

Appendix A



Energy Step Code

Implementation for Part 9 Residential Buildings

Updated May 2019

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Executive Summary

The BC Energy Step Code is a provincial standard, designed to achieve the goals set out in the national 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. Currently, local governments can voluntarily reference requirements of the Energy Step Code, however, according to the Province’s CleanBC Strategy, released December 2018, future iterations of the BC Building Code¹ will require Energy 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 3 for part 9 buildings and Step 2 for part 3 buildings)
- 40 per cent more energy efficient by 2027 (approximately Step 4 for part 9 buildings and Step 3 for part 4 buildings)
- 80 per cent more energy efficient by 2032 (Step 5, net-zero energy ready standard for part 9 buildings, and Step 4 for part 3 buildings)²

Many communities across the Province are already currently referencing the Energy Step Code. In fact, communities that issue more than two-thirds of the province’s residential building permits have referenced the BC Energy Step Code in building bylaws or policies. An additional nine per cent of communities are consulting with industry on a plan to do so.³

Since the fall of 2017, the City of Kelowna has been engaging and developing an Energy Step Code Implementation Plan for Part 9 buildings as outlined in this document (Part 3 buildings will be addressed in a separate process). The engagement process included over 55 touchpoints with affected stakeholders from September, 2017 through February, 2019. This was through a series of meetings, informational offerings (print, email, web), several industry surveys, targeted training opportunities and an Energy Step Code Solutions Lab. The proposed Energy Step Code Implementation Strategy for Part 9 buildings, as outlined in the table below, takes into consideration the input from stakeholder engagement and best practices from across the province.

The Energy Step Code Implementation Plan for Kelowna 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 the industry to build capacity and to catch up to other communities in the Province who are requiring buildings to meet Step 3.

¹ The BC Building Code will be updated two or three times prior to 2032, and the Province will most likely move up the steps with each of the Building Code iterations.

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

³ Energy Step Code Council, 2019. March 2019 Stakeholder Update email report.

<https://mailchi.mp/energystepcode/march2019?e=4cd7c05fad>

Training	Incentives
Prior to Step 1 Spring – November 30, 2019	
<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> City of Kelowna Rebates*: <ul style="list-style-type: none"> \$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: <ul style="list-style-type: none"> Energy advisor support - \$500 Builders achieving various steps are eligible for rebates in addition to energy advisor support: <ul style="list-style-type: none"> \$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	
<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> City of Kelowna Rebates*: <ul style="list-style-type: none"> \$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: <ul style="list-style-type: none"> Energy advisor support - \$500 Builders achieving various steps are eligible for rebates in addition to energy advisor support: <ul style="list-style-type: none"> \$1000 (Step 2), \$2000 (Step 3), \$4000 (Step 4) and \$8000 (Step 5)
Step 3 Implementation June 1, 2021 to December 2022	
<ul style="list-style-type: none"> Training opportunities to be determined 	<ul style="list-style-type: none"> Fortis Rebates: <ul style="list-style-type: none"> Builders achieving various steps are eligible for rebates in addition to energy advisor support: <ul style="list-style-type: none"> \$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.

Introduction

Energy Step Code Overview

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. This federal plan, adopted in 2016, outlines targets to make new buildings more energy efficient. It calls for federal, provincial and territorial governments to develop and adopt increasingly stringent model building codes, with a goal of achieving "net-zero energy ready"⁴ model building codes by 2030⁵.

The BC Energy 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.

On April 11, 2017, the Province announced its adoption of the BC Energy Step Code as a technical regulation. It is currently a voluntary compliance path within the BC Building Code (9.36.6) that establishes a series of measurable, performance-based energy efficiency targets (or steps) that supports market transformation from the current prescriptive energy efficiency requirements to net-zero energy ready buildings by 2032. The BC Energy Step Code aims to provide consistency across BC by creating a standard set of performance requirements for a buildings envelope, equipment and systems, and air-tightness, while offering local governments a simple and effective set of standards to support their energy conservation and greenhouse gas (GHG) emissions reduction goals.

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

- "Part 3" buildings – large and/or complex buildings such as large multi-family, commercial, and industrial buildings, and
- "Part 9" buildings – residential buildings three (3) stories and less, and under 600m² building area.⁶

The Province of BC released the CleanBC Strategy in December 2018. The purpose of the Strategy is to reduce GHG emissions from all sectors while building the economy. Future iterations of the BC Building Code will require Energy 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 3 for part 9 buildings and Step 2 for part 3 buildings)
- 40 per cent more energy efficient by 2027 (approximately Step 4 for part 9 buildings and Step 3 for part 4 buildings)

⁴ 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 has the ability to produce as much energy as it consumes on a yearly basis.

⁵ 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>

⁶ In the future, the Energy Step Code Council will work with stakeholder and experts to develop proposals for Part 3 buildings in other climate zones.

- 80 per cent more energy efficient by 2032 (Step 5, net-zero energy ready standard for part 9 buildings, and Step 4 for part 3 buildings)⁷

Since the fall of 2017, the City of Kelowna has been engaging and developing an Energy Step Code implementation plan for Part 9 buildings as outlined in this document. The City of Kelowna will address Energy Step Code Implementation for Part 3 buildings in a separate process.

Shifting to a Performance-Based Approach

The BC Energy 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 Energy Step Code vary between climate zones⁸.

For Part 9 buildings, there are five performance target steps, each representing a higher level of performance. Steps 1 through 3 represent the Lower Steps, while Steps 4 and 5 form the Upper Steps (Figure 1).

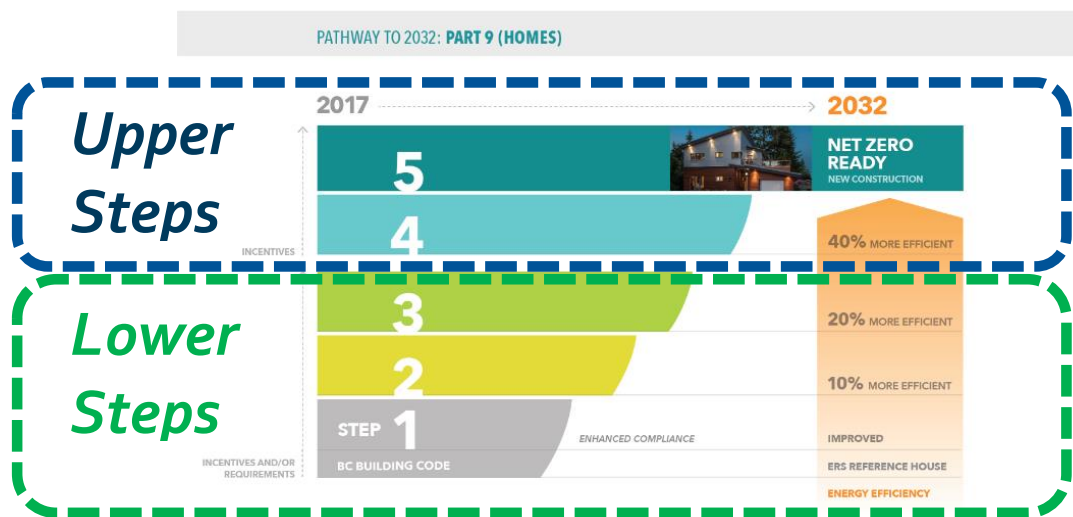


FIGURE 1: 'STEPS' FOR PART 9 BUILDINGS.

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 must be achieved by 2032. The purpose

⁷ 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

⁸ 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) (Attachment A). Kelowna is in Climate Zone 5.

of Step 1 is to familiarize builders with a new way of measuring energy efficiency although the actual construction of the building remains the same as conventional construction.⁹

How the Energy Step Code can be used by Local Governments

The BC Energy Step Code policy states that the first three years (2017 to 2020) are to serve as a transition period, during which time the Energy Step Code Council¹⁰ and member organizations will provide support to communities as they learn to apply the regulation. Recognizing that builders, designers, and trades will need time to build capacity to achieve better performing buildings, the Energy Step Code Council recommends that local governments only cite Lower Steps in their policies and regulations (Steps 1 – 3 for Part 9 residential buildings); upper Steps should only be referenced if significant incentives are being offered.¹¹ This transition period is an opportunity for local governments to be proactive by adopting one or more Steps to enable the local market to mature and to spur increased industry capacity for services and products that support higher performing buildings.

Benefits to the City of Kelowna and Community

Buildings account for approximately 36 per cent of Kelowna's community GHG emissions.¹² Increasing energy efficiency in buildings is identified as one of the means for Kelowna to achieve its GHG emissions reduction target of 4 per cent below 2007 levels by 2023. The easiest and most cost effective time to make energy efficiency upgrades is during the construction of new buildings. Significant additional benefits are associated with higher performing buildings, including:

- Increased comfort – Buildings with high performance building envelopes are more comfortable, with fewer drafts and more consistent temperatures near exterior windows and walls.
- Quieter homes – Homes with better insulation and airtightness are quieter, with less external noise pollution entering the interior spaces.
- Improved indoor air quality – Buildings constructed with performance in mind have balanced ventilation, delivering fresh air to occupants, while expelling stale air and excess moisture. This results in better indoor air quality and health outcomes for occupants, while reducing moisture related problems. Local anecdotal evidence demonstrates that higher performing homes are also effective in filtering out smoke and particulate associated with summer wildfires.
- Increased building durability and ease of maintenance - Buildings built to Energy Step Code requirements require a whole-systems approach, resulting in better performing building envelopes that manage moisture and increase durability, while also simplifying building heating and cooling systems.

⁹ 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

¹⁰ The Energy Step Code Council (ESCC) is comprised of associations representing industry professions and trades, local government and public sector organizations, and utilities and consumer interests. Its role is to build consensus between stakeholders and to support a smooth transition to BC Energy Step Code implementation.

¹¹ 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

¹² City of Kelowna, 2018. Our Kelowna as We Take Action: Kelowna's Community Climate Action Plan. Estimate based on 2012 GHG Emissions inventory. https://www.kelowna.ca/sites/files/1/docs/community/community_climate_action_plan_june_2018_final.pdf

Durable buildings with simpler systems reduce the potential for expensive repairs as a building and its systems age.

- Regional economic development - The global green-building market is said to double every three years, with a value of the green building materials market expected to reach \$234 billion by 2019.¹³ Since the BC Energy Step Code encourages high performance building envelopes, with many of the components manufactured locally – insulation, windows, framing components – new local economic development opportunities await.
- Climate change adaptation - Buildings with better building envelopes are more adaptable to changing climates, remaining warmer in the winter and cooler in the summer.
- Reduced utility costs – As identified in Kelowna’s Healthy Housing Strategy, the cost of housing is increasing and income isn’t keeping pace. In both rental and ownership categories, many Kelowna residents are spending over 30 per cent of their annual income on housing costs. Utility costs can be a significant portion of shelter costs, and improving energy efficiency in buildings can result in lower utility bills for owners and occupants.¹⁴

¹³ “World Green Building Trends 2016, Developing Markets Accelerate Global Green Growth.” World Green Building Council.

¹⁴ City of Kelowna, 2018. Healthy Housing Strategy.

<https://kelownapublishing.escribemeetings.com/filestream.ashx?DocumentId=16448>

Approach to Step Code in other BC Communities

Local governments across BC have used a broad spectrum of policy tools including tools that raise awareness, provide incentives, institute bylaw requirements, remove barriers to energy efficient buildings, and/or demonstrate leadership. Many communities across the Province are already currently referencing the Energy Step Code. In fact, communities that issue more than two-thirds of the province's residential building permits have now referenced the BC Energy Step Code in building bylaws or policies. An additional nine per cent of communities are consulting with industry on a plan to do so.¹⁵

As of April, 2019, the following local governments have referenced the Energy Step Code in their policies¹⁶:

Adopted the Step Code (currently in effect, or will come into effect)	Incentivizing the Step Code
<p>Already in effect:</p> <p>Climate Zone¹⁷ 5:</p> <ul style="list-style-type: none"> • City of Penticton • District of Lake Country <p>Climate Zone 6:</p> <ul style="list-style-type: none"> • Resort Municipality of Whistler <p>Climate Zone 4:</p> <ul style="list-style-type: none"> • City of Burnaby • City of New Westminster • City of North Vancouver • City of Richmond • City of Surrey • City of Victoria • District of North Saanich • District of North Vancouver • District of Oak Bay • District of Squamish • District of West Vancouver • Township of Langley • University of British Columbia • Village of Anmore <p>Adopted to come into effect:</p> <ul style="list-style-type: none"> • Bowen Island Municipality (October 2019) • City of Abbotsford (September 2019) 	<p>Climate Zone 5:</p> <ul style="list-style-type: none"> • City of Campbell River • City of Kimberley • Comox Valley Regional District • District of Sparwood

¹⁵ Energy Step Code Council, 2019. March 2019 Stakeholder Update email report.

