Energy Step Code

Implementation Strategy for **Part 3** Buildings

February 2021

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Executive Summary

The BC Energy Step Code (Step Code) is a provincial standard, designed to help both local government and industry incrementally move toward a future in which all new construction across the province is "net-zero energy ready" by 2032. Through the CleanBC Strategy, the Province has set the direction for future iterations of the BC Building Code to require Step Code compliance through a step by step path so that, compared to current base BC Building Code, new homes will be:

- 20 per cent more energy efficient by 2022 (approximately Step 2 for all Part 3 buildings)[1]
- 40 per cent more energy efficient by 2027 (approximately Step 3 for Part 3 residential buildings; Step 2 for commercial buildings)
- 80 per cent more energy efficient by 2032 (approximately Step 4 for Part 3 residential buildings; Step 3 for commercial buildings).[2]

The City of Kelowna (the City) has taken a proactive approach to Step Code adoption in order to:

(1) Support Provincial CleanBC efforts towards net-zero energy buildings;
(2) Prepare the local building industry for proposed Building Code changes in late-2022; and
(3) Drive climate action in the community.

For Part 9 residential buildings (three stories or less and less than 600 m^2), the City adopted Step 1 as of December 1, 2019 and will be moving to Step 3 on June 1, 2021. The authority for local governments outside of Climate Zone 4 (the Lower Mainland and southern Vancouver Island) to reference Step Code for larger Part 3 buildings (greater than three stories and greater than 600 m^2) only became available more recently.

Since mid-2019, the City has been engaging and developing a Step Code Implementation Strategy for Part 3 buildings as outlined in this document. The City engaged with affected stakeholders between September 2019 and December 2020 through a series of meetings, information offerings, targeted training opportunities, and a Solutions Lab. The proposed strategy takes into consideration input from stakeholder engagement and best practices from other local governments.

Due to the COVID-19 pandemic, moving forward on implementing Step Code for Part 3 buildings was put on hold in March 2020 to gauge impacts to the local development community. As such, the proposed timelines have been adjusted to account for economic recovery from the COVID-19 pandemic, while also ensuring industry stakeholders are prepared for Provincial Step Code requirements slated for late-2022.

The strategy seeks to provide a balance of building industry capacity while reaching the community's goals for energy and greenhouse gas emissions reduction. The timeline allows industry to prepare for the Building Code changes, to catch up to many communities in Climate Zone 4 who have already implemented Step Code for Part 3 buildings, and to show leadership in early adoption in the BC Interior. The proposed timelines are shown below.

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[1] Typically Building Code revisions occur later in the year. So, it is anticipated that the Province would require the change near the end of 2022.

[2] Province of BC, 2018. CleanBC our nature. our power. our future. https://cleanbc.gov.bc.ca/app/uploads/sites/436/2018/12/CleanBC_Full_Report.pdf

STEP CODE ADOPTION TIMELINE FOR PART 3 BUILDINGS

Phase I: Voluntary Adoption*

Present – December 31, 2021

- Voluntary to build to Step Code.
- Development permit applications received after June 1, 2021 will need to demonstrate compliance with Step Code.
- The City to offer training to staff and industry.
- Develop and implement a revitalization tax exemption for highest steps.

Phase 2: Higher Energy Efficiency

January 1, 2022 - TBD

- Building permit applications will need to demonstrate compliance with mid- to upper-steps, depending on building archetype**:
  - Group C - Single detached residential occupancy: **Step 4**
  - Group C - multi-unit residential occupancy of combustible construction (including hotels and motels): **Step 3**
  - Group C - multi-unit residential occupancy of non-combustible construction: **Step 2**
  - Group D - business and personal service occupancy OR Group E - mercantile occupancy: **Step 2**
- The applicant must create an Energy Star Portfolio Manager profile of the building prior to occupancy.
- Revised resources and training from the City to support higher steps.

LATE 2022 - PROVINCE REQUIRES BUILDINGS TO BE 20% MORE ENERGY EFFICIENT***

** Development Permits issued prior to June 1, 2021 may apply for a Building Permit to construct in compliance with the energy efficiency requirements applicable prior to the adoption of Step Code for the duration of the time that their Development Permit is valid, but before the Province making Step Code requirements mandatory (expected late-2022).*

*** Step Code will not apply to buildings with the following major occupancies: assembly (e.g., schools, libraries, colleges, recreation centres), treatment (e.g., hospitals), and care (care centre).*

**** The Province has indicated through CleanBC that, compared to the current base BC Building Code, new buildings will be 20 per cent more energy efficient by late-2022. This equates to roughly Step 2 for Part 3 buildings.*

Introduction

The federal Pan-Canadian Framework on Clean Growth and Climate Change was developed to meet Canada's emissions reduction targets, grow the economy, and build resilience to a changing climate. The plan outlines targets to make new buildings more energy efficient with a goal of provincial and territorial building codes achieving "net-zero energy ready[3]" model building codes by 2030[4].

The BC Energy Step Code ("Step Code") is a provincial standard, designed to achieve the goals set out in the Pan-Canadian Framework, to help both local government and industry incrementally move toward a future in which all new construction across the province is "net-zero energy ready" by 2032. A variety of stakeholders were involved in its development, including the Urban Development Institute (UDI), Canadian Home Builders Association (CHBA), BC Hydro, FortisBC, Architectural Institute of BC, Engineers and Geoscientists BC, BC Housing, the Local Government Management Association, as well as a number of local governments.

The Step Code is currently a voluntary compliance path within the BC Building Code to support market transformation from the current prescriptive energy efficiency requirements to performance requirements for a buildings envelope, equipment and systems, and airtightness. The Step Code also offers local governments a simple and effective set of standards to support their energy conservation and greenhouse gas (GHG) emissions reduction goals. Local governments currently have the option of mandating a specific step within their region.

The Step Code consists of two broad sets of energy standards that cover:

- "Part 9" buildings – three (3) stories and less, and not exceeding 600 m^2 in building area. (The City developed and implemented a strategy which saw Step 1 adopted as of December 1, 2019 moving to Step 3 on June 1, 2021.)
- "Part 3" buildings – large and/or complex buildings such as large multi-family and commercial buildings exceeding three (3) stories and exceeding 600 m^2. (addressed in this report)

The Province's CleanBC Plan outlines actions to reduce GHG emissions from all sectors while building the economy. It sets the direction for future iterations of the BC Building Code to require Step Code compliance through a step by step path so that, compared to current base BC Building Code, new homes will be:

- 20 per cent more energy efficient by 2022 (approximately Step 2 for all Part 3 buildings)[5]
- 40 per cent more energy efficient by 2027 (approximately Step 3 for Part 3 residential buildings; Step 2 for commercial buildings)

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[3] A net-zero energy ready building is designed and built to reduce energy needs to a minimum such that with the inclusion of on-site renewable energy systems, the building can produce as much energy as it consumes on a yearly basis.

[4] Government of Canada. Pan-Canadian Framework on Clean Growth and Climate Change. https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/climate-change-plan.html

[5] Typically Building Code revisions occur later in the year. So, it is anticipated that the Province would require the change at the end of 2022.

- 80 per cent more energy efficient by 2032 (approximately Step 4 for Part 3 residential buildings; Step 3 for commercial buildings)[6]

To ensure industry readiness for the proposed Building Code changes and to advance climate action, the City of Kelowna (the City) has taken a proactive approach to Step Code adoption. For Part 9 Buildings, the City developed and implemented a strategy which saw Step 1 adopted as of December 1, 2019 (see Attachment A for more details on the Part 9 Implementation Strategy) moving to Step 3 on June 1, 2021. This document summarizes the City's Step Code Implementation Strategy for Part 3 buildings.

Energy Step Code: From Prescriptive to Performance

The Step Code marks an end to the prescriptive approach. Instead, a building's performance must be proven, demonstrated through whole-building energy modelling and on-site testing to validate how the design, and the constructed building, meet the performance targets associated with each 'Step'. A "performance" approach is inherently flexible, as it simply establishes a performance target and leaves it to the building team to decide how to meet the target in the most efficient and cost-effective manner. The efficiency requirements of the Step Code vary between climate zones[7]. Kelowna is in Climate Zone 5.

For Part 3 buildings, there are four steps for wood-frame and concrete residential buildings, and three steps for commercial buildings, each representing a higher level of performance (Figure 1).

[6] Province of BC, 2018. CleanBC our nature. our power. our future. https://cleanbc.gov.bc.ca/app/uploads/sites/436/2018/12/CleanBC_Full_Report.pdf

[7] The climate zones are based on an average annual temperature indicator called a heating-degree day (HDD). The higher the HDD value, the colder the location. In BC there are six climate zones (4, 5, 6, 7A, 7B, and 8) (Figure 2).

FIGURE 1: ENERGY STEP CODE 'STEPS'

The Step Code forms a framework by which the construction industry can, over time, "step up" the performance of their buildings to the net-zero energy ready level that the Province requires by 2032.[8]

How Local Governments can use the Energy Step Code

Local governments can choose to require or incentivize builders to meet one or more steps of the Step Code, as an alternative to the compliance paths set out in the base BC Building Code.

For Part 3 buildings, local governments outside of Climate Zone 4 (i.e., the Lower Mainland and southern Vancouver Island) have only been permitted to reference Step Code as of early 2019. This is because performance metrics had not yet been established for other climate zones in BC outside of Climate Zone 4. Kelowna sits in Climate Zone 5 (Figure 2); thus, the ability to reference Step Code for Part 3 buildings is relatively recent compared to Part 9 buildings.

As outlined in Attachment B, many communities in Climate Zone 4 have already adopted Step Code for Part 3 buildings, and communities across the rest of BC are beginning to set Part 3 requirements. Local governments in the Okanagan are investigating adopting strategies for Part 3 buildings and this is being discussed as part of the Okanagan Energy Step Code Local Government Peer Network.

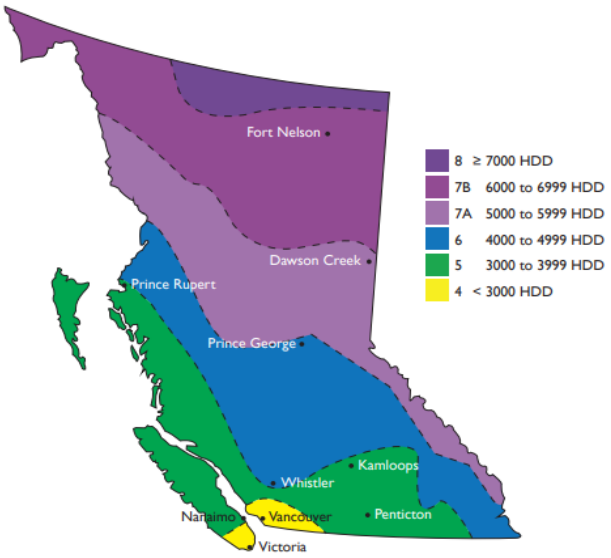

FIGURE 2: CLIMATE ZONES IN BC, DEFINED BY THE # OF HEATING DEGREE DAYS (HDD) IN ONE YEAR

[8] Province of BC, 2017. BC Energy Step Code: A Best Practices Guide for Local Governments. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/construction-industry/building-codes-and-standards/guides/bcenergystepcode_guide_v1.pdf

Part 3 Energy Step Code Strategy

Kelowna's Official Community Plan (OCP) has a goal of improving energy efficiency and performance of buildings.[9] The OCP targets an 80 per cent reduction in community greenhouse gas emissions by 2050 (below 2007 levels). Actions to achieve these goals are outlined in Kelowna's Community Climate Action Plan[10], including actions to implement Step Code to reduce GHG emissions and energy use in new buildings. The Healthy Housing Strategy[11] also recommends the implementation of Step Code to help improve affordability, as improvements to energy efficiency can help reduce household operating costs.

Building Permit Impact

Currently, there are approximately 1,100 residential and 580 commercial Part 3 buildings in Kelowna. On the residential side, this includes approximately 130 single-family dwellings that are classified as Part 3 buildings, since they are greater than 600 m^2. Between 2015 and 2019, there was an average of 44 Part 3 building permits issued annually in the city. This includes an average of 1,167 residential units annually. As the City promotes urban densification, Part 3 buildings are expected to make up a growing share of the local building stock.

It is estimated that by 2040, 30 per cent of all the residential units in the community (including units in large multi-unit residential buildings) will have been constructed since 2018, providing an opportunity to include energy efficiency and lower GHG emissions as part of this new construction. While estimates are more difficult for the commercial sector, it is expected that new construction in this sector will continue to expand along with projected population growth for Kelowna; therefore, there is equal opportunity in the commercial sector.

Stakeholder Consultation

On September 18th, 2019, Staff facilitated an Energy Step Code Solutions Lab for Part 3 buildings. The intent of the Solutions Lab was to gather a diverse group of representatives from the building industry (e.g., energy modelers, professional architects and designers, professional engineers, builders, tradespeople, developers, etc.) to gather feedback on an implementation timeline for Part 3 buildings that seeks to reduce energy and GHG emissions while building industry capacity in advance of the Province requiring buildings to be 20 per cent more energy efficient by 2022. Thirty participants were chosen from over fifty applicants ensuring a variety of building industry representation with differing perspectives.

