2021)*

** Allows for natural gas use in **Step 5** buildings*

Richmond

Getting to 5.5 kg and 3 kg CO_2e/m^2/year...



For the average **Step 1** house:

- Use electricity for **75%** of space heating (baseboard or heat pump) = ~5.5 kg CO_2/m^2
- Decarbonize **all** space heating = ~3.0 kg CO_2/m^2
- Decarbonize **all** space heating, cooling and DHW, **but** install natural gas range and/or fireplace = ~3.0 kg CO_2/m^2

Defining "Low Carbon Energy System"

West Vancouver uses several **performance metrics**:

- *Building energy system (heating, cooling, hot water) is limited to GHG emissions of **3 kg CO_2e / m2 / year** (November 2020) [i.e.: a 300 m^2 building = 900 kg = 0.9 tonnes GHG per year]*

- *The system must have a seasonal average **COP > 2** (November 2020)*
  - *Coefficient of performance (COP) for various heating systems:*
    - *Natural gas furnaces and boilers = **< 1*** X
    - *Electric baseboards = **1*** X
    - *Natural gas heat pumps = **<2*** X
    - *Electric heat pumps = **1 – 2.5+*** ✓

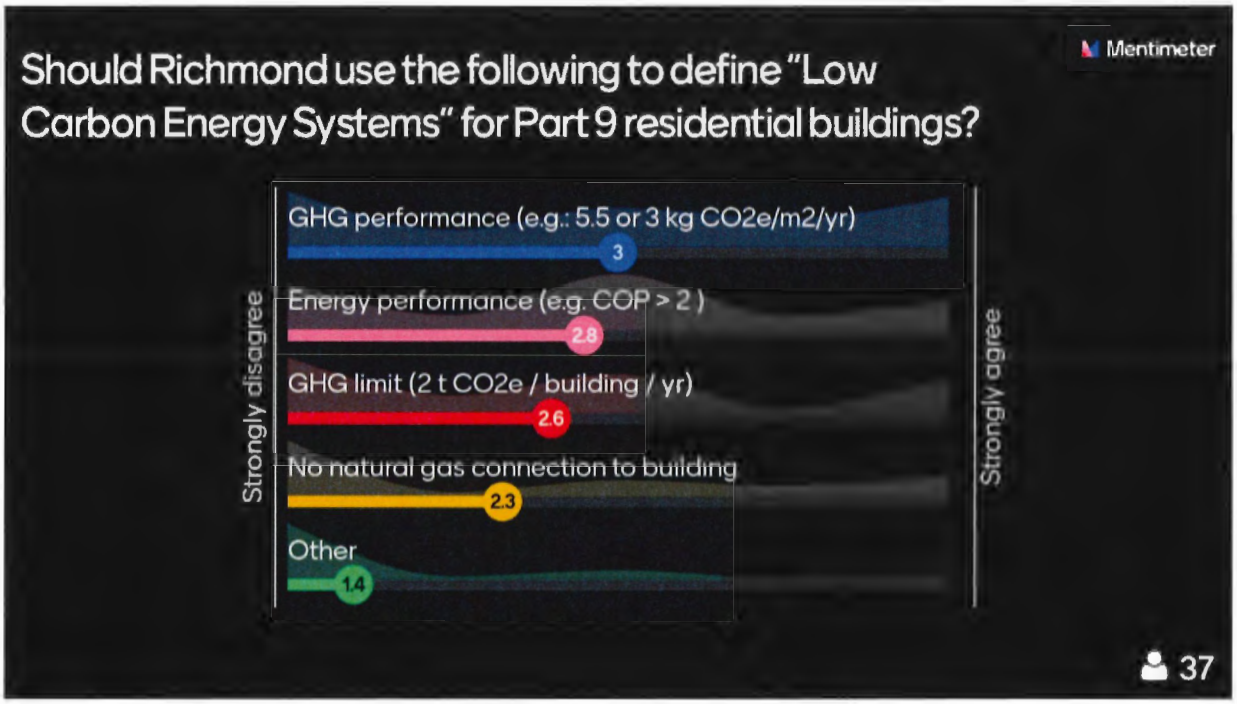
Richmond

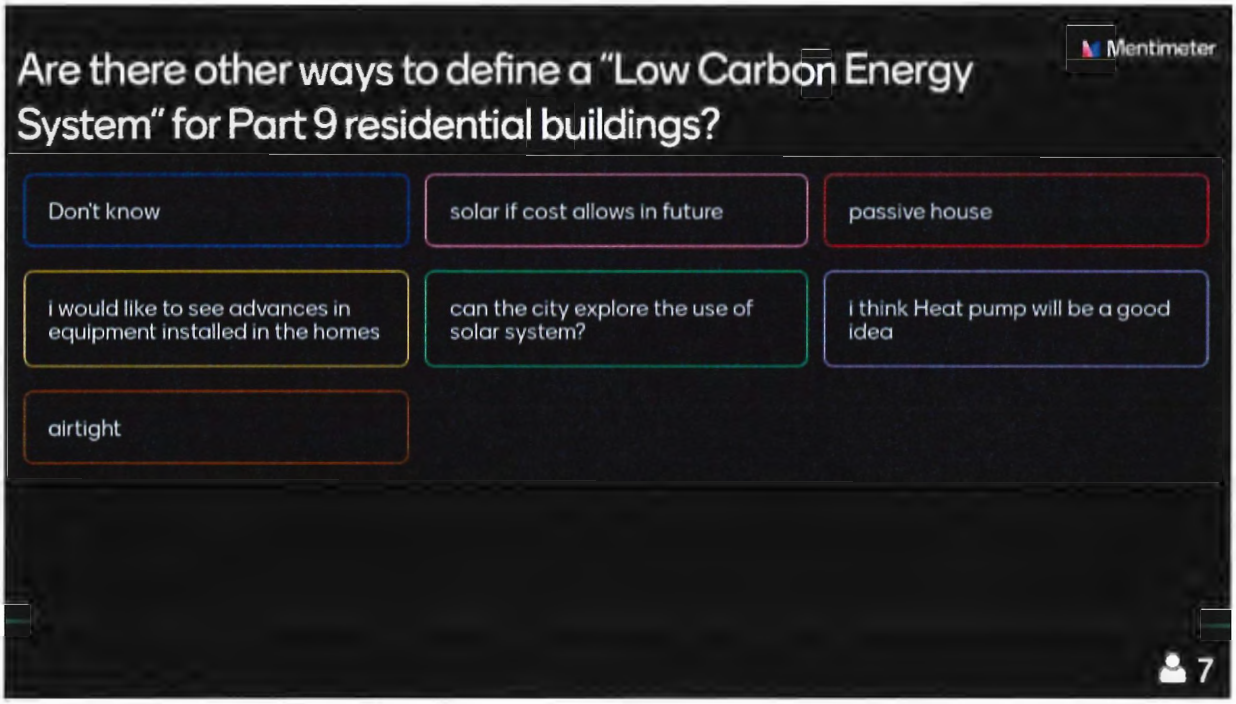
Defining "Low Carbon Energy System"

Other suggested measures:

- *No natural gas connection to building*

Richmond


Mentimeter
Should Richmond use the following to define "Low Carbon Energy Systems" for Part 9 residential buildings?
GHG performance (e.g.: 5.5 or 3 kg CO2e/m2/yr)
3
Energy performance (e.g. COP > 2)
2.8
GHG limit (2 t CO2e / building / yr)
2.6
No natural gas connection to building
2.3
Other
1.4
Strongly disagree
Strongly agree
37


Mentimeter
Are there other ways to define a "Low Carbon Energy System" for Part 9 residential buildings?
Don't know
solar if cost allows in future
passive house
i would like to see advances in equipment installed in the homes
can the city explore the use of solar system?
i think Heat pump will be a good idea
airtight
7

Two-Option Part 9 (TOP9) ESC: Key Implementation Issues

✓ 1. Defining the TOP9 ESC framework (requirements and timing)

✓ 2. Defining "low carbon energy system"