<https://mailchi.mp/energystepcode/march2019?e=4cd7c05fad>

¹⁶ Province of BC, Implementation Updates: Local Governments Referencing the BC Energy Step Code.

https://energystepcode.ca/implementation_updates/ and Energy Step Code Council, 2019. March 2019 Stakeholder Update email report. <https://mailchi.mp/energystepcode/march2019?e=4cd7c05fad>

¹⁷ See footnote 8 for a description of climate zones. See Attachment A for a map showing the six climate zones in BC.

For a complete list of the steps each local government is referencing or incentivizing, see the summary presented in Attachment A: Local Governments Reference the BC Energy Step Code as of April 2019.

Locally, Okanagan municipalities (City of Kelowna, City of Penticton, District of Summerland, District of Peachland, City of West Kelowna, District of Lake Country, and City of Vernon) have been collaborating on Energy Step Code in the region. The City of Penticton has already adopted an implementation timeline, and Step 1 came into effect in that community on March 15, 2019 (Step 3 will follow in March, 2020). District of Lake Country has also endorsed Energy Step Code and Step 1 was implemented on April 1, 2019 and Step 3 will be implemented on October 1, 2020 (Step 2 for accessory suites). Many other Okanagan communities have provided their “notification to consult” to the Province stating their intent to engage with industry on an adoption approach to the Step Code including:

- City of Vernon
- District of Peachland
- City of West Kelowna
- District of Summerland

Step Code Strategy for Kelowna

Kelowna's Official Community Plan (OCP) has a goal of improving energy efficiency and performance of buildings. 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 Our Kelowna as We Take Action, Kelowna's Community Climate Action Plan, including actions to implement Energy Step Code to reduce GHG emissions and energy use in new buildings. The recently endorsed Healthy Housing Strategy also recommends the implementation of Energy Step Code to help improve affordability, as improvements to energy efficiency help reduce household operating costs.

After an initial round of stakeholder engagement that commenced in September 2017, City Council directed staff to engage key stakeholders on the Energy Step Code Implementation Strategy on March 26th, 2018. In collaboration with the UDI Okanagan Chapter, Canadian Home Builder's Association Central Okanagan (CHBA-CO), and with local municipalities from Penticton to Vernon, staff sought to inform and gather feedback from development industry representatives, home builders, architects and designers, engineers, suppliers, energy advisors/modelers and others.

Building Permit Impact

It is estimated that by 2040, 30 per cent of all the residential units in the community will have been constructed since 2018, providing an opportunity to include energy efficiency as part of this new construction. In 2018 alone, the City issued building permits for 2,639 residential units.

This Energy Step Code implementation strategy focuses on Part 9 residential buildings. Part 9 residential buildings are three storeys or less and have a building area no more than 600 square meters. These include single family dwellings, duplexes, triplexes, quadplexes, townhouses, some smaller apartment buildings, and carriage houses. Based on the trends of previous years, it is anticipated that the Step Code requirements for Part 9 buildings will affect 700 to 800 building permits annually.

Industry Engagement on Proposed Approach

The engagement process included over 55 touchpoints with affected stakeholders from September, 2017 through February, 2019. This was through a series of meetings, informational offerings (print, email, web), several industry surveys, targeted training opportunities and an Energy Step Code Solutions Lab. A full list of stakeholder touchpoints is available in Attachment B: Engagement Summary on Energy Step Code Implementation.

Engagement prior to August 2018

Engagement prior to August, 2018 was based on a proposed implementation timeline for Part 9 buildings of:

- Step 1 on April 1, 2019
- Step 3 on October 1, 2020.

An industry survey (See Attachment C: Regional Industry Survey and Results) was completed by 53 people in the building industry with roles including property owners/developers, general contractors, design-builders, construction managers, trade contractors, design professionals, and energy advisors, who were involved in construction of a variety of Part 9 buildings between April 15 and May 30, 2018. Feedback from the survey on the proposed timeline is summarized below.

- 86 per cent of survey respondents indicated that the proposed timeline is achievable:
 - 31 per cent indicated that the City should not wait to implement the Step Code, and that we should get started today
 - 29 per cent indicated that it is achievable with the right supports
 - 26 per cent indicated that it is achievable but may pose challenges
 - Only 14 per cent of survey respondents indicated that the proposed timeline was not achievable
- Many viewed training/educational supports as a key to success for a smooth transition, including:
 - Energy modelling and the role of the Energy Advisor
 - Trades specific training (e.g., air and moisture barriers, window installation, etc.)
 - New construction techniques
 - Ventilation and mechanical systems for high performance housing
- Incentives such as those offered by FortisBC are seen as an important tool in helping transition the market:
 - 73 per cent of survey respondents said they were 'very likely' or 'somewhat likely' to access the FortisBC incentives available for each step achieved of the Energy Step Code in 2018.
- The need for City staff to be trained to ensure a smooth roll-out and processing of building permit applications
- Having sufficient Energy Advisor capacity was noted as necessary for meeting the proposed timelines and ensuring they are accredited and that quality assurance checks are in place
- Some concern for impacts to affordability was noted, especially for the higher 'Steps'
- The need to communicate customer benefits, particularly through home energy labeling programs such as the EnerGuide label.

Additional engagement during this time period included workshops with CHBA-CO and UDI, individual discussions with builders, energy advisors, contractors, FortisBC, BC Housing and a local government working group. While many thought the timeline was achievable (including letters of support from FortisBC, BC Housing, a local builder), others felt that there were challenges to achieving the timeline including impacts to affordability, insufficient energy advisors, lack of industry skills, and impacts to processing times.

Engagement after August 2018

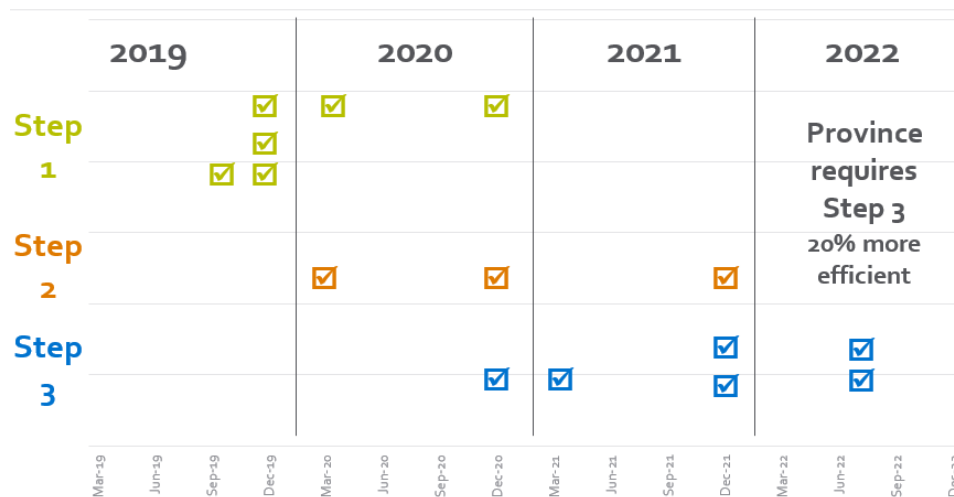
On August 27, 2018 Council made the decision to defer the proposed implementation strategy of Step 1 on April 1, 2019 and Step 3 on October 1, 2020 in order for the CHBA-CO to complete their Energy Step Code Costing Study. They also requested that staff do additional engagement with stakeholders.

After receiving CHBA-COs costing study (for additional information on the study see "Addressing Concerns" section), staff worked with the BC Buildings Standard Branch, Energy Step Code Council, BC Housing, and FortisBC to understand the differences between the results of CHBA-CO's costing study and BC Housing's 2018 Metrics Research Full Report Update.

In December, 2018, the Province released its CleanBC Plan which provided a provincial timeline for the implementation of the Energy Step Code, with Step 3 for Part 9 buildings being mandated as part of a BC Building Code update by 2022.¹⁸

An Energy Step Code Solutions Lab was hosted by the City on February 12, 2019. The intent of the Solutions Lab was to gather a diverse group of representatives from the building industry to gather additional feedback on an implementation timeline for Part 9 buildings that seeks to reduce energy and GHG emissions while building industry capacity in advance of the Province implementing Step 3 in 2022. Thirty participants were chosen from over fifty applicants ensuring a variety of building industry representation (e.g., builders, developers, trades, architects/designers, energy advisors/consultants) with differing views on Energy Step Code.

Working together in diverse groups, participants developed options for implementation between now and when the Province makes Step 3 mandatory in 2022. As illustrated in the figure below, the majority of proposed solutions identified Step 1 becoming mandatory by the end of 2019 (the green check marks). Only three of the groups felt that there was a need to include Step 2 in the implementation process (the orange check marks). There were differing views on when Step 3 should be implemented by the City; however the majority of the proposed solutions thought it should be adopted in advance of when the province requires it in the BC Building Code in 2022.



Participants also identified the importance of training to support implementation, including training on working with energy advisors and designers, blower door testing, and the new permitting process. They also suggested additional incentives such as subsidized training, incentives for blower door testing, and bylaw relaxations for more efficient homes.

Attachment D: Energy Step Code Solutions Lab Summary provides a complete summary of the event.

¹⁸ 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

Addressing Concerns

The engagement process revealed a number of concerns regarding Step Code implementation. These concerns were carefully considered and informed the Implementation Strategy and recommended timeline for adoption presented in this report.

1. Insufficient Energy Advisor Capacity

Through discussions with energy advisors, it was shown that boosted energy advisor capacity is contingent on governments enacting robust regulations that provide some measure of assurance to those wishing to invest in the training to become an energy advisor, or for those businesses wishing to hire more energy advisors. Currently, there are approximately eight energy advisors servicing the area. In addition, to an energy advisor course and exam hosted in Kelowna in 2018, another training course will be offered in Kelowna for April 2019¹⁹. Further, the timeline proposed below provides over 7 months from the time of Council adoption to the implementation of Step 1 for energy advisor capacity to respond to the anticipated demand.

2. Impacts affordability

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

BC Housing's *Metrics Research Full Report Update (2018)*²⁰ modelled between 10,000 and 20,000 combinations of energy conservation measures for six different archetypes (multi-unit residential buildings, row house, quadplex, large single family dwelling, medium single family dwelling and a small single family dwelling) in each climate zone. Part 9 buildings in Climate Zone 5, which Kelowna is in, showed the following lowest increases in costs over constructing to the base building code as:

	10 unit MURB	6-unit Row House	Quadplex	Large SFD	Medium SFD	Small SFD – slab on grade
Step 1	0.1%	0.2%	0.2%	0.2%	0.2%	0.4%
Step 2	0.5%	0.5%	0.3%	0.4%	0.2%	0.5%
Step 3	0.6%	0.5%	1.1%	0.6%	0.4%	1.2%

In 2018, CHBA-CO also commissioned a study on the costs of achieving various steps of the Energy Step Code. The BC Housing Metrics study focused its research on how to achieve low costs based on optimized building design and energy efficiency measures. The CHBA-CO study question was slightly different, and it looked at the incremental cost increases of what would need to be added to an existing building design in order to meet the various steps. The results of the CHBA-CO study²¹ for the lower steps showed:

¹⁹ Personal Communication with Total Home Solutions, March 5, 2019.

