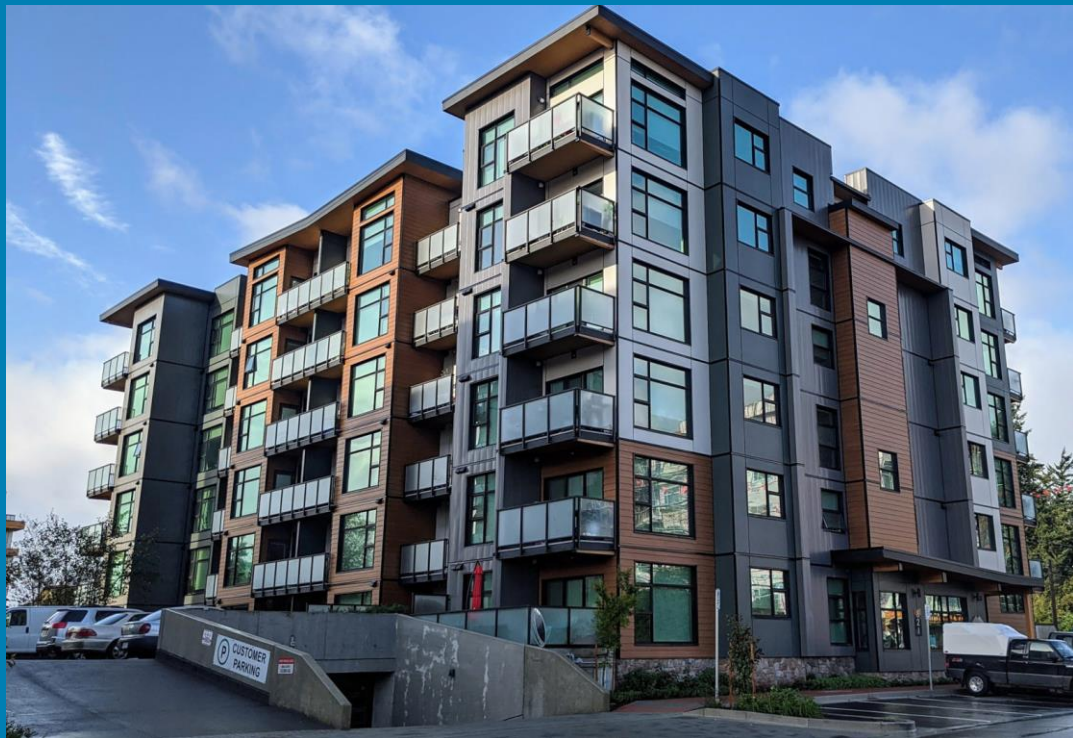


2022

# Final Engagement Report: Step Code and Carbon Pollution Standard

Charting a Path to Net Zero Emissions Buildings  
in the Victoria Region



July 5, 2022



## Executive Summary

The City of Victoria, District of Saanich and District of Central Saanich have been engaging the regional building industry on the adoption of the highest energy efficiency standards in the BC Energy Step Code and the implementation of a new Carbon Pollution Standard, which limits greenhouse gas emissions (GHGs) in new buildings, since February 2022. This project was undertaken with the support of the Capital Regional District (CRD).

This Step Code Regional Engagement Project has focused on determining the best way for local governments to use the regulatory tools available to reduce operating GHG emissions from new construction.

The local governments noted above have specific GHG emission targets and Council direction that requires reductions from new construction. These GHG emission reductions need to be achieved using the BC Energy Step Code and the newly drafted Carbon Pollution Standards, which are expected to be included in the BC Building Code at the end of 2022. The mandate to advance the Step Code and the Carbon Pollution Standards is rooted in the community engagement conducted as a part of our respective Climate Plans and Council directions.

These local governments and the CRD have worked together with to the Urban Development Institute (UDI) - Capital Region, the Canadian Home Builders Association (CHBA) - Vancouver Island and the Vancouver Island Construction Association (VICA) in designing and delivering the engagement process. The engagement process included two information sessions, two industry surveys, two solutions labs, two final engagement sessions and one-on-one meetings and phone calls. The building industry has been the primary audience for this engagement effort given their key role in implementing the new standards. Other local governments and electoral areas within the region have been invited to collaborate or participate in the process and information has been shared with them throughout.

This Engagement Report summarises the engagement process and feedback from all phases of engagement. Key messages communicated through the engagement include:

- There is agreement on the need for carbon emission reductions;
- There is support for focussing regulation on GHG emissions reduction, efficiency is secondary;
- Current Step Code requirements do not fundamentally change how homes are built, accelerating to higher step could;
- Significant lead time and/or allowing applications to be legacied before new regulations come into effect is desired. The lead time needed varies by building type and depending on the regulatory change;
- Construction costs were identified as a key concern;

- Simplicity in messaging is desired - keep policy simple and easy to understand and outline the full pathway to 2030/2032;
- Education/Training – labor market restrictions are a concern;
- The housing availability and affordability challenge is a core consideration that forms a backdrop for this work;
- Decarbonizing is technically possible and is achievable by the building industry;
- Consumer understanding is lagging: consumers don't typically understand the benefits of efficiency and decarbonisation;
- Builder and trades training would support new efficiency and carbon regulations;
- Regional consistency remains a priority;
- How the FortisBC grid and RNG will contribute is an open question; and
- BC Hydro grid capacity and connection process is an ongoing concern.

The engagement feedback has been used to inform final recommendations to Councils on how to adopt the higher steps of the BC Energy Step Code and the Carbon Pollution Standard.

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# 1.0 Common Acronyms and Definitions

**Part 3:** all buildings larger than three stories and/or larger than 600m<sup>2</sup> - more than 4 residential units is often the cut-off.

**Part 9:** residential buildings which are three stories or less, 600m<sup>2</sup> or smaller, 4 units or less is often the cut-off.

**GHG emission:** Greenhouse gas emissions

**Step Code:** The BC Energy Step Code is an optional compliance path in the BC Building Code that local governments may use, if they wish, to incentivize or require a level of energy efficiency in new construction that goes above and beyond the requirements of the BC Building Code.

**Carbon Pollution Standard:** A set of emissions targets, both annual greenhouse gas emissions intensities based on a buildings' size, and total annual greenhouse gas emissions that builders and developers would have to meet if a local government required them to. These targets are expected to remain in draft form until adopted into the BC Building Code in December, 2022.

**The Industry:** In this document “the Industry” refers to all businesses that are actively involved in the construction and development of new buildings. This can include, but is not limited to Registered Professional Builders, Energy Advisors, home designers, Architects, Engineers, Energy Modellers, developers and representatives of membership organizations.

# 2.0 Industry Engagement Overview

## 2.1 Objectives

Engagement objectives for this project were to:

- 1. Establish a cohort of municipalities who intend to participate in the engagement and who are interested in adopting additional Step Code and Carbon Pollution Standards to accelerate greenhouse gas (GHG) emission reductions from new construction;
- 2. Develop a fulsome understanding of the opportunities and challenges associated with several Step Code and Carbon Pollution Standard adoption scenarios by providing varied opportunities for feedback from industry members; and
- 3. Identify a preferred adoption scenario for Councils in the Capital Region to consider through a collaborative solutions-oriented process that will achieve the greenhouse gas (GHG) emissions reductions required to meet our climate targets.

## 2.2 Engagement Process

The engagement process builds upon extensive regional industry engagement conducted in 2017 and 2018 for the initial Step Code adoption and considerable public and stakeholder engagement completed during the development of the climate action plans. The engagement has followed the process outlined in Figure 1.

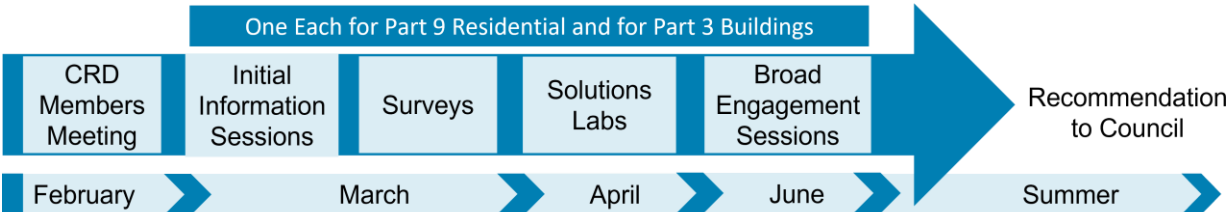


Figure 1: Engagement Process

*\*Part 9 residential buildings are residential buildings which are three stories or less, 600m<sup>2</sup> or smaller, Part 3 buildings are all buildings larger than three stories and/or larger than 600m<sup>2</sup>.*

## 2.3 Technical Review

A significant technical review was also conducted in parallel with this engagement process. This included a review and analysis of data from Step Code compliance in the CRD and Province, several economic analyses and Provincial modelling. The results of this technical review are included in the Technical Analysis Report (July, 2022), a companion document.

## 3.0 Engagement Opportunities

Engagement with the industry took place between February 2022 and June 2022. This engagement took several different forms. There were virtual events, open surveys, in person events, one-on-one phone calls and the opportunity for individual meetings with project leads from City of Victoria, District of Saanich and District of Central Saanich. There were approximately 150 touchpoints made with industry stakeholders throughout the process.

### 3.1 Industry Associations

The CRD, City of Victoria, District of Saanich and District of Central Saanich have worked closely with the Urban Development Institute (UDI) - Capital Region, the Canadian Home Builders Association - Vancouver Island (CHBA-VI) and the Vancouver Island Construction Association (VICA) in designing and delivering the engagement process. Several meetings were held with these associations at different points throughout the project, from pre-project development through to drafting the final recommendations. This was valuable to understand industry engagement needs, identify additional stakeholders, inform the webinar and workshops/solution labs contents, advise on suitable venues/format/timing, raise awareness of the engagement and share information with their members in addition to providing valuable feedback on information gaps and areas of potential concern. The Victoria Residential Builders Association were invited to participate in the engagement process several times, however they declined. A letter submitted on the association's behalf by their Executive Director is attached to this package as Appendix A. The Executive Director did attend some of the engagement sessions.

### 3.2 CRD Members Meeting

A Capital Region Local Government Step Code Workshop was held on February 9, 2022. The purpose was to ensure all local governments and electoral areas in the region were aware of the future BC Energy Step Code changes to be implemented as part of the BC Building Code and the opportunity presented by the forthcoming provincial Carbon Pollution Standards. They were also invited to collaborate or participate in the industry engagement process. The meeting sought to accomplish the following outcomes:

- Provide a background on Step Code incorporation into future Provincial Building Code updates;
- Summarize Step Code adoption, design implications, and compliance in the Capital Region (City of Victoria and District of Saanich in particular) to date;
- Provide an overview of the approaches taken to integrate GHG emissions reductions into Step Code by other local governments in BC;

- Summarize local government direction and targets for adoption of higher steps of the Step Code and GHG emissions/Low Carbon Energy Systems performance standards; and
- Outline the proposed industry engagement process and next steps.

While the project has continued to be led by the CRD, City of Victoria, District of Saanich and District of Central Saanich, several other local governments in the region have expressed interest in following the engagement process, receiving the results and understanding the final recommended pathways. Some have indicated the potential for alignment with the implemented approach.

### 3.3 Initial Industry Information Sessions

Two two-hour long virtual sessions were held with industry to provide background information on the BC Energy Step Code and provincial Low Carbon Pollution Standards as a basis for the engagement process. The Part 3 building industry information session was held on March 2, 2022 and the Part 9 residential building industry was held on March 9, 2022. Each session focused on the challenges and opportunities specific to these major building types.

The information sessions covered the following:

- Background on the BC Energy Step Code and its adoption in the capital region;
- A summary of data analysis for Step Code implementation to date (focused on the City of Victoria and District of Saanich);
- An overview of low carbon energy systems and Greenhouse Gas emission intensity (GHGi) measurements, including the draft provincial Carbon Pollution Standards;
- Provincial timeline and local government direction on implementing higher steps of the BC Energy Step Code and Carbon Pollution Standards;
- Provincial direction for 100% equipment efficiency requirements;
- Grid carbon intensity regulation (gas and hydro);
- Examples of approaches taken to achieve higher steps of the Step Code and low carbon energy systems;
- Opportunity for questions through a Q&A panel; and
- Overview of the Step Code industry engagement process and timeline, ways to provide input and next steps.