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[9] City of Kelowna. 2011. Kelowna 2030 – Official Community Plan: Chapter 6 – Environment. Retrieved from: https://apps.kelowna.ca/CityPage/Docs/PDFs/Bylaws/Official%20Community%20Plan%202030%20Bylaw%20No.%2010500/Chapter%2006%20-%20Environment.pdf.

[10] City of Kelowna. 2018. Our Kelowna as we take action: Kelowna's Community Climate Action Plan. Retrieved from: https://www.kelowna.ca/sites/files/1/docs/community/community_climate_action_plan_june_2018_final.pdf.

[11] City of Kelowna. 2018. Healthy Housing Strategy. Retrieved from: https://www.kelowna.ca/sites/files/1/docs/logos/healthy_housing_strategy_final_reduced_size.pdf.

Working together in diverse groups, participants developed options for implementation between now and when the Province requires buildings to be 20 per cent more energy efficient than base Code at the end of 2022. The proposed implementation timelines for each of the three Part 3 building types (i.e., wood-frame residential buildings, concrete residential buildings, and commercial buildings) are shown in Figures 3 to 5. The key findings from the Solutions Lab are:

- The majority of proposed solutions recommended early adoption of Step 1 for all three building types (i.e., wood-frame residential, concrete residential, and commercial) (the green check marks).
- Only two of the five groups felt that there was a need to include Step 2 in the implementation process for wood-frame residential buildings (the orange check marks). However, the majority of groups believed Step 2 should be required either in 2021 or 2022 for concrete residential buildings and commercial buildings.
- The majority of groups believed Step 3 should be required either in 2021 or 2022 for wood-frame residential buildings. However only one group thought Step 3 should be required for concrete buildings prior to the Provincial requirements, and no groups thought Step 3 should be required for commercial buildings prior to the Provincial requirements.

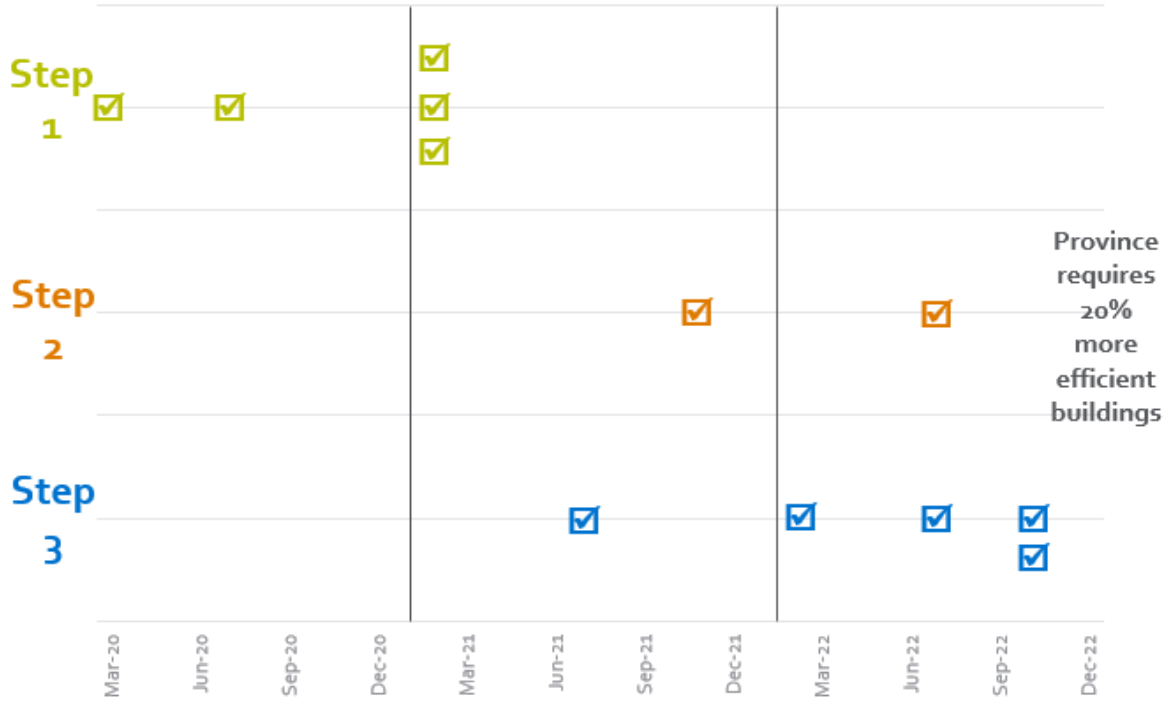


FIGURE 3: PROPOSED STEP CODE ADOPTION TIMELINES FOR PART 3 WOOD-FRAME RESIDENTIAL BUILDINGS

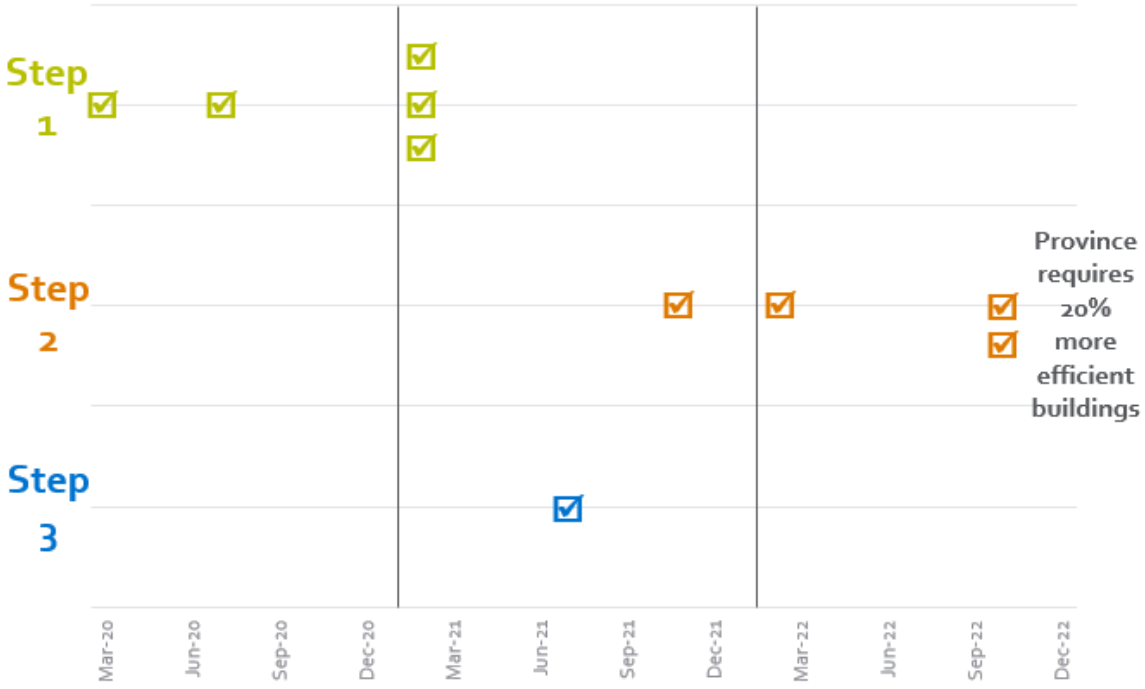


FIGURE 4: PROPOSED STEP CODE ADOPTION TIMELINES FOR PART 3 CONCRETE RESIDENTIAL BUILDINGS

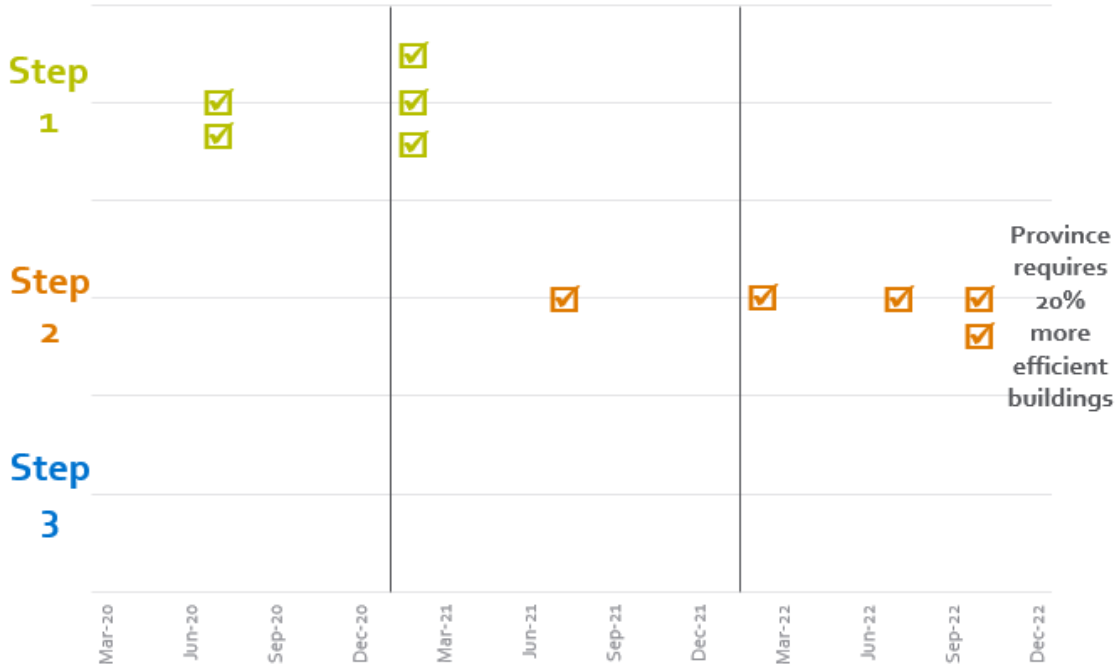


FIGURE 5: PROPOSED STEP CODE ADOPTION TIMELINES FOR PART 3 COMMERCIAL BUILDINGS

A complete summary of the Solutions Lab is provided in Attachment C.

The City also engaged in other external stakeholder engagement, including the following:

- Meetings with relevant stakeholders to get input on Step Code for Part 3 buildings (e.g., Roundtable Architects quarterly meetings, Canadian Home Builders Association of Central Okanagan)
- Presentations at local Step Code events (e.g., Okanagan Construction Industry Conference, Building Net-Zero: Constructing Affordable Step Code Homes in the Okanagan, BCIT Lab in a Box Airtightness and Assembly Details, Built Green Canada Kelowna Workshop)
- Regular updates through the Step Code e-subscribe list (863 subscribers as of January 18, 2021)
- Participation on the Province's Local Government Energy Step Code Peer Network quarterly meetings.
- A review of best practices from other BC communities, and conversations with several communities.
- Circulated the draft Step Code Implementation Strategy for external comments on December 3, 2020. The recipient list included:
    - Step Code e-subscribers
    - Urban Development Institute (UDI)
    - Canadian Home Builders Association of Central Okanagan (CHBA-CO)
    - City's Roundtable Architects list (24 listed architects)
    - Okanagan Local Government Step Code Peer Network (local government representatives from nine neighbouring local governments and First Nation communities)
    - Participants of the Step Code Solutions Lab hosted on September 18, 2019

  (NOTE: No letters of comment were received from any of the recipients.)

Addressing Concerns

The engagement process included a discussion regarding concerns for Step Code implementation. These concerns were carefully considered and informed the Implementation Strategy and recommended timeline for Part 3 adoption presented in this report.

1. **Lack of industry skills**

   To support the transition to Step Code, the City will support training and resources in partnership with other organizations, so the building industry is well-equipped to incrementally meet higher energy efficiency targets. For example, the City offered a full-day Step Code Industry Workshop in May 2018, and partnered with BCIT, the Community Energy Association, and FortisBC to offer airtightness training in 2019 and 2020. Additionally, CHBA-CO regularly hosts workshops focused on various Step Code related topics (e.g., working with an energy advisor, high performance windows, airtightness). While many of these events were focused on Part 9 Buildings, the content can be catered to a Part 3 audience.

   In addition to training, the City will create bulletins and checklists for the building industry so they can easily understand the submission requirements for the Step they need to construct to. Further, resources are also available on the Province's online Step Code hub, energystepcode.ca, including, BC

Housing's *BC Energy Step Code Design Guide* illustrative guide that summarize design and building techniques to help meet Step Code for Part 3 buildings.

2. **Impacts affordability**

Staff have reviewed the findings of several costing studies for cost increases associated with building to the lower steps.

BC Housing - *Metrics Research Full Report Update (2018)*[12]

This report modelled the lowest increases in costs over constructing to the base building code for six different Part 3 archetypes in each Climate Zone: high-rise multi-unit residential building (MURB), low-rise MURB, hotel, commercial office, other commercial, and retail. In summary, all buildings modelled were able to achieve Step 1 with no construction cost increase, and Step 3 for less than a 2.4 per cent increase to construction costs. Table 1 shows the modelled cost increases to achieve each applicable step for six different Part 3 archetypes.