3. Supporting the transition to high-performance low-carbon homes

Supporting the transition to high-performance low-carbon homes

Objectives:

a. Improve / streamline building code regulation and regulatory compliance

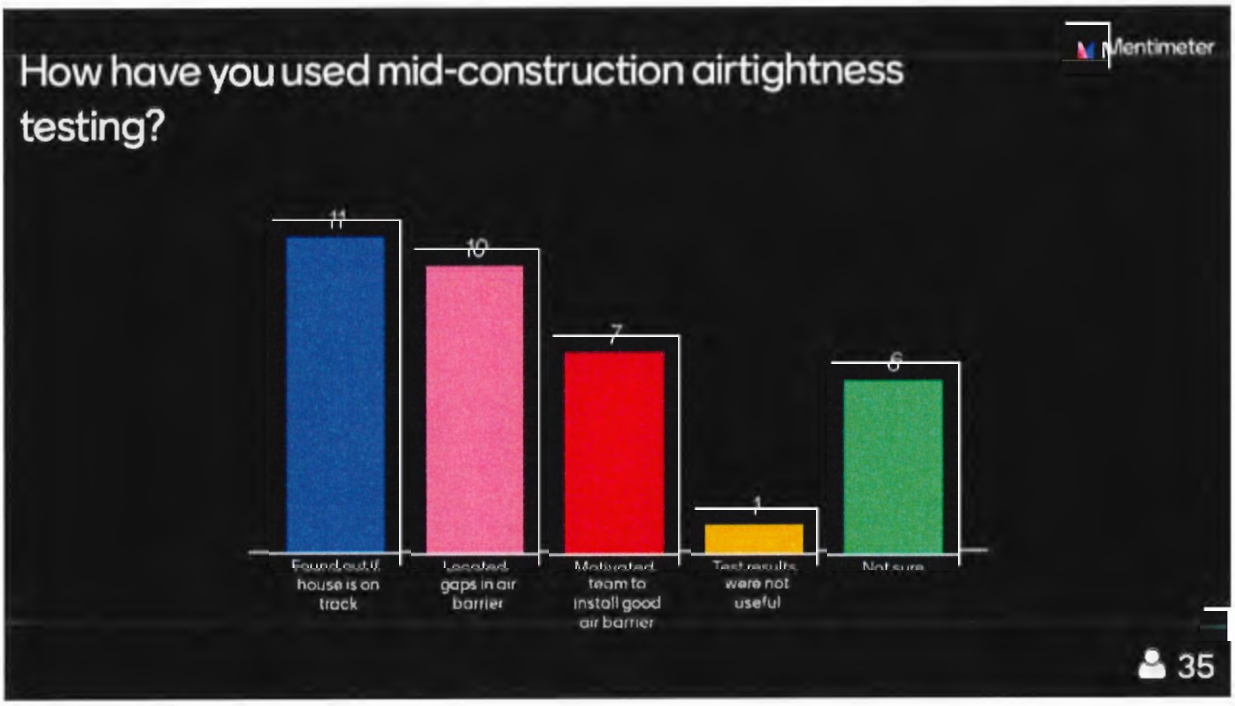
b. Support local builders in building to higher levels of the ESC

Supporting the transition to high-performance low-carbon homes

Objectives:

a. **Improve/streamline building code regulation / regulatory compliance**

- ESC requires pre-construction and post-construction forms
- Richmond currently requires a **mid-construction** check as well:
  - Verification of upgrades
  - Pre-drywall blower door test

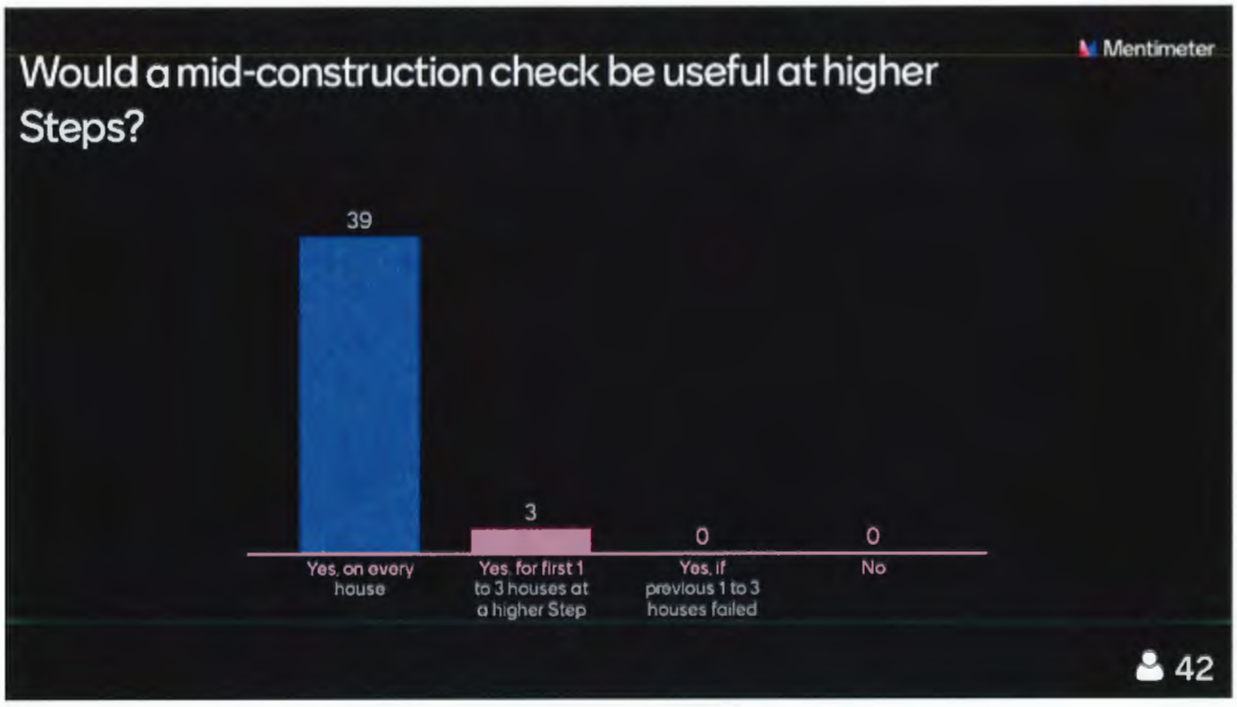


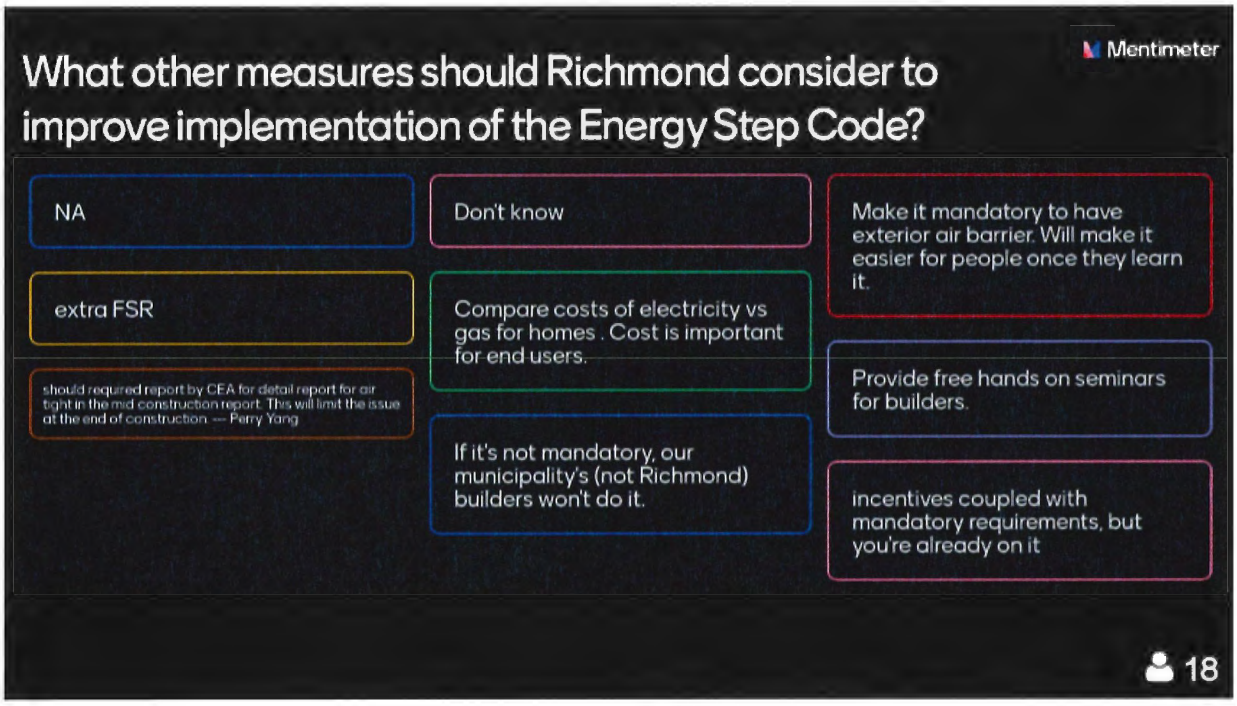
ENERGY STEPCODE
BUILDING BEYOND THE STANDARD