<p>53 People attended the Part 9 Information Session, 66 attended the Part 3 Information Session</p>
--

Speakers included the CRD, local government project leads and key subject matter experts, including the co-chair of the Local Government Step Code Peer Network, the Director of Electric Mobility & Low Carbon Strategies at AES Engineering who is on contract to provide technical



support for local governments on matters related to the Step Code, Energy Advisors, builders, designers and architects.

Participants were encouraged to provide feedback via the industry survey and participate in future rounds of engagement, including the solutions labs.

### 3.4 Initial Industry Survey

The survey focussed on identifying technical and process constraints that the industry might face with the adoption of higher steps of the Step Code, developing an understanding of industry knowledge of the GHG intensity (GHGi) metric and Carbon Pollution Standards regulation, and establishing an understanding of the Industry's perspective on Step Code implementation to date. The survey was hosted by the CRD on behalf of the participating local governments and open for feedback from March 2 – March 27.

The industry survey was distributed to the attendees of the initial information sessions, emailed to the full stakeholder project list (with approximately 260 industry contacts), promoted through the construction industry association newsletters and posted on local government webpages and planning/building inspection counters. 31 industry members completed the survey.

### 3.5 Solutions Labs

The solutions labs involved convening small groups of industry members to discuss the feedback from the survey and a short-list of adoption scenarios to determine an optimal path forward to decarbonize new construction. Two three-hour in-person sessions were held on April 20, 2022. One focussed on Part 9 buildings and one on Part 3 buildings. There were 15 people in addition to municipal staff at the Part 9 workshop, they included Energy Advisors, Builders, and home designers. There were 18 people in addition to municipal staff at the Part 3 workshop, they included energy modellers, developers, Builders, Architects, and mechanical engineers.

#### *Recruitment*

The solutions labs participants were recruited by invitation. Those who completed the survey had the opportunity to volunteer for the solutions lab they were interested in and all of those who volunteered received an invitation to participate. Recruitment via direct contact (email and phone) followed. Companies that were relatively frequently either submitting or supporting the submission of building permits were invited to attend. A balance between design professionals (e.g. architects, home designers, Energy Advisors, energy modellers and engineers) and builders and developers was sought to ensure a fulsome and informed discussion.

### 3.6 Final Phase - Broad Engagement Sessions, Survey & Individual Meetings

The final engagement sessions were open to all industry stakeholders (including local government staff) who wished to attend and were intended to seek feedback on the proposed adoption pathways.

These sessions covered the engagement to date, provided a recap of the Carbon Pollution Standard and presented the proposed adoption pathways. After the presentation attendees were invited into breakout rooms for small group discussions, which was followed by plenary discussions. Throughout the sessions attendees were asked to answer questions via Zoom polls. For those unable to attend the sessions, a survey was open from June 2 to June 13. There were a combined 70 attendees at the two sessions and 11 completed surveys.

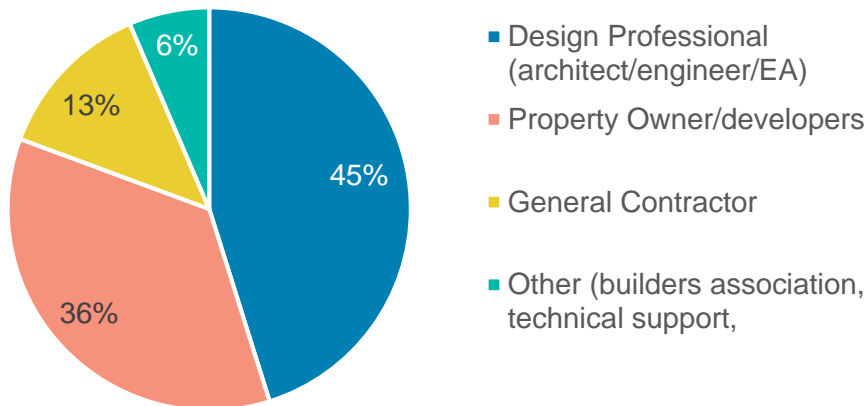
In addition to these feedback and discussion opportunities, industry members were invited to book a one-on-one meeting with a local government project lead. A presentation was also delivered to the CHBA-VI Builders Council and staff followed-up with several organizations to explore feedback in more detail and identify any information that would help further inform final recommendations to council. Given some concerns raised during the engagement process regarding costs and with consideration given to housing affordability, staff met with BC Housing in a separate meeting to discuss the proposed pathway to adoption. BC Housing indicated support for the proposed approach in this meeting and follow-up email (see Appendix B). BC Housing currently has a GHGi requirement of 5.5kg CO<sub>2</sub>/m<sup>2</sup> and they recognize that it will be increasingly difficult to meet their CleanBC targets if they add new buildings that burn fossil fuels. As such, they are seeking approval from their executive this summer to lower the allowable GHGi in our climate zone to 3kg CO<sub>2</sub>/m<sup>2</sup> and expect to further reduce this to 1kg CO<sub>2</sub>/m<sup>2</sup> in the next version of their Design Guidelines and Construction Standards expected in 2024. These dates would be slightly ahead of those being proposed within recommendations for regional adoption for low and zero carbon new development.

## 4.0 What We Heard

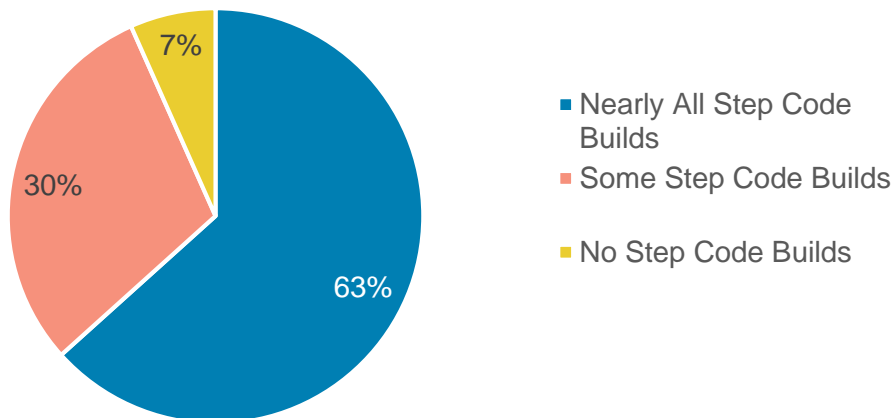
The following sections summarize the feedback that was received throughout the engagement process.

### 4.1 Initial Industry Survey Results

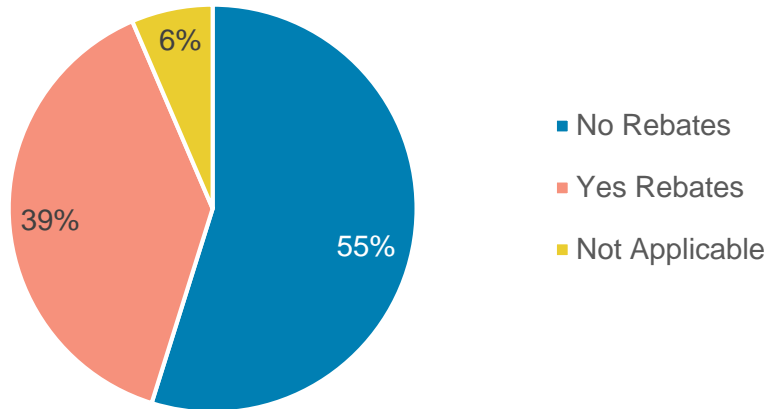
**How would you describe your role as it relates to development and buildings?**



**Do you currently build or contribute to the design of new buildings that achieve (or are designed to achieve) Step Code compliance?**



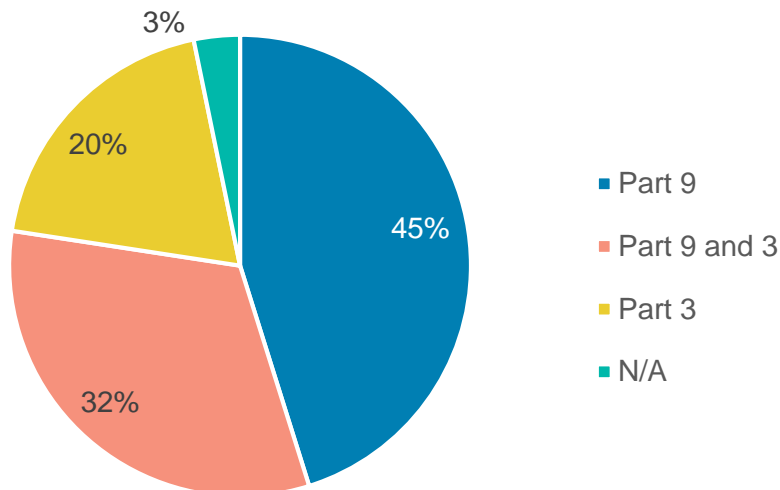
**Have you accessed any rebates to comply with Step Code?**



**Which rebates have you accessed?**

Program Identified	Number of Responses
CleanBC Better Homes New Construction Program	11
CleanBC Commercial New Construction Program	2
Local government Step Code implementation	4
FortisBC New Home Program	8
Mid-construction blower door test rebate	4
FortisBC Commercial New Construction Performance Program	2

**What type of buildings do you construct or design?**



### 4.1.1 Part 9 Residential Specific Responses

For Part 9 residential Step 3 compliance, which of the following is the most challenging part of a project?

Building Component	Responses
Air Barrier (ACH)	4
All Equally Challenging	6
Enclosure	3
Not Challenging	8
Mechanical	3
No Answer	7

**Please explain why (optional):**

The common themes for this open-ended question were:

- Step 3 is an achievable standard
- Cost is a top concern
- Design is key to meeting targets
- Consumer demand lags creating challenges for contractors
- Heat pumps are not the only option for GHG reduction

*See Appendix C: Completed Open Ended Question Responses for complete comments.*

For Steps 4 and 5 compliance, which of the following is likely to be the most challenging part of a project?

Building Component	Response
Air Barrier (ACH)	8
All Equally Challenging	6
Enclosure	3
It wasn't challenging	2
Mechanical equipment and systems	5
No Answer	7

**Please explain why (optional):**

The common themes for this open-ended question were:

- Concern related to higher technical difficulty
- The need for education was emphasized
- Air tightness in particular was identified as a challenge
- Lack of consumer demand was mentioned
- Concern about unintended consequences of higher efficiency was raised

*See Appendix C: Completed Open Ended Question Responses for complete comments.*

**Please pick the top two challenges you anticipate for achieving the required Air Changes per Hour (ACH50) for the upper steps (Steps 4 and 5).**

Challenges	First Choice	Second Choice
Availability of appropriate building materials	2	--
Availability of required expertise	13	1
Ensuring performance at completion	1	5
Incremental cost increase	1	9
Time to master construction details	2	4
Design impacts related to building form and exposure	5	2
No second choice	--	3
No Answer	7	7

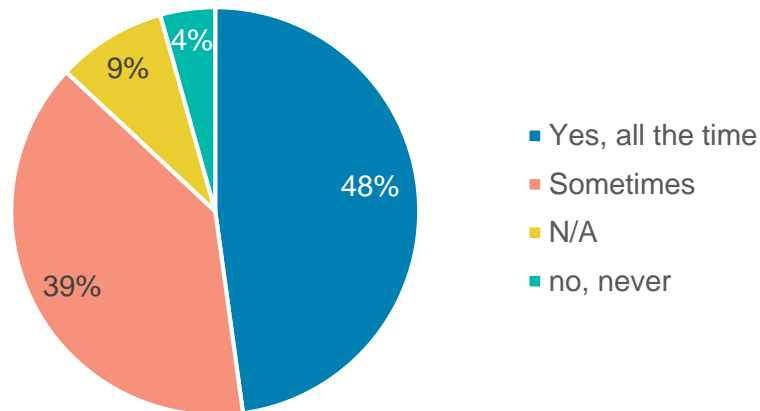
**Please explain why (optional):**

The common themes for this open-ended question were:

- Mid-construction blower door tests are critical to success
- Achieving the ACH target is difficult
- Education is essential
- Consumer education will be needed

*See Appendix C: Completed Open Ended Question Responses for complete comments.*

**Do you typically conduct a blower door test?**



**Please pick the top two challenges you anticipate for achieving the required enclosure/envelope efficiency targets for the upper steps (Steps 4 and 5).**

Challenges	Choice 1	Choice 2
Availability of appropriate building materials	2	--
Availability of required expertise	8	1
Design impacts relating to building form	9	2
ensuring performance at completion	2	2
Incremental cost increase	3	10
Time to master construction skills	--	5
no second choice	--	4

**Please explain why (optional):**

The common themes for this open-ended question were:

- Detailed planning and design important
- Education should come before higher standards
- Increase costs a concerns

See Appendix C: Completed Open Ended Question Responses for complete comments.