TABLE 1: MODELLED COST INCREASE TO ACHIEVE STEP CODE - BC HOUSING METRICS REPORT UPDATE

	Archetype					
	High-Rise MURB	**Low-Rise MURB**	**Hotel**	**Commercial Office**	**Other Commercial**	**Retail (e.g., Big Box)**
Step 1	0.0	0.0	0.0	0.0	0.0	0.0
Step 2	1.0	0.5	-0.1	-0.1	-0.1	1.3
Step 3	2.3	2.2	1.2	0.2	0.2	3.7
Step 4	3.2	3.3	2.1	NA	NA	NA

Morrison Hershfield – *BC Energy Step Code Costing Studies Analysis (2019)*[13]

This report examines 10 studies of the construction cost implications of the Step Code for both Part 9 and Part 3 buildings. A review of the 10 studies found that, not all studies optimized the building design for the lowest capital cost to comply with Step Code requirements, consequently yielding different costing results.

Because several of the costing studies were completed for specific municipalities (e.g., Surrey, Vancouver, and Richmond), the results may not be directly applicable to the Kelowna context. However, insights can be gleaned illustrating the increasing building costs for each step. Based on the cost estimates compiled, many of the studies show an incremental capital cost (ICC) to build to Step 1 in the order of 0.0 per cent to 1.5 per cent and on the order of 3 per cent to 10 per cent for Step 4 (for all Part 9 and Part 3 building types in Climate Zones 4 and 5).

[12] BC Housing. 2018. 2018 Metrics Research Full Report Update. http://energystepcode.ca/app/uploads/sites/257/2018/09/2018-Metrics_Research_Report_Update_2018-09-18.pdf.

[13] Morrison Hershfield. 2019. *BC Energy Step Code Costing Studies Analysis*. http://energystepcode.ca/app/uploads/sites/257/2018/09/2018-Metrics_Research_Report_Update_2018-09-18.pdf.

The data for Part 3 buildings suggest more of an escalating rate of increase from one step to the next (see Figure 6). Applicable costing studies for Part 3 buildings showed the following ICC increases:

- Step 1: 0.0 – 0.1 per cent
- Step 2: -0.2 – 1.2 per cent
- Step 3: 0.0 – 4.0 per cent
- Step 4: 1.3 – 10.0 per cent

The high end of the above ICC's is generated from the City of Surrey's Step Code Costing Study. This data is considered an outlier because it produces significantly higher ICC's for Step's 3 and 4 compared to the other costing studies.

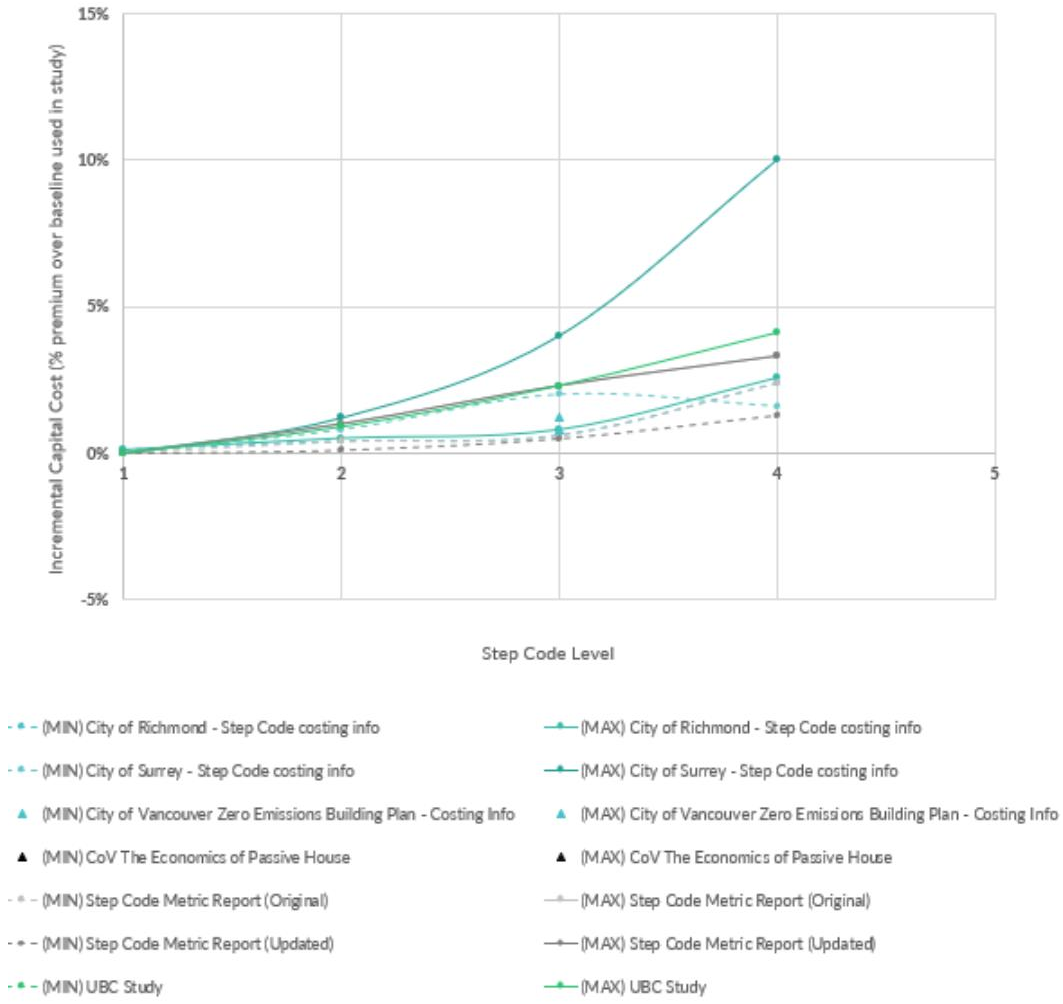


FIGURE 6: INCREMENTAL CAPITAL COST FOR PART 3 BUILDINGS (CLIMATE ZONES 4 & 5)[14]

[14] Morrison Hershfield. 2019. *BC Energy Step Code Costing Studies Analysis*. http://energystepcode.ca/app/uploads/sites/257/2018/09/2018-Metrics_Research_Report_Update_2018-09-18.pdf.

While the various costing studies show some variability in the approaches and costs to construction of more efficient Part 3 buildings, by adopting Step Code, long term affordability is bolstered by providing lower operating costs and protecting tenants/homeowners from rising utility costs (as outlined in Kelowna's Healthy Housing Strategy).

To help off-set any added costs of building to the Step Code, FortisBC's Commercial New Construction Program offers Step Code rebates up to $500,000, depending on the Step being pursued and the indoor floor area (i.e., square feet).[15] Incentives range between $1.00/sq. ft. for Step 2 and $2.20/sq. ft. for Step 4. FortisBC also offers energy model rebates (50 per cent of the cost of the energy model to a maximum of $15,000) and airtightness testing rebates (for both mid-construction and post-construction tests, 75 per cent of the cost of the airtightness test, to a maximum of $5,000 per test).

3. **Insufficient Energy Modeler Capacity**

Energy modelling for Part 3 buildings is different than for Part 9 buildings. Whereas Certified Energy Advisors (CEAs), typically registered with Natural Resources Canada and using the EnerGuide rating system, conduct the modelling for Part 9 residential buildings, Registered Professional Engineers typically conduct or sign-off on the modelling for Part 3 buildings. During Step Code consultation for Part 9 buildings, the availability of CEAs was a major concern because it was a relatively new profession with limited market demand prior to Step Code. Energy modeling for Part 3 buildings, on the other hand, is already an established discipline and many of the larger engineering firms have an energy modeler on staff. Locally, there are at least three energy modelers based in Kelowna, and some of the engineering consulting firms with a local office house energy modelers in their larger offices in Vancouver, Victoria, or Calgary. Because of the limited amount of Part 3 building permits in Kelowna compared to Part 9 residential buildings (i.e., 40-50 annually compared to 700-800) and the fact that most energy modelling services can be conducted remotely, energy modeler capacity is not expected to be a major hurdle when Step Code for Part 3 buildings is implemented in Kelowna.

4. **Will slow down building permit processing times**

Much of the energy modelling required as part of the Step Code is done during the design phase and will be completed before the building permit application (see Attachment D for submission requirements). Furthermore, the City will provide the necessary resources (e.g., bulletin with submission requirements, Part 3 Energy Design Report) to make the reporting requirements straightforward. The City will also offer training and resources to internal staff to ensure the application process is seamless. The addition of the Community Energy Specialist position in 2018[16] ensures that the necessary processes are in place and questions by industry and staff can be answered.

[15] https://www.fortisbc.com/rebates/business/commercial-new-construction-performance-incentives.
[16] The Community Energy Specialist Position is currently funded through a grant from FortisBC until July 2023.

5. **Lack of clarity on airtightness requirements for larger buildings**
   While airtightness testing is a Step Code requirement for Part 3 buildings, there are no airtightness performance targets for these archetypes (e.g., number of air changes per hour @ 50 pascals). While the City acknowledges that airtightness testing may be more challenging for Part 3 buildings than Part 9 buildings, airtightness testing is a valuable quantitative quality control tool allowing the building industry to learn over time what measures result in an airtight building. Further, financial incentives from FortisBC can help alleviate some of the cost concerns. Section 10.2.3.5 (Building Envelope Airtightness Testing) of the 2018 BC Building Code outlines the Step Code requirements for airtightness testing.

6. **The relationship between Step Code and building design/architecture**
   Some stakeholders expressed concern that Step Code (in particular the higher steps) would place constraints on designers/architects that would result in less attractive buildings. For example, high performance buildings from an energy perspective typically require low window-to-wall ratios and simplified massing. While design adjustments may be required as higher steps are required, there are already many examples of building designs from other communities that are both visually attractive and energy efficient. To support the design community, BC Housing published the *BC Energy Step Code Design Guide*, and a new High-Performance section of the City's 2040 Official Community Plan's Form & Character Guidelines provides design strategies to help achieve Step Code.

7. **The relationship between Step Code and GHG emissions reduction**
   While the Step Code represents a significant achievement in the regulation of building performance, its focus on the use of energy efficiency metrics has raised the question as to whether it is effective in reducing GHG emissions from the built environment. In 2019, Integral Group commissioned a study *Implications of the BC Energy Step Code on GHG Emissions*[17] and found that, although Step Code will reduce GHG emissions, its focus on energy efficiency does not guarantee the level of GHG emissions reductions necessary to drive emissions to zero or near-zero levels, as is the intent through CleanBC. Building designers can pursue mechanical system options that result in significantly different GHG intensity's (GHGi) (i.e., GHGs / area). While the study only modelled GHG emissions impacts for building archetypes in Climate Zone 4, the general findings of the study are likely to be similar for other climate zones in BC.

   Integral Group recommended a variety of ways to decrease GHG emissions in new buildings. While most of these recommendations focus on how the Province could mandate change (e.g., include GHG emissions targets in the Step Code, or improve efficiency standards for space and water heating equipment), only one focuses on actions local government can take: using financial and other incentives as a means of encouraging the adoption of low-carbon energy systems (LCES). One form

[17] Integral Group. 2019. *Implications of the BC Energy Step Code on GHG Emissions*. Prepared for the Building and Safety Standards Branch, Ministry of Municipal Affairs and Housing. http://energystepcode.ca/app/uploads/sites/257/2019/11/BC-Step-Code-GHGI-Report_Nov-2019.pdf.

of non-financial incentive is to encourage the use of LCESs in return for lower thresholds for energy performance (i.e., a low carbon 'two-step' approach). Several local governments in the Lower Mainland (e.g., City of Surrey, City of Burnaby, City of Richmond) have adopted this two-step approach. While an LCES option is not part of this initial strategy, the Province is exploring ways to incorporate GHG emission reductions in Step Code, and the City will look to incorporate progressive GHG emissions reduction policy once options become available.

Recommended Energy Step Code Implementation for Part 3 Buildings

The proposed Step Code Implementation Strategy for Part 3 buildings supports Kelowna's commitment to climate action as outlined in the Community Climate Action Plan and increasing energy efficiency and reducing utility costs in new builds to reduce household carrying costs as outlined in the Healthy Housing Strategy.

Due to the COVID-19 pandemic, moving forward on implementing a Step Code strategy for Part 3 buildings was put on hold in March 2020 to gauge impacts to the local development community. The proposed timelines have been adjusted to account for uncertainty from the COVID-19 pandemic, while also ensuring industry stakeholders are prepared for Provincial Step Code requirements slated for late-2022.