Part 9 Step Code Requirements for Richmond, BC (Climate Zone 4) as of December 12, 2019

Richmond

Step	Building energy model	Airtightness Requirement:		Performance Requirement of Building Equipment and Systems				Performance Requirement of Building Envelope				
		Blower door test	ACH_{50}: *air changes per hour @ 50 Pa pressure differential*	Reference House: *__% better than ERS v15 ref. house*	OR	mechanical energy use intensity (MEUI): *kWh/m²·year*		thermal energy demand intensity (TEDI): *kWh/m²·year*		OR	Reference House: *__% better than ERS v15 ref. house*
1	✓	✓	report score	0%	OR	conform to Subsection 9.36.5						
2	✓	✓	≤ 3.0	10%	OR	≤ 60	**OR** for A/C and/or < 210m² houses, see *Table 9.36.6.3.A*	≤ 35	**OR** HDD-adjusted TEDI: ≤ 41	OR	5%	
3	✓	✓	≤ 2.5	20%	OR	≤ 45	**OR** for A/C and/or < 210m² houses, see *Table 9.36.6.3.A*	≤ 30	**OR** HDD-adjusted TEDI: ≤ 36	OR	10%	
4	✓	✓	≤ 1.5	40%	OR	≤ 35	**OR** for A/C and/or < 210m² houses, see *Table 9.36.6.3.A*	≤ 20	**OR** HDD-adjusted TEDI: ≤ 26	OR	20%	
5	✓	✓	≤ 1.0	≤ 25			**OR** for A/C and/or < 210m² houses, see *Table 9.36.6.3.A*	≤ 15	**OR** HDD-adjusted TEDI: ≤ 18	OR	40%	





Supporting the transition to high-performance low-carbon homes

Objectives:

b. Support building to higher levels of the ESC

Richmond implemented the Airtightness Training Program in Fall 2018.

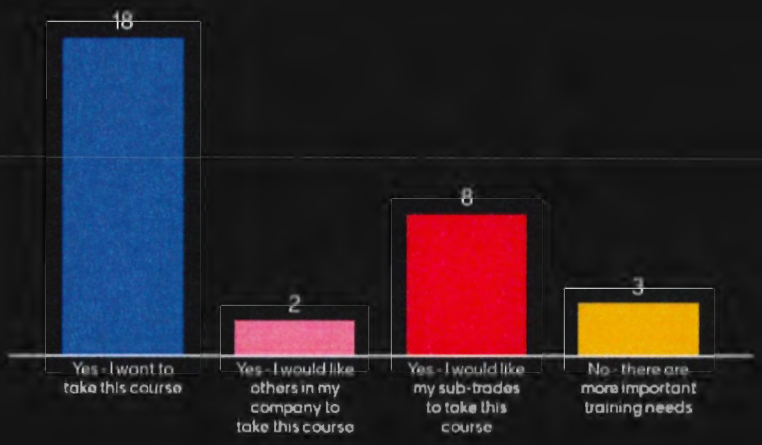
- Over 75 builders have taken the free one-day training course
- Over 25 (non-ESC) houses have had a free diagnostic blower door test

There are funds remaining in both programs.

Richmond

Should Richmond continue to fund airtightness training courses?

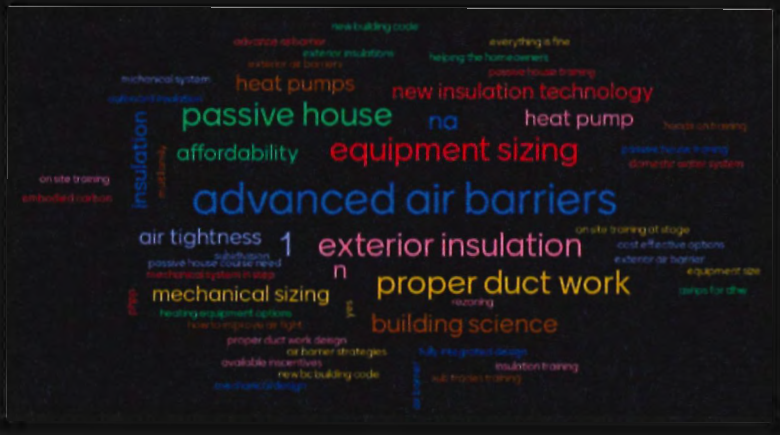
Mentimeter



31

What other training programs are needed by local homebuilders?

Mentimeter



50

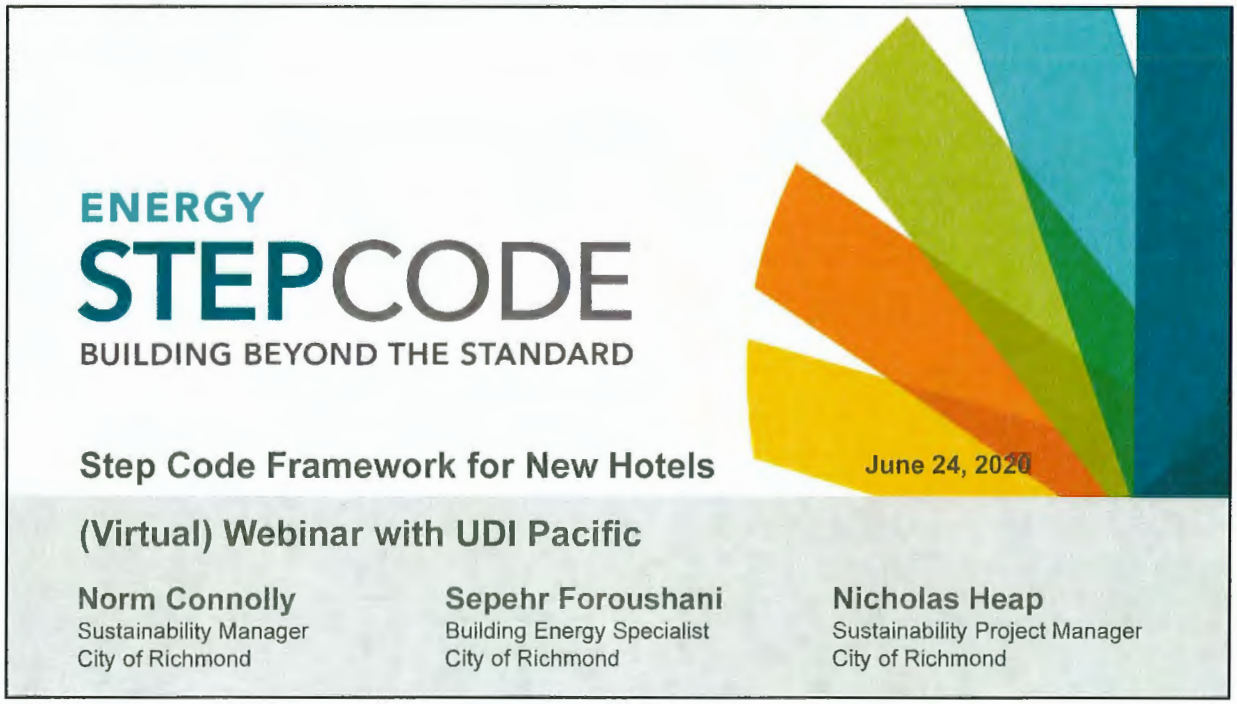
Low Carbon Energy Systems Incentives for Ground-Oriented Housing