**Please pick the top two challenges you anticipate for achieving the required mechanical equipment and systems efficiency for the upper steps (Steps 4 and 5).**

Challenges	Choice 1	Choice 2
Availability of Appropriate Equipment	7	--
Considering design of building as whole system	9	1
Incremental Cost Increase	2	7
Installation expertise	2	2
Meeting DHW Demand	1	2
Meeting Space Heating Demand	2	1
Meeting Ventilation	1	--
No second choice	--	5
Electrical Energy on Grid	--	1

**Please explain why (optional):**

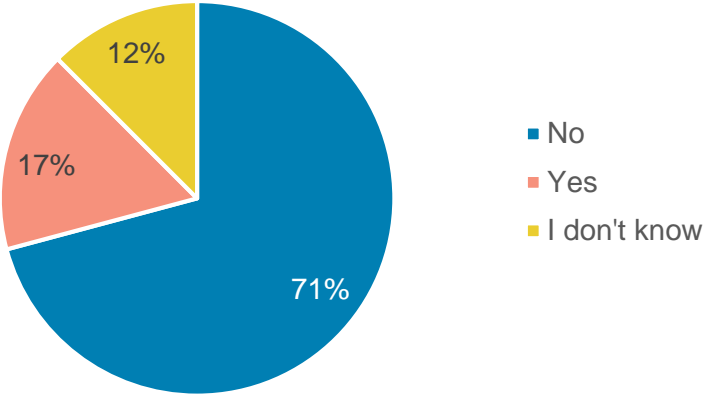
The common themes for this open-ended question were:

- Challenges with supply chain and access to equipment such as air to water heat pumps were the primary points raised
- Conflicting regulatory standards (zoning bylaws) a challenge for some sites

*See Appendix C: Completed Open Ended Question Responses for complete comments.*



**Do you feel there are barriers to implementing low carbon energy (electric) space heating systems in new buildings?**



**If Yes - What are the barriers to implementing low carbon energy (electric) space heating systems in new buildings?**

Challenges	Responses
Incremental cost increase	3
Electrical service	2
Operating costs	2
Availability of appropriate equipment	2
Confidence in relatively new practices/equipment	1
increased electrical loads	1
Would require business model change	1

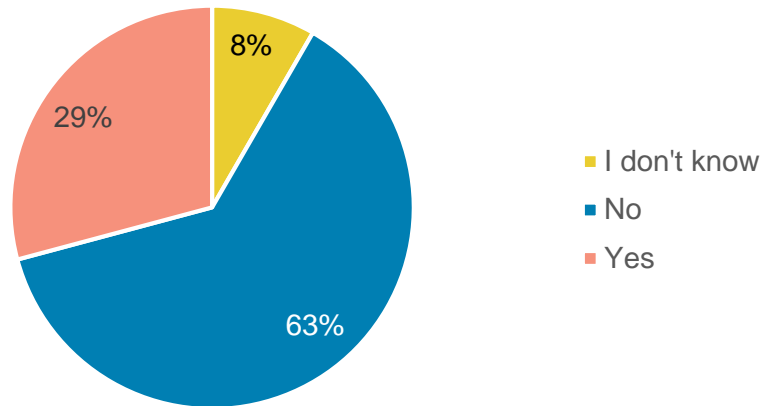
**Please explain why (optional):**

The common themes for this open-ended question were:

- Increased installation and operating costs
- Heat pumps already common practice

See Appendix C: Completed Open Ended Question Responses for complete comments.

**Do you feel there are barriers to implementing low carbon energy (electric) domestic hot water systems in new buildings?**



**If Yes - What are the barriers to implementing low carbon energy (electric) domestic hot water systems in new buildings?**

Challenges	Responses
Availability of appropriate equipment	3
Confidence in relatively new practices/equipment	3
Electrical service	3
Incremental cost increase	3
Operating costs	3
Design (availability of required expertise)	1
Market demand for gas boilers won't change any time soon	1

**Are there other challenges or opportunities related to Low Carbon Energy Systems (electric) that you would like to share?**

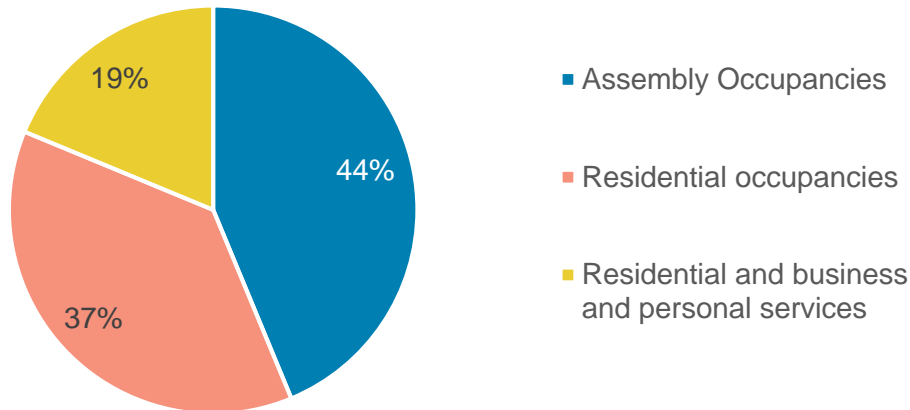
The common themes for this open-ended question were:

- Increased cost
- Electrical service costs a concern
- Heat pumps and electric hot water already common

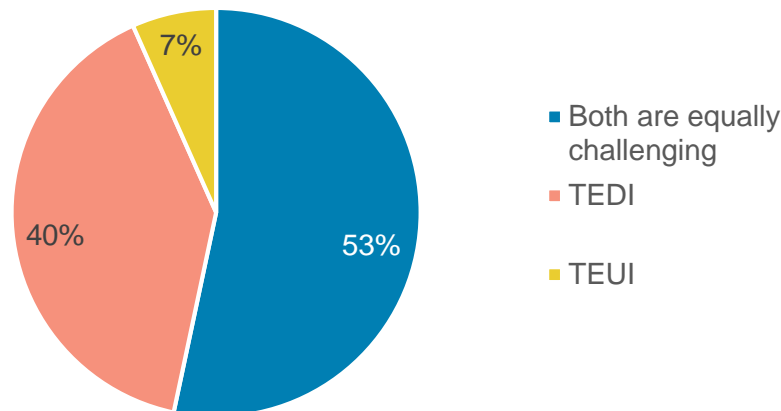
*See Appendix C: Completed Open Ended Question Responses for complete comments.*

## 4.1.2 Part 3 Residential and Commercial Responses

What part 3 occupancies do you typically build?



For the lower steps (Steps 2/3) which Step Code metric presents the greatest challenge to comply with?

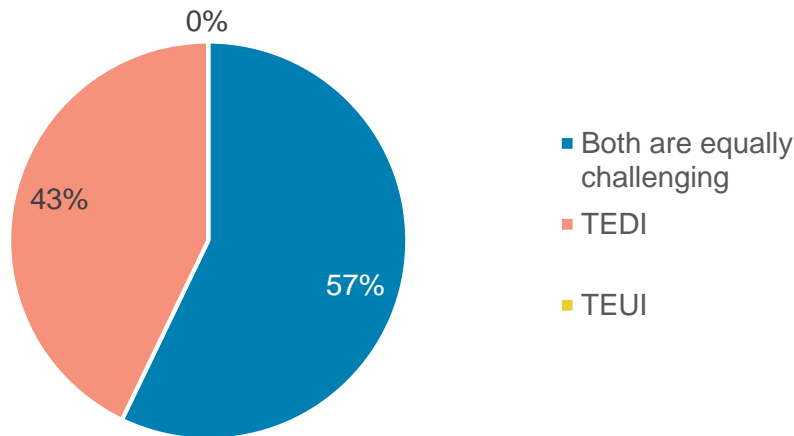


Please explain why (optional): (all submitted comments)

- The cost impact of step code was vastly underestimated by governments. With the rising cost of materials, there is no such "Affordable housing." Talk to builders about the real costs of windows, doors, insulation.
- The lower steps are not difficult to achieve but there are costs associated with choices. However as global warming accelerates, we will be going to an emphasis on cooling versus heating and we should be weighing how new buildings should be designed to either meet or be adapted for these scenarios.
- Energy required for ventilation is often a big hurdle. ERVs are an easy solution. Buildings with unfavorable geometry can make TEDI an issue.

- Depends on the building type and density. High density buildings almost get a free pass on TEDI while the TEUI is a challenge. Low density buildings have a challenge to meet TEDI

**For the upper steps (Steps 3/4) which Step Code metric do you anticipate will present the greatest challenge to comply with?**



**Please pick the top two challenges you anticipate for achieving the required Thermal Energy Demand Intensity (TEDI) for Step 4 (for Part 3 mid-rise/wood-frame buildings 6 storeys and under) or Step 3 (for Part 3 concrete high-rise residential buildings 7+ storeys or commercial).**

Challenges	Choice 1	Choice 2
Design impacts relating to building form and exterior insulation	5	2
Incremental cost increase	2	6
Ensuring performance at completion	2	2
Availability of appropriate building materials	2	--
Availability of required expertise	2	--
Time to master construction details	1	--
No Second Choice	--	3

**Please explain why (optional): (all submitted comments)**

- One of our commercial office projects was used as a Step Code case study. The buildings were designed before the Step Code but they were targeting better-than-Code energy performance for LEED certification. One part of the building had been constructed using a raised floor and the energy saved by displacement ventilation helped the project meet Step 3 requirements; the part of the project without the raised floor could only achieve Step 2. The raised floor is an expensive system and also some Clients are not yet comfortable with it from an occupant experience point of view. We know designing to Step 3 for concrete buildings is going to be challenging and will require us to take a more simplified approach to building shape & articulation.
- Appropriate building materials are available, but the additional cost for additional insulation, additional steps in construction, or more efficient products is unpalatable to many clients.
- Airtightness is such a high contributor to heat loss that it CAN'T be ignored for a high-performance building, however many contractors don't have a good grasp on what results they can achieve and what is required to achieve them. I have gathered a personal collection of results over the past few years and know the team can pursue lower airtightness with a particular pre-fab builder, but generally don't have confidence in any other builder meeting any result higher than the default assumption give in CoV modelling guidelines.
- The cost impact of step code was vastly underestimated by governments. With the rising cost of materials, there is no such "Affordable housing." Talk to builders about the real costs of windows, doors, insulation.
- Basically this is now crucial in schematic design and requires more input from the whole design team.

**Please pick the top two challenges you anticipate for achieving the required Total Energy Use Intensity (TEUI) for Step 4 (for Part 3 mid-rise/wood-frame buildings 6 storeys and under) or Step 3 (for Part 3 concrete high-rise residential buildings over 6 storeys)**

Challenges	Choice 1	Choice 2
Design (availability of required expertise)	3	1
Availability of appropriate equipment	3	--
Incremental cost increase	1	4
Meeting cooling demand	2	2
Confidence in relatively new practices/equipment	2	1
Common area make-up air units	1	1
Domestic hot water demand	1	1
Common Area Space Heat	--	2
Unit space heat	1	--
Ventilation	--	1

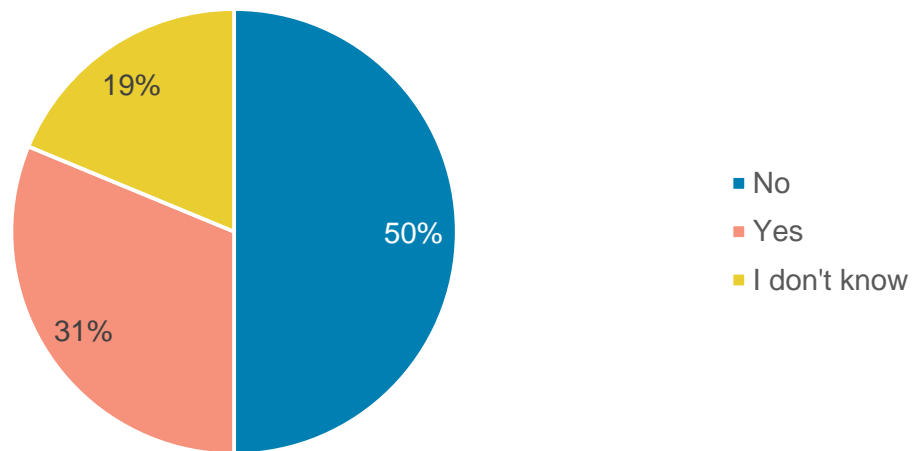
**Please explain why (optional): (all submitted comments)**

- In a seniors housing project we were looking at common floor lounges to be air conditioned as an area of refuge during summer heat waves and the challenge of working within the parameters.
- We currently have a TEDI/TEUI reduction factor for corridor pressurization, but this is still real-world energy that is being consumed (and usually on-site gas combustion). Improving airtightness of internal partitions between suites and ventilating the corridors and common areas with a heat-recovery system represents a significant real-world (and modelled) energy savings (even with the reduction factor).
- Pressurization of MURB corridors with door undercuts at each suite is so ingrained to prevent odours that a learning curve is needed to shift toward more efficient strategies.
- Domestic hot water energy consumption requires newer and more expensive tech to improve.
- Designing for complex urban sites will be a challenge, in terms of site orientation and building articulation to address fit to context.