²⁰ 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>

²¹ Canadian Home Builder's Association Central Okanagan, 2018. A study by Industry for Consumers. <https://www.chbaco.com/wp-content/uploads/2018/12/CHBA-CO-Step-Code-Costing-Report-Full-2018-12-05.pdf>

	Small (2,307 ft ²)	Medium (2,806 ft ²)	Duplex (4,432 ft ²)
Step 1	2%	4%	0.3%
Step 2	3%	4.3%	1.3%
Step 3	4.3%	6.4%	2.5%

(note: in cases of multiple iterations for a step, the average of those provided in the study are illustrated here)

Enquiring to BC Building and Safety Standards Branch, the Energy Step Code Council and BC Housing as to the cost differences between the two studies, several factors were identified. Several differences were noted including:

1. The BC Housing study had thousands of possible design combinations while the CHBA-CO study was limited in the scope of its analysis. While it is unreasonable to expect builders to examine thousands of combinations, tools have been developed, such as BC Housing's Energy Step Code Builders Guide, to help identify cost-effective solutions.
2. Administration and management fees were included in the CHBA-CO study but were not in the Metric's study.
3. Architectural differences resulted in higher energy costs for the CHBA-CO study. For example, comparing the medium homes, CHBA-CO window wall ratio was significantly higher (25.9 per cent versus 14.7 per cent) and there is a penalty in both the Energy Step Code and the base BC Building Code for homes with more than 22 per cent window-to-wall ratio, while a bonus for less than 17 per cent. Further, the CHBA-CO medium home had more west windows compared to the even distribution in the Metric's study which would have added to the cooling loads. The envelope to floor area was 26 per cent greater in the CHBA-CO allowing more envelope area for heat loss per unit of floor area.²²

BC Hydro's Community Energy Manager's network recently produced a series of 5 case studies²³ (from various climate zones), of actual constructed single family homes and the strategies and costs associated to meet Step 3 or Step 4 of the BC Energy Step Code. Cost increases for the various steps were:

Location	Climate Zone	Single Family Dwelling Size	Step Achieved	Cost Increase over base BCBC
Campbell River	5	2,525 ft ²	3	0%
Kamloops	5	2,300 ft ²	4	4%
Whistler	6	2,198 ft ²	3	2%
Invermere	6	1,536 ft ²	3	Less than 2%
Victoria	4	2,505 ft ²	4	2%

While all three costing studies show some variability in the costs to construction of more efficient homes, by adopting Energy Step Code, long term affordability is bolstered by providing lower operating costs and protecting tenants/homeowners from rising utility costs.

²² Zachary May, 2019. Energy Step Code Solutions Lab Presentation: Assessing Step Code Compliance Options and Costs.

²³ BC Hydro, 2018. Step 3: Hassle-Free: Five new British Columbia homes that cost-effectively meet the energy efficiency requirements of the BC Energy Step Code

To help off-set any added costs of building to the Energy Step Code, FortisBC's New Home Program offers rebates of \$500 for engaging an energy advisor. Added to this, builders achieving Steps 2 to 5 are eligible for between \$1,000 and \$8,000 in rebates.²⁴

3. Will slow down building permit processing times

The energy modelling required as part of the Step Code is done during the design phase and will be completed before a building permit is applied for. Furthermore, the City of Kelowna has created a Bulletin and compliance reports (pre-build and as-built) to make the reporting requirements straightforward.

4. Lack of industry skills

Step 1 is the first step in helping move toward the Step Code's performance-based approach and requires that builders use the services of an energy advisor or energy modeler to satisfy the requirements. The design and construction techniques necessary to comply are unchanged from the requirements found in the base BC Building Code. Additionally, staff have noted that CHBA, BC Housing, Natural Resources Canada, and FortisBC, among others, have already begun offering training and resources related to the Step Code, and access to training is not anticipated to be a challenge going forward. Further, the City of Kelowna, in partnership with the Community Energy Association, CHBA-CO, and FortisBC hosted a one-day workshop in 2018 to introduce the Step Code, with a special emphasis on high performance construction methods.

Recommended Energy Step Code Implementation for Part 9 Buildings

The process for developing Kelowna's Energy Step Code Implementation Strategy is based on the direction provided in the BC Energy Step Code: A Best Practices Guide for Local Governments.²⁵ The Implementation Strategy takes into consideration the feedback from all of the stakeholder engagement over the past 1.5 years and best practices from across the province. The table below outlines the recommended Energy Step Code Implementation Strategy in Kelowna for Part 9 buildings and allows for:

- Over 7 months to allow for increased energy advisor capacity prior to Step 1 implementation.
- Rebates to become familiar with using an energy advisor for modelling and blower door tests prior to implementation of Step 1.
- Builder and trades training in advance of Step 1 on the new permitting process associated with Energy Step Code.
- Implementation of Step 1 by December 2019. This date was chosen as 4 out of 6 proposed solutions at the Energy Step Code Solutions Lab recommended Step 1 implementation by December 2019. This is further supported by the industry implementation survey done last Spring, which 86 per cent of respondents felt the timeline of implementing Step 1 by April 1, 2019 was achievable.
- Implementation of Step 3 in June of 2021. There were differing views on when Step 3 should be implemented; however the majority of the proposed solutions identified it should be in advance of when the province requires it in the BC Building Code in 2022. As many other communities will be requiring Step 3 by 2020 (including Penticton which requires Step 3 by March of 2020; Lake Country

²⁴ FortisBC. The New Home Program in support of the BC Energy StepCode (brochure)

²⁵ 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

has proposed October, 2020), the building industry will have had an opportunity to learn from these endeavors. Further, requiring Step 3 eighteen months in advance of the BC Building Code update allows the building community to focus on the other changes in the 2022 Code update.

- Building Permit Fee Rebates for Steps 4 and 5 of Energy Step Code, and Certified Passive Houses to incentivize high performance buildings. These are in addition to the FortisBC Rebates offered.

Training	Incentives
Prior to Step 1 Spring – November 30, 2019	
<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> City of Kelowna Rebates*: <ul style="list-style-type: none"> \$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: <ul style="list-style-type: none"> Energy advisor support - \$500 Builders achieving various steps are eligible for rebates in addition to energy advisor support: <ul style="list-style-type: none"> \$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	
<ul style="list-style-type: none"> Staff/Council training on 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. 	<ul style="list-style-type: none"> City of Kelowna Rebates*: <ul style="list-style-type: none"> \$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: <ul style="list-style-type: none"> Energy advisor support - \$500 Builders achieving various steps are eligible for rebates in addition to energy advisor support: <ul style="list-style-type: none"> \$1000 (Step 2), \$2000 (Step 3), \$4000 (Step 4) and \$8000 (Step 5)
Step 3 Implementation June 1, 2021 to December 2022	
<ul style="list-style-type: none"> Training opportunities to be determined 	<ul style="list-style-type: none"> Fortis Rebates: <ul style="list-style-type: none"> Builders achieving various steps are eligible for rebates in addition to energy advisor support: <ul style="list-style-type: none"> \$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.

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 these first few years of adoption of the Energy Step Code and will help to inform an appropriate adoption timeline for the Upper Steps beyond 2022.

Application Process and In-Stream Applications

The application process for *all new Part 9 residential projects* is recommended to be as follows:

- Projects that have applied for building permit prior to December 1, 2019 will be considered in-stream and will not be subject to Step Code requirements.
- Building permits applied for between December 1, 2019 and May 31, 2021 will need to demonstrate compliance with Step 1 of the Step Code.
- Building permits applied for on or after June 1, 2021 will need to demonstrate compliance with Step 3 of the Step Code.
- The application process for projects subject to Step Code will require:
 - o A 'pre-build' (aka 'as-designed') compliance report completed by a licensed energy advisor and submitted along with the building permit application.
 - o An 'as-built' compliance report completed by a licensed energy advisor and submitted along with the occupancy permit application.

Recommended Future Work

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

Energy Step Code Implementation Strategy for Part 3 Buildings

As of December 10, 2018, municipalities outside of Climate Zone 4 (the lower mainland and southern Vancouver Island) can now reference Energy Step Code for Part 3 Buildings. As the provincial CleanBC plan outlines an implementation of updates to the BC Building Code that all buildings are to be 20 per cent more energy efficient buildings by 2022, the City should look to engage and develop a strategy for building types which includes building industry capacity and knowledge.

Energy Retrofit Strategy

Approximately 72 per cent of the current housing stock in Kelowna was built prior to 2000.²⁶ Many of these homes 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.

²⁶ 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: Local Governments Referencing the BC Energy Step Code as of April, 2019

Communities can use a wide variety of policy tools to either incentivize or require the BC Energy Step Code. The tables below outline how local governments in different climate zones across BC (see map below) are putting the standard to work. It should be noted, that some local governments are using a combination of both mandatory requirements and incentives to achieve a variety of steps.

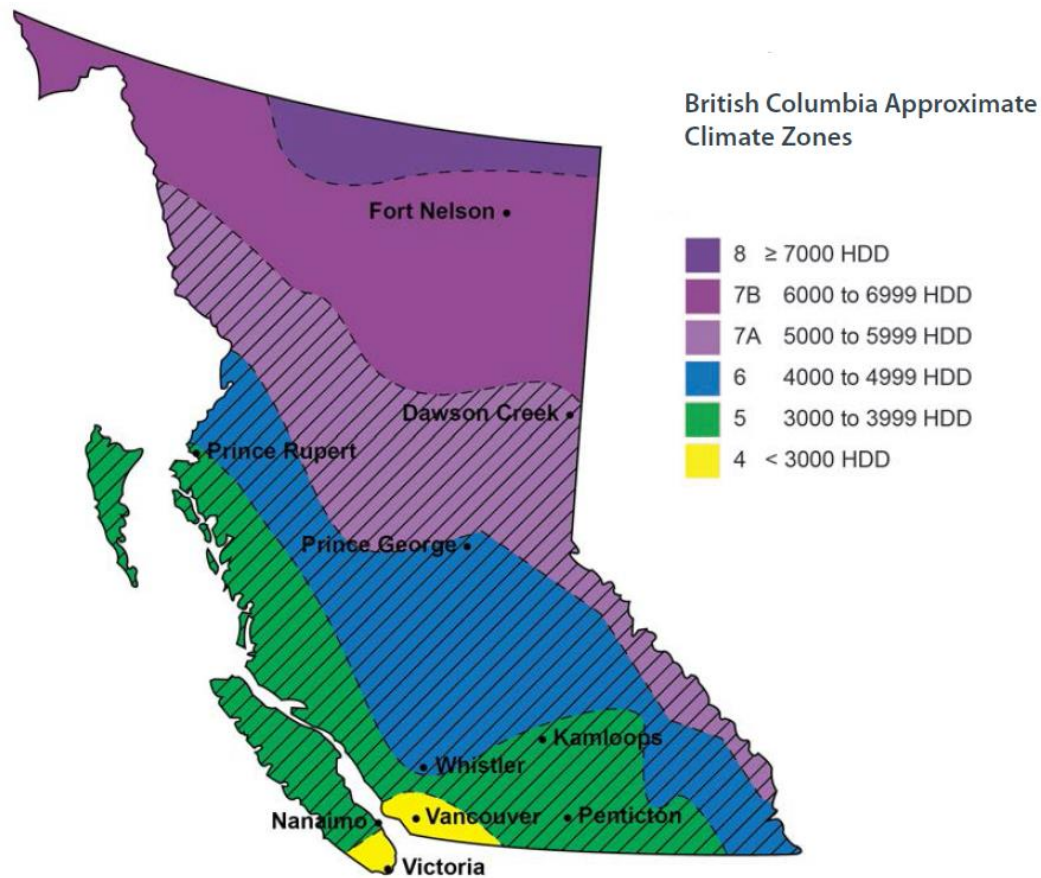


Figure 2: Climate Zones in BC²⁷

²⁷ 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>.