Roberto Pecora, Zero Emission Building Exchange

BC Step Code or Passive House Performance	Ground Oriented Dwellings (Single Family, Laneway House, Duplex, Triplex, Quadplex, Townhouse)			
	Heat Pumps for Space Heating (1st Dwelling)	For Each Additional Dwelling[1]	Additional Incentive for DHW Heat Pump	Additional Incentive for Induction Cooktops
Step 4	Up to $15,000	Up to $5,000	Up to $1,000/unit for integrated Up to $2,500/unit for split	$500/unit
Step 5	Up to $20,000	Up to $5,000	Up to $1,000/unit for integrated Up to $2,500/unit for split	$500/unit
Passive House[2]	Up to $20,000	Up to $5,000	Up to $1,000/unit for integrated Up to $2,500/unit for split	$500/unit

1 - An additional unit may include a lock-off suite, laneway house or additional units in duplexes, multi-plexes or townhouses
2 - Passive House projects that only require a DHW heat pump for both space and hot water heating may qualify for the combined incentive amounts for space heating and DHW.


Virtual
Webinar #1
UDI Developer Workshop:
Proposed Energy Step Code
Framework for New Hotels
City of Richmond
June 24, 2020
Richmond


ENERGY
STEPCODE
BUILDING BEYOND THE STANDARD
Step Code Framework for New Hotels
June 24, 2020
(Virtual) Webinar with UDI Pacific
Norm Connolly
Sustainability Manager
City of Richmond
Sepehr Foroushani
Building Energy Specialist
City of Richmond
Nicholas Heap
Sustainability Project Manager
City of Richmond

AGENDA

Proposed Two-Option Step Code Framework for New Part 3 Hotels

- National and Provincial Building Code Context
- City of Richmond policy approach: supporting the Step Code transition
- Proposed two-option Step Code framework for new hotels
- Incentives for low-carbon mechanical systems

  Live polling of participant feedback via an easy-to-use survey tool.
- New energy modeling tools for Part 3 buildings
- Training opportunities available in Metro Vancouver

Richmond

Provincial Policy Context

December 2018

CleanBC – Better Buildings

Energy Efficiency
Climate Resilience
Seismic Resilience

British Columbia's commitment for future Building Codes

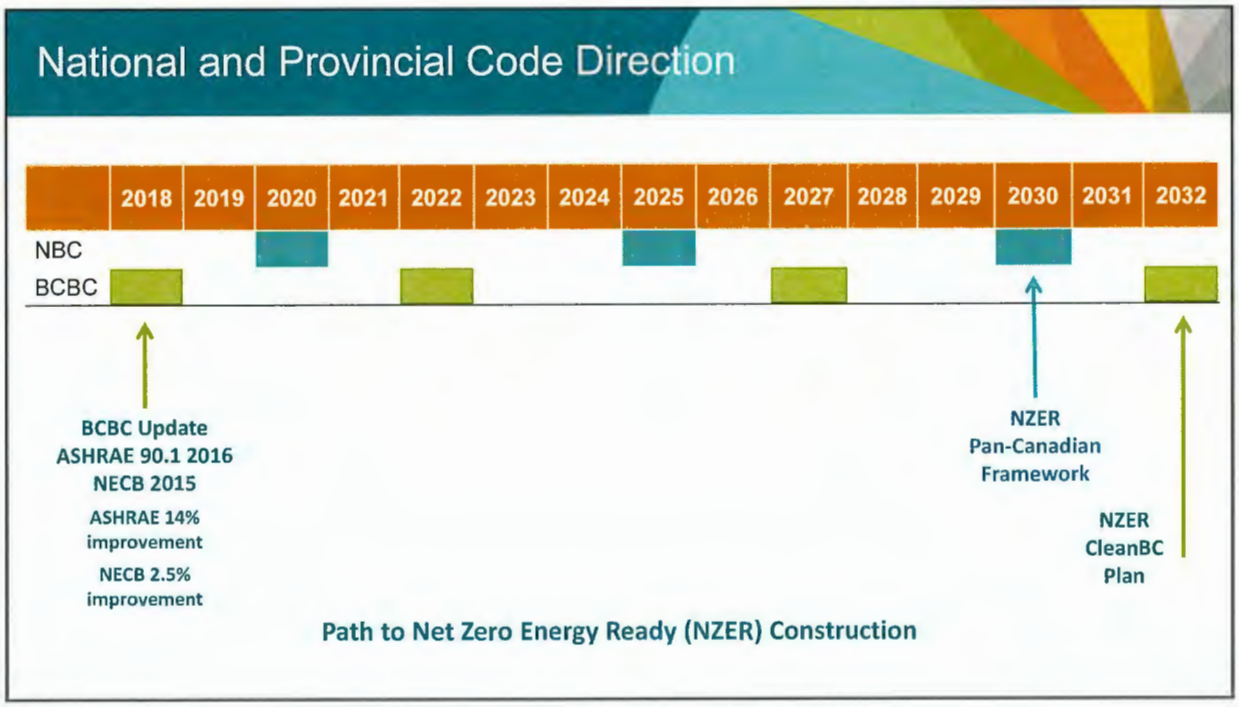
New Buildings
2022 – 20% improvement
2027 – 40% improvement
2032 – Net Zero Energy Ready

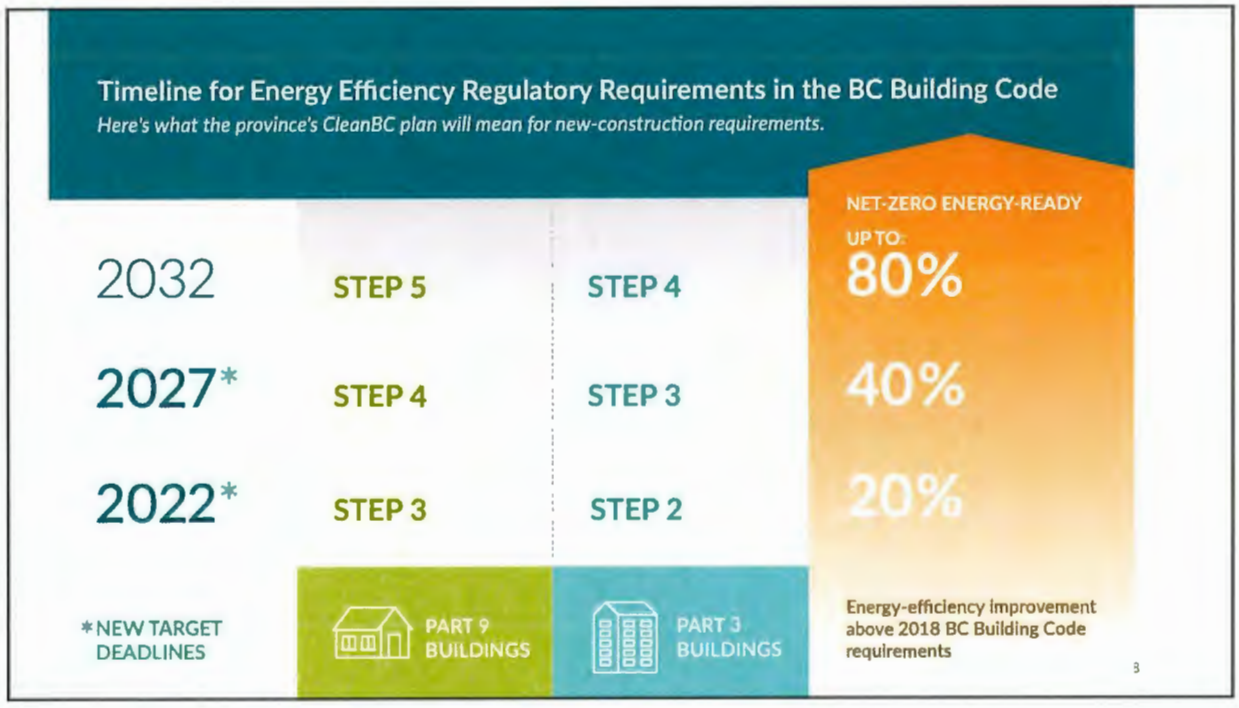
Existing Buildings
Code for existing buildings in 2024