**Overall, what do you feel are the top two key barriers to adopting the higher steps of the Step Code?**

Challenges	Choice 1	Choice 2
Additional construction costs	9	--
Knowledge of energy efficient building practices among architects	5	2
Lack of consumer demand for energy-efficient buildings	--	6
Potential compliance challenges	1	2
Difficulty coordinating developers, builders trades, architects, and energy modelers	1	--
Knowledge of energy efficient building practices among the trades	--	3
Lack of information and training on the BC Energy Step Code	--	2

**Do you feel there are barriers to implementing low carbon energy (electric) space heating systems in new buildings?**



**Please pick the top two challenges you anticipate for using low carbon energy (electric) space heating systems in new buildings.**

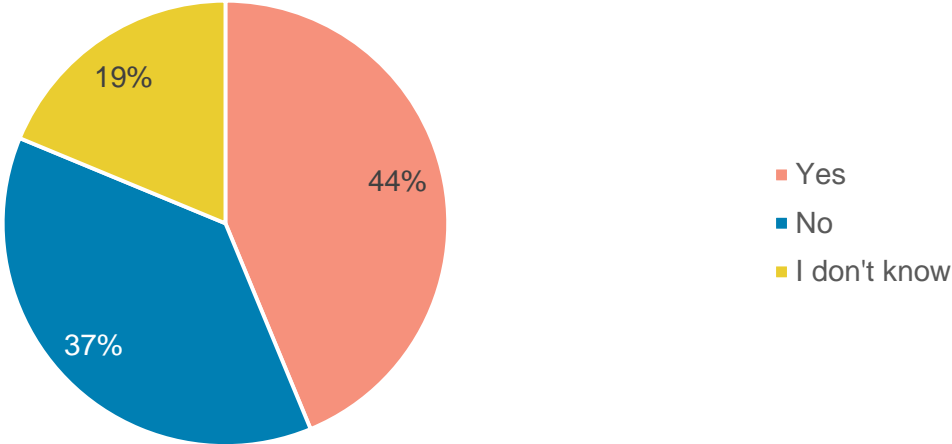
Challenges	Choice 1	Choice 2
Availability of appropriate equipment	3	--
Confidence in relatively new practices/equipment	3	--
Electrical service	--	5
Common area make-up air units	2	--
Design (availability of required expertise)	1	2
Incremental cost increase	1	2
Operating costs	1	2
Meeting cooling demand	1	1
Ventilation	1	--
Installation	1	--
Common area space heat	1	--
Unit space heat	--	1
No second choice	--	1
None	1	1

**Please explain why (optional): (all submitted comments)**

- On a project to avoid gas use, all systems are electric including central hot water. This required bringing 3 phase power to the site from 4 blocks away.
- We're seeing more MURBS designed with heat pumps to provide cooling, (out of concern for summer heat dome risks). Routing of services and locating units on the roofs is challenging.



**Do you feel there are barriers to implementing low carbon energy (electric) domestic hot water heating systems in new buildings?**



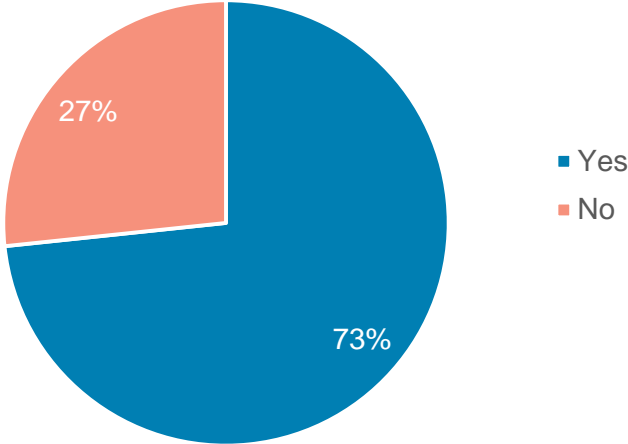
**Please pick the top two challenges you anticipate for using low carbon energy (electric) domestic hot water systems in new buildings.**

Challenges	Choice 1	Choice 2
Operating Costs	5	--
Electrical Service	--	6
confidence in relatively new practices/equipment	3	1
Incremental cost increase	2	4
Availability of appropriate equipment	3	--
Design (availability of required expertise)	2	2
No second choice	--	2

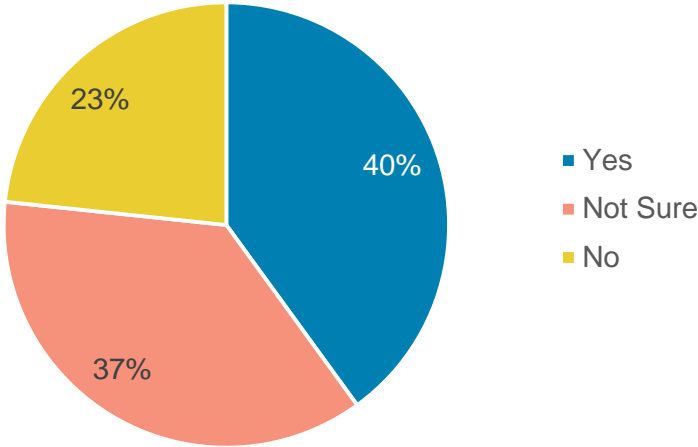
**Are there other challenges or opportunities related to Low Carbon Energy Systems (electric) that you would like to share? (All submitted comments)**

- On demand hot water is a must have for every new home. I do not believe an electric unit can operate at the required level
- The opportunity is that industry will rise to the challenge so moving to a Low Carbon legal requirement will spur on the industry. Of course hydrogen is still an opportunity.

**Have you participated in any Step Code specific training or training that would support you in developing higher steps of the Step Code or implementing Low Carbon Energy Systems?**



**Is there sufficient training available to support you in adopting higher steps of the BC Energy Step Code and Low Carbon Energy Systems?**



### 4.1.3 All Building Types Responses

#### Do you have any other comments or suggestions on how local governments within the capital region could support industry in adopting higher steps of the BC Energy Step Code and Low Carbon Energy Systems? (All submitted comments)

- Educate consumers about energy efficiency and comfort.
- The cost impact of step code was vastly underestimated by governments. With the rising cost of materials, there is no such "Affordable housing." Talk to builders about the real costs of windows, doors, insulation. I have priced out homes where the window cost increased by nearly \$8000.
- The tighter we build homes, with more dependency on mechanical ventilation, puts that house at risk to be non functional/ dangerous/ unhealthy during periods without energy or emergencies. Say compared to a log home heated with wood? Are we building better? Is more complicated, greater engineering a better solution? or should we perhaps look from different angles. And perhaps have a few paths to choose? Easy to build super high efficient homes when money is not an issue, but with the housing market hitting all time highs, how does the future look. Good for people with bottomless pockets, not so good for average working family who can't afford maintenance/repairs or upkeep and will let systems deteriorate due to their income status. Perhaps we should look a lower cost and or simpler alternatives at the same time. If you add in all the energy it takes to build the components needed for construction, it's possible you'd not break even with cost/energy/ carbon footprint?
- This is a phased solution and timing is critical. BC Housing projects are getting industry to rise to the challenge and Governments should legislate min Step Code requirements (also needs to adopted province wide).
- Not currently building.
- Steps 4 and 5 should not be considered until mandatory training has taken place through BC Housing for Steps 4 & 5. In addition. the steps should not be implemented at the local govt level before being mandated in the BC Building Code. fast-tracking energy efficiency leads to unintended consequences like leaky condo, asbestos & urea formaldehyde in the past.
- Follow the National Building Code, do not leap forward without proper diligence.
- The most bureaucratic, and costly municipalities are only ones pushing this, STOP, it costs more to build and takes 3X as long to get permits in these jurisdictions, you wont save the world but you add to the number families that have to move to westshore or up island for affordable and timely construction. Whole seminar and this survey are BIASED and leaders have no intent to listen to majority of industry saying enough is enough...

- Speed up DP permits for high performance buildings to incentivize higher steps. Considering how long the DP processes take, if it is possible to fast-track buildings that meet higher performance targets it might be worth the additional costs.
- Allowing flexibility to conform with a lower step if a LCES is used.
- Stability - i.e. - sufficient notice of when requirements will increase, early notice of the intended path.
- Some flexibility to reduce window sizes from development permit submission drawings without restarting the process. Development permit applications are often done before an energy modeller is engaged and the drawings are submitted with WWR>40%. When I ask if reducing some window sizes is possible in some key locations to improve energy performance, the response is that we can't change the external design of the building from the development permit application. This results in inefficient buildings when the architect sends in a preliminary fancy looking rendering for development permit with huge windows.
- In this Survey, there is nothing on updating or improving older homes that are far worse GHG pigs than new homes. Some older homes are 15-20 Air Changes per hour 30- 40 times more than a Step Code 5 home. GHG is still GHG right. Why do condo buildings with up to 200 plus units only have to achieve a Step Code 2 in the same municipalities that have Step Code 3?
- give info to home owners.
- This is tricky. LG's can require Step Code compliance for issuing permits and occupancy, but it's more like negative attitudes that hinder the implementation of higher steps.
- Offer more training for air barrier installations and details.
- More hands-on training will demystify the process, increase industry uptake, and improve quality of final construction details.

## 4.2 Solutions Labs

The solutions labs convened two small groups of building and development industry professionals to discuss in detail several proposed Step Code and Carbon Pollution Standard adoption timelines and approaches. These sessions were small groups by design to facilitate in-depth discussions.

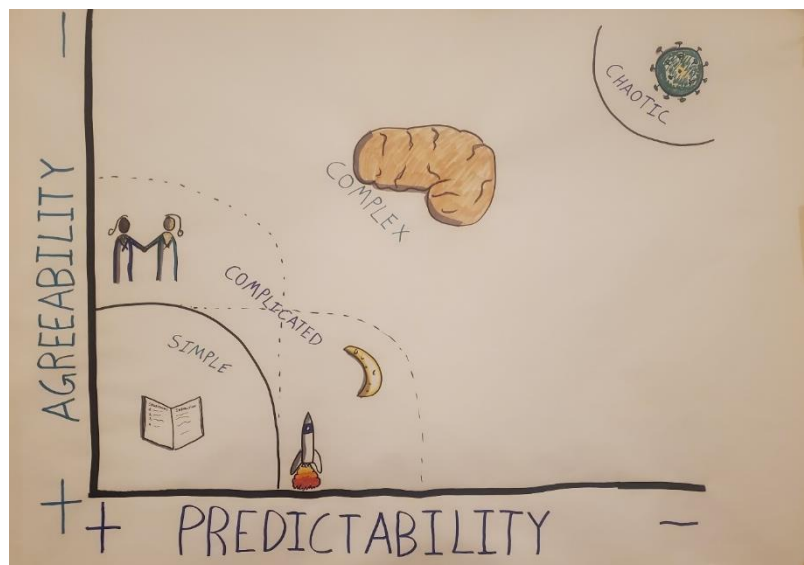
Both solutions labs followed this agenda:

- Welcome and Introductions
- Quick, one-on-one Networking
- Introductory Presentation
  - Survey Results
  - Current Policy Options
- Challenge Identification
  - As individuals
  - As a table level group
- Whole group discussion
- Whole group agreement certainty matrix exercise

### 4.2.1 Agreement Certainty Matrix Exercise

The purpose of the agreement certainty matrix was to help the groups make sense of the challenges that were identified in the first half of the solutions labs. The exercise helped us to move from simply identifying challenges, to organizing the challenges in a way that allowed them to be better understood. This sorting was done using an agreement certainty matrix.