Local Governments that have adopted Energy Step Code policy (mandatory requirements)

Local Government	Part 3	Part 9
Climate Zone 5		
City of Penticton		<ul style="list-style-type: none"> March 15, 2019: Step 1 March 15, 2020: Step 3
District of Lake Country		<ul style="list-style-type: none"> April 1, 2019: Step 1 October 1, 2020: Step 3 (Step 2 for accessory buildings)
Climate Zone 6		
Resort Municipality of Whistler		<ul style="list-style-type: none"> Jan. 1, 2019: Step 3 (Step 4 for rezoning to increase density or permit additional uses)
Climate Zone 4		
Bowen Island Municipality		<ul style="list-style-type: none"> October 1, 2019: Step 1 October 1, 2020: Step 3
City of Abbotsford		<ul style="list-style-type: none"> Sept., 2019: Requirement to submit energy modelling reports April 1, 2020: Step 1
City of Burnaby	<ul style="list-style-type: none"> February 2019: Step 1 for new Part 3 buildings July 2019: Step 3 of the BC Energy Step Code or Step 2 with a low carbon energy system for buildings seeking rezoning 	
City of New Westminster	<ul style="list-style-type: none"> January 1, 2020: Step 3 or Step 2 with approved low carbon energy system for Group C residential occupancies 6 stories or less and combustible construction. Step 2 for offices, other group D and E occupancies 	<ul style="list-style-type: none"> March 31, 2019: Step 1 January 1, 2020: Step 3 for single-detached, semi-detached, townhomes and apartment buildings up to three floors, Step 2 for laneway and carriage homes.
City of North Vancouver	<ul style="list-style-type: none"> July 1, 2018: Step 2 (residential) July 1, 2018: Step 1 (commercial) If rezoning, then requires one step above (i.e. Step 3 and Step 2 respectively) 	<ul style="list-style-type: none"> July 1, 2018: Step 1 for small buildings (under 1200 ft²) July 1, 2018: Step 3 for large residential buildings (over 1200 ft²)
City of Richmond	<ul style="list-style-type: none"> Sept. 1, 2018: Step 3 Group C (greater than 6 stories) (or Step 2 with a low carbon building energy system) Sept. 1., 2018 Step 3 (less than 6 stories) Sept. 1, 2018 Step 2 Group D and E 	<ul style="list-style-type: none"> Sept. 1, 2018: Step 3 (townhomes and apartments) Sept. 1, 2018: Step 1 (Single family, duplex). Goes to Step 3 January 2020
City of Surrey	<ul style="list-style-type: none"> April 1, 2019: Step 3 for residential (or Step 2 if connected to Surrey City Energy or satisfies low-carbon energy requirements) April 1, 2019: Step 2 for commercial and mercantile 	<ul style="list-style-type: none"> April 1, 2019: Step 1 Jan. 1, 2021: Step 3
City of Victoria	<ul style="list-style-type: none"> Nov. 1, 2018: Step 1 Jan. 1, 2020: Step 3 (under 6 stories residential), Step 2 (over 6 stories residential), Step 2 commercial office. 	<ul style="list-style-type: none"> Nov. 1, 2018: Step 1 Jan. 1, 2020 Step 3 (except small homes which require Step 2)

Local Government	Part 3	Part 9
District of North Saanich	<ul style="list-style-type: none"> Jan 1, 2019: Step 1 Jan. 1, 2020: Step 3 	<ul style="list-style-type: none"> Jan. 1, 2019: Step 1 Jan. 1, 2020 Step 3 (less than 92m², Step 2)
District of North Vancouver	<ul style="list-style-type: none"> July 1, 2018: Step 1 for commercial, Step 2 for residential. All residential projects requiring rezoning are required to meet Step 3. 	<ul style="list-style-type: none"> July 1, 2018: Step 3
District of Oak Bay	<ul style="list-style-type: none"> Nov. 1, 2018: Step 1 Jan 1, 2020: Step 2 	<ul style="list-style-type: none"> Nov. 1, 2018: Step 1 Jan 1, 2020: Step 3
District of Squamish	<ul style="list-style-type: none"> July 1, 2018: Step 3 (wood frame residential), Step 2 (concrete frame residential), Step 2 (commercial) Jan 1, 2021: Step 4 (wood frame), Step 3 (concrete frame residential), Step 3 (commercial) 	<ul style="list-style-type: none"> July 1, 2018: Step 1 (residential under 1000 ft²), Step 2 (residential over 1000 ft²), Step 2 (commercial) Jan 1, 2019: Step 3 over 1000ft² Jan 1, 2021: Step 4 (over 1000ft²), step 3 (commercial)
District of West Vancouver		<ul style="list-style-type: none"> July 1, 2018: Step 3 for SFDs
Township of Langley	<ul style="list-style-type: none"> Jan. 1, 2019: Step 1 (not located within a DPA), Step 2 (located in a DPA) 	<ul style="list-style-type: none"> Jan. 1, 2019: Step 1 (not located within a DPA), Step 2 (located in a DPA) Incentives for mid-construction blower door tests and upper steps
University of British Columbia	<ul style="list-style-type: none"> Sept. 27, 2018: Step 2 (optional credits within their own green building rating system can be obtained for projects that achieve higher steps). 	
Village of Anmore		<ul style="list-style-type: none"> Feb. 19, 2019: Step 1 for all new single family dwellings

Local Governments Incentivizing Energy Step Code (voluntary uptake)

Local Government	Part 3	Part 9
City of Campbell River		<ul style="list-style-type: none"> Incentives for different steps for new Part 9 residential buildings (Step 2 and above)
City of Kimberley		<ul style="list-style-type: none"> \$500 off the BP cost subject to completion of pre-construction EnerGuide Evaluation Report Additional rebate based on final EnerGuide Evaluation Report based on Step achieved (step 2 and up, ranging from 10% - 60% of BP fee).
Comox Valley Regional District	<ul style="list-style-type: none"> Jan. 1, 2018: BP rebate for step 3 or higher 	<ul style="list-style-type: none"> Jan. 1, 2018: BP rebate for step 3 or higher
District of Sparwood	<ul style="list-style-type: none"> Rebates for step 1 and above 	<ul style="list-style-type: none"> Rebates for step 1 and above

Attachment B: Engagement Summary on Energy Step Code Implementation

Summary of Engagement Points of Contact

Date	Contact	Notes
Sept 7, 2017	CHBA, BC Housing, various builders, engineers, consultants	Input sought from industry stakeholders on the Energy Step Code as part of the Community Climate Action Plan engagement process.
Oct 5, 2017	CHBA-CO (Marika Luczi)	Mo Bayat, Development Services Director, presented to the Canadian Home Builders Association on the BC Energy Step Code
Jan 11, 2018	Industry stakeholders involved in the construction of new Part 9 buildings in Kelowna and area (150 attendees)	Mo Bayat, Development Services Director, presented at the BC Housing-sponsored Energy Step Code seminar in Kelowna, which was attended by roughly 150 participants, the majority of which are directly involved in the construction industry in the city
Jan 15, 2018	UDI (Jennifer Dixon)	City staff participated in the UDI-led Step Code roundtable discussion with industry and local government staff from the City of Kelowna, City of West Kelowna, District of Lake Country, District of Peachland and City of Vernon.
Jan 23, 2018	Total Home Solutions (Gilles Lesage)	Met to discuss Energy Advisor capacity, upcoming training opportunities offered by Total Home, and to discuss local builder capacity to build to a higher level, particularly around airtightness.
Jan 23, 2018	City of Penticton (Ken Kunka)	Met to discuss City of Penticton's proposed approach to Step Code and to explore the opportunity for developing a regional approach to Step Code Implementation.
Feb 2, 2018	ROV Consulting (Bahareh Reza)	Met to discuss Energy Advisor capacity, and to discuss local builder capacity to build to a higher level, particularly around airtightness.
Feb 6, 2018	CHBA-CO (Marika Luczi)	Met with Marika to discuss our intended approach to Step Code implementation and to explore ways to get the message out to the CHBA membership.
Feb 26, 2018	Little House Contracting (Tara Tschritter)	Met to discuss the potential impact of the Step Code on small houses/carriage houses.
Mar 1, 2018	ASTT-BC (Bruce Stevens & Jason Jung)	Met to discuss the City's intended approach to Step Code implementation and to explore the potential regulation of Energy Advisors/energy modellers by ASTT-BC.
Mar 3, 2018	Industry stakeholders involved in the construction of new Part 9 buildings in the Okanagan	Participated in the BC Housing-sponsored Energy Step Code seminar in Penticton, which was attended by roughly 60 participants
Mar 8, 2018	Regional Governments	Met with municipal governments from City of Penticton, District of Summerland, District of Peachland, City of West Kelowna, Westbank First Nation, District of Lake Country, Regional District of Central Okanagan, and City of Vernon to discuss moving forward on a regional approach to engagement/implementation.

Date	Contact	Notes
Mar 21, 2018	OK College (Brian Rippy)	Sent email to discuss the City's intended approach and to discuss opportunities for training opportunities with the College.
Mar 22, 2018	OK College (Rob St Onge)	Met to discuss the City's intended approach and to discuss opportunities for training opportunities with the College.
Mar 27, 2018	UDI (Jennifer Dixon)	Provided email to inform that Council had endorsed Energy Step Code proposed timeline and implementation strategy. Requested that Council Report be shared with the UDI/CHBA Energy Step Code Roundtable group.
Apr 16, 2018	Industry stakeholders involved in the construction of new Part 9 buildings in Kelowna and area	Developed an Energy Step Code landing page on the kelowna.ca to provide information on the Energy Step Code, including the proposed implementation timeline and ways to engage (202 unique page views from April 15 – June 24, 2018)
Apr 19 – May 30, 2018	Industry stakeholders involved in the construction of new Part 9 buildings in Kelowna and area	Invitation to engage on Step Code Survey and Industry Workshop displayed on One Window Screen on Second Floor of City Hall behind Development Services counters
April 20 - 27, 2018	Okanagan Regional Governments	Invitation to engage on Step Code Survey and Industry Workshop: <ul style="list-style-type: none"> - Regional governments (April 20, 2018) - Fortis BC (April 20, 2018) - CHBA-CO (April 23, 2018) - UDI (April 23, 2018) - CEA (April 23) - Okanagan College (April 23, 2018) - City of Kelowna Architect Committee (April 27, 2018)
April 29/30, 2018	BOABC Annual Conference hosted by City of Kelowna	Staffed City of Kelowna booth for 2 days promoting the City's proposed timeline, implementation strategy, and engagement opportunities
May 4, 2018	Daily Courier	Public Notice on Step Code engagement
May 5, 2018	Building Suppliers	Distributed information about the regional engagement process to 11 of the largest building suppliers in Kelowna: <ul style="list-style-type: none"> - OK Builders Ellis St - Home Hardware Springfield - Rona - BC Fasteners and Tools - Home Depot - Brock White - Foundation Building Materials - OK Builders McCurdy Rd - Kenroc Building Supply - Home Hardware Rutland - Home Depot Westbank
May 9, 2018	UDI (Jennifer Dixon)	UDI/CHBA-CO Energy Step Code Roundtable meeting
May 9, 2018	UDI (Jennifer Dixon)	Sent reminder email invitation to engage on Step Code Survey and Industry Workshop and information about the CHBA Innovation Exchange workshop
May 10, 2018	Southern Interior Construction Association (Carolyn Mann)	Sent email invitation to engage on Step Code Survey and Industry Workshop to distribute to the SICA membership