The strategy consists of two phases:

- **Phase 1: Voluntary Adoption and Capacity Building (present – December 31, 2021):** To help build awareness of Step Code requirements (e.g., adoption timelines, submission requirements, general knowledge of Step Code, metrics, testing requirements, etc.) for both industry and staff, it is valuable to have **a period of voluntary adoption prior to Step Code being mandatory for Part 3 buildings**. Learning from the implementation of Step Code for Part 9 residential buildings, allowing for several months of capacity building between Council endorsement of the strategy and any mandatory requirements can help make the transition easier and facilitate industry buy-in. During this phase, the City will be active in partnering to offer industry training and will develop standard processes with staff to ensure Step Code considerations are incorporated into development permit and building permit applications.

  Building permit applications that use the Step Code pathway during this phase will be accepted and encouraged. While financial incentives will not be offered by the City to encourage voluntary adoption, applicants will be connected with FortisBC's Commercial New Construction Program that offers up to $500,000 in incentives, as well as energy model and airtightness testing rebates.

  To incentivize Downtown development and high performance building, Part 3 developments in the City's Downtown Tax Incentive Area 2 may be eligible for a ten-year 100 per cent revitalization amount for projects of 40,000 sq. ft. or greater where they achieve the highest level of the Step Code (Step 4 - wood-frame residential; Step 4 - concrete residential; and Step 3 - commercial). Subject to Revitalization Tax Exemption (RTE) Program Bylaw 9561 being updated, this RTE will likely be available in the latter half of 2021.

Understanding that most of the development applications received in the latter half of 2021 will not apply for a building permit or begin construction until 2022 or later, development permit applications received after June 1, 2021 will need to demonstrate compliance with Energy Step Code requirements in Phase 2.

- **Phase 2: Higher Energy Efficiency Requirements in advance of proposed Building Code changes in 2022 (January 1, 2022):** Feedback from the Solutions Lab indicates there were differing views on when either Step 2 or 3 should be implemented, and this varied depending on archetype. However, most of the proposed solutions indicate Step 2 or 3 should be required in advance of proposed provincial Building Code changes in 2022.

  The following Steps are proposed for January 1, 2022, based on major occupancy and archetype:
  - Group C:
    - Non-combustible (concrete) multi-unit residential: Step 2
    - Combustible (wood-frame) multi-unit residential: Step 3
    - Single-detached residential greater than 600 m^2: Step 4
  - Group D & E Commercial (business and personal service; mercantile): Step 2

  Mixed Use buildings (e.g., commercial at-grade with residential above) should follow the energy modelling guidelines outlined in Section 5.1 of the City of Vancouver's Energy Modelling Guidelines (V 2.0).

  Step Code performance targets have not been established for buildings with the following major occupancies: Group A - assembly (e.g., schools, libraries, colleges, recreation centres); Group B - treatment and detention (e.g., hospitals); Group B - care (care centre); and Group F - industrial. Therefore, Step Code will not apply to buildings with these major occupancies until the Province develops appropriate performance targets in the BC Building Code.

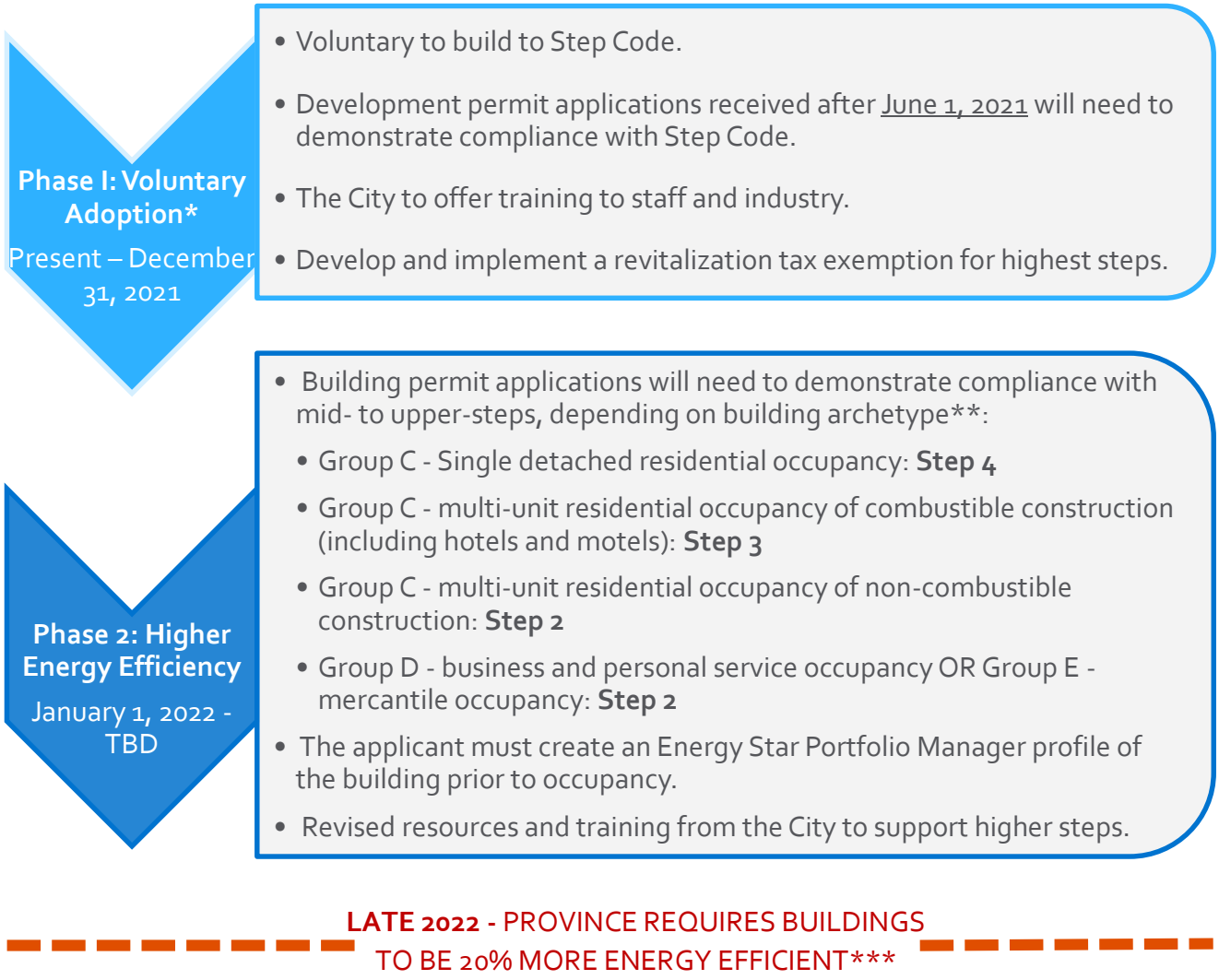
  This phase allows Kelowna to accelerate energy efficiency improvements and GHG emissions reduction, and ensures industry is prepared for the Provincial Building Code changes. Further, requiring Part 3 buildings to be at least 20 per cent more efficient in advance of the BC Building Code update allows the building community to focus on the other changes in the 2022 Code update. The City will continue to offer resources to industry and staff during this phase and will partner to offer high performance building training.

  A small number (~130) of larger single-family houses in Kelowna are considered under Part 3 of the BC Building Code. This results from a building footprint exceeding 600 square metres (i.e., 6,458 square feet). The recommendation is to adopt Step 4 for this archetype, the highest Step for Part 3 residential buildings.

  Although Solutions Lab participants generally supported Step 1 implementation prior to Steps 2 or 3, the unforeseen COVID-19 pandemic has delayed Step Code implementation for Part 3 buildings.

Therefore, with condensed timelines prior to the Province requiring Step Code at the end of 2022, a phase for Step 1 is not achievable. However, staff are confident that with adequate lead time with a voluntary phase and sufficient capacity building/awareness opportunities, industry will be able to achieve the lower-mid steps without any major issues.

The phased approach is summarized in Figure 7.



** Development Permits issued prior to June 1, 2021 may apply for a Building Permit to construct in compliance with the energy efficiency requirements applicable prior to the adoption of Step Code for the duration of the time that their Development Permit is valid, but before the Province making Step Code requirements mandatory (expected late-2022).*

*** Step Code will not apply to buildings with the following major occupancies: assembly (e.g., schools, libraries, colleges, recreation centres), treatment (e.g., hospitals), and care (care centre).*

**** The Province has indicated through CleanBC that, compared to the current base BC Building Code, new buildings will be 20 per cent more energy efficient by late-2022. This equates to roughly Step 2 for Part 3 buildings.*

FIGURE 7: STEP CODE ADOPTION TIMELINE FOR PART 3 BUILDINGS

This timeline seeks a balance between local and Provincial energy efficiency and GHG emissions reduction goals and provides industry adequate time to build the capacity necessary to achieve the Step Code targets. All projects will be monitored during implementation of the Step Code and will help to inform an appropriate adoption timeline for the Upper Steps beyond 2022.

To ensure Part 3 builders who build to the highest steps are not penalized for incorporating thicker walls, amendments to the Zoning Bylaw to allow a reduction of various setback requirements are also being investigated. Development Planning staff are leading a major Zoning Bylaw update throughout 2021; therefore, any "thick wall exclusion" policy will occur in coordination with this update.

Recommended Future Work

There are several additional and related pieces of work that staff recommend undertaking to continue improving energy efficiency of buildings in Kelowna.

Training and Education

To support industry and City staff through the Step Code transition, the City will partner with various organizations and stakeholders (e.g., CHBA-CO, FortisBC, UDI, UBCO, OC) to develop a training and education program that will extend through the two phases of the Implementation Strategy. This will include administrative training (e.g., Step Code process, City Building Permit submission requirements, etc.), hands-on/technical training, resources (e.g., technical documents, forms, website), and continuous updates (e.g., Step Code e-bulletins). Specific training opportunities and educational resources will be developed upon Council adoption of the Implementation Strategy. The City has an established Step Code e-subscribe list with over 850 followers, which provides an effective platform to reach a wide and interested industry network.

Energy Step Code Strategy after 2022

This strategy extends to at least the end of 2022, when the Province is expected to make updates to the BC Building Code that would require buildings to be 20 per cent more efficient than current base Code. It is recommended that the City re-evaluate the strategy in late 2022 or early 2023 to see if higher steps should be required, if GHG emissions requirements can be incorporated into the strategy, and if the RTE for the highest steps can be expanded beyond Downtown Tax Incentive Area 2. Through CleanBC, the Province has indicated that additional Building Code changes will occur in 2027, which will require buildings to be 40 per cent more efficient than current base Code. As such, a strategy to prepare for this timeline will be needed.

GHG Emissions Consideration in Step Code

Options to reduce GHG emissions using the Step Code framework (e.g., low-carbon energy systems) were not provided for the two adoption phases identified in this strategy. While the City recognizes that the LCES option is one way to use the Step Code framework to incentive/ prioritize GHG emissions reduction, instead of focusing strictly on energy efficiency, more research needs to be conducted to determine what GHG emissions reduction option would be suitable in the Kelowna market (e.g., co-efficient of metric performance, GHGi targets). The BC Local Government Energy Step Code Peer Network and the Province are currently

conducting research to determine if there are opportunities to align local governments' efforts on GHG emissions reduction through Step Code. Therefore, the City will stay informed on provincial policy development in this area and will look to incorporate progressive GHG emissions reduction policy once options are provided by the Province. The City will also consider policy options to address embodied carbon of new construction.

Energy Retrofit Strategy

Approximately three-quarters of the current housing stock in Kelowna was built prior to 2000.[18] Many of these residential buildings are reaching the age where major structural components will need to be replaced. This offers an excellent opportunity to increase energy efficiency through envelope and mechanical system upgrades. A Community Energy Retrofit Strategy that addresses energy efficiency in existing buildings is currently being developed.