Roadmap to Net Zero Energy Ready

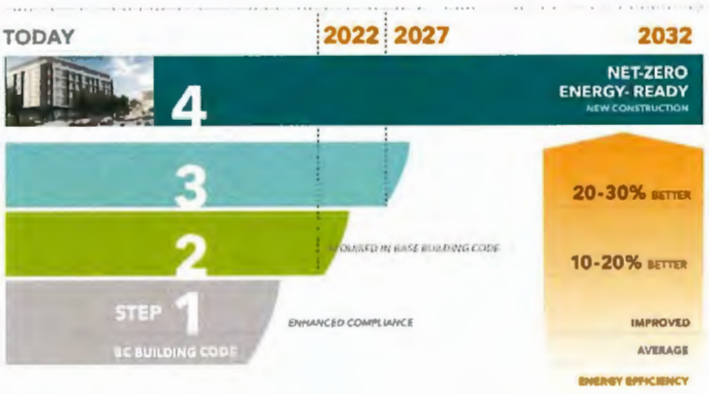
BC Energy Step Code Expansion since 2017

6


National and Provincial Code Direction
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
NBC
BCBC
BCBC Update
ASHRAE 90.1 2016
NECB 2015
ASHRAE 14% improvement
NECB 2.5% improvement
NZER Pan-Canadian Framework
NZER CleanBC Plan
Path to Net Zero Energy Ready (NZER) Construction


Timeline for Energy Efficiency Regulatory Requirements in the BC Building Code
Here's what the province's CleanBC plan will mean for new-construction requirements.
NET-ZERO ENERGY-READY
UP TO:
2032
STEP 5
STEP 4
80%
2027*
STEP 4
STEP 3
40%
2022*
STEP 3
STEP 2
20%
*NEW TARGET DEADLINES
PART 9 BUILDINGS
PART 3 BUILDINGS
Energy-efficiency improvement above 2018 BC Building Code requirements
3

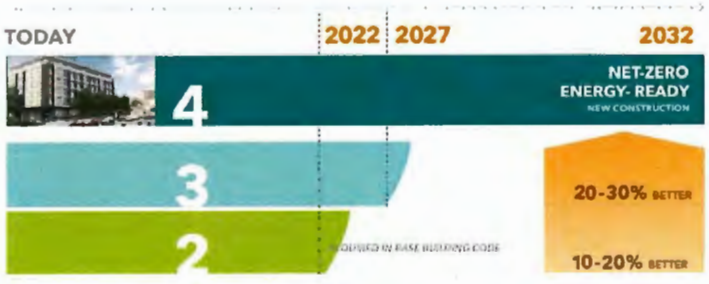
New Construction – Part 3 Group C Occupancies



Includes

- Hotels
- Multi-Unit Apartment Buildings (BCBC: *'Other Group C Occupancies'*)

New Construction – Part 3



Energy Step Code in 2022: Considerations

- NECB-2020 baseline (ASHRAE 90.1-2019?)
- Discussion about "20% better" and possible target adjustments
- Continued focus on industry and local government leadership
- Continued focus on modelling and airtightness testing
- Seeking recommendations through Energy Step Code Council

Responding to the Climate Emergency

As of June 2020, **1,500** jurisdictions in **30** countries have declared a climate emergency.

In BC, **26** local authorities have declared a climate emergency through their Councils.

Responding to the Climate Emergency

Policy and Program Approach:

Integrate energy efficiency and emissions intensity in assessing overall building performance.

Set minimum performance levels in Bylaw, and signal to industry when requirements will step up.

City of Richmond

Report to Committee

To:	General Purposes Committee	**Date:**	November 29, 2019
From:	Peter Russell Director, Sustainability and District Energy	**File:**	10-6125-07-02/2019
Re:	**Community Energy and Emissions Plan 2020-2050 Directions**		

CARBON NEUTRAL ENERGY FOR NEW BUILDINGS *Major Move for 2020-2030*

DIRECTION 3

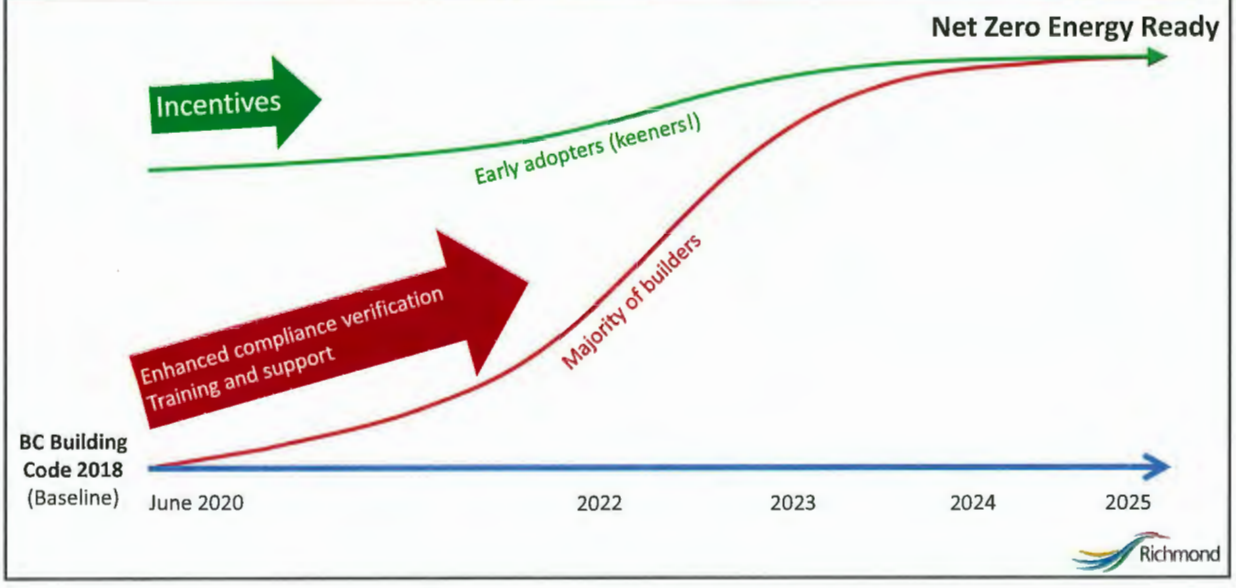
All new building applications will meet the applicable (for building type) top performance level of the BC Energy Step Code starting in 2025, and be powered by low carbon energy systems (in-building or district energy).

Carbon Reduction Impact by 2030:

- ✓ Achieve 80% low-carbon energy supply for heating and cooling district-energy-connected buildings in Richmond.
- ✓ All new buildings completed after 2025 (not connected to district energy) will consume 50% less energy and emit two-thirds less greenhouse gases than new buildings built in 2017.