An agreement certainty matrix has two axes, the agreeability axis, and the predictability axis. The agreeability axis (Y axis) is to measure the likelihood that the building industry would agree on solutions to the identified challenges. The predictability axis (X Axis) is for plotting the degree to which the identified challenges are technical in nature, and therefore, may have solutions which have predictable outcomes.



First people were asked to identify the predictability of outcomes associated with solutions for the identified challenges. To do this, people were tasked with dividing the challenges into four categories: simple, complicated, complex, and chaotic. This exercise was intended to clarify the potential responses to the challenges. A problem is defined as simple when it can be solved reliably with practices that are easy to duplicate that have predictable results. It is complicated when experts are required to devise a sophisticated solution that will yield the desired results predictably. A problem is complex when there are several valid ways to proceed but results are not predictable in detail. Chaotic is when the context is too turbulent to identify a path forward and trial and error is likely the only way to find a solution.

The following analogies may be used to further clarify the differences;

- simple challenges – can be solved with simple solutions, like following a recipe;
- complicated challenges – can be solved with technical expertise, like sending a rocket to the moon;
- complex challenges – may require unique solutions, e.g. like raising a child where a technique that worked on one child doesn't necessarily work on another;
- chaotic challenges – an example could be like the beginning of the COVID19 pandemic; a fast-changing issue with very limited data and understanding but where immediate action is required.

### **4.2.2 Part 9 Solutions Lab**

The following feedback was provided during the first half of the Part 9 solutions lab. Challenges that stood out to attendees were then plotted on the agreement certainty matrix which is presented below in Table 1.

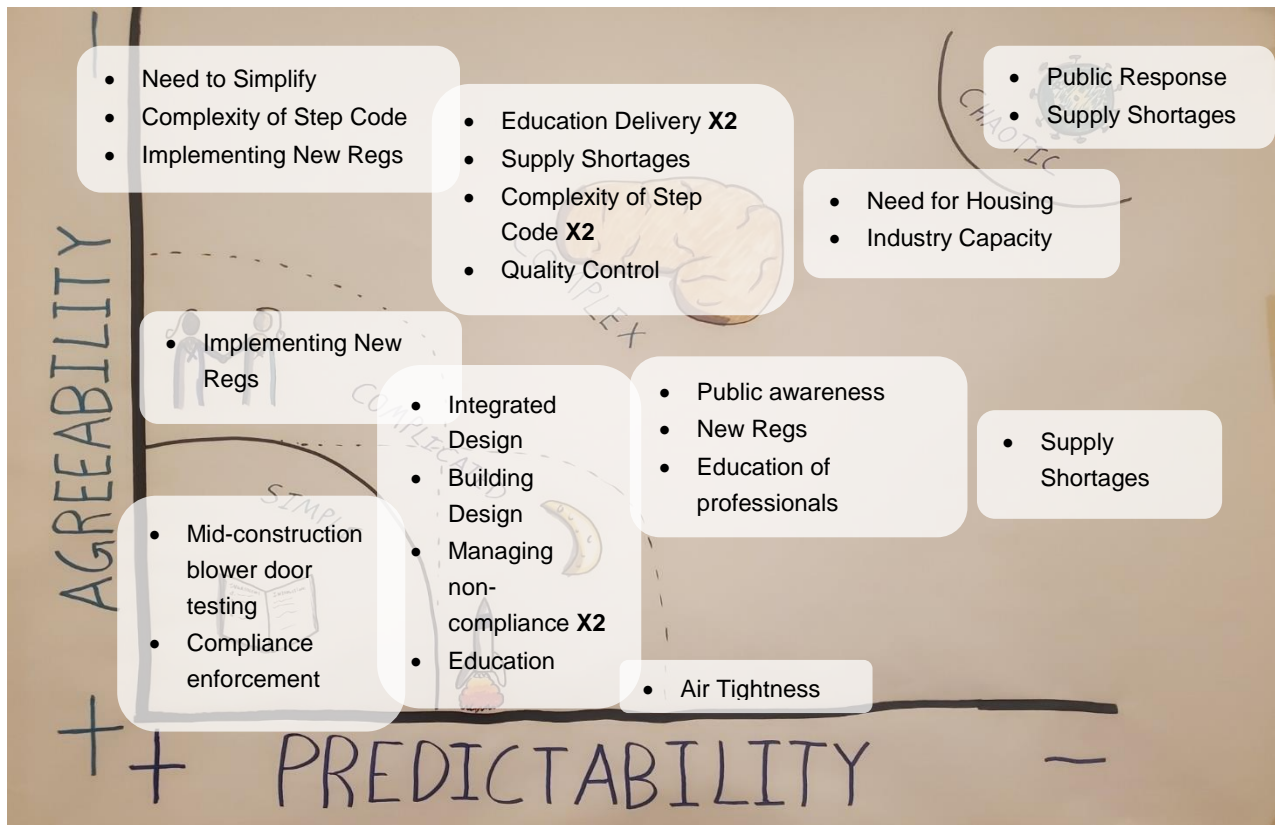
**Table1: Part 9 Solutions Lab Feedback**

<b>Ways to Support</b>	<b>Education</b>	<ul style="list-style-type: none"> <li>• Education is needed for industry and home buyers</li> <li>• Challenge delivering education with consistent messaging</li> <li>• Education EA's and builders, needs to be free and readily available</li> <li>• Share knowledge (with other local governments)</li> </ul>
	<b>Education Outcomes</b>	<ul style="list-style-type: none"> <li>• Quality control key during building</li> <li>• Open dialogue regarding building form</li> <li>• Motivate action</li> <li>• EA's need to be involved earlier</li> <li>• Integration</li> <li>• How do I actually do this?</li> <li>• Quality Control</li> </ul>
		<ul style="list-style-type: none"> <li>• Incentives for highest steps and Zero Carbon (Floor area ratios)</li> <li>• Consistency with messaging, don't switch standards</li> </ul>
<b>Timing</b>	<b>Concerns</b>	<ul style="list-style-type: none"> <li>• Step jumps have design implications</li> <li>• Home design 2-3 years out</li> <li>• 2023 is too soon for higher Step Changes</li> <li>• Lead time is critical +1</li> </ul>
	<b>Move Fast</b>	<ul style="list-style-type: none"> <li>• Can't afford to wait, but not all voices are in the room – those that aren't participating probably don't want change</li> <li>• No time to waste</li> </ul>
<b>Regulatory Guidance</b>	<b>General Principles</b>	<ul style="list-style-type: none"> <li>• Need to simplify</li> <li>• Consistency of application (of Step Code regulation by AHJ)</li> <li>• Focus</li> <li>• Balance (Municipal) objectives</li> <li>• Focus on what we can do today</li> <li>• We need homes people can afford</li> <li>• Safe, low carbon and affordable housing (in the context of concern regarding complex design standards)</li> </ul>
	<b>Regional Consistency</b>	<ul style="list-style-type: none"> <li>• Is this all municipalities in CRD, or just those here?</li> <li>• I want to see consistency across the region</li> </ul>
	<b>Likely Policy Outcomes</b>	<ul style="list-style-type: none"> <li>• Seems likely zero carbon would drive higher steps (by virtue of the carbon intensity of electricity)</li> <li>• Step 3 requires very efficient home</li> </ul>

	<b>Motivation for Change</b>	<ul style="list-style-type: none"> <li>• How can we make the world a better place</li> <li>• GHGs need to be addressed and we need direction</li> <li>• Prevent Greenhouse Gas Emissions</li> </ul>
	Mid-construction blower door test should be mandatory	
<b>Policy Guidance</b>	<b>Possible Policy Outcomes</b>	<ul style="list-style-type: none"> <li>• Step 4 is a departure (of what is currently being built), Low Carbon less so</li> <li>• Pushing low carbon can push cooling</li> </ul>
	<b>Requests for Policy</b>	<ul style="list-style-type: none"> <li>• Keep it simple</li> <li>• Simple and Clear +1</li> </ul>
	<b>Specific Suggestions</b>	<ul style="list-style-type: none"> <li>• Introduce measurement requirement ASAP</li> <li>• “Or” allows workaround in the interim</li> </ul>
<b>Challenges</b>	<b>Regulatory</b>	<ul style="list-style-type: none"> <li>• Complexity of Step Code</li> <li>• How to ensure compliance and how to manage non-compliance</li> <li>• Some things out of Municipalities control</li> </ul>
	<b>Public</b>	<ul style="list-style-type: none"> <li>• Managing public response</li> <li>• Public resistance to change</li> </ul>
	<ul style="list-style-type: none"> <li>• Supply shortages</li> <li>• Observed entropy with agreement matrix</li> <li>• Push back from fortis would be strong (for option 3)</li> <li>• (Challenges with) implementing new regulations</li> </ul>	
<b>Option Specific Feedback</b>	<b>Observations</b>	<ul style="list-style-type: none"> <li>• Option 3 – flexibility</li> <li>• Option 3 might help small houses while meeting targets – the more comfortable option</li> <li>• Options 1&amp;2 seem to provide an out for builders (to avoid meaningful emission reductions)</li> <li>• Option 2 is also very flexible</li> <li>• Option 2&amp;3 Give us the chance to stay at Step 3</li> </ul>
	<b>Suggestions</b>	<ul style="list-style-type: none"> <li>• Option 3 Is best – we don’t have time (referring to global climate change)</li> <li>• Step 4 – 2024, OR Low Carbon Construction (suggested alternative Option)</li> <li>• Observed agreement with Option 3</li> </ul>



### 4.2.3 Agreement Matrix – Part 9 Residential



Each table was asked to select the challenges that had been identified by the group that resonated the most with them and then to plot them on the agreement certainty matrix. Each group then plotted the challenges as they saw fit which is reflected by the same challenges appearing multiple times, sometimes in different parts of the matrix. This demonstrates a lack of agreement on the level of predictability and agreeability of different challenges.



#### 4.2.4 Part 3 Solutions Lab

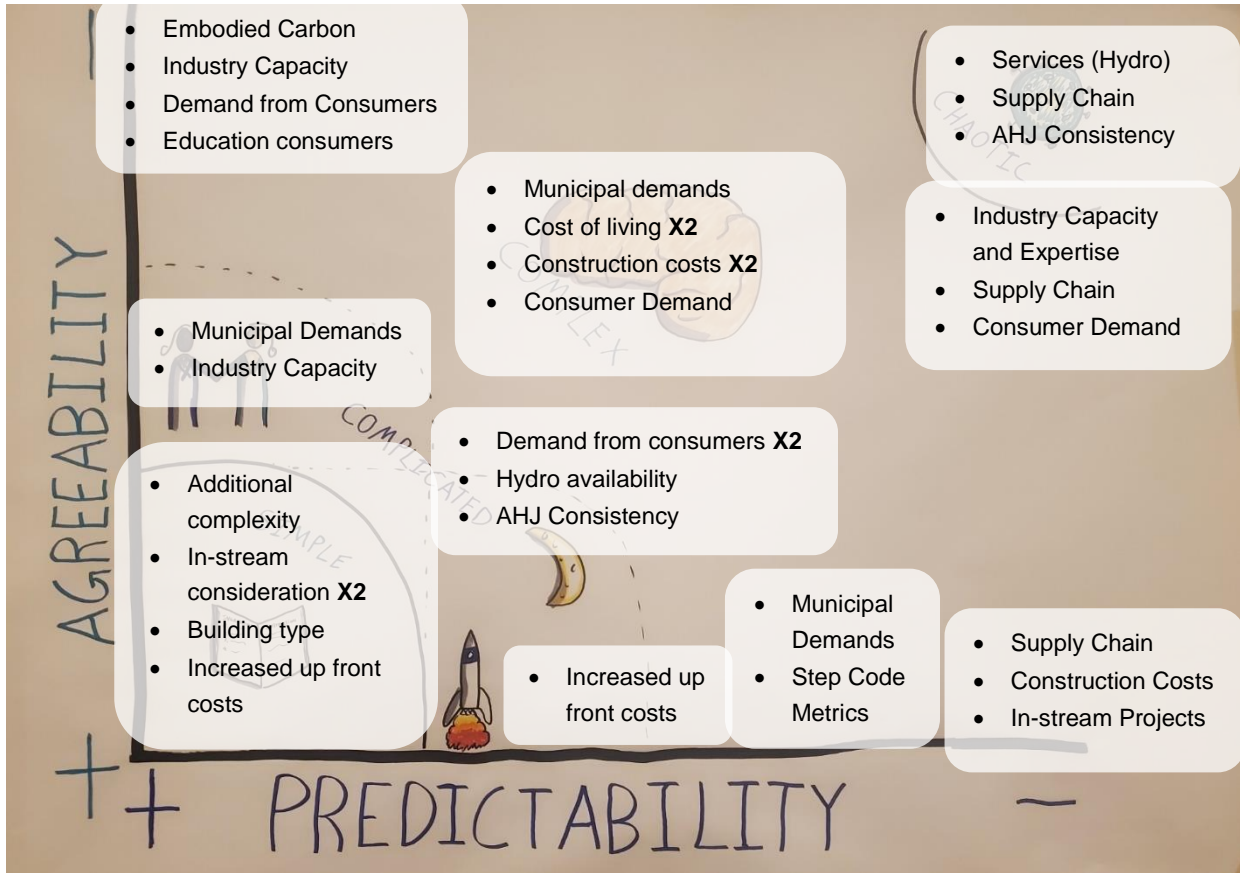
The following challenges and points were identified during the first half of the Part 3 solutions lab. The challenges that really stood out to attendees were then plotted on the agreement certainty matrix which is presented below in Table 2.