[18] City of Kelowna, 2018. Our Kelowna As We Take Action: Kelowna's Community Climate Action Plan. https://www.kelowna.ca/sites/files/1/docs/community/community_climate_action_plan_june_2018_final.pdf

Attachment A: Summary of Part 9 Residential Step Code Strategy

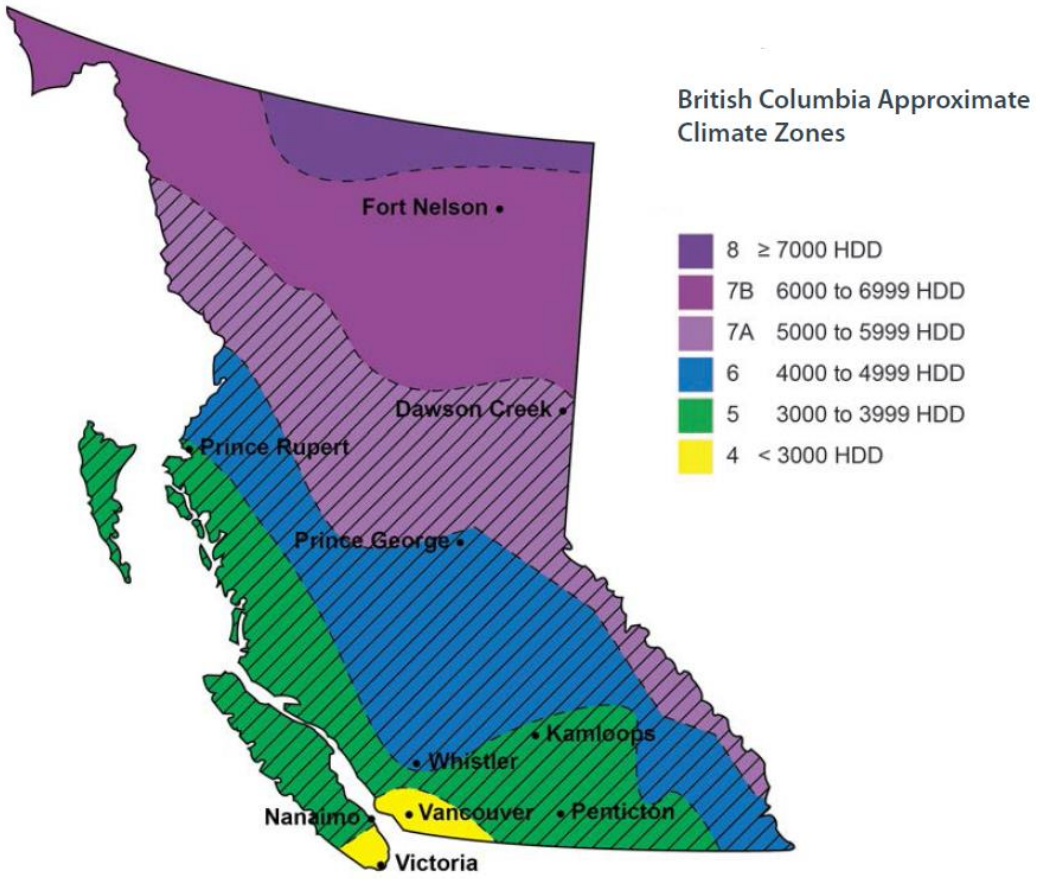
Training	Incentives
Prior to Step 1: Spring – November 30, 2019	
• City of Kelowna building officials training on Energy Step Code permitting process • Builders and trades training: Understanding the permitting process for Energy Step Code • Additional training opportunities being explored with the Energy Step Code Council, FortisBC, and Okanagan College.	• City of Kelowna Rebates*: ○ $500 building permit rebate for engaging an energy advisor for modelling, and final construction blower door test (maximum 10 rebates per builder). Mid-construction blower door tests as learning opportunity are encouraged, but not required. Incentive available until Nov. 30, 2019. ** ○ $500 building permit fee rebate to achieve Step 4 – available until May 31, 2021 ○ $1000 building permit fee rebate to achieve Step 5 or certified Passive House – available until May 31, 2021 • Fortis Rebates: ○ Energy advisor support - $500 ○ Builders achieving various steps are eligible for rebates in addition to energy advisor support: ▪ $1000 (Step 2), $2000 (Step 3), $4000 (Step 4) and $8000 (Step 5) • Zoning bylaw amendment for Step 5 / certified Passive House to relax setbacks as outlined in Attachment E.
Step 1 Implementation: December 1, 2019 to May 31, 2021	
• Staff/Council training on building form and character associated with upper steps, as part of design guideline discussion with OCP update • Additional training opportunities being explored with the Energy Step Code Council, FortisBC, and Okanagan College.	• City of Kelowna Rebates*: ○ $500 building permit fee rebate to achieve step 4 – available until May 31, 2021 ○ $1000 building permit fee rebate to achieve step 5 – available until May 31, 2021 • Fortis Rebates: ○ Energy advisor support - $500 ○ Builders achieving various steps are eligible for rebates in addition to energy advisor support: ▪ $1000 (Step 2), $2000 (Step 3), $4000 (Step 4) and $8000 (Step 5)
Step 3 Implementation: June 1, 2021 to December 2022	
• Training opportunities to be determined	• Fortis Rebates: ○ Builders achieving various steps are eligible for rebates in addition to energy advisor support: ▪ $2000 (Step 3), $4000 (Step 4) and $8000 (Step 5)
Province requiring buildings to be 20% more energy efficient: December 2022 – BC Building Code Update	

**A maximum of $75,000 is dedicated to all City of Kelowna rebates. If the maximum value of rebates is used prior to 2021, staff will review and investigate opportunities for new incentives.*

***The $500 rebate will be applied at time of building permit issuance. Occupancy will be granted on the condition of the builder completing the energy model, final construction blower door tests and associated compliance forms. There are no targets to be met as this is being provided as a learning opportunity for builders to begin working with an energy advisor and completing blower door tests on their buildings prior to Step 1 becoming mandatory.*

Attachment B: Local Governments Referencing Step Code for Part 3 Buildings as of November 2020

The tables below outline how local governments in different climate zones across BC (see map below) are putting the standard to work for Part 3 Buildings. It should be noted that some local governments are using a combination of both mandatory requirements and incentives to achieve a variety of steps.



Climate Zones in BC[19]

[19] Homeowner Protection Office – a Branch of BC Housing. 2014. Illustrated Guide - Energy Efficiency Requirements for Houses in British Columbia (Zones 5-7A North Vancouver Island and Interior). Retrieved from https://www.bchousing.org/research-centre/library/residential-design-construction/ig-energy-efficiency-houses-climate-zone-5-7a&sortType=sortByDate.

Municipality	Implementation Date and Steps Required	LCES Option?	Other Comments
Climate Zone 4 (Lower Mainland and Southern Vancouver Island)			
City of Burnaby	February 11, 2019 • Step 1 (i.e., energy modelling and airtightness testing): July 1, 2019 • Step 2: Projects seeking rezoning with a low-carbon energy system (LCES) • Step 3: Projects seeking rezoning without an LCES	Yes	For new construction projects seeking rezoning, they can achieve a lower step (i.e., Step 2) if they agree to install an LCES. The LCES must achieve a GHGI of 6 kg/m²/y, which should result in a 70 per cent reduction in GHG compared to the base BCBC if Step 2 is achieved. Burnaby recognizes that Energy Step Code requirements don't directly address GHG emissions reductions because it allows for any mix of fuel systems for heating and cooling. The LCES option for rezoning is one way to overcome this, and they recognize that a GHGi requirement could be updated and applied more broadly in the future.
City of New Westminster	January 1, 2020 • Step 3: all Part 3 archetypes with no LCES • Step 2: all Part 3 archetypes with an LCES	Yes	Currently, the City is not accepting applications under the LCES option until additional policy development is complete.

City of North Vancouver	December 15, 2017
	• Step 1:
	  ○ Part 3 residential buildings
	  ○ Part 3 commercial buildings
	
	July 1, 2018
	• Step 1: Part 3 commercial
	• Step 2: Part 3 residential buildings
		No	As of January 1, 2018, for rezoning (i.e., when additional density or land use changes are requested by an applicant), Step 3 is required for Part 3 residential buildings, and Step 2 is required for Part 3 commercial buildings.

City of Port Moody	January 1, 2020
	• Step 1:
	  ○ Part 3 office, retail, and hotel
	  ○ Part 3 residential buildings with an LCES
	• Step 2: Part 3 residential buildings
	
	January 1, 2021
	• Step 2:
	  ○ Part 3 office, retail, and hotel
	  ○ Part 3 residential buildings with an LCES
	• Step 3:
	  ○ Part 3 residential buildings
		Yes	

City of Richmond	September 1, 2018
	• Step 2:
	  ○ Residential greater than 6 stories or non-combustible construction with a LCES
	  ○ Businesses and personal services
	  ○ Mercantile occupancies
	• Step 3:
	  ○ Residential greater than 6 stories or non-combustible construction
	  ○ Residential 6 stories or less with combustible construction
		Yes	Residential occupancies (over 6 stories) and non-combustible construction (e.g., concrete), projects may be constructed to Step 2 instead of Step 3 if they include a LCES.
			
			Timetable for future consideration:
			• Residential concrete towers:
			  ○ January 2022: Step 3
			  ○ January 2025: Step 4
			• Residential Low/Mid-Rise:
			  ○ January 2022: Step 4
			  ○ January 2025: Step 4
			• Office & Retail Buildings:
			  ○ January 2022: Step 3
			  ○ January 2025: Step 3

City of Surrey	April 1, 2019
	• Step 2:
	  ○ Commercial office and mercantile
	  ○ Large wood frame or concrete residential connected to Surrey City Energy or satisfies LCES requirements.
	• Step 3:
	  ○ Large wood frame residential apartments
	  ○ Large concrete residential apartments
		Yes	Both large wood and concrete residential buildings need only to meet Step 2 if they are connected to Surrey City Energy (a district energy system) or satisfies low-carbon energy requirements.

City of Victoria	November 1, 2018
	• Step 1: All Part 3
	
	January 1, 2020:
	• Step 2:
	  ○ High-rise/concrete residential buildings and commercial buildings
	• Step 3:
	  ○ Mid-rise wood-frame residential buildings
		No	

District of North Saanich	January 1, 2019 • Step 1 for all buildings January 1, 2020 • Step 3 for all buildings	No	
District of North Vancouver	July 1, 2018 • Step 3: Part 3 residential if rezoning is required • Step 2: Part 3 residential	No	

	• Step 1: Part 3 commercial		
District of Oak Bay	November 1, 2018 • Step 1: Any Part 3 Building January 1, 2020 • Step 2: Any Part 3 Building	No	
District of Saanich	June 1, 2019 • Step 1: Any Part 3 Building Jan 1, 2020 • Step 3: mid-rise/wood-frame residential • Step 2: concrete high-rise residential • Step 2: commercial	No	

District of Squamish	July 1, 2018
	• Step 3:
	  ○ Part 3 wood-frame residential buildings
	  ○ Part 3 concrete residential buildings with rezoning application
	• Step 2:
	  ○ Part 3 concrete residential buildings
	  ○ Part 3 commercial buildings
		No	

District of West Vancouver	July 1, 2018
	• Step 2:
	  ○ Part 3 multi-unit residential
	• Step 1:
	  ○ Part 3 commercial
		No	Some single-family homes in West Vancouver are considered Part 3 (i.e., building height over three storeys and/or a building footprint exceeding 600 square metres (6,458 square feet). The highest step applies to these homes.

Township of Langley	January 1, 2019 • Step 2: Residential buildings located within a DPA • Step 1: Residential buildings NOT located within a DPA • Step Code is not required for other (non-residential) building types at this time.	No	Several areas in the Township have already been designated Development Permit Areas (DPAs) for energy conservation and reduction of greenhouse gas (GHG) emissions. The adoption of the Step Code will provide performance-based targets for the construction of new residential buildings to provide a clear and consistent methodology to achieve compliance with the DPA guideline items related to the building itself. Some of the guideline items in these DPAs though address energy conservation and GHG reduction strategies that extend beyond the building itself to the design of the site parameters and, therefore, would not be addressed by the Step Code.
Town of Gibsons	January 1, 2021	No	

	• Step 1: all Part 3 and Part 9 buildings		
University of British Columbia	September 27, 2018 • Step 2: Part 3 residential buildings	No	The UBC Residential Environmental Assessment Program (REAP) is UBC's green building rating system and REAP gold certification is required in UBC's neighbourhoods. Step Code is only one component of REAP.
Village of Belcarra	September 27, 2018 • Step 2: Part 3 buildings	No	
Climate Zone 5 (South-Central Interior, Central and Northern Vancouver Island, Sunshine Coast, Northwest Coast)			
City of Courtenay	April 6, 2020 • Step 2: all Part 3 archetypes	No	
City of Nelson	January 1, 2021 • Council is considering requiring Step 2 for Part 3 building archetypes	No	
District of Peachland	September 23, 2020 • Step 1 for Part 3 buildings	No	

Attachment C: Part 3 Solutions Lab Summary

Introduction

Furthering the conversation on Energy Step Code Implementation for Part 3 buildings in Kelowna, the City hosted an Energy Step Code Solutions Lab on September 18, 2019. The intent of the Solutions Lab was to gather a diverse group of representatives from the building industry to discuss options for implementation of the Energy Step Code for Part 3 buildings in Kelowna.

As part of their CleanBC Plan, the Province is committed to require buildings to be 20 per cent more energy efficient by 2022 when compared to the current base BC Building Code. Building on the input already provided, the City wanted to gather additional feedback on an implementation timeline that seeks to reduce energy and GHG emissions while building industry capacity.

Participants

An invitation to apply to participate in the Energy Step Code Solutions Lab was distributed through the following channels:

- City of Kelowna's Energy Step Code e-subscribe
- CHBA-Central Okanagan membership
- UDI Okanagan membership
- City of Kelowna' Architects Roundtable network
- FortisBC network
- Community Energy Association network
- University of British Columbia Okanagan network
- Okanagan College network
- Notification to local engineering firms with energy modeling services

As part of the process, applicants were asked what segment of the building industry they were from, their experience with energy efficient construction, and their initial thoughts about implementing Energy Step Code for Part 3 buildings early in Kelowna or aligning with the Provincial timeline for 20 per cent more efficient buildings by 2022.