Date	Contact	Notes
May 10, 2018	CHBA-CO (Marika Luczi)	Emailed Marika requesting the CHBA costing study and methodology that Les Bellamy referenced in the May 9, 2018 Roundtable meeting
May 11, 2018	Daily Courier	Public Notice on Step Code engagement
May 11, 2018	City of Penticton (Ken Kunka)	City of Kelowna's Community Energy Specialist presented on the engagement process at the Penticton-hosted BCBC Training session for area building inspectors and builders. 60 in attendance
May 18, 2018	Troika Group (Josh Klassen)	Sent email invitation to engage on Step Code Survey and Industry Workshop
May 18, 2018	Regional Governments, CHBA-CO (Marika Luczi) & UDI (Jennifer Dixon)	Sent reminder to municipal government contacts that Step Code Industry Survey closes May 23, 2018
May 31, 2018	Industry stakeholders involved in the construction of new Part 9 buildings in Kelowna (106 attendees) Co-hosted with Community Energy Association, and in partnership with CHBA-BC and CHBA-CO	Full day Industry Energy Step Code workshop. Presenters: Peter Robinson: Community Energy Association Marika Luczi: Canadian Home Builders Association - Central Okanagan Ashley Lubyk: City of Kelowna Hayley Newmarch: FortisBC Hamid Heidarali: Hamid Design Build Gilles Lesage: Total Home Solutions
June 12, 2018	CHBA-CO (David Pfuetzner)	Phone call requesting meeting to discuss CHBA-CO Energy Step Code subcommittee
July 4 – July 27, 2018	UDI Okanagan Chapter CHBA-CO City of Kelowna Architect Subcommittee (local architects) Energy Advisor community (including the Canadian Association of Consulting Energy Advisors – BC Chapter) Okanagan College Kelowna's Innovative Energy Forum FortisBC BC Housing Municipal governments in the Okanagan	Invitation for final comments on initial proposed implementation timeline for Part 9 buildings.
July 13, 2018	CHBA-CO	Email to City of Kelowna, City of Vernon, City of West Kelowna, District of Coldstream, District of Lake County, District of Peachland with recommendations to: implement only in coordination with provincial BC Building Code, suspend mandatory implementation until CHBA BC cost analysis complete, and provide voluntary incentives. Note: City of Kelowna provided a response on August 3, 2018.
July 25, 2018	En Circle Design & Build	Letter of support for initial implementation timeline for Part 9 buildings
July 26, 2018	FortisBC	Letter of support for initial implementation timeline for Part 9 buildings
August 13, 2018	BC Housing	Letter of support for initial implementation timeline for Part 9 buildings

Date	Contact	Notes
August 24, 2018	CHBA-CO	City staff met with CHBA-CO representatives who had three main points of concern: affordability, energy advisor capacity, timing.
August 27, 2018	CHBA-CO / Bellamy Homes	Email to Mayor and Council disagreeing with early adoption of BC Energy Step Code in Kelowna and request to defer 90 days pending CHBA-CO's costing study.
September 20, 2018	FortisBC	Staff met with Fortis to discuss options for Energy Step Code Implementation.
October 4, 2018	Total Home Solutions	Staff met with representatives from Total Home Solutions to discuss Energy Step Code.
October 4, 2018	McEwen Climate	Staff met with McEwen Climate to discuss Energy Step Code and what has been done in other jurisdictions
October 30, 2018	QuikTherm	Inquiries about Energy Step Code in Kelowna
November 5, 2018	CHBA-CO	CHBA-CO presented the results of their costing study to City of Kelowna Staff, FortisBC and UDI. (note: other local governments were invited, but unable to attend)
November 7, 2018	BC Housing	Email communication to understand results of CHBA-CO Costing Study compared to Provincial Metrics Study
November 7, 2018	FortisBC	Staff met with FortisBC to discuss technical aspects of CHBA-CO Costing Study and options moving forward.
November 7, 2018	Energy Step Code Council of BC	Staff met with representative from Energy Step Code Council of BC / City of Surrey to discuss the results of the CHBA-CO Costing Study and relationship to Provincial Metrics Study.
November 21, 2018	Energy Step Code Council of BC	Staff met with Maxwell Sykes from Energy Step Code Council of BC / City of Surrey to further discuss the results of CHBA-CO Costing Study and relationship to Provincial Metrics Study
November 21, 2018	City of Richmond	Staff met with City of Richmond staff to understand how Energy Step Code is implemented in that community.
November 22, 2018	ROV Consulting	Response letter to CHBA-CO on their costing study with cc to City of Kelowna Staff
December 13, 2018	BC Building Standards Branch	Staff met with BC Building Standards Branch to discuss the differences of CHBA-CO Costing Study and Metrics Study, assumptions pertaining to Step 1, and workshop options.
January 8, 2019	BC Building Standards Branch	Staff met with BC Building Standards Branch to understand assumptions of Base Building Code versus Step 1 and provincial implementation timelines for Energy Step Code.
January 10, 2019	District of Lake Country	Email update from District of Lake Country on Energy Step Code implementation progress in that community and request for Kelowna's timelines.
January 17-30, 2019	Invitation sent to apply to participate was distributed through the following channels: <ul style="list-style-type: none"> City of Kelowna's Energy Step Code e-subscribe CHBC-Central Okanagan membership UDI Okanagan membership FortisBC network 	Invitation to participate in Kelowna Energy Step Code Solutions Lab

Date	Contact	Notes
	<ul style="list-style-type: none"> Community Energy Association network 	
January 30, 2019	City of Penticton	Email update on status of Energy Step Code implementation in Penticton and request for Kelowna's implementation process
February 4, 2019	BC Building Standards Branch	Staff met with BC Building Standards Branch to discuss content for Energy Step Code Solutions Lab in Kelowna
February 12, 2019	Energy Step Code Solutions Lab Consultation – 10 builders, 5 developers, 3 trades, 6 architects/designers, 5 energy advisors/energy consultants	Staff hosted an Energy Step Code Solutions Lab which had participants work in groups to develop options for implementation moving forward
March 4, 2019	Local Energy Advisors	Responsibilities of Energy Advisors and local capacity.
March 11, 2019	BC Buildings Standards Branch	Costing study information and draft implementation strategy
March 12 – April 5, 2019	UDI Okanagan Chapter CHBA-CO City of Kelowna Architect Subcommittee (local architects) Energy Advisor community (including the Canadian Association of Consulting Energy Advisors – BC Chapter) Okanagan College Kelowna's Innovative Energy Forum FortisBC BC Housing Municipal governments in the Okanagan	Invitation for final comments on proposed implementation timeline for Part 9 buildings.

Attachment C: Industry Survey Results

Recognizing that challenges exist and understanding that local governments can be instrumental in helping the building industry prepare for forthcoming regulations and changes to the Building Code to meet the Energy Step Code ("Step Code"), the purpose of the Energy Step Code Industry survey was to:

- Raise awareness of the Step Code;
- Identify capacity gaps as it relates to implementation of the Step Code;
- Inform respondents of incentives related to the Step Code;
- Assess industry readiness for the forthcoming changes to the Building Code.

The survey was coordinated by the City of Kelowna and encouraged anyone involved in the building industry related to the construction of Part 9 buildings in the City of Kelowna or neighbouring municipalities from Penticton to Vernon, who were also investigating Energy Step Code implementation strategies. Licenses residential builders, trades, architects, home designers, and Energy Advisors had the opportunity to complete the survey between April 15 and May 30, 2018.

Responses to the survey questions are outlined below:

1. In which municipalities and electoral areas are your projects located?

Municipality	Responses (%)	Responses #
City of Kelowna	88.68%	47
City of West Kelowna	50.94%	27
City of Vernon	41.51%	22
City of Penticton	39.62%	21
Regional District of Central Okanagan	37.74%	20
District of Lake Country	60.38%	32
District of Summerland	26.42%	14
District of Peachland	28.30%	15
Other	24.53%	13
Total Respondents: 53		

2. How would you describe your role in the building industry? Check all that apply.

Role	Responses (%)	Responses #
Property owner/developer	28.30%	15
General contractor	32.08%	17
Design-builder	30.19%	16
Construction manager	22.64%	12
Trade contractor	5.66%	3
Design professional	33.96%	18
Energy Advisor	11.32%	6
Other	20.75%	11
Total respondents: 53		

3. Which types of Part 9 residential buildings do you construct? Check all that apply.

Type of Part 9 Residential Building	Responses (%)	Responses #
Carriage / Laneway Houses	56.60%	30
Small Single Family Dwellings (SFDs) (up to 1100ft ²)	54.72%	29
Medium SFDs (1100 to 2550ft ²)	77.36%	41
Large SFDs (greater than 2550 ft ²)	83.02%	44
Duplexes	43.40%	23
Tri/Quadplexes	32.08%	17
Row houses	45.28%	24
Multi-Unit Residential Buildings (3 storeys and under and under 600 m ² building area)	50.94%	27
Total respondents: 53		

4. How many Part 9 buildings units are you involved in the design/construction of on a yearly basis? Check the one that applies.

# Part 9 building units	Responses (%)	Responses #
5 or fewer	28.30%	15
6 to 10	24.53%	13
11 to 25	11.32%	6
26 to 50	13.21%	7
51 to 100	7.55%	4
101+	15.09%	8
Total responses: 53		

5. How often do you currently build using the performance path for energy efficiency in the BC Building Code, use energy modelling, and/or air tightness testing? Check the box that applies for each row. A performance path requires that the building as a whole performs to a certain standard, as opposed to a prescriptive path that requires each component to be built to a certain standard (e.g. Wall R-value at least 20). Although the performance path requires energy modelling and air tightness testing, some professionals may have used these while following prescriptive code requirements (for example when obtaining an EnerGuide label).

Answered: 38 Skipped: 15

	All the time	Sometimes	Never	N/A	Total	Weighted Average
Performance path	23.68% (9)	42.11% (16)	28.95% (11)	5.26% (2)	38	2.06
Energy modelling	34.21% (13)	23.68% (9)	36.84% (14)	5.26% (2)	38	2.03
Air tightness testing	28.95% (11)	34.21% (13)	31.58% (12)	5.26% (2)	38	2.03

6. If you've used the tools listed above have they helped to improve design performance or resulted in other benefits? Check the box that applies.

Answered: 38 Skipped: 15

Helped improved performance?	Responses (%)	Responses #
Yes	55.26%	21
Maybe	7.89%	3
Unsure	23.68%	9
No	13.16%	5
Total responses: 38		

Please state the benefits you have seen:

- Energy modelling and performance path makes the design options to be more open, being able to search for trade-off solutions among the passive design and HVAC systems.
- PHPP Energy Modeling is a fully encompassing piece of software for all assemblies and systems of a home. Even if it's not being used for passive house applications, it calculates a very accurate snapshot of how the house consumes energy and gives a target for air tightness requirements. I have always taken the prescriptive approach for building assemblies to meet or exceed minimum code requirements.
- Energy modelling has helped optimize our designs for performance and cost-effectiveness to our clients. They help us optimize everything from building form, to what wall assembly is necessary to meet the insulation requirements, how much to insulate the slab and roof, specifying HVAC equipment so that it's right sized, optimizing design for passive cooling, and understanding the impact of glazing and air tightness on overall performance. The air tightness testing is a no brainer. By testing air tightness before drywall is up we are able to locate leaks to further enhance energy performance.
- in the past the performance path has resulted in the buildings only requiring the basic insulation requirements to meet code yet perform close to the old EnerGuide level of 80
- Simple, yet accurate, energy modelling is used on every project to establish a direct, specific estimate of annual energy consumption and intensity, as well as sizing of peak loads for heating, cooling and DHW. The carbon intensity (kg CO₂e per year) is also a straightforward byproduct of energy modelling. It makes total sense to do this for every project.
- The only way to get a modern building is by measuring it.
- use of air tight testing helped establish new standards for us in the use of spray foam in complex assemblies
- More coordination between architect and design professionals for a more comprehensive design.
- Have a hard time gauging the accuracy of our modelling results.
- We recently air tested a 4200sf home just prior to drywall. We used the test to seal penetrations.
- Performance based compliance allows for cost-optimized design regardless of the target.
- Yes, using the PHPP (Passive House Planning Package) allows our projects to exceed Step 5.
- When not doing full Passive House, we still energy model all of our projects and use "highperformance" assemblies using the five basics - superinsulation, airtightness, high-performance windows/doors, thermal bridge free and heat recovery ventilation.

7. What is the most stringent energy efficient home building standard you have designed or built, and what do you typically build to? Check all that apply.