**Table 2: Part 3 Solutions Lab Feedback**

<b>Ways to Support</b>	<b>Authorities Having Jurisdiction Action</b>	<ul style="list-style-type: none"> <li>• Tax Exemptions for better buildings</li> <li>• Making DP Process more predictable</li> <li>• AHJ enforcement consistency</li> </ul>
	<b>Consumer Education</b>	<ul style="list-style-type: none"> <li>• Consumer Education Key</li> <li>• (Lack of) demand from consumers</li> <li>• Educate Consumers</li> </ul>
		<ul style="list-style-type: none"> <li>• (increase) Industry capacity</li> <li>• (increase) Economic Activity</li> </ul>
<b>Timing</b>	<b>Implementation Lead Time</b>	<ul style="list-style-type: none"> <li>• Projects with shorter cycles can move faster</li> <li>• (proposed) Timelines way too short</li> <li>• 2-3 year lead time for commercial projects</li> <li>• Potentially move faster with low rise</li> </ul>
	<b>In Stream Projects</b>	<ul style="list-style-type: none"> <li>• Timeline - # of projects in midstream is a concern</li> <li>• -DP pipeline should be considered in stream</li> </ul>
	<b>Principles</b>	<ul style="list-style-type: none"> <li>• Move standard once, bigger jump, later.</li> <li>• Phased approach based on buildings</li> <li>• Flexibility and notice helps with supply challenge</li> </ul>
<b>Challenges</b>	<b>Authorities Having Jurisdiction Related</b>	<ul style="list-style-type: none"> <li>• Additional metric adds complexity to permitting and design</li> <li>• (multiple) demands from municipalities</li> <li>• (how to handle) in stream projects</li> </ul>

	<b>Incremental and Shifting Costs</b>	<ul style="list-style-type: none"> <li>• Additional upfront cost – increases carrying costs</li> <li>• Construction Costs</li> <li>• Unpredictable Cost</li> </ul>
	<b>BC Hydro</b>	<ul style="list-style-type: none"> <li>• Hydro capacity a big issue</li> <li>• Availability of hydro</li> <li>• Hydro approvals can be 18 months</li> </ul>
	<ul style="list-style-type: none"> <li>• Supply Chain</li> <li>• Cost of Living</li> <li>• Different implications for different building types</li> </ul>	
<b>Policy Guidance</b>	<b>Possible Policy Outcomes</b>	<ul style="list-style-type: none"> <li>• Step 4 is a departure (of what is currently being built), Low Carbon less so</li> <li>• Pushing low carbon can push cooling</li> </ul>
	<b>Requests for Policy</b>	<ul style="list-style-type: none"> <li>• Keep it simple</li> <li>• Simple and Clear +1</li> </ul>
	<b>Specific Suggestions</b>	<ul style="list-style-type: none"> <li>• Introduce measurement requirement ASAP</li> <li>• “Or” allows workaround in the interim</li> </ul>
<b>Option Recommendations</b>	<ul style="list-style-type: none"> <li>• Option 2 because of the “or” – more choice</li> <li>• Too many options with option 2</li> <li>• Option 3 provides certainty</li> <li>• Low Carbon by 2025 instead of zero carbon</li> </ul>	
<b>Where are we at now?</b>	<ul style="list-style-type: none"> <li>• (we want to) Do Better</li> <li>• (we want to) Understand</li> <li>• Desire for consumer choice</li> <li>• Sense of inevitability</li> <li>• Feel we all agree at the high level, disagree in detail</li> <li>• Optimistic RE: local successes</li> <li>• Sense of Urgency</li> </ul>	

## 4.2.5 Agreement Matrix – Part 3



## 4.3 Final Engagement

### 4.3.1 Engagement Sessions

Two online engagement sessions were held on June 2, 2022. These engagement sessions were intended to present a proposed adoption pathway for all building types and to facilitate a discussion with attendees to receive feedback and provide any clarifications. Both sessions followed this agenda:

1. Welcome
2. Presentation
  - a. Engagement to date
  - b. Proposed adoption pathways overview
3. Feedback on adoption pathways
  - a. In breakout rooms
  - b. In plenary via polls
4. Open discussion
5. Next steps

42 attended the Part 9 session.

28 attended the Part 3 session.

70 total attendees.

### Renewable Natural Gas & Low Carbon Fuels

There was some discussion during the first two phases of engagement related to the ability to meet the carbon pollution standards with Renewable Natural Gas (RNG). Given this, some effort was made in the third phase of engagement to address this issue and clarify what would be considered low and zero carbon approaches in the proposed adoption pathways. As there is currently no ability for municipalities to recognize RNG for compliance with carbon pollution standards, engagement participants were asked to respond considering electrification as the only compliance path. It was noted that while FortisBC has submitted a BC Utilities Commission application that seeks to create a renewable gas and low carbon fuel rate class for new residential connections, many questions remain regarding how enforcement would be handled, what the global warming potential of these gases will be over the long term, and how permanence over the lifetime of the building will be guaranteed. FortisBC employees were active participants in the engagement and discussions.

### 4.3.2 Combined Survey and Poll Results

During the two engagement sessions the attendees were asked to respond to a few polls. These same questions were then included in a survey which contained room for comments to allow participants an additional opportunity to provide more detailed feedback and to ensure those who were unable to attend the final phase engagement sessions also had the ability to provide input. The results of the polls and survey are combined below. While each poll varied in response rate, there were 70 possible respondents to each poll question and 11 additional

surveys completed. Actual numbers and percentages are presented in the results tables. All of the open ended comments were submitted via the survey and are also included below.

1) Saanich, Victoria, and Central Saanich Council’s directed staff to require the highest Step Code step by 2025 in order to indirectly reduce greenhouse gas (GHG) emissions and meet our climate plan targets. The province will empower municipalities to regulate carbon pollution levels directly in new buildings to reach those goals. Saanich, Victoria, and Central Saanich, are now proposing to slow down on Step Code implementation to align with the province and, instead, focus on regulating carbon pollution. **What is your level of agreement that regulating carbon emissions from new builds is a preferred approach, compared to increasing step code efficiency requirements ahead of the province?**

\*Note: this question was not asked in Polls during the virtual engagement sessions, all responses to question #1 are from the survey.

Response Options	Response Count	Percentage of Total Responses
1 - Fully agree	4	36%
2 - Agreement with a minor point of contention	3	27%
3- Support with reservation	2	18%
4 - Abstain; this doesn’t affect me	0	0%
5 - More discussion needed	0	0%
6 - Don’t like it but understand the rationale	0	0%
7 - Serious disagreement	2	18%

**2) Why? Please describe your reason for the above answer. (all responses)**

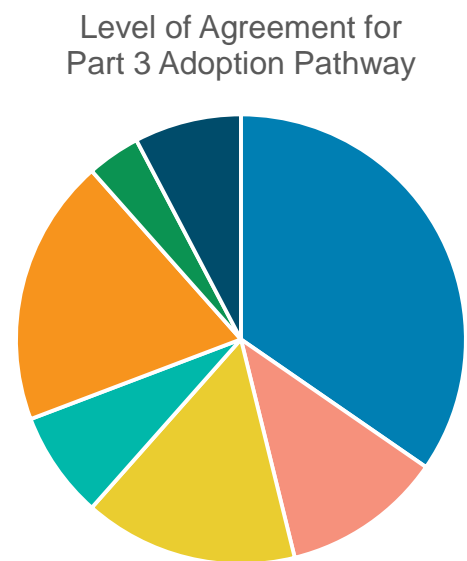
- with any attempt to scale down the proposed Central Saanich plan already voted on by Council & included in our climate leadership plan.
- With a greater dependence on electricity as the main source of heating the need for backup generators will become higher, especially as we move into more frequent extreme weather events. Backup generators/inverters can be designed into homes to automatically start during no power events. The optimum source of fuel for these is a natural gas line to the generator which is far more environmentally friendly and safe

than gasoline. For this and other reasons I would recommend not putting any restrictions on natural gas lines to homes. But do fully agree with have the primary source of heating and cooling being electricity.

- Step Code should align with mandated BC Code. Renewable Natural Gas from Hartland Landfill is a necessary part of sustainable energy security, and released into atmosphere anyway.
- GHGI reduction is the priority, would like to see energy efficiency improved if not too onerous on builders and developers.
- It's good to reduce GHG emissions, and regulate carbon pollution, but I don't think Step Code should be slowed down. Do it in parallel. No more gas supplying buildings.
- also fine to keep the step pace AND do the GHG.
- How will the carbon footprint of new building materials be regulated?
- We all need to be moving as one, not having certain areas miles ahead of others
- Can we not do both, or is affordable housing the issue?

**3) Part 3 - What is your level of agreement with the proposed pathway for Part 3 new buildings outlined above and in the Briefing Note?**

Response Options	Response Count	Percent of Responses	Pie Chart Colour
Fully agree	9	35%	Blue
Agreement with a minor point of contention	3	12%	Light Red
Support with reservation	4	15%	Yellow
Abstain; this doesn't affect me	2	8%	Teal
More discussion needed	5	19%	Orange
Don't like it but understand the rationale	1	4%	Green
Serious disagreement	2	8%	Dark Blue



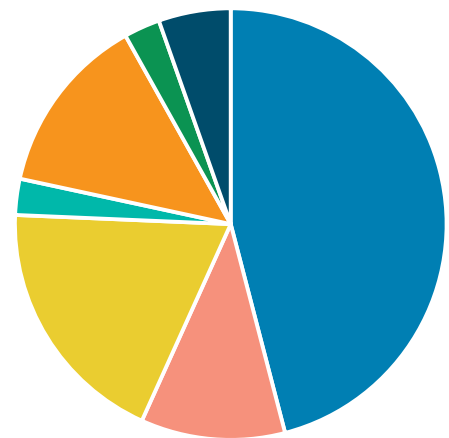
**4) Why? Please describe your reason for the above answer. (all responses)**

- This questionnaire does not appear to have been written by Central Saanich as it does not explain what Council already agreed to
- Step Code should align with mandated BC Code. Renewable Natural Gas from Hartland Landfill is a necessary part of sustainable energy security, and released into atmosphere anyway.
- Wish we didn't have to slow down energy efficiency at a time when the industrial is on a learning curve.

**5) Part 9 - What is your level of agreement with the proposed pathway for Part 9 new buildings outlined above and in the Briefing Note?**

Response Options	Response Count	Percent of Responses	Pie Chart Colour
Fully agree	17	46%	Blue
Agreement with a minor point of contention	4	11%	Light Red
Support with reservation	7	19%	Yellow
Abstain; this doesn't affect me	1	3%	Teal
More discussion needed	5	14%	Orange
Don't like it but understand the rationale	1	3%	Green
Serious disagreement	2	5%	Dark Blue

Level of Agreement for Part 9 Adoption Pathway



**6) Why? Please describe your reason for the above answer. (all responses)**



- Same as above, this does not pertain to Central Saanich, why would we back down on our leadership?
- The definition of zero carbon should still allow for wood or natural gas fireplaces, and natural gas fueled backup generators.
- Step Code should align with mandated BC Code. Renewable Natural Gas from Hartland Landfill is a necessary part of sustainable energy security, and released into atmosphere anyway.
- Similar to my answer for question 4. No more gas serving buildings, and keep Step Code on track.
- Its easier to change utilities than to change to fully insulated passive house construction.