Thirty participants were chosen from over 50 applicants, ensuring a variety of building industry representation with differing views on the Energy Step Code. Participants included four CHBA-CO board members and three UDI Okanagan board members. The composition of the participants included the following:

- 4 builders
- 4 developers
- 3 trades
- 8 architects / designers
- 6 energy modelers / energy advisors
- 2 engineers
- 2 academia
- 1 not-for-profit

Please note that participants may have backgrounds in more than one category, but for this purpose were grouped according to primary area.

Methods

Prior to developing solutions, presentations were provided to ensure that all participants had the same information on Energy Step Code including Provincial timelines, current incentives, and consultation to date. The three presentations were as follows:

1. The Provincial Energy Step Code, Province of BC
2. Incentives to build to the steps – FortisBC's Commercial New Construction Program, FortisBC
3. Energy Step Code in Kelowna, City of Kelowna

Participants were grouped in five tables ensuring a variety of building industry representation (such as builders, contractors, developers, trades, architects, designers, and energy modelers) with differing views on Energy Step Code. Tables were tasked to:

"Work together to create a solution that incorporates reducing energy use while building industry capacity between now and 2022"

The solutions that participants came up with were to address three items:

1. What are some of the biggest challenges with the implementation of the Energy Step Code for Part 3 buildings?
2. How can Kelowna's Part 3 building industry be best prepared for the implementation of the Energy Step Code (e.g., education, training, tools, etc.)?
3. What is the best adoption timeline for implementation for Steps 1 to 3 (as it is recommended that local governments outside of the lower mainland only mandate the lower steps and incentivize the upper steps? It should be noted that not all steps needed to be included in the implementation timeline and it was up to each table to determine when and if a Step should be required.

The sections that follow summarize the input that was received. The five Proposed Implementation Solutions at the end of this section provide a photo representation of all the timelines proposed.

Results

Challenges

The responses for "what are some of the biggest challenges with the implementation of the Energy Step Code for Part 3 Buildings" generally fit into six categories:

- **Process**
  - Lack of clarity on airtightness requirements for larger buildings
  - Lack of Industry coordination
- **Costs**
  - Added costs to client
  - Added turnaround times for applications
- **Capacity**
  - Industry knowledge and capacity
  - Municipal staff knowledge and capacity
  - Availability of energy modellers
- **Technical Gaps**
  - Part 3 complexity
  - Building overheating and cooling loads

    - High ventilation requirements in large buildings
    - High window to wall ratio in high rises
    - Cooling passive measures
    - Packaged terminal air-conditioners and Step Code relationship
    - Thermal comfort in very tight/low TEDI buildings
- **Quality Assurance**
    - Monitoring difference between modelled and actual performance
- **Step Code Gaps**
    - Does not address GHG emissions

Solutions

Most of the solutions identified involves some form of **education and awareness** to help industry (and City staff) with the transition and address the 'Capacity' challenge:

- **Training:**
    - Education for energy modelling consultants
    - Client education of process
    - Client education of new requirements
    - Blower-door test training
    - Have trades attend PassiveHouse course to increase capacity for quality control for airtightness
    - Interactive seminar (e.g., go through an example project)
    - City staff training on how to review energy model documents

- **Educational Resources:**
    - Publicly available baseline tests
    - Acceptable solutions documents from the city for trickier details
    - Clear guidelines (no grey areas)
    - FortisBC share actual TEUI for Kelowna customers
    - Archetype models for each step
    - Building design solutions to meet challenges
    - Standardized checklists
    - Case studies from real projects

Several **communication** solutions were also proposed to address Step Code process challenges:

- Municipal intervention with energy modeling professionals
- Managing client expectations
- Cohesive design meetings
- Coordination between project stakeholders
- Understanding design implications
- Early analysis
- Engage building occupants (for buy-in and behaviour change)

- Consolidated regional approach

A few of the groups identified various forms of **incentives** to help make the transition easier and to reward Step Code adoption:

- Incentives for airtightness
- Incentives (permit costs, relaxations, DCC credits, revitalization tax exemptions)
- Recognition/certification of builders

Several groups considered **ways that Step Code Gaps could be addressed**:

- Include GHGi targets as metrics
- Stipulate low carbon energy system
- Carbon and economic costing
- Lifecycle costing
- Cooling reduction technology

Several groups suggested **ways the City could ensure successful implementation**:

- Enforce but not too heavy on the hammer to begin with
- Incremental approach to implementing

Implementation Timeline

Working together in diverse groups, participants developed options for implementation between now and when the Province requires buildings to be 20 per cent more energy efficient than base Code in 2022. The proposed implementation timelines for each of the three Part 3 building types (i.e., wood-frame residential buildings, concrete residential buildings, and commercial buildings) are shown in Figures 1-3. The key findings from the Solutions Lab are:

- The majority of proposed solutions recommended early adoption of Step 1 for all three building types (i.e., wood-frame residential, concrete residential, and commercial) (the green check marks). (NOTE: this Solutions Lab occurred before the COVID-19 pandemic; therefore, the proposed timelines do not reflect eventual delays in 2020.)
- Only two of the five groups felt that there was a need to include Step 2 in the implementation process for wood-frame residential buildings (the orange check marks). However, the majority of groups believed Step 2 should be required either in 2021 or 2022 for concrete residential buildings and commercial buildings.
- The majority of groups believed Step 3 should be required either in 2021 or 2022 for wood-frame residential buildings. However only one group thought Step 3 should be required for concrete buildings prior to the Provincial requirements, and no groups thought Step 3 should be required for commercial buildings prior to the Provincial requirements.