Answered: 38 Skipped: 15

	Have Built to this once or more	Typically Build to this Level	Total	Weighted Average
Base BC Building Code	21.43% (6)	78.57% (22)	28	1.79
BUILT GREEN® Silver	55.56% (5)	44.44% (4)	9	1.44
BUILT GREEN® Gold	85.71% (6)	14.29% (1)	7	1.14
BUILT GREEN® Platinum	75.00% (3)	25.00% (1)	4	1.25
LEED® Homes	75.00% (3)	25.00% (1)	4	1.25
ENERGY STAR® for New Homes	63.64% (7)	36.36% (4)	11	1.36
R-2000	60.00% (3)	40.00% (2)	5	1.40
Passive House	58.33% (7)	41.67% (5)	12	1.42
CHBA Net Zero Ready Home	62.50% (5)	37.50% (3)	8	1.38
CHBA Net Zero Home	87.50% (7)	12.50% (1)	8	1.13

Other, e.g. EnerGuide rating (please specify)

- Many homes we design use Passive House principles. Some clients don't want to certify so we design homes well above minimum code but short of Passive House to give them the best possible house within their budget and design constraints.
- Living Building Challenge. NetZeroEnergy (ILFI)
- Living building challenge
- EGR 82
- 9.36. compliance or BC Step 1 equivalent (nic airtightness)

8. Which of the following education and training opportunities would be helpful in supporting a smooth transition to Step Code adoption? Check all that apply.

Answered: 34 Skipped: 19

Helped improved performance?	Responses (%)	Responses #
Introduction to BC Energy Step Code	61.76%	21
Energy modelling and the role of Energy Advisors	61.76%	21
Hands-on training	41.18%	14
Trades specific training (e.g. air and moisture barriers, window installation,...)	61.76%	21
Marketing energy efficient homes	44.12%	15
New technologies	41.18%	14
New construction techniques	61.76%	21
Right-sizing of heating systems	50.00%	17
Ventilation in energy efficient homes	52.94%	18
Other:	14.71%	5
Total responses: 34		

Other:

- Giving incentive to North American HVAC manufacturers to offer smaller capacity systems.
- Many of the current systems are oversized because the minimum capacities are beyond what a building requires.
- A systems approach. A course tailored to help the industry understand the tradeoffs and potential avoided costs to do the right things right. Then also trade specific training in window installation, HRVs, and air tightness. Moisture management in wall assemblies will be a big concern with these thicker walls. It's important there are good resources in the design of walls that work for our climate.
- Educating how much the envelope and orientation effect the energy performance – especially with regard to preventing summertime overheating - one of the most important issues with climate change and the Okanagan.
- how to conduct a blower door test and calculate air changes
- The energy component is one side, what is being lost in the discussion is that water (air borne or liquid) behaves differently in thicker assemblies. Training must be provided on this or the number of failures of higher performance assemblies will be the next "leaky condo" problem.

9. Aside from the challenges to implementation outlined in the introduction (e.g. costs, lack of technical training, energy advisor capacity, compliance monitoring), do you have any other comments on what regional governments should consider leading up to the implementation of the Energy Step Code? Please comment.

Answered: 22 Skipped: 31

- It is not feasible to accurately test Modular buildings until they are set up on site. As we deliver homes throughout BC including smaller remote communities availability and cost of the energy advisors would be even greater to our industry and could result in lost sales opportunities.
- Have an immense concern with the Energy Step Code being introduced as it will have an overall dramatic negative effect with the cost of housing. Based on studies that I have researched and partaken in we are moving towards \$300 per square foot without land. I can appreciate there are efficiencies and cost savings with respect to utilities, but I don't believe those efficiencies will be greater than the mortgaged amount the typical homeowner will be borrowing. This is a really bad idea!!!!
- Don't hesitate on implementation. Industry needs a wake up call and we can't keep building to the current minimums. I also think the municipal or provincial governments should be in charge of energy modeling, right along side plan checking in the permit application stages.

- Implementation of Step Code is absolutely necessary to support consumer choice and keep energy costs low. Having a performance based approach is entirely reasonable despite resistance to change from the industry. One important point, once we start designing and building homes with more insulation than a 2x6 stud wall then adding more insulation beyond that based on budget or energy model requirements is straightforward. With housing prices rapidly rising step code or not, it is essential that at the very least a massively better product is offered. I hope governments will take this opportunity to lead in this important initiative.
- The energy used by pools and hot tubs. This should be included with the home modelling. Silly that we can build an energy efficient home and then waste electricity heating a pool in the early fall and late spring.
- building to this level should be an option not a mandate. This adds to the cost of a home and does not promote getting young families into the housing market. Also what about all the commercial buildings that are energy hogs with no standards for insulation
- Try to make builders and consumers understand the big picture. The long term effects of energy efficient housing and how it reduces GHGs and costs due to the efficiency of the product.
- Mainly the costs will rise to an unattainable or sellable level. We need affordable homes.
- The cost benefit ratio for home owners as the requirements for higher steps cost way more money
- We need to consider the promotion of healthier buildings in the light of energy efficiency. Most specifically the ventilation/air-exchange during peak summer/winter when outdoor air is often reduced due to energy costs for tempering. We have proven alternate solutions that we have installed on numerous projects in the Okanagan that guarantee healthier buildings with no energy penalty.
- We need legislation to bring our building practices out of the dark ages.
- They should at min do air test regardless of the ACH outcome. This should happen now.
- rate of implementation as it relates to additional cost. i.e. selling similar spec homes with different step code levels and inherent cost.
- Education is extremely important. More emphasis on the building envelope design and air sealing especially.
- Lack of supply of building products that help achieve air tightness. Currently only 3 companies providing this product with only one them being sold locally.
- no
- An educated, consistent and practical enforcement from the local building officials so all buildings are on the same basis. Respect the knowledge and assistance of design professionals.
- Costs of implementation, it is becoming very expensive to build and although these programs sound fantastic with increases in every sector of building we need to be aware of how this will impact the consumer, currently with all the engineering required the cost of permits and cost of materials how one will it be before the average consumer will not be able to afford a Home, we are already there
- Negative impact to creating affordable Housing. Does not address the real energy users – like older homes.
- With building compliance to be largely dependent on the quality of of energy compliance reports, it will be important for municipalities to be versed with what are 'reasonable results' and to be able to detect obvious modeling mistakes if they are made. I think it is important that municipalities be aware of the advantageous modeling flexibility currently built into the Step Code to ensure it is retained in future code editions. The current allowance for the use of alternate ASHRAE 140 compliant (as opposed to a Hot2000 only approach) ensures consumer choice and design innovation is not limited to the capabilities/scope of a single software tool. As an active energy consultant I would be pleased discuss these matters in person or over the phone.
- Make using www.u-wert.com (u-value.com in English) mandatory to mitigate potential moisture issues within thicker assemblies. When submitting this data to local municipalities, our experience has shown that plan checkers do not understand the information presented and yet this should be mandatory in our opinion. I also recommend using U-values (not RSI...!!!) consistently for all assemblies including windows as mixing RSI into the same discussion is confusing. u-wert allows users to quickly build

assemblies to determine the U-value, condensate, moisture content of wood, drying time, interior surface temperatures, drying reserve, temperature amplitude drying, phase shift and finally heat storage capacity.

10. How likely are you to use the incentives being provided by FortisBC/Fortis Energy Inc. in 2018? Keep in mind that performance requirements of the Step Code will be embedded in the base BC Building Code in future code updates, and that these incentives are an initial offering for 2018 and may change beyond that.

Answered: 35 Skipped: 18

	Responses (%)	Responses #
Very likely	57.14%	20
Somewhat likely	11.43%	4
Somewhat unlikely	17.14%	6
Very unlikely	8.57%	3
I'm ineligible	5.71%	2
Total responses: 35		

11. If you are likely to use the incentives being provided by FortisBC/Fortis Energy Inc. in 2018, what Step of the Energy Step Code are you most likely to attempt to build to?

Answered: 35 Skipped: 18

	Responses (%)	Responses #
Step 1 (Enhanced Compliance)	17.14%	6
Step 2 (10% improvement over base BC Building Code)	8.57%	3
Step 3 (20% improvement over base BC Building Code)	28.57%	10
Step 4 (40% improvement over base BC Building Code)	5.71%	2
Step 5 (Net Zero Energy Ready)	17.14%	6
Not applicable	22.86%	8
Total responses: 35		

12. Which statement best reflects how you feel about the proposed timeline?

- Step 1 compliance within 12 to 18 months (Spring/Summer 2019); graduating to
- Step 3 compliance 18 months later (Autumn/Winter 2020).

Answered: 35 Skipped: 18

	Responses (%)	Responses #
Why wait a full year? We should get started today	31.43%	11
The timeline is achievable with the right supports	28.57%	10
It's achievable but may pose challenges	25.71%	9
Not achievable	14.29%	5
Total responses: 35		

Please comment on previous answer. In particular, please state your perspective.

- It is difficult to make the whole construction market be ready for such a challenging task, without fail in some other important aspects like economic feasibility, quality control of new construction methods, implementation of new HVAC systems...
- Feasibility of energy testing on 100% of Modular homes delivered within BC is unrealistic with current capacity of energy advisors and due to associated costs.
- There are not enough Energy Advisors to take up this demand. I think Energy Advisors should be a public service at the Municipal or Provincial Level. This also guarantees a third party to confirm all the data hand in hand while a building permit application is being reviewed.

- Step 3 should be sooner, 12 months after Step 1. Step 1 doesn't require any deviation from minimum code.
- The sooner the better.
- Costs will rise to a point people will not build anymore. Costs are not worth the risk of our construction economy. This should be by choice of the client building their home. Not pushed on by governments.
- Still concerned about the costs of construction
- Let's get going. I am all for soft starts to get things moving and everyone on board, but energy efficiency is a NOT A NEW IDEA! Just take the lead and show the community that we are a grown up and responsible region of districts, towns and municipalities - who want to get this moving. With growth in the Okanagan expanding - we are constructing a legacy of buildings that will be around for many years. Let's start the process with Step 3 right now - and offer benefits to Step 4 / 5 that offer tangible rewards to the developers who want to take them on.
- We are a growing region and have the means to do this.
- How will home assessments vary for each step achieved. How will home pricing vary based on which step home was built to. Until home pricing is valued the same way as the automotive industry ie .cost of automobiles is based on performance.
- Many builders and trades are unaware of the energy step code and haven't prioritized ongoing education as business is so good right now in the Okanagan that they don't have to.
- Not sure, with the large demand for energy advisors, that the current professionals will meet the time demands on completing the calculations in a timely manner.
- Educating every single trade to the level required will be very difficult. Especially trades that are not governed by an organizing body (ex. insulators)
- I am biased. We intend to support Step Code compliance within the Okanagan.
- Get on with it.....what are we waiting for? We've been designing and building Passive Houses since 2012 and the rest of the industry is stuck. The reality is that every builder/designer is not going to make the cut and the question that should be asked is, is that a bad thing?
- Based on my experience, the one year gap is not encouraging the industry to get ready for the changes, but is rushing them to build more building before the new changes apply!

13. If you have any additional comments you'd like to add, please include them here:

Answered: 8 Skipped: 45

- This initiative is extremely negative towards housing affordability. I believe we need to restructure our overall approach to the BC Building Code with respects to overall phasing/levels of the code. In essence it would be the same as purchasing a vehicle. Standard safety code applies (typical construction - Level 1), then add steps as they have been outlined, however it should not be "required" for housing to reach "net zero". When these houses are sold it would be disclosed under which level of the Building Code home was constructed under. This will maintain affordability measures for those looking to be introduced to home ownership or don't believe efficiency measures are of priority.
- Affordable homes should be top priority.
- I greatly admire and offer sincere thanks to the City and Fortis for funding this process to get energy efficiency rolled out in our region. Please use this timing to achieve the higher goal of straight to step 3, rather than moving slowly, by which time another 5,000 homes will be less efficient for their lifetime. Let's go higher now. Thank you to those involved in this program.
- We support legislation to get this move forward in our building practices.
- very proud of our construction community leading the way to energy efficient building
- Need to have incentives in BC Hydro territory as well as Fortis areas.
- The Step code will negatively impact housing affordability for only a minuscule return in energy savings to the consumer. It does not address the real energy usage - older homes. The step code is politically motivated in its current form and should be applied to all homes - not just new homes (low hanging fruit)

- Incentives....hmmm.....if it is like the FortisBC new home program incentives then a lot of Passive House projects will not be eligible because we are forced to use European components simply because the comparable components, on a performance level, do not exist in North America (this is starting to change but we shouldn't be penalized when the data clearly shows higher performance). For example, on numerous projects we have used Zehnder HRV's and European windows simply because we can't get the same levels of performance from North American products. The issue is that the European products do not have the silly "EnergyStar sticker" and so our customers are not able to obtain the incentive. To date, our customers have received very little to zero, on average, for building massively better and that is quite honestly pretty frustrating.