Richmond

Richmond's direction | All Step Code buildings



Richmond

Part 3 Archetypes

- Mid-Rise MURB
- High-Rise MURB
- Mid-Rise Mixed Use
- Commercial Office
- Commercial Retail / Mercantile
- Hotel / Motel (December 2018)

PATHWAY TO 2032: **PART 3 (WOOD-FRAME RESIDENTIAL)**

NOTE: To be replaced with similar slide for concrete frame

Part 3 Building Metrics

- Thermal Energy Demand Intensity (TEDI)
- Total Energy Use Intensity (TEUI)
- Air leakage rate, in L/(s.m2) @75 Pa Pressure Differential

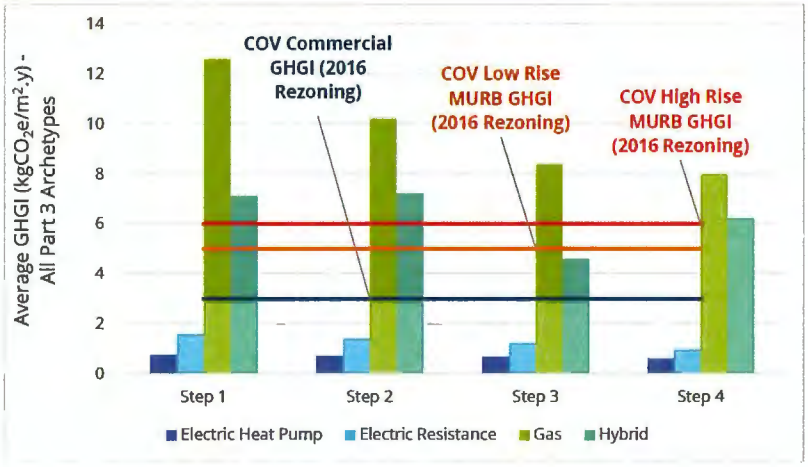
GHGI Targets

Greenhouse Gas Intensity (GHGI)

- ✓ Visible progress toward municipal and provincial carbon reduction targets
- ✓ Helps reduce number of buildings requiring costly retrofits to meet future targets

Solution: Incent building-scale or district-scale Low-Carbon Energy Systems (LCES)

Emission Intensities | All Part 3 Archetypes

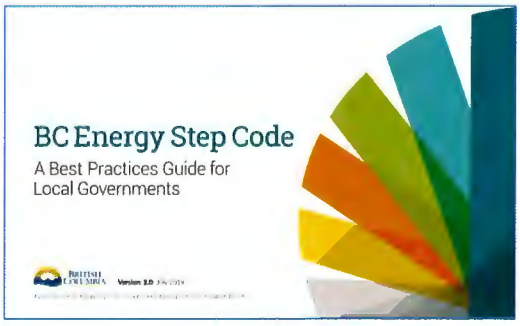


Graph Source: Integral Group. June 2019. *Implications of BC Energy Step Code on GHG Emissions*

Low Carbon Energy Systems provide lower GHG intensities, even at high thermal loads.

Low Carbon Energy Systems | Two Option Approach

- A two-option Energy Step Code framework offers builders choice, while encouraging lower emission development:
  - Option A: **Step X**
  - [or]
  - Option B: **Step (X – n) with a LCES**
- This two-option approach is already used for **Part 3** construction in **Richmond, Burnaby, Surrey, Vancouver, New Westminster, Port Moody and UBC.**
- Included in the *Best Practices Guide for Local Governments v.2*



"Offering industry a relaxation clause that will also reach climate objectives"

Energy Step Code schedule in Official Community Plan

Bylaw 9771
2018/07/16

Building Type	Building Permit Application *Estimated Timetable for Future Consideration*			
Smaller Part 9 Residential	**September 1, 2018**	**January 2020**	**January 2022**	**January 2025**
Townhomes and Apartments	Step 3	Same as 2018	Step 4	Step 4 or Step 5
Single Family, Duplex and Other Residential	Step 1	Step 3	Step 3 or Step 4	Step 4 or Step 5
Larger Part 3 Developments				
Residential Concrete Towers	Step 3 or Step 2 for buildings with low carbon energy system	Same as 2018	Step 3	Step 4
Residential Woodframe Low/Mid-Rise	Step 3	Same as 2018	Step 4	Step 4
Office & Retail Buildings	Step 2	Same as 2018	Step 3	Step 3

Richmond

Low Carbon Energy Systems | Definition for Part 3

- **LCES**: A professionally operated or maintained on-site energy system supplying a minimum of 70-75% of the building's annual heating, cooling, and domestic hot water demand.

  Examples include, electrical air source heat pump or variable refrigerant flow, geo-exchange, in-building sewer heat recovery, biomass, solar, or other system approved by the City.
- **Step Code relaxation** applies to buildings implementing an on-site Low-Carbon Energy System, or connecting to a district energy system (for buildings within a DE service area).

Richmond

Hotels and Motels

[Table 10.2.2.3.-H; Dec.'19]

Step	Building energy model	Airtightness Requirement		Building Equipment and Systems	Building Envelope
		Airtightness Test	Performance Requirement	Total Energy Use Intensity (TEUI) *kWh/m²·year*	thermal energy demand intensity (TEDI) *kWh/m²·year*
1	✓	✓	report score	Conform to Part 8 of NECB	Conform to Part 8 of NECB
2	✓	✓	report score	≤ 170	≤ 30
3	✓	✓	report score	≤ 140	≤ 20
4	✓	✓	report score	≤ 120	≤ 15

Part 3: "Other Residential Occupancies"

[Table 10.2.2.3.-H; Dec.'19]

Step	Building energy model	Airtightness Requirement		Building Equipment and Systems	Building Envelope
		Airtightness Test	Performance Requirement	Total Energy Use Intensity (TEUI) *kWh/m²·year*	thermal energy demand intensity (TEDI) *kWh/m²·year*
1	✓	✓	report score	Conform to Part 8 of NECB	Conform to Part 8 of NECB
2	✓	✓	report score	**≤ 130**	**≤ 45**
3	✓	✓	report score	**≤ 120**	**≤ 30**
4	✓	✓	report score	**≤ 100**	**≤ 15**

Hotels and Motels

[Table 10.2.2.3.-H; Dec.'19]

Step	Building energy model	Airtightness Requirement		Building Equipment and Systems	Building Envelope
		Airtightness Test	Performance Requirement	Total Energy Use Intensity (TEUI) *kWh/m²·year*	thermal energy demand intensity (TEDI) *kWh/m²·year*
1	✓	✓	report score	Conform to Part 8 of NECB	Conform to Part 8 of NECB
2	✓	✓	report score	≤ 170 (+31%)	≤ 30 (67%)
3	✓	✓	report score	≤ 140 (+17%)	≤ 20 (67%)
4	✓	✓	report score	≤ 120 (+20%)	≤ 15 (same)

Hotels: Energy Step Code requirements in Metro Vancouver

Richmond's proposed new hotel Energy Step Code requirement:

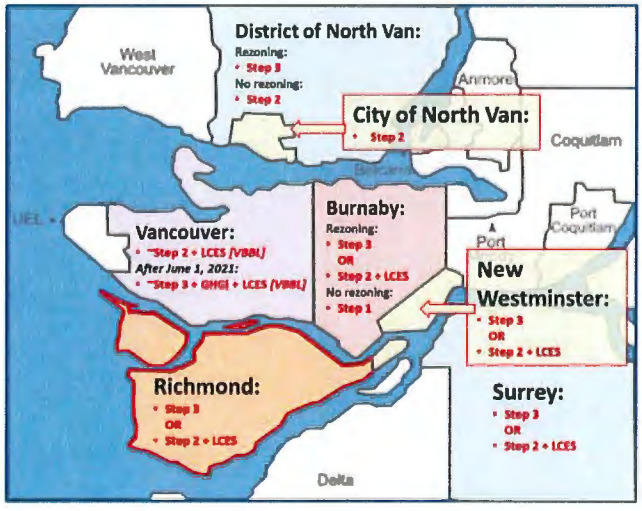
- **Step 3**
  OR
- **Step 2 + LCES**

Is aligned with:

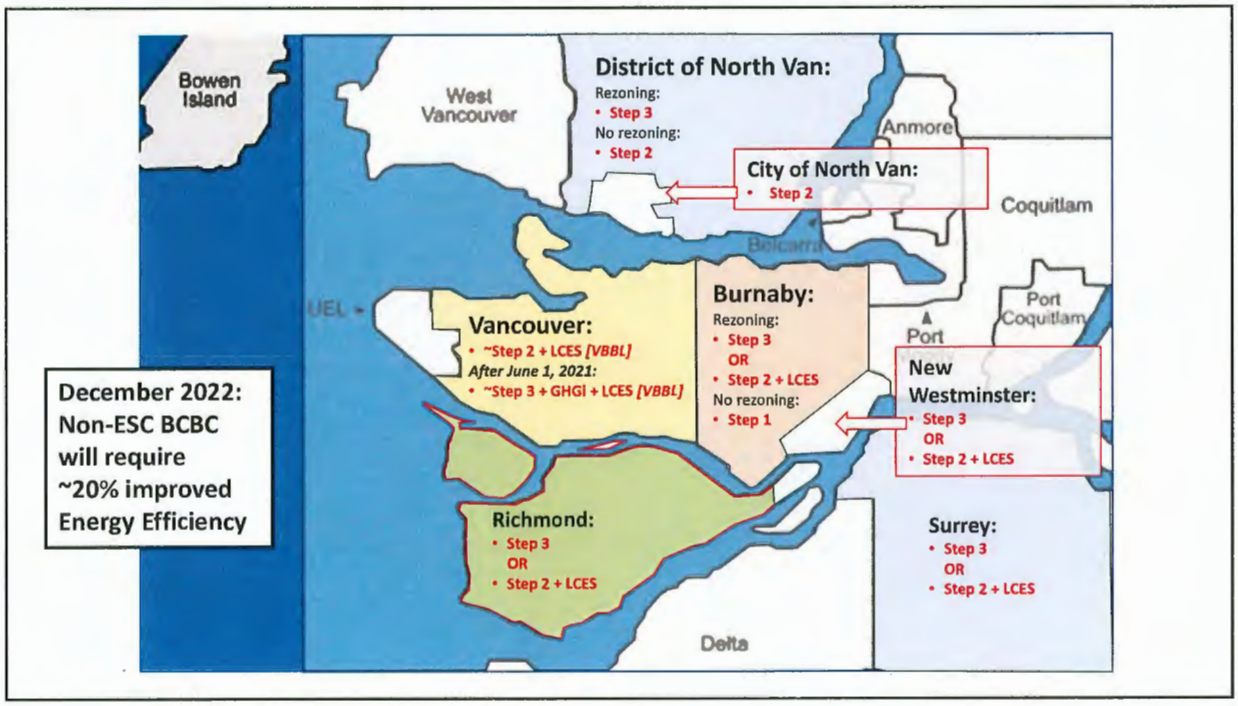
- Surrey
- New Westminster
- Burnaby *(w/ rezoning)*

... and less stringent than:

- Vancouver (after June 1, 2021)
- District of North Van (w/ rezoning)



Note: *2022 BCBC: ~20% gain in energy efficiency for all new construction*



Proposed Two-Option Step Code Framework for Hotels (performance requirements and timing)

	September 2020	January 2022	January 2025	City Staff Proposal Options
A	Step 3	Step 3	Step 4	• *Step Code framework similar to other Metro Vancouver muni's*
	OR	*OR*	*OR*	
	Step 2 + LCES	Step 2 + LCES	Step 3 + LCES	
B	Step 2	Step 3	Step 4	• *Step Code framework referencing relaxation to Step 1 (2020-2021)*
	OR	*OR*	*OR*	
	Step 1 + LCES	Step 2 + LCES	Step 3 + LCES	

Richmond

NEW! Part 3 Energy Design Report

Voluntary **Excel-based tool** that can be used by energy modellers and design professionals as a checklist and submitted to local government authorities to verify compliance.

Development of the Design Report funded by **City of Richmond** and **BC Hydro**.

Gives industry and local authorities a consistent way to gather and review energy performance characteristics of **Part 3 Step Code buildings** at both pre-construction and as-built stages, tailored to the energy performance characteristics of larger buildings.

When to use the report

Used at any of the development review stages for larger buildings:

- Pre-Application or Application
- Rezoning Application
- Development Permit
- Building Permit
- Occupancy

Richmond

NEW! Part 3 Energy Design Report

Application

For buildings containing major occupancies complying with Subsection 10.2.3. of the BC Building Code. Intended to capture requirements of Articles 2.2.2.1 and 2.2.9.2 of Division C of the Code, as well as local government Bylaw requirements for energy use and emissions reductions in buildings. Portions of the building that are subject to Subsection 10.2.2.1.(1)(a) or (b) of Division B of the BC Building Code should also be included in this modelling report.

Learn to use the report *July webinar dates to be announced soon!*

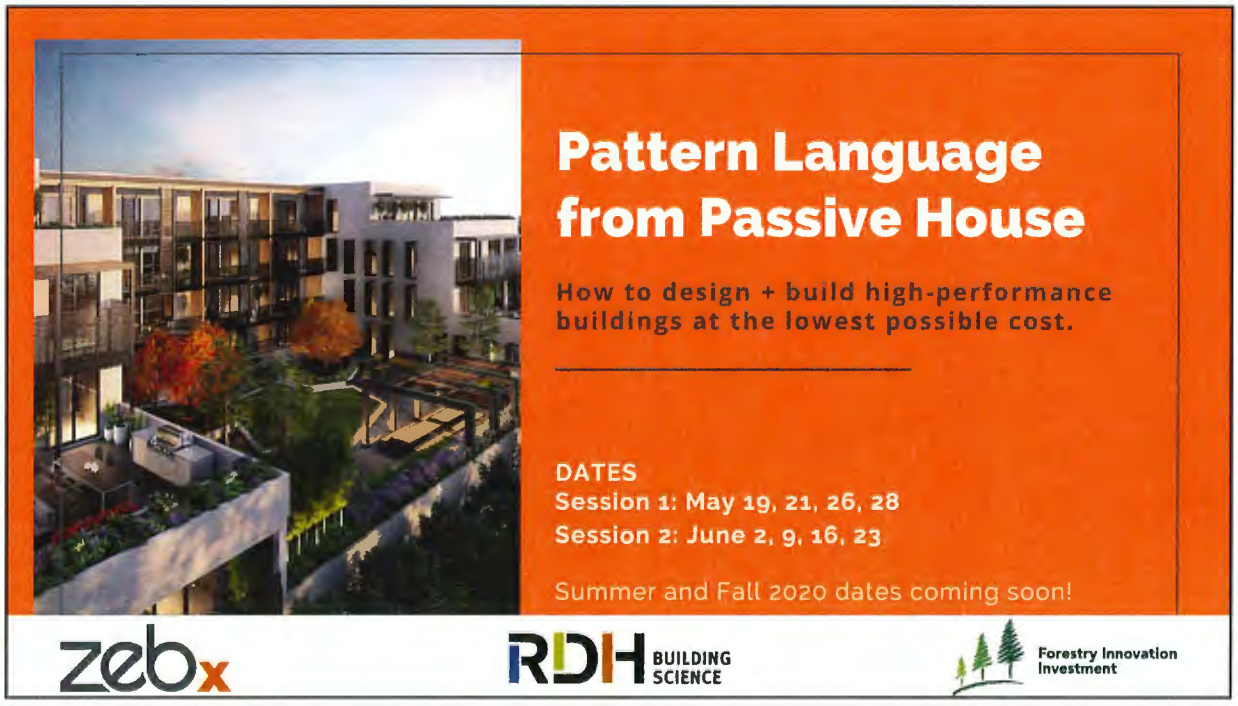
The Building and Safety Standards Branch is offering free webinars on this report:

Webinar #1 For **building energy modellers**. It will summarize the features of the checklist and how to complete it.

Webinar #2 For **local government staff**. It will summarize how to review the completed checklist to confirm that modelled energy and/or emissions performance has been met, and how to review the completed checklist for purposes of compliance.