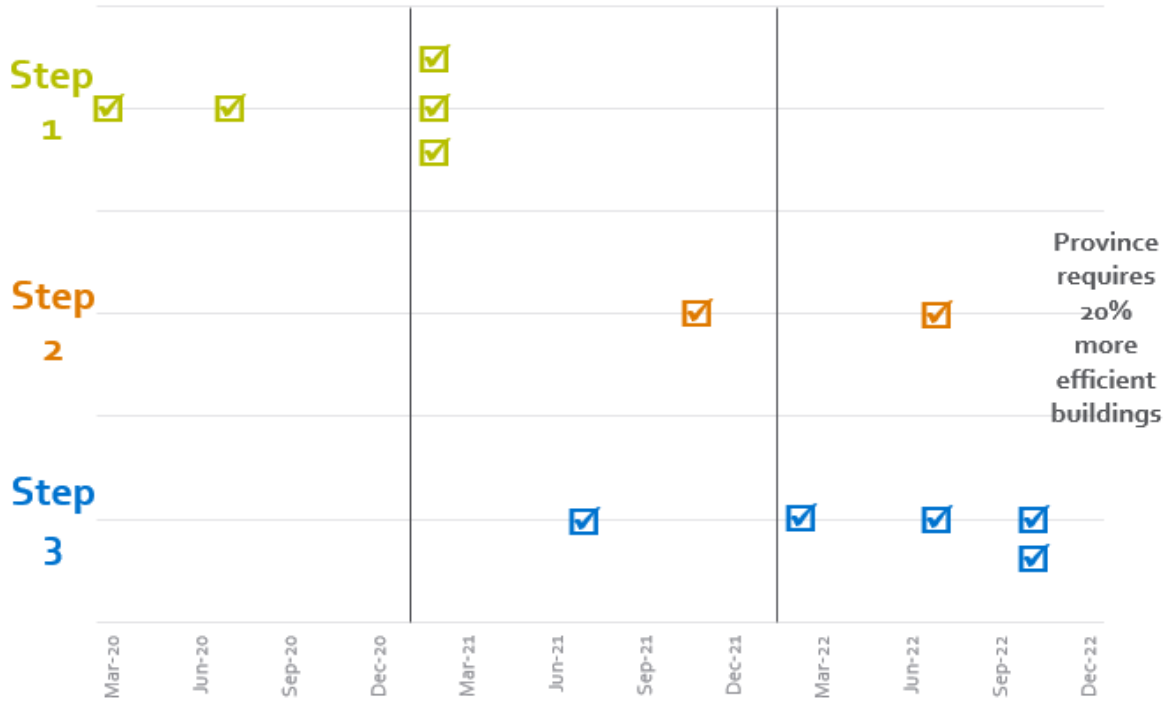


FIGURE 1: PROPOSED STEP CODE ADOPTION TIMELINES FOR PART 3 WOOD-FRAME RESIDENTIAL BUILDINGS

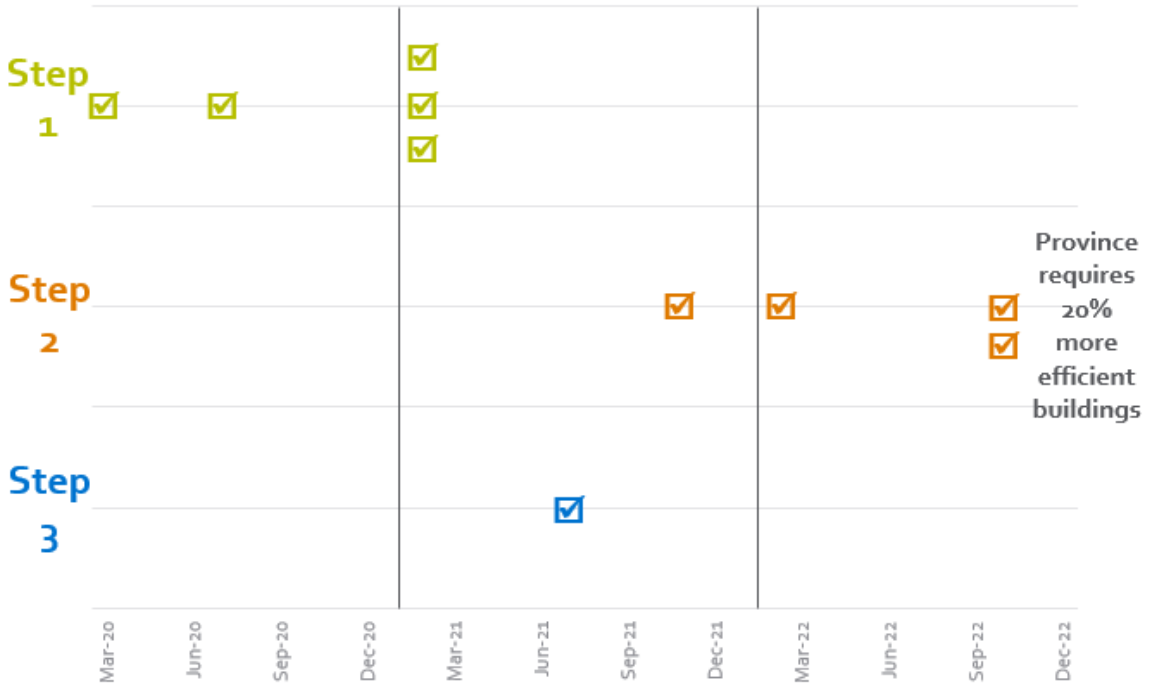


FIGURE 2: PROPOSED STEP CODE ADOPTION TIMELINES FOR PART 3 CONCRETE RESIDENTIAL BUILDINGS

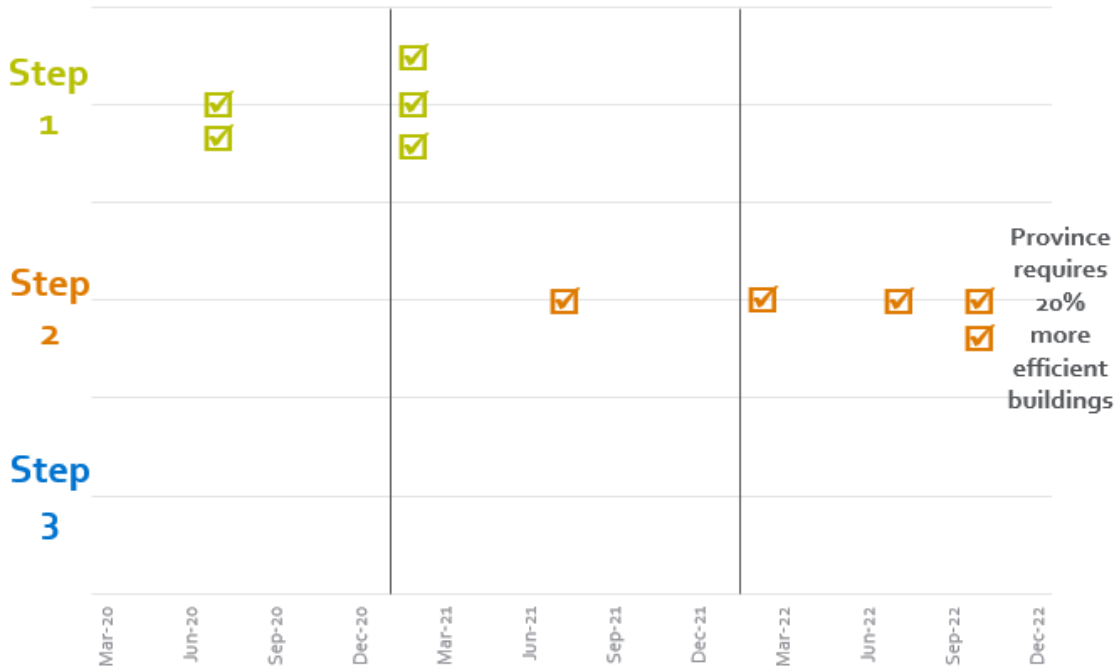
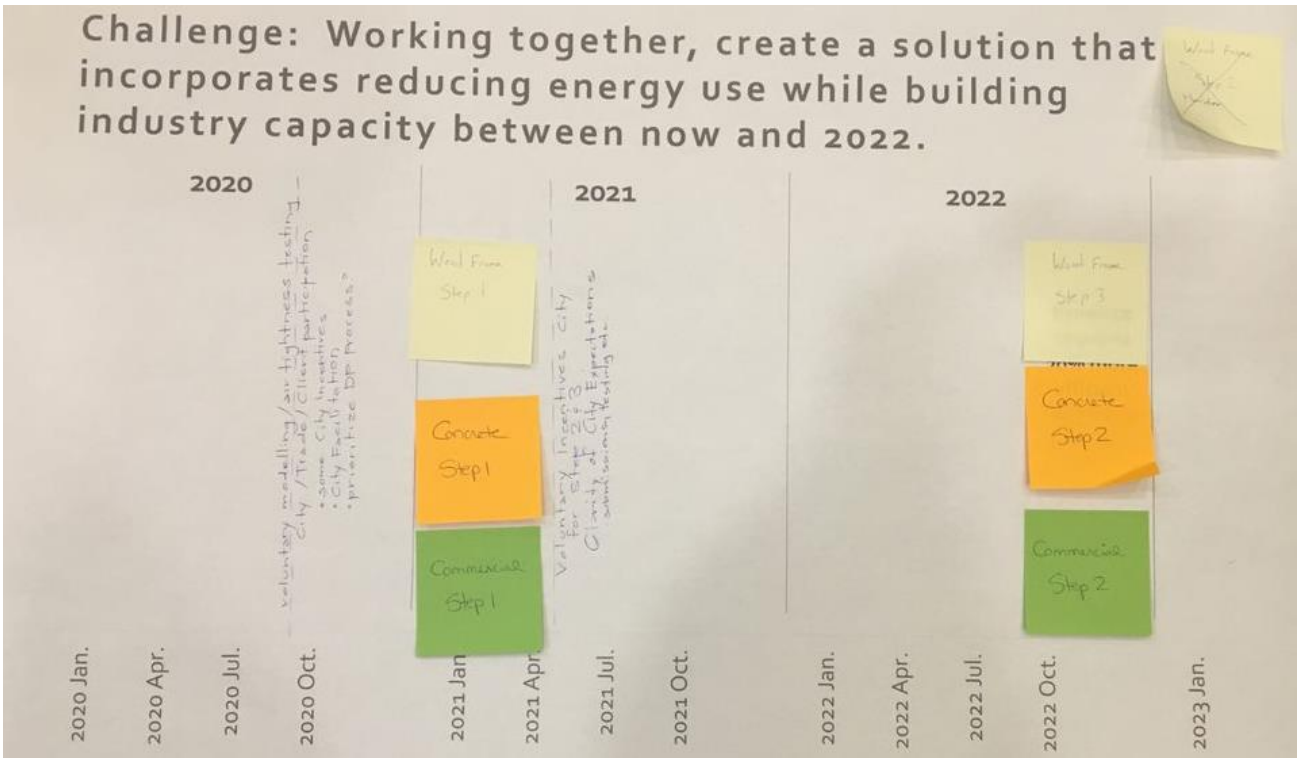
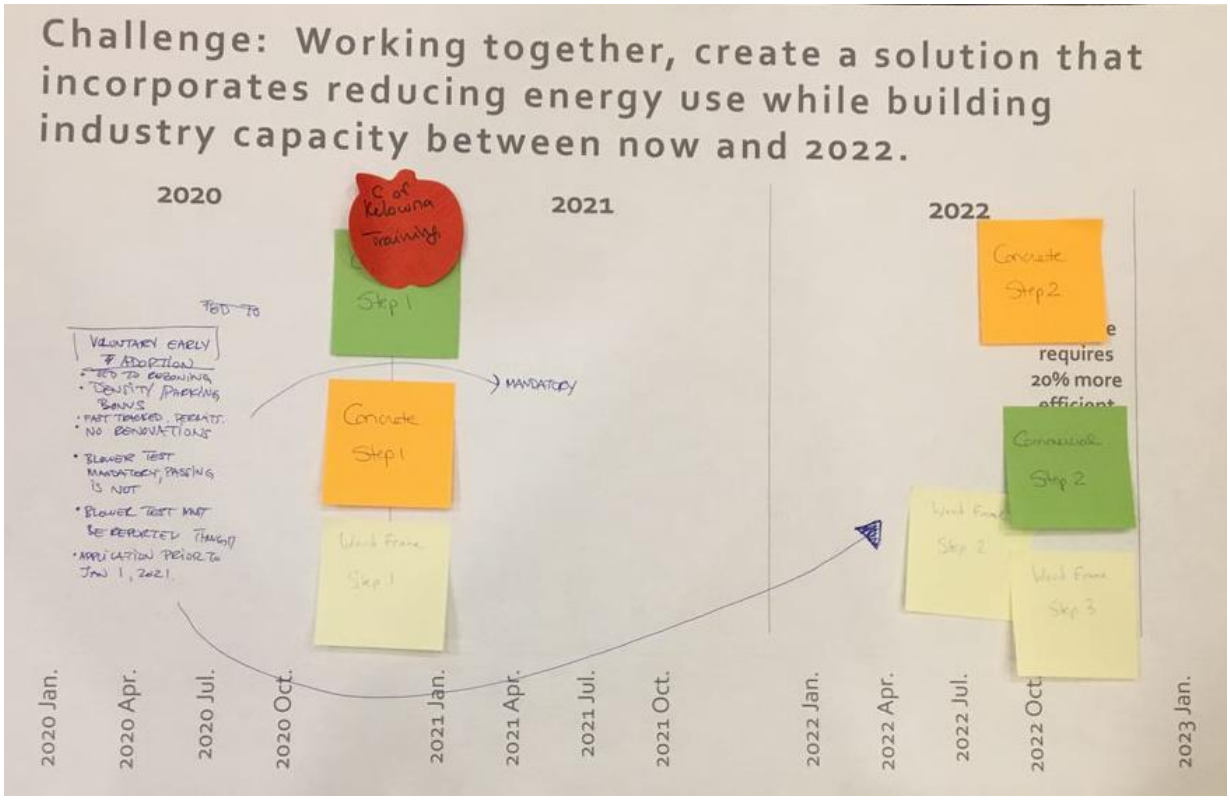
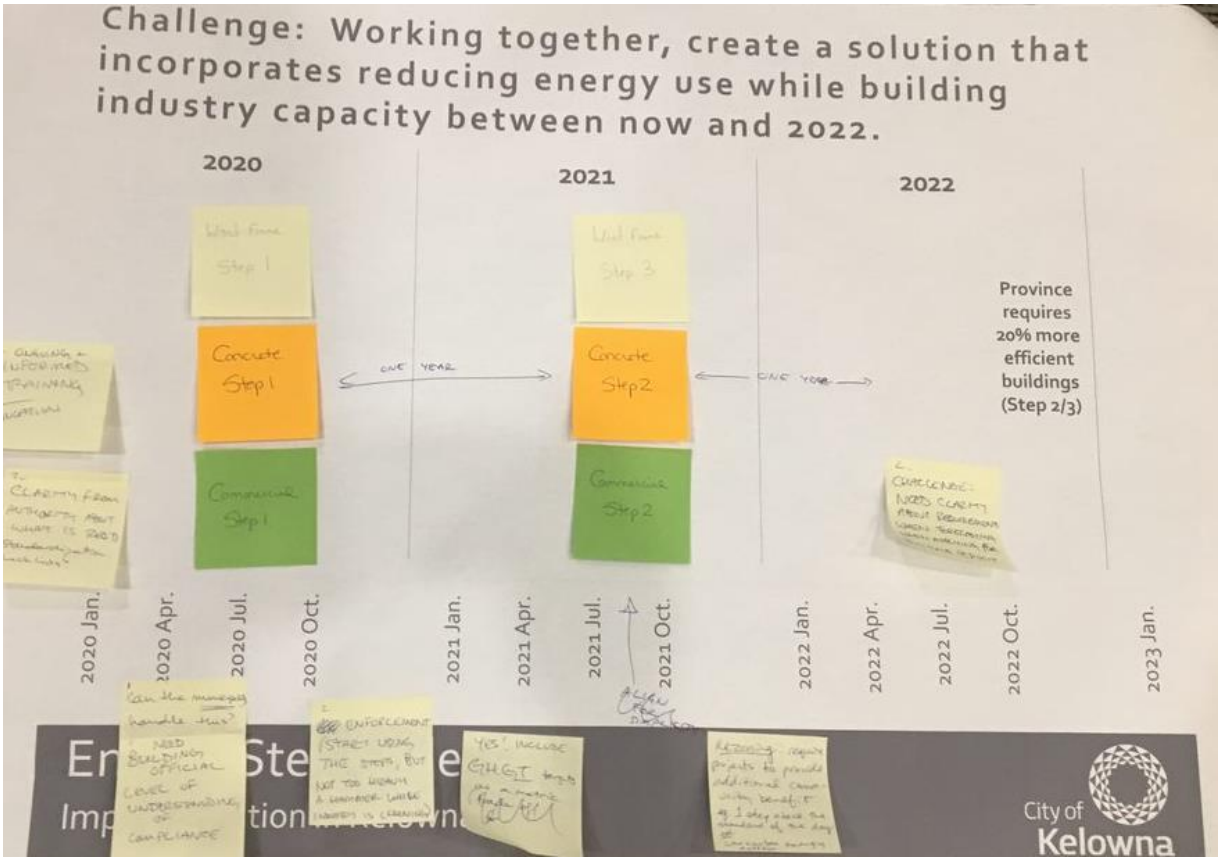