Attachment D: Energy Step Code Solutions Lab Summary

Introduction

Furthering the conversation on Energy Step Code Implementation in Kelowna, the City hosted an Energy Step Code Solutions Lab on February 12, 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 9 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.

The 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
- FortisBC network
- Community Energy Association network

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 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:

- 10 builders
- 5 developers
- 3 trades
- 6 architects / designers
- 6 energy advisors / energy consultants

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

The Solutions

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
3. Energy Step Code in Kelowna, City of Kelowna

Participants were grouped in six tables ensuring a variety of building industry representation (such as builders, contractors, developers, trades, architects, designers and energy advisors) 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. Timeline for implementation for Steps 1 to 3, as local governments outside of the lower mainland are only currently allowed to 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;
2. Education and training that is required to support the implementation of Energy Step Code; and
3. Other tools to support implementation.

The sections that follow summarize the input that was received. The 6 Proposed Implementation Solutions at the end of this section provide a photo representation of all of the solutions proposed.

Implementation Timeline

Figure 1 summarizes the input received regarding their ideas on when the City should make each of the Steps mandatory between now and 2022. The majority of proposed solutions identified Step 1 becoming mandatory by the end of 2019 (the green check marks). Only three of the groups felt that there was a need to include Step 2 in the implementation process (the orange check marks). There were differing views on when Step 3 should be implemented, however the majority of the proposed solutions identified it should be in advance of when the province requires it in the BC Building Code in 2022.

	2019				2020				2021				2022			
Step 1			✓	✓	✓		✓						Province requires Step 3 20% more efficient			
Step 2			✓	✓	✓		✓				✓					
Step 3							✓	✓			✓	✓	✓	✓		
	Mar-19	Jun-19	Sep-19	Dec-19	Mar-20	Jun-20	Sep-20	Dec-20	Mar-21	Jun-21	Sep-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22

Figure 3: Summary of proposed implementation dates

Education and Training

Two distinct timelines for education/training were identified: education/training that is required prior to the implementation of Step 1, and other education/training that was suggested. It is recognized that training may be required from multiple organizations.

1. Education/training required in advance of Step 1:
 - Industry education/training on blower door testing
 - Industry training on working with an Energy Advisor and designers
 - Communication between Energy Advisors, architects and mechanical companies
 - Training for insulators and framers
 - Value proposition training
 - Training on the new permitting process
 - Building official training on Step Code implementation
2. Other education/training required
 - Life cycle costing in place of capital costing
 - Training to industry and consumers on economic benefits of energy step code
 - Professional trade education on air-tightness
 - Information sharing within industry on cost-effective solutions
 - Sub-trade training on targets
 - Form and character implications of Energy Step Code to city Council and staff
 - Building envelope training
 - Contractor training
 - Advanced framing techniques training
 - Alternative building assembly training

- Builder information meetings with Energy Advisors on basic information required on varying design
- Understand how test results are recorded for the long term
- Promote training to builders who are not attending workshops
- Continuing professional development (CPD) credits should require energy education / step code training

Other Tools

Other tools to support the implementation of Energy Step Code are compiled below in two categories: incentives and other tools.

1. Incentives

- Subsidize training
- Offer incentives for mandatory pre-drywall blower door testing
- Offer incentives or have penalties
- Offer non-utility based incentive for builders pursuing Step 1 prior to implementation
- Offer incentives for new Energy Advisors
- Offer rebates to offset costs
- Bylaw relaxations for more efficient homes
- City should offer incentives for all steps

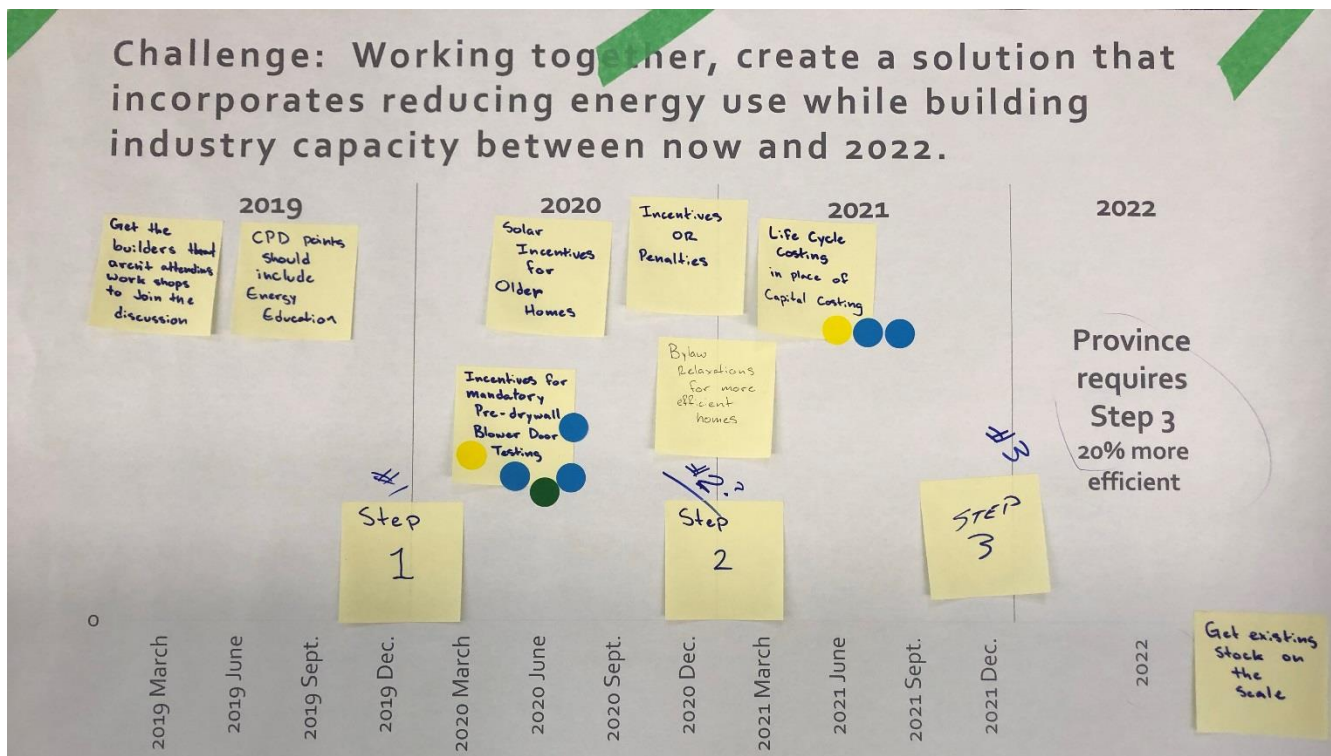
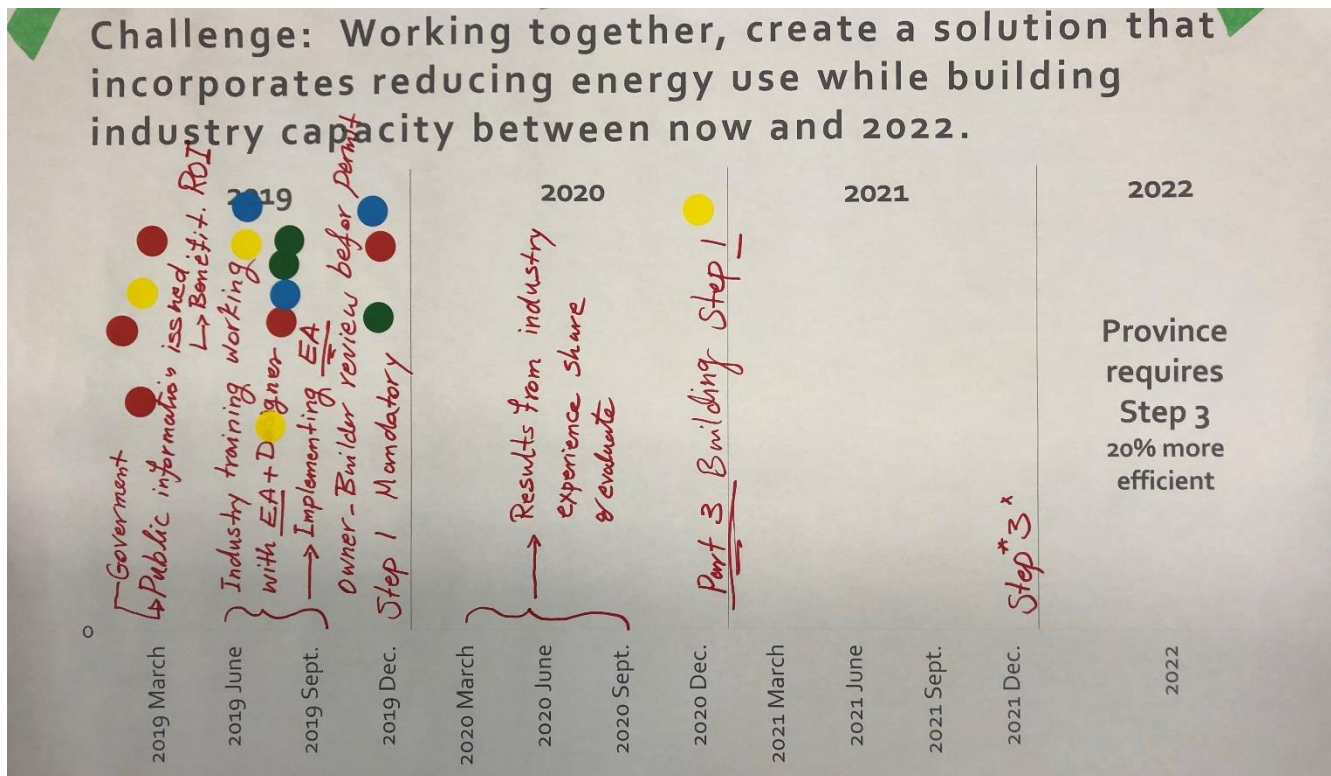
Other tools to help support implementation of Energy Step Code include:

- Better data on incremental construction – design techniques, RSI values and their related benefits
- Build up Energy Advisors
- More training for Energy Advisors
- Government public information issued (benefit, ROI)
- Program merging Hot 2000/heatloss calculation
- Implementing Energy Advisor owner-builder review before permit
- Share results and experiences of Step 1 implementation with industry
- Monitor performance and capacity of energy advisors
- Mandatory certification on air barrier installation for trades
- Voluntary home model and blower door testing (gauging the capacity of Energy Advisors and other stakeholders)
- Mid construction blower door test
- Gather data on what is being built and all air tightness measures and their benefits
- Cost effective facades for simple massing
- Get 10% of existing stock on EnerGuide or TEUI Scale
- Air tightness
- HRV, ERV or Bath Fan
- Provincial harmonization
- Reduced municipal inspections replaced by Energy Advisor (insulation, vapor barrier)
- City to conduct 'scorecard' on each builders' performance. Builders who perform well may require less continuing education than a builder that needs help. 'Scorecards' help City to monitor progress of each builder.
- City to certify builders as Step Code certified