Richmond


zebx
In partnership with:
BC Hydro
Power smart
Canada Green Building Council
PASSIVEHOUSE CANADA
MOVING ONLINE FOR JUNE!
Decarb Lunch Series
CO_2
Lessons Learned from Three Local Multi-Family Heat Pump Retrofit Projects
June 26, 2020 | 12:00pm - 1:00pm | FREE WEBINAR


Pattern Language from Passive House
How to design + build high-performance buildings at the lowest possible cost.
DATES
Session 1: May 19, 21, 26, 28
Session 2: June 2, 9, 16, 23
Summer and Fall 2020 dates coming soon!
zebx
RDH BUILDING SCIENCE
Forestry Innovation Investment

Provision for In-Stream Development Permits

Staff propose that Part 3 Hotels and Motel buildings, and Part 9 buildings currently required to build to Step 1 (e.g. duplexes), be permitted to build to the prior energy efficiency requirements if they are well advanced within the Development Permit process at the time the new Step Code requirements come into force. Specifically, to be eligible for this exemption, a proposed new development requiring a Development Permit, would have to meet the following conditions:

a) If a Development Permit has been issued prior to December 15, 2020, the owner may, while their Development Permit remains valid, apply for a Building Permit in compliance with the energy efficiency requirements applicable prior to the adoption of Amendment Bylaw No. 10205; or

b) If an acceptable Development Permit application has been submitted to the City prior to adoption of Amendment Bylaw No. 10205, it must be considered and endorsed by the Development Permit Panel and have a complete building permit application acceptable to the City submitted prior to December 15, 2021. The Building Permit application must include architectural drawings showing envelope details and schedule of mechanical systems in compliance with Part 10 (Step Code section) of the BC Building Code (BCBC).

URBAN DEVELOPMENT INSTITUTE – PACIFIC REGION
#1100 – 1050 West Pender Street
Vancouver, British Columbia V6E 3S7 Canada
T. 604.669.9585 F. 604.689.8691
www.udi.bc.ca

August 13, 2020

Nicholas Heap
Sustainability Project Manager
City of Richmond
6911 No. 3 Road
Richmond BC V6Y 2C1

Norm Connolly
Community Energy Manager
City of Richmond
6911 No. 3 Road
Richmond BC V6Y 2C1

Dear Mr. Heap and Mr. Connolly:

Re: Proposed Energy Step Code Implementation for New Hotel Developments

The Urban Development Institute (UDI) would like to thank Richmond Staff for meeting virtually with representatives from building and hotel sectors to discuss proposals to implement the *BC Energy Step Code (ESC)* for new hotel development in Richmond. The *ESC* is important to us, as our organization was one of the original participants in its development, and we continue to sit on the BC Energy Step Council. We see the *ESC* as a positive vehicle to meet the 2032 energy efficiency targets established by senior governments in a consistent and flexible way across multiple jurisdictions that allows builders to adapt to new approaches in construction.

We would like to commend staff for their work on the development of this policy and their dedicated outreach to local builders, in-particular those with in-stream applications. Although hotel development is not a primary focus for many of our members, we would like to offer some general comments on the proposed policy and Richmond's broader *ESC* framework.

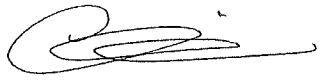
UDI continues to support the two-option framework through which, builders in many areas can choose to build to a higher step or a lower step with a low carbon energy system (LCES), as it provides additional flexibility for builders. However, as we have expressed in the past, we are concerned with the City's continued requirement for builders to design and construct a District Energy-ready LCES in the City Centre area, to be provided to the Lulu Island Energy Company with no compensation. This is an added cost for builders, at a time when the economy is transitioning into a recovery phase.

By requiring that LCES systems be provided to the City, it prevents the builder from pursuing other cost recovery mechanisms, including allowing other energy provider, such as Corix or FortisBC, to purchase the system. Homebuyers and tenants are paying much more for their units to be have their energy costs regulated by the City – as opposed to the BC Utilities Commission.

As we noted in the discussion in the July 22nd webinar, the grandfathering period for in-stream applications is relatively short. It was acknowledged that the time for a new application to reach the Development Permit Panel stage will most likely exceed the 6-month in-stream protection proposed in the policy. To provide increased certainty to applicants we would suggest that staff consider extending the grandfathering period to ensure that applications that are already underway can proceed without the need redesign projects, contributing to costly delays. Our members purchase land and make financial commitments early in the development process. Adjustments become increasingly difficult to make at later stages.

We thank staff again for meeting with builders regarding these proposals, and ask that you consider our recommendations as part of the ongoing work on this policy. We look forward to working with Richmond on this and other initiatives.

Sincerely,



Anne McMullin
President and CEO, Urban Development Institute

City of Richmond

Bylaw 10205

Building Regulation Bylaw No. 7230, Amendment Bylaw No. 10205 (Energy Step Code requirements for new Part 9 Residential and Part 3 Hotel buildings)

The Council of the City of Richmond, in open meeting assembled, enacts as follows:

1. *Building Regulation Bylaw No. 7230*, as amended, is further amended by replacing the schedule in Section 10.1.1 with the following schedule:

Buildings subject to Part 9 of the Building Code		
Building Type	**Building permit** application filed on or after September 1, 2018	**Building permit** application filed on or after December 15, 2020
Townhomes and **apartments**	Step 3	Step 3 OR Step 2 for **buildings** that implement a **low carbon building energy system.**
Single family, **duplex** and other **dwelling units**	Step 1	

Buildings subject to Part 3 of the Building Code		
Building Type	**Building permit** application filed on or after September 1, 2018	**Building permit** application filed on or after December 15, 2020
Hotels and Motels	n.a.	Step 3 OR Step 2 for **buildings** that implement a **low carbon building energy system.**
Other Group C Residential occupancies greater than 6 stories or **non-combustible construction** (not including hotel and motel occupancies)	Step 3 OR Step 2 for **buildings** that implement a **low carbon building energy system.**	
Other Group C Residential occupancies 6 stories or less and **combustible construction** (not including hotel and motel occupancies)	Step 3	
Group D Business and personal services occupancies or **Group E mercantile occupancies**	Step 2	

2. *Building Regulation Bylaw No. 7230*, as amended, is further amended at Section 16.1 by adding the following definitions in alphabetical order:

CARBON DIOXIDE EQUIVALENT	has the meaning given to that term in the *Greenhouse Gas Industrial Reporting and Control Act*, **[SBC 2014] Chapter 29**.
CONDITIONED SPACE	has the meaning given to that term in the **Building Code**.

HOTEL	has the meaning given to that term in the **Richmond Zoning Bylaw No. 8500.**
MOTEL	has the meaning given to that term in the **Richmond Zoning Bylaw No. 8500.**
OTHER GROUP C RESIDENTIAL OCCUPANCY	has the meaning given to that term in the **Building Code.**
LOW CARBON BUILDING ENERGY SYSTEM	means: a) for **buildings** subject to Part 3 of the **Building Code**, a **building**'s space heating, cooling and domestic hot water heating mechanical system that is supplied energy through: i) a connection to a district energy utility system owned by the **City** or a corporate subsidiary of the **City**; or (ii) on-site energy supply equipment designed to meet a minimum 70% of the **building**'s annual heating, cooling and domestic hot water energy demand from a renewable energy source, approved by the **City**'s General Manager of Engineering and Public Works. Applicable renewable energy source technologies include, but are not limited to, air and ground source heat pump systems, waste heat recovery systems, solar collectors, or other systems as approved by the **City**'s General Manager of Engineering and Public Works. The **building**'s energy system must be designed and constructed such that it is ready to connect to a future district energy utility system owned by the **City** or a corporate subsidiary of the **City.** For sites outside district energy utility service areas and the City Centre Area (as defined in Bylaw No. 9000, Official Community Plan), the City's General Manager of Engineering and Public Works may exempt the building's energy system from the requirement to be ready to connect to a future district energy utility system.

b) for **buildings** subject to Part 9 of the **Building Code**, a **building**'s space heating, cooling and domestic hot water heating mechanical system that in combination meets the following performance requirement:

i) less than 1.2 tonnes of carbon dioxide equivalent emissions per building per year; or

ii) 6 kg or less of carbon dioxide equivalent emissions per square metre of conditioned space per year.

3. This Bylaw may be cited as **"Building Regulation Bylaw No. 7230, Amendment Bylaw No. 10205".**

FIRST READING	_____	CITY OF RICHMOND
SECOND READING	_____	APPROVED by
THIRD READING	_____	APPROVED by Manager or Solicitor BRB
ADOPTED	_____	

_____ _____

MAYOR CORPORATE OFFICER

6506222