7) Multiple training opportunities exist to support local industry in adopting higher steps of the BC Energy Step Code and low carbon energy systems/Carbon Pollution Standard. Some examples of organizations providing training include, but are not limited to, BCIT, LCZEB, UNBC, VIU, ASTTBC, BC Housing, BOABC, GaGBC, CHBA BC, CEA, ICBA, Passive House Canada and ZEBx. Despite the availability of training, engagement feedback clearly indicated a desire for additional training participation and other supports. **What is the most effective support the municipality can help provide during the transition to decarbonize new construction? (please tick all that apply)**

Response Option	Response Count
Support and communicate information related to rebates for reducing carbon emissions	17
Collaborate with your associations to provide new/additional education opportunities.	14
Work with the realtor industry to increase knowledge and public understanding of the value of low and zero carbon buildings	10
Enhance other public communications related to the value of low and zero buildings	7
Subsidize existing training opportunities	2
Collaborate with your associations to provide new/additional education opportunities	5
Enhance other public communications related to the value of low and zero buildings (including appliances)	7

8) **(please specify)** (all responses)

- Explain Central Saanich's position as already approved appropriately, do not be asking for a slow down, this is not acceptable

**9) Do you have any other feedback or input? (all responses)**

- as above - no slow down!
- Thank you for your hard work
- Leave energy efficiency and carbon emissions in housing to National Building Code expertise. Municipalities are not qualified to address these issues.
- Need more information on the municipal bylaw changes needed in order to make this a reality. Implications for municipal staff in terms of enforcing this.
- Great work!
- As much as it is good to try and obtain buy in from as many as you can, sometimes you just have to use policy to make people do the right thing. Even if they're kicking and screaming about it. I personally get annoyed with other builders who just don't like change, and give stupid arguments, when all they have to do is educate themselves.

# Appendix A – Letter from Victoria Residential Builders Association



*Community Builders...*

*Building Communities*

April 12, 2022

Matt Greeno, Community Energy Specialist  
Capital Regional District  
625 Fisgard Street,  
Victoria, BC V8W 2S6

Dear Mr. Greeno,

**Re: Solutions Lab to Accelerate Step Code in the CRD**

The Victoria Residential Builders Association will decline to attend the CRD's "Solutions Lab" to "accelerate implementation of higher steps of the Step Code." The BC government plans to make Step Code 3 mandatory by year-end. Fast-tracking the BC Step Code beyond this level only undermines consumer protection and housing affordability. Numerous flaws in the BC Step Code have been discovered including:

- Lack of research into toxic radon issues and mitigation in energy efficient homes. Radon levels exceeding the maximum established by the World Health Organization have been detected in Victoria;
- No prescriptive path to address high modeling costs and no mandatory Step Code education;
- Wildly inaccurate cost estimates and dysfunctional energy efficiency metrics;
- Net-zero is achievable at Step 4 making BC's costly Step 5 unnecessary adding to unaffordability.

Much of this information was revealed by the National Building Code's due diligence. BC Step Code's significant flaws undermining both consumer protection and affordability are the direct result of "accelerating" energy efficiency in BC's Building Code.

The Solutions Lab is at the "direction" of several councils to "accelerate implementation of higher steps of the Step Code." Municipalities do not possess the expertise, experience nor resources to do the necessary research and diligence for major code changes to ensure health and safety.

Codes Canada recently released energy efficiency changes in the National Building Code including a prescriptive option to address affordability. However, Codes Canada has not completed research on very high Step Code levels proposed by the CRD's "Solutions Lab."

VRBA continues advising municipalities to wait for the BC government to establish mandatory levels of energy efficiency combined with education rather than use local bylaws to fast-track energy efficiency. A local "Solutions Lab" does not replace National Building Code expertise, research and due diligence.

If you require more additional information, feel free to contact me at 250-383-5044.

Sincerely,

Casey Edge  
Executive Director

## Appendix B – Email from BC Housing

Hi Victoria,

This looks great. Thanks for sharing. As you know, BC Housing currently has a GHGI requirement of 5.5 kg CO<sub>2</sub>/m<sup>2</sup>. for new buildings. As a Crown Agency, we have found it will be increasingly difficult to meet our Clean BC targets as we add new buildings with systems that burn fossil fuels. As a result we are hoping to lower our allowable GHGI in climate zone 4 (which includes the above listed municipalities) to 3 kgCO<sub>2</sub>/m<sup>2</sup>. We are hoping to have this change approved by our executive this summer. This is planned to be a temporary measure included in a technical bulletin to accommodate commercial kitchens and limited gas back up for peaking heating and hot water. Our hope is to further reduce this to around 1 kgCO<sub>2</sub>/m<sup>2</sup> in the next version of our Design Guidelines and Construction Standards expected in 2024, as CO<sub>2</sub> heat pumps, cold temperature heat pumps with better GWP coolants, and electric commercial kitchen options become more available. The Clean BC Roadmap to 2030 states that the province will be “requiring all new public sector buildings to align with our climate goals beginning with performance standards (2023) and moving to zero-carbon new buildings (2027)”. Municipal leadership across the province will be crucial to helping us meet these goals and sends a signal to owners, builders, designers, suppliers, and installers that these changes are immanent. I’ll keep and eye out for your new policy this summer and please feel free to loop me in if you need anything.

Bill



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**Bill MacKinnon** Senior Manager, Energy & Sustainability | Development and Asset Strategies  
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1701 - 4555 Kingsway, Burnaby, BC V5H 4V8 Canada

I would like to gratefully acknowledge that I work on the traditional and unceded territory of the x<sup>w</sup>məθk<sup>w</sup>əyəm (Musqueam), Skwxwú7mesh (Squamish), and səlilwətaʔ (Tsleil-Waututh) peoples

**From:** Rebecca Newlove <[Rebecca.Newlove@saanich.ca](mailto:Rebecca.Newlove@saanich.ca)>  
**Sent:** June 21, 2022 10:18 AM  
**To:** Bill MacKinnon <[bmackinnon@bchousing.org](mailto:bmackinnon@bchousing.org)>  
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**Subject:** RE: Victoria Region Step code and Carbon Pollution Standards

Morning Bill

Great to chat to you yesterday about BC Housing standards and guidelines as it relates to the Step Code and carbon pollution standards in new buildings. As discussed, the CRD, District of Saanich, City of Victoria and District of Central Saanich are undertaking engagement with building industry on the upper steps of the BC Energy Step Code and the new Provincial

Carbon Pollution Standards in new buildings. This work is focused on determining the best way to use the regulatory tools available to reduce operating carbon emissions from new construction and meet our Councils' direction and climate targets. The work is being shared with other local governments and electoral areas in the region.

We wanted to follow up from our meeting to provide an overview of our proposed approach for implementation in the region. As mentioned, this has been informed by local industry engagement, data analysis and the provincial implementation timelines for Step Code and carbon pollution standards. We've outlined these timelines below as context for the proposed approach, but we appreciate that BC Housing is already aware of these future legislative changes.

### Provincial Timelines Overview

The Step Code will be brought into effect by the Province through the BC Building Code this December 2022, starting with "20% better" minimum standard, which is equivalent (in most respects) to what has already been adopted by the noted local governments above. Progressively higher energy efficiency performance will be introduced into the BC Building Code over time, with next steps in 2027 and then the highest steps by 2032.

Similar to the Step Code, the Province intends to phase in the Carbon Pollution Standards for new buildings as part of the BC Building Code starting this December 2022 with "measuring", and moving progressively higher in 2024, 2027 and then reaching zero carbon ready by 2030.

### Proposed Approach in the region (some LGs)

While the local governments noted above have Council direction to move to the highest steps of the Step Code by 2025, there is an opportunity to meet our climate targets through implementation of the new Provincial Carbon Pollution Standards instead. Industry feedback to date has demonstrated a strong preference to focus on the Carbon Pollution Standards versus acceleration of the BC Energy Step Code. Four additional clear messages heard through engagement were to keep it simple, provide time to plan, present the full pathway to 2030/2032 and aim for regional alignment.

Given this feedback, analysis, and consideration of affordability, the proposed approach includes no further accelerated implementation of the BC Energy Step Code; as of December 2022 the intention is to not increase the requirements under the Step Code until the Province increases them. Instead, this proposed pathway will focus on Carbon Standard requirements (GHGi maximums) only and includes just two moves between now and 2032 as outlined in the table below:

### **Proposed Adoption Pathways**

	Description	Date	
		Part 9 Buildings	Part 3 Buildings
Move 1	<u>Low Carbon Standard Requirement</u> - in most cases will require decarbonization of both space & domestic hot water heating	July 1, 2023	July 1, 2024
Move 2	<u>Zero Carbon Ready Standard Requirement</u> - in most cases will require decarbonization of all energy uses	Jan. 1, 2025	July 1, 2025

More details and background information are available at [www.saanich.ca/stepcode](http://www.saanich.ca/stepcode).

### BC Housing Standards

Thank you for outlining the current BC Housing Design Guidelines and Construction Standards and potential future direction as it relates to GHGi. It was valuable to hear about examples of completely electrified buildings in our Climate Zone/region and to discuss specific areas of focus and how this work relates to cooling.

Given the above, we would be grateful for your feedback on the proposed approach for implementation of the Step Code/Carbon Pollution standards in the Victoria region. The local governments noted above are intending to present this to their respective Councils in early August.

We look forward to your response and please let us know if you have any questions.

Kind regards  
Rebecca

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We acknowledge that the District of Saanich lies within the territories of the lək'wəŋən peoples represented by the Songhees and Esquimalt Nations and the W̱SÁNEĆ peoples represented by the W̱JOḺELP (Tsartlip), BOKEĆEN (Pauquachin), S̱TÁUTW (Tsawout), W̱SIḴEM (Tseycum) and MÁLEXEŁ (Malahat) Nations.

We are committed to celebrating the rich diversity of people in our community. We are guided by the principle that embracing diversity enriches the lives of all people. We all share the responsibility for creating an equitable and inclusive community and for addressing discrimination in all forms.

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# Appendix C - Complete Open-Ended Responses

## Part 9, Step 3 Compliance

**For Step 3 compliance, what is the most challenging part of a project? Open ended responses:**

- Implementation of readily available systems make it easy to achieve this Step. The biggest hurdle is cost.
- Step 3 compliance is not as difficult to design or build. Smart pre-design makes this easily attainable with minimal changes to standard materials, design strategies, especially in a forgiving climate like our own.
- The few Part 9 buildings we have working on under the Step Code have been custom homes on view properties for Clients that want a large amount of glazing in their home but don't want to pay for triple glazing and/or don't like the appearance of triple glazing and coatings to reduce solar heat gain.
- Construction industry has limited experience with airtightness. Assumptions at the pre-design and design phases need to be conservative to allow for this.
- The bias towards hydro power is limiting for mechanical heating systems in terms of overall occupancy comfort. One unintended (hopefully) consequence is GHG boilers won't be able to achieve higher than Step 3 Metrics even though Fortis will be able to carbon capture neutral gas generation for consumer use in the near future for those new and in use boilers. Heat pumps are not the only answer to GHG reduction. As homes start to use outside insulation to achieve higher step codes B.C. hydro has fallen behind in improving their metering products to help reduce Air Change efficiency by business as usual methods and cutting a 16"x 20" hole in the side of a home and then filling that cavity with concrete to protect the exposed conduit. Step Code 5 allows a .5 Air Change max tolerance. For a perspective .5 Air Changes is allowing a hole smaller than a golf ball in total around the whole home to be exposed to outside circulation. The industry has fallen behind keeping up with Step Code 3 implementation and municipalities that chose the step code are not allowing fair expectations of the Steps. The Step Code started 4 years ago and in 2022 BC Housing has only made it mandatory for Home Builder's to participate in Step Code training. Passive Homes only have to achieve 1 Air Change per hour which is the Step Codes hard stick yet in Step Code 5 it is .5. Energy Efficiency and reduction in GHG's is without question, Step Code 3 in my experience (being a home builder for 16 years adds 35000 effectively to a home. The Provincial governments figures around Step Code 3 adages are way to low and not realistic. I'm currently building my home to Step Code 5 standards and the costs are not yet

completed but heading to the low \$70000.00 just for Step Code. One recommendation is to use the National Building codes vetted tried and true new energy efficiency option and have some prescriptive options to choose from. This gives the builder more flexibility around costs and the right method to choose for them. Of course, as a builder will tell you these costs are passed down to the first time home buyer or custom home client.