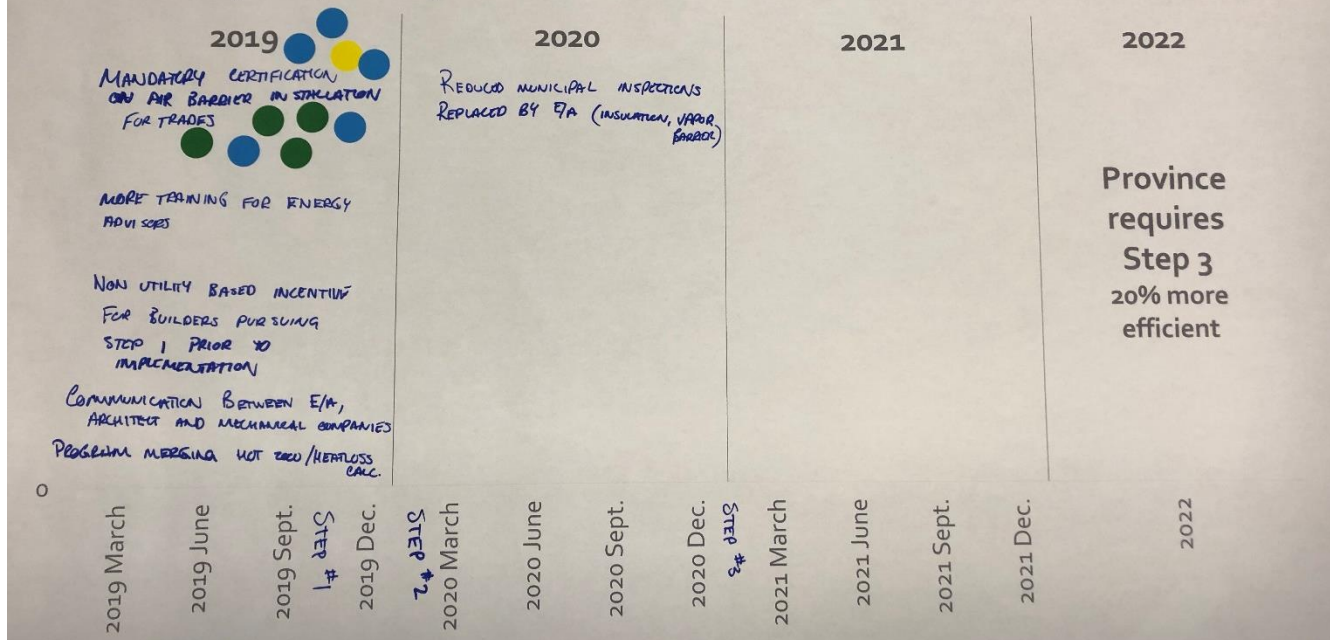
*Identified as beneficial
prior to implementation
of Step 1*

- How does Step Code address cost of manufacturing Styrofoam, etc?
- What are the costs of the Steps?
- Integrated Energy Advisors
- Builders should be able to do internal blower door tests
- Orientation needs to be less dominant in reference house

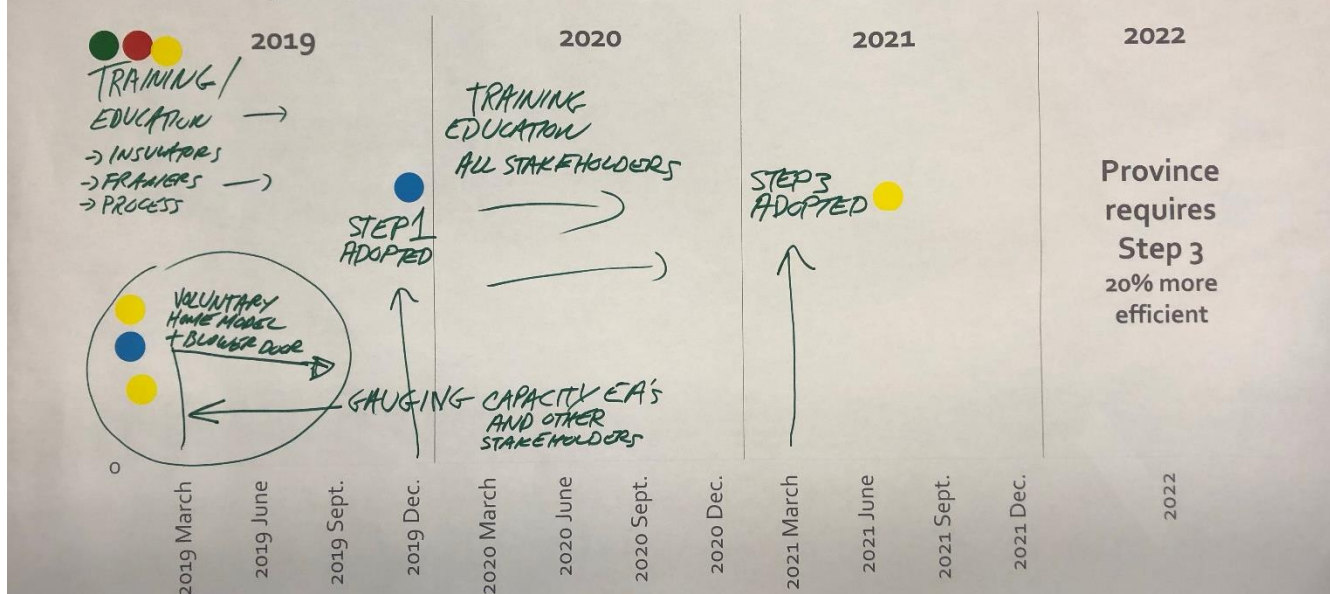
The 6 Proposed Implementation Solutions



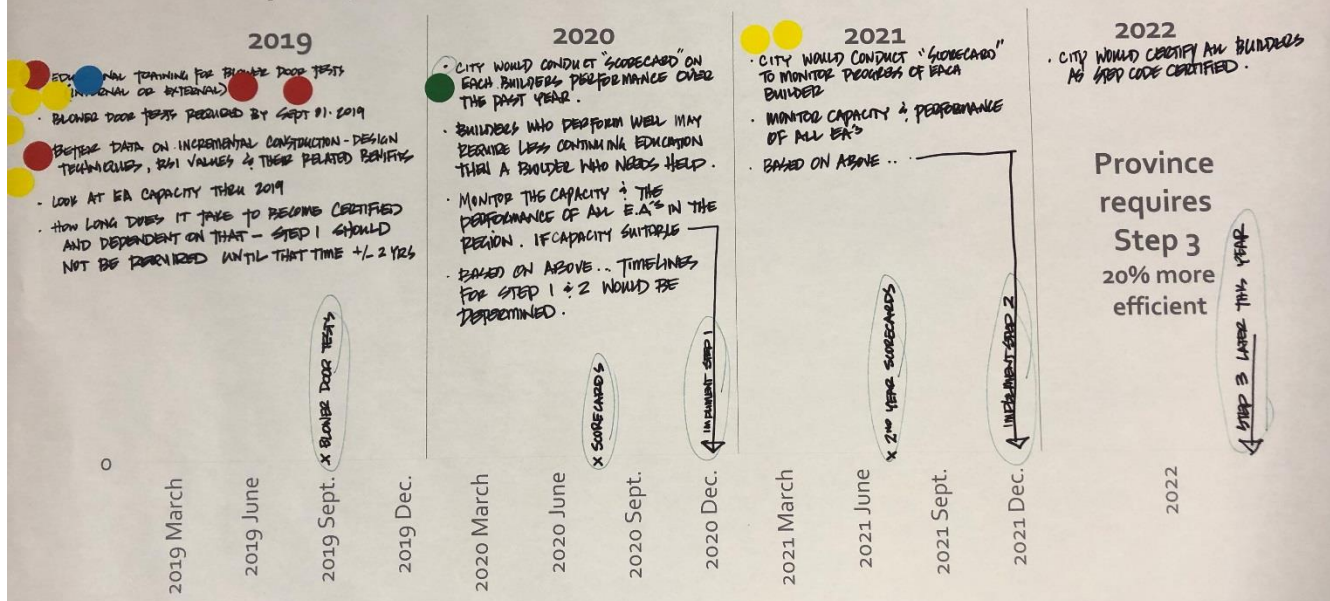
Challenge: Working together, create a solution that incorporates reducing energy use while building industry capacity between now and 2022.



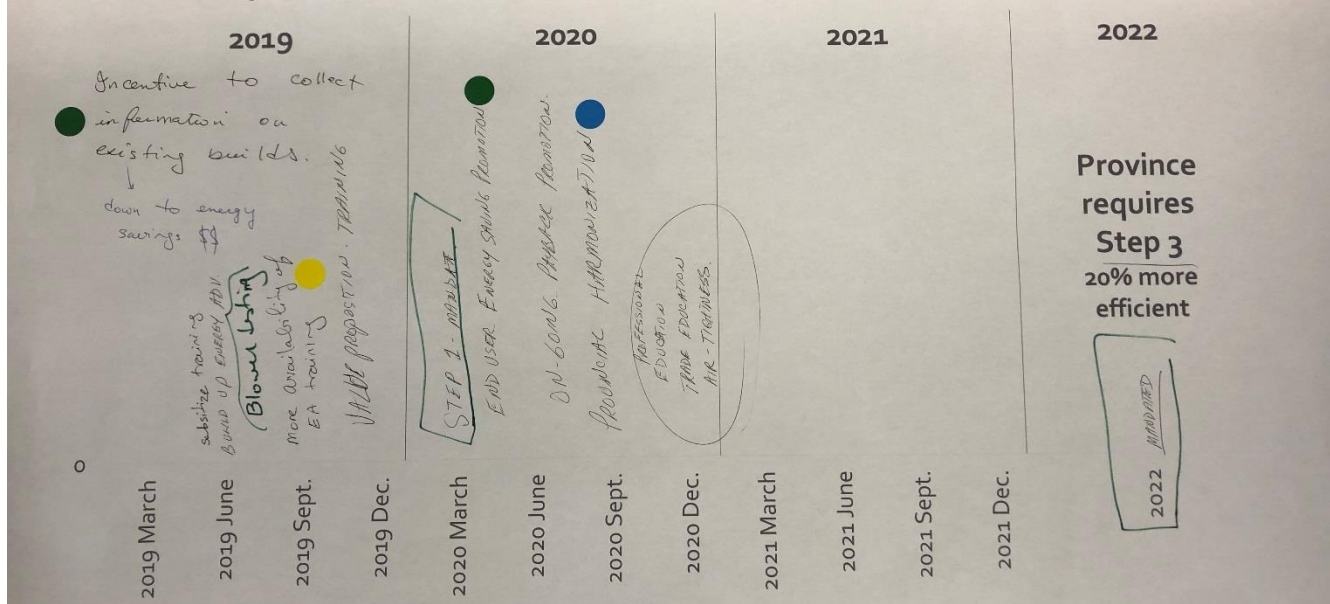
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Attachment E: Proposed Zoning Bylaw Regulations

Amendments to Bylaw No. 8000 to incent achieving higher steps of the Energy Step Code

No.	Section	Existing	Proposed	Explanation
1	Section 6 – General Development Regulations Add a new section as 6.17		6.17 Energy Efficiency	
2	Section 6 – General Development Regulations Add a new regulation as 6.17.1		6.17.1 Any Part 9 residential building, as defined by the BC Building Code, that is constructed to Step 5 of the BC Building Code's Energy Step Code or is constructed as a certified Passive House, may reduce the minimum side yard, rear yard, front yard, and/or flanking street requirements of the zone by up to 0.25 metres. Where there is a minimum requirement of 6.0 m for a front yard or from a flanking street to a garage or carport, that 6.0 m may not be reduced.	<p>- OCP Policy 5.16.3 Variances for "Green" Features. Staff will give favourable regard to variance applications to reduce setbacks whose sole purpose is to accommodate green building features (e.g. solar panels etc.), provided that safety and neighbourhood impact issues can be addressed.</p> <p>- The Energy Step Code is a provincial standard designed to transition new construction across the province to "net-zero energy ready" by 2032. This amendment seeks to remove the barrier associated with thicker walls needed to achieve Step 5 of the Standard.</p>