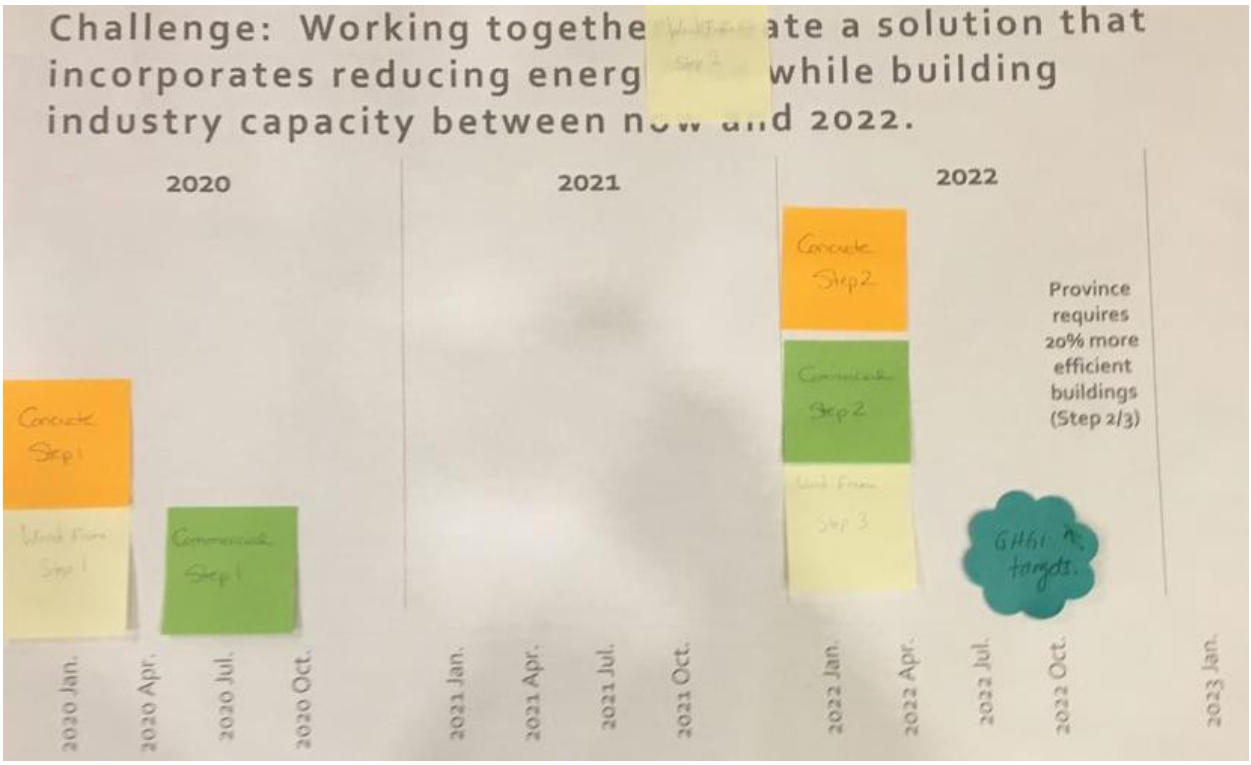
FIGURE 3: PROPOSED STEP CODE ADOPTION TIMELINES FOR PART 3 COMMERCIAL BUILDINGS

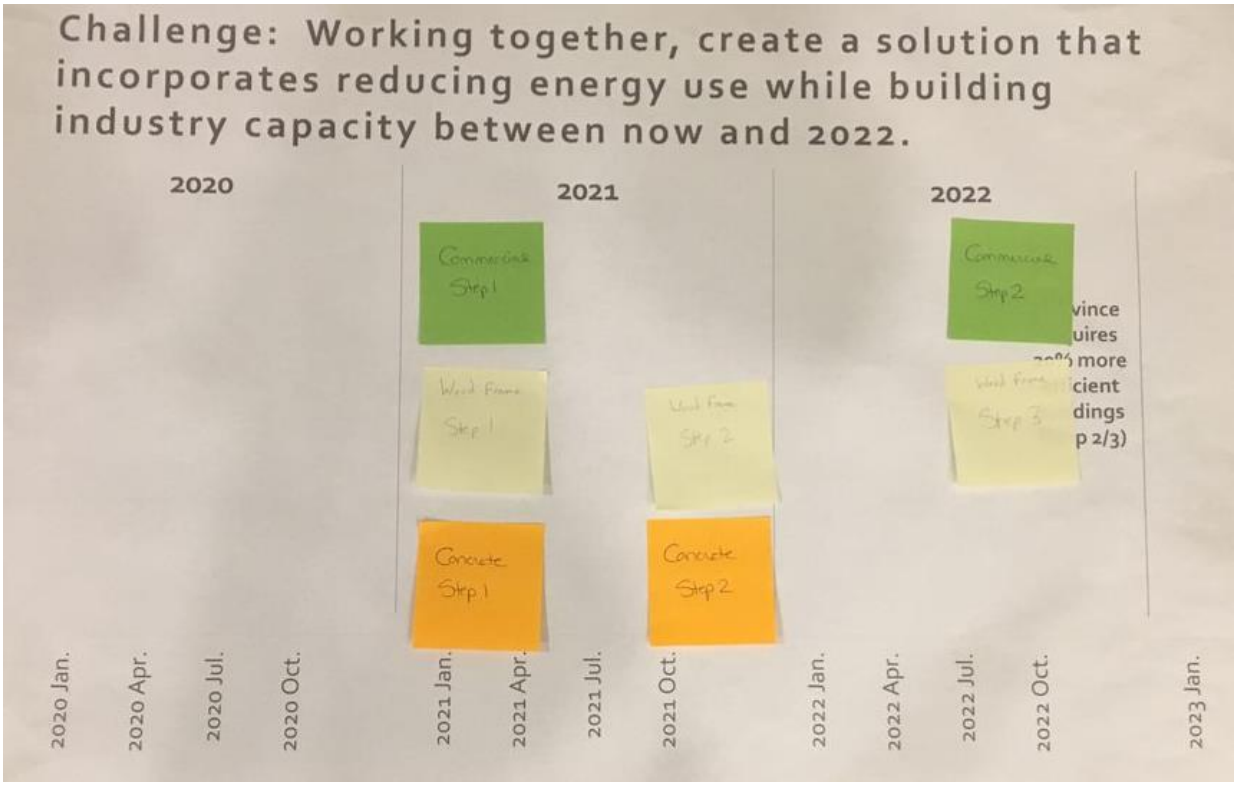
The five proposed timelines are summarized below:




Challenge: Working together, create a solution that incorporates reducing energy use while building industry capacity between now and 2022.
2020
2021
2022
C of Kelowna Training
Step 1
Concrete Step 1
Work Frame Step 1
Concrete Step 2
requires 20% more
Connection Step 2
Work Frame Step 2
Work Frame Step 3
VOLUNTARY EARLY ADOPTION
• TOD TO REZONING
• DENSITY/PARKING BONUS
• PART TENANTED, PERMITS, NO RENOVATIONS
• BLOWER TEST MANDATORY, PASSING IS NOT
• BLOWER TEST NOT REPEATED THROUGH
• APPLICATION PRIOR TO JAN 1, 2021
MANDATORY
2020 Jan.
2020 Apr.
2020 Jul.
2020 Oct.
2021 Jan.
2021 Apr.
2021 Jul.
2021 Oct.
2022 Jan.
2022 Apr.
2022 Jul.
2022 Oct.
2023 Jan.


Challenge: Working together, create a solution that incorporates reducing energy use while building industry capacity between now and 2022.
2020
2021
2022
Work Frame Step 1
Concrete Step 1
Connection Step 1
ONE YEAR
Work Frame Step 3
Concrete Step 2
Connection Step 2
ONE YEAR
Province requires 20% more efficient buildings (Step 2/3)
2020 Jan.
2020 Apr.
2020 Jul.
2020 Oct.
2021 Jan.
2021 Apr.
2021 Jul.
2021 Oct.
2022 Jan.
2022 Apr.
2022 Jul.
2022 Oct.
2023 Jan.
City of Kelowna


Challenge: Working togethe ate a solution that
incorporates reducing energ while building
industry capacity between now and 2022.
2020
2021
2022
Province requires 20% more efficient buildings (Step 2/3)
2020 Jan.
2020 Apr.
2020 Jul.
2020 Oct.
2021 Jan.
2021 Apr.
2021 Jul.
2021 Oct.
2022 Jan.
2022 Apr.
2022 Jul.
2022 Oct.
2023 Jan.


Challenge: Working together, create a solution that
incorporates reducing energy use while building
industry capacity between now and 2022.
2020
2021
2022
2020 Jan.
2020 Apr.
2020 Jul.
2020 Oct.
2021 Jan.
2021 Apr.
2021 Jul.
2021 Oct.
2022 Jan.
2022 Apr.
2022 Jul.
2022 Oct.
2023 Jan.

Attachment D: Application Process and In-Stream Applications

Step Code requirements apply to all Building Permit applications as per the requirements at the time of application, except for the following:

- Developments that have been issued Development Permits prior to June 1, 2021, may, until the Province makes Step Code requirements mandatory (expected late-2022), apply for a Building Permit to construct in compliance with the with the energy efficiency requirements applicable prior to the adoption of the Step Code Implementation for the duration of the time that their Development Permit is valid.

Submission Requirements

Rezoning Application and Development Approvals

As part of both Rezoning and Development applications, applicants are expected to conduct energy modelling and provide a statement to the City that their proposed design is able to meet the requirements of Step Code that will be in place at the time of their Building Permit application. This statement must be submitted prior to City Council's consideration of the project's rezoning, and prior to consideration of the project by City staff.

Building Approvals

Applicants must submit the proper Letters of Assurance as part of the Building Permit application, and prior to occupancy, assuring that the project substantially complies with the City's Step Code requirements. In addition, the following documents must be completed and submitted to Development Services at the Building Permit application stage:

1. The Energy Design Report for the BC Energy Step Code for Part 3 Buildings,[20] completed by a Registered Professional who is either a Qualified Modeller (QM) or overseeing a QM in the role of Energy Modelling Supervisor (EMS), as per the Joint Professional Practice Guidelines for Whole Building Energy Modelling Services. The Registered Professional must include their Registration/License number after their name in Section G.
2. The energy model report for each building, signed by the Registered Professional acting as the QM or EMS on the project. The City may contact the Registered Professional to submit the associated model files for auditing purposes.
3. Plan drawings clearly showing all energy efficiency upgrades (e.g., wall assemblies including the type of air barrier).

The Registered Professionals of Record (RPRs) for the architectural, mechanical, plumbing, and electrical disciplines each have specific responsibilities to energy efficiency requirements under the BC Energy Step Code. The City will not accept Letters of Assurances (Schedule B) if the BC Energy Step Code section has been crossed out.

Prior to occupancy, the applicant must create an Energy Star Portfolio Manager profile of the building(s) (see: https://www.fortisbc.com/services/commercial-industrial-services/energy-efficiency-tools-for-natural-gas-

[20] This report is still in its beta-version and is available at https://energystepcode.ca/compliance-tools-part3/.

business-customers). To support implementation of future benchmarking reporting requirements, applicants may share the property profile with the City of Kelowna as a "Read Only" permission level.

All Energy Step Code reports along with any supporting documents specified in this bulletin must be emailed to the City (energystepcode@kelowna.ca) as a ZIP file with the site address and report title in the email subject (e.g., "#### Bernard Avenue – As-Designed").

Attachment E: Proposed Building Bylaw Amendments

Proposed Amendments to Building Bylaw No. 7245 to support Energy Step Code adoption for Part 3 buildings:

<table>
<tr><th>Bylaw No.</th><th>Part</th><th>Existing</th><th>Proposed</th><th>Explanation</th></tr>
<tr><td rowspan="3">7245 – Building Bylaw</td><td>Part 1 – Interpretation</td><td>None</td><td>Add the following definition: "Energy Step Code" means the Province of British Columbia's performance-based standard for energy efficiency in new construction requiring energy modelling and on-site testing to demonstrate minimum performance against metrics for building envelope, equipment and systems, and airtightness requirements, and including Step 1, Step 2, Step 3, Step 4, and Step 5, as defined in the Building Code, all as amended or re-enacted from time to time.</td><td>• To provide clarity on what the Energy Step Code is (it is not currently defined in the BC Building Code).</td></tr>
<tr><td>14.1</td><td>14.1 Regulations</td><td>Replace with "14.1 Energy Step Code Requirements"</td><td>• New language is more representative of the new requirements under subsection 14.1.</td></tr>
<tr><td>14.1</td><td>14.1. Regulations

14.1.1 Effective December 1, 2019, any Part 9 residential building, as set out in the Building Code, must be designed and constructed to meet the minimum performance requirements specified in Step 1 of the BC Energy Step Code.

14.1.2 Effective June 1, 2021, any Part 9 residential building, as set out in the Building Code, must be designed and constructed to meet the minimum performance requirements specified in Step 3 of the BC Energy Step Code.</td><td>Delete 14.1 Regulations and delete all subsequent subsections as written below:

14.1 Energy Step Code Requirements
14.1.1 Part 9 and Part 3 buildings and structures must be designed and constructed in compliance with the applicable step of the Energy Step Code, as set out in the schedules below:
<table>
<tr><th colspan="3">Buildings classified as <u>Part 9</u> of the Building Code</th></tr>
<tr><th>Building Type</th><th>Building permit application filed on or after December 1, 2019</th><th>Building permit application filed on or after June 1, 2021</th></tr>
<tr><td>Part 9 residential buildings</td><td>Step 1</td><td>Step 3</td></tr>
</table>
<table>
<tr><th colspan="2">Buildings classified as <u>Part 3</u> of the Building Code</th></tr>
<tr><th>Building Type</th><th>Building permit application filed on or after January 1, 2022</th></tr>
<tr><td>Group C – single-detached residential occupancy</td><td>Step 4</td></tr>
<tr><td>Group C – multi-unit residential occupancy of combustible construction (including hotels and motels)</td><td>Step 3</td></tr>
<tr><td>Group C – multi-unit residential occupancy of non-combustible construction</td><td>Step 2</td></tr>
<tr><td>Group D – Business and personal service occupancy OR Group E – mercantile occupancy</td><td>Step 2</td></tr>
</table>
14.1.2 Development applications that include Part 3 buildings that were accepted for processing prior to June 1, 2021 are exempt from the requirements of Part 14 of this Bylaw but</td><td>• Adding bylaw changes to enforce the adoption timelines from the Energy Step Code Implementation Strategy for Part 3 Buildings.
• Adding additional requirements (14.1.2 – 14.1.4) to clarify submission requirements for Energy Step Code.</td></tr>
</table>

Bylaw No.	Part	Existing	Proposed	Explanation
			must meet the minimum energy efficiency requirements as outlined in the **building code** at the time of building permit. 14.1.3 For Part 9 and Part 3 buildings, the **Owner** or **Agent** must, to the satisfaction of the **Building Official**, provide all documentation required by the City's **Energy Step Code** administrative requirements or as required by the **Building Official**, prepared by an energy advisor or a registered professional. 14.1.4 For Part 9 buildings, the documentation required as set out in the **Energy Step Code** must provide evidence to the **Building Official** that the energy advisor is registered and in good standing with Natural Resources Canada.	