- contractors that are rooted in ancient construction sequencing and techniques. complex, antiquated housing designs. housing designers who design without regard for air barrier detailing
- It is not difficult to build a step code compliant house if you pay attention to detail
- The building envelope is a system where air tight buildings may experience earlier hygrothermal failure using traditional materials (findings of National Code Task Group), or where depressurization may cause greater radon ingress. Houses are getting tighter and exhaust fans more powerful. The result is more frequent and severe depressurization of houses. Radon is site specific and cannot be identified on a map. An SFU radon scientist says there has been insufficient testing in Greater Victoria. These issues are being reviewed by the National Building Code committees and were not addressed by the BC govt for the Step Code. The BC Step Code circumvented due diligence.
- I work 'occasionally' on residential, garden suites, secondary suites; basically reno's.
- I can hit the ACH, and I'm good with the enclosure efficiency. Having clients on board with better mechanicals is the hardest part. Paying more for better equipment can be a tough sell. Heat pumps are fine, but the HRV's are the challenge. The price point is high and they'd rather spend it on countertops, etc.
- The climate here in Victoria is mild and a little air leakage is actually good for the home. Building them so air tight causes additional problems for the home occupants. Introducing a fan that exhausts warm air out of the home is not a solution. New homes are very energy efficient as is and introducing further costs to the builder is not a good solution. A lot of research needs to go into these types of decisions. Your target should be homes built prior to 2010 and have the government implement energy efficient standards on these existing homes and place all of the costs on the home owners. This system is flawed as new homes are not the problem the old homes are the biggest problem.
- The pre-construction energy modelling determines what goes into the building, and as long as the plans and the BCESC report are followed there is no concern. However, the air tightness is entirely built on site, and almost all builders and contractors have growing pains. Most people fail the first one or two tests trying to meet BCESC Step 3, and have to learn through trial and error.
- Air tightness requires quality control, and supervisions of trades. Many contractors offer little to no supervision for Step 3 and lower projects.



- The air tightness component will be the hardest aspect for people to meet, especially at the higher Steps.
- Canada contributes very little in comparison to Asia, this race to self inflict cost for virtue signalling is detrimentally affecting building cost and those inflicting it are wrongly imposing their will on others will little tangible result and huge tangible cost... build well and be done. Gas is a very viable energy source, heat pumps are poor if they use electric backup... Stop encouraging misguided objectives, many govt and energy advisors are enabling and don't recognize cost increases, obvious from the presenter... Data was very SKEWED, majority of SFDs in CRD are NOT at step 3, Almost no Westshore data used, the four jurisdictions pushing this don't even contribute 20% of SFD housing stock, JUST STOP this ridiculous panacea...
- Step 3 is standard practice
- The targets are easily accomplished. The main challenge is; finding ways to accomplish the same targets with less skilled workers, at volume, and reduced cost.

## Part 9 Step 4/5 Compliance

**For Step 4/5 compliance, which of the following is the most challenging part of a project**  
**Open ended responses:**

- It takes a little more creativity to hit the higher end targets.
- I believe air changes per hour will be the most difficult for builders as the knowledge is not quite there yet and there are many different strategies. This is why a mid construction blower door is a necessity for early adoption.
- If you have a smart envelope/mechanical designer, they can typically tweak design to meet requirements.
- Everyone likes expansive windows and currently their performance values are going to make this difficult to achieve the targets.
- Might be a bit off the questions topic  
 However Relying on mechanical means which rely on consistent energy, and being part of the bigger grid. Is risky I tend to prefer independent systems that can operate within their own individual smaller groups which when large scale disasters happen cannot affect a larger group. I.e blackouts floods, natural disasters such as earthquakes.
- I expect builder familiarity with construction techniques & quality control to be challenging on custom homes.
- Same reasons as above
- Limited options and limited choices to achieve Step Code 4 and 5 without prescriptive method.

- contractors that are rooted in ancient construction sequencing and techniques. complex, antiquated housing designs. housing designers who design without regard for air barrier detailing
- Again, the house is a system where mechanicals, materials and their application must work together. Very few people understand the issues and some don't know the difference between an air barrier and vapour barrier. Fast-tracking higher levels of the Step Code is a recipe for major unintended consequences and liability for local govts. This is especially true when it's a local bylaw and not mandatory BC code. Delta was successfully sued for \$3 million over a leaky condo issue. The BC govt is planning to require CPD builder education for Step 3, which should have been done before introducing Step Code in 2017. There is no mandatory education and training for Step 4 & 5.
- I can hit the ACH, and I'm good with the enclosure efficiency. Having clients on board with better mechanicals is the hardest part. Paying more for better equipment can be a tough sell. Heat pumps are fine, but the HRV's are the challenge. The price point is high and they'd rather spend it on countertops, etc. The units only get more expensive.
- I am opposed to fast-tracking energy efficiency without due diligence by the National Code committee, including cost-benefit analysis in the real world of construction, review of potential unintended consequences such as radon, etc. BC Step Code needs to follow the National Code and leaping forward to Step 4 and 5 without understanding all of the diligence is not achieving anything.
- The pre-construction energy modelling determines what goes into the building, and as long as the plans and the BCESC report are followed there is no concern. However, the air tightness is entirely built on site, and almost all builders and contractors have growing pains. Most people fail the first one or two tests trying to meet BCESC Step 3, and have to learn through trial and error.
- The air tightness component will be the hardest aspect for people to meet, especially at the higher Steps.
- energy advisor stated heating solutions that didnt include moving air but neglected the cost of necessary air change equipment ...
- Canada contributes very little in comparison to Asia, this race to self inflict cost for virtue signalling is detrimentally affecting building cost and those inflicting it are wrongly imposing their will on others will little tangible result and huge tangible cost... build well and be done. Gas is a very viable energy source, heat pumps are poor if they use electric backup... Stop encouraging misguided objectives, many govt and energy advisors are enabling and dont recognize cost increases, obvious from the presenter... Data was very SKEWED, majority of SFDs in CRD are NOT at step 3, Almost no Westshore data used, the four jurisdictions pushing this dont even contribute 20% of SFD housing stock, JUST STOP this ridiculous panacea...

- Step 4 is best practice
- Accomplishing better ACH doesn't require unique assemblies, only improved existing ones. But envelope efficiency requires new upfront design considerations and processes and/or unique assemblies that require more education from all parties.

## Part 9 Air Tightness Compliance

**What do you anticipate challenges for achieving the required Air Changes per Hour (ACH50) for the upper steps (Steps 4 and 5), open responses:**

- I believe air changes per hour will be the most difficult for builders as the knowledge is not quite there yet and there are many different strategies and trades that will have an effect on the air barrier. This is why a mid construction blower door is a necessity for early adoption.
- Sub-trades are used to punching holes through the building as needed to accommodate services. This can lead to reduced performance between the mid-construction and final blower door tests.
- A more elegant solution is needed for domestic kitchen air make-up when the kitchen hood is used. Ventless dryers help with depressurization in airtight construction, but kitchen hoods exhausting to the exterior are causing depressurization leading to whistling under doors, poor performance of the kitchen exhaust, and increased uncontrolled air infiltration.
- Why are the Air Changes more difficult to achieve than a Passive Home when this seems to be the bench mark.
- building and design culture. homeowners who think they can do whatever they want without consequence.
- Supply chain issues are making materials hard to get in a timely manner
- Education should come first before implementing major code changes. This has not been done with Step Code. All are issues ranging from no formal education to construction detailing to very high costs to supply issues.
- Making sure that clients understand the importance of simpler building form.
- The orientation on the lots can be out of the designer and builder's hands.
- Mid construction blower test will verify ACH, and hopefully the "big picture" in the end will all come together to confirm targets were hit.
- This whole presentation and survey is skewed and BIASED... options in 12 should include large cost increases, so many presenters sit in offices and don't see the real costs....
- Zoning requirements and design guidelines contradict with high performance design
- Low ACH is technically quite simple to achieve in application once the construction design accounts for it and there is awareness of the problem areas during planning.

## Part 9 Envelope/Enclosure Compliance Steps 4/5

**What do you anticipate challenges for efficiency for the upper steps are? (Steps 4 and 5), open responses:**

- Building form is often limited by lot shape & orientation. Some designers do not prioritize efficient building shapes prior to development permit applications.
- Developers and contractors are concerned with the cost increase to build high performance wall systems (i.e - additional labour and materials for continuous exterior insulation on wood frame). Upgrading larger windows to triple pane can lead to large increases in installation cost, as additional equipment may be required to lift the heavier product.
- complex building geometry requires detailed oriented planning and protecting. the building industry typically relies on insulators to complete this work. insulators are not known for being the most responsible trade. shifting building culture is extremely difficult.
- The house is a system. Education should come first before implementing major code changes. This has not been done with Step Code, especially 4 & 5.
- Making sure that clients understand the importance of simpler building form.
- The orientation on the lots can be out of the designer and builder's hands.
- Mid construction blower test will verify ACH, and hopefully the "big picture" in the end will all come together to confirm targets were hit.
- Unnecessary given how inhabitants will in the end use/live in the home..
- Finding trades willing to do quality work is a problem but not really limited to step code.
- The variety of possible assemblies and products requires fairly deep and also broad experience to ensure quality and affordability aren't completely sacrificed.

## Part 9 Mechanical Equipment Compliance Steps 4/5

**What do you anticipate challenges for achieving the required mechanical equipment and systems efficiency for the upper steps are? (Steps 4 and 5), open responses:**

- Need more hot water heat pumps.
- The house is a system. Education should come first before implementing major code changes. This has not been done with Step Code especially 4 & 5.
- A more elegant solution is needed for domestic kitchen air make-up when the kitchen hood is used. Ventless dryers help with depressurization in airtight construction, but kitchen hoods exhausting to the exterior are causing depressurization leading to whistling under doors, poor performance of the kitchen exhaust, and increased uncontrolled air infiltration. Buildings with high domestic hot water demand relative to the floor area can struggle to achieve the total and mechanical energy use intensity targets. Limited products are available with efficiencies about 100% (i.e - heat pumps

with COPs>1) for domestic hot water. Contractors and developers are often wary of new products, and also wary of more expensive products.

- Some sites have limited electrical services available which pushes the domestic hot water system toward gas.
- A mixture of energy supplies to power a home is beneficial to occupant comfort.
- supply chain issues, misinformation from FORTIS, high energy draw from increased electrification.
- Everything needs to come together: Enclosure and mechanicals.
- HRV's and ERV's would be necessary (no more continuous bathroom fans)
- Sometimes I wonder if it could be "prescriptive". Certain size houses with a certain shape might be able to have similar mechanicals, and enclosure details/insulation.
- Location of air-to-water heat pumps is challenging on smaller lots due to noise impacts, visibility and bylaw restrictions. Geothermal for heat pumps is very expensive on Vancouver Island due to the cost of bring the drilling rig to the Island (this has been the case previously, it may have improved recently).

## Barriers to Low Carbon (Electric) Space Heating?

**What are the barriers to implementing low carbon energy (electric) space heating systems in new buildings?**

- Seems that solar energy should be far more integrated into homes than it is now. Should be more incentives offered. Should be no barriers or "hurdles" for home owners. Especially new construction. Taking pressure of the main grid to ensure our future generations are able to have an affordable future.
- BC Hydro cannot meet peak demand. Also see above response.
- Yes again cost, is this a survey or an attempt by a few to brainwash and have every intent to implement regardless of survey results ??
- All electric is already the cheaper option
- Huge demands on power servicing, equipment is very expensive. Size of electrical service at some sites is not sufficient to allow electric domestic hot water systems. Operating costs are a concern. Heat pump options which reduce operating costs are still developing in North America and developers / contractors are wary or new tech and additional cost.
- Not with the MUEI metric.
- I like Rheem Marathon tanks. Pair them with recirc pumps, and you're golden!
- Electric DHW is already typical.
- Many Clients still prefer gas cooktops and fireplace