

# Capacity Scan for the Energy Step Code in Select BC Communities



Prepared by: **BC Housing, Research and**

**Corporate Planning**

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## RESEARCH HIGHLIGHTS

- Although the initial steps of the Energy Step Code are not expected to substantially increase construction costs, and may even provide opportunities to reduce costs, some builders are concerned about initial cost impacts and consumer response. Municipal staff highlighted that these concerns will be important to elected officials when deciding if and how to implement the Energy Step Code. Information on potential costs and benefits of building to the Energy Step Code targeting builders and elected officials would facilitate adoption.
- While builders are required to attend on-going education, most trades are not and many lack the necessary skills or experience to achieve higher energy performance. There is a need for more training and education targeted specifically to the trades, particularly training that is ‘hands-on’.
- Municipal-led education initiatives such as builder forums and pre-construction meetings have generally been effective, and should be promoted. However, not all building officials have sufficient knowledge or resources to guide builders. Education for building officials, including tools and materials to be used when working with builders and trades, would foster these practices in more municipalities.
- Some builders reported success in marketing higher performance homes by having face-to-face discussions on improved health, comfort, noise reduction, and energy costs, but also noted that it was time consuming and difficult to quantify these benefits. Realtors were identified as lacking the knowledge to market these benefits effectively. More accessible information on the health, comfort, noise reduction, and cost benefits could help generate more demand for energy efficient homes.
- Density bonuses and up-zoning can be effective incentives for higher energy performance in large, urban municipalities, where there is limited land but high residential demand. Rebates and subsidies may be more effective in smaller and more rural municipalities.
- The Province could support local governments to implement the Energy Step Code by developing province-wide standardized guidelines, processes and templates. Further work is also necessary to address local government concerns about potential liabilities, their role vis a vis Certified Energy Advisors, and monitoring and enforcing compliance with the Energy Step Code.
- Builders have identified a need for sufficient time to plan for implementation of the Energy Step Code i.e. the progression of required Steps in the municipalities where they build.

## INTRODUCTION

### RESEARCH PURPOSE AND METHODOLOGY

This study was conducted as a first step in exploring municipal and industry capacity and information needs for successful implementation of the Energy Step Code. A qualitative approach was used to obtain the insights of local government representatives and industry practitioners who have significant experience in advancing high performance homes, including Certified Energy Advisors (CEAs) and members of the Canadian Home Builders Association of British Columbia (CHBABC). Altogether, close to 40 individuals participated in focus groups and one-on-one interviews that took place from November 2016 to January 2017. The interviews included participants from the following communities:

- Metro Vancouver (North Vancouver, Surrey, Richmond, New Westminster, and Langley)
- Central Vancouver Island
- East Kootenay (Cranbrook, Kimberly, and Invermere)
- Thompson Nicola (Kamloops)
- Northern Interior (Prince George and Vanderhoof)

This report documents the experience and observations of the participants, and will help identify issues that can be further explored through more comprehensive research, including province-wide surveys and additional key informant interviews. This report focuses on new construction and Part 9 Buildings, as this reflects the experience of interview participants, although some observations on Part 3 Buildings are also included.

## CURRENT EXPERIENCE WITH ENERGY EFFICIENT HOMES

### ACTIONS TO ADVANCE CONSTRUCTION OF ENERGY EFFICIENT HOMES

Table 1 describes current requirements and incentives being used by local governments to advance the construction of energy efficient residential buildings. The table also shows the targeted level of performance according to the approximate equivalent of the Energy Step Code. As the focus is on new construction, initiatives to improve energy efficiency of homes through retrofits are not included.

**Table 1. Current Municipal Requirements and Incentives to Advance Energy Efficient Homes**

Community	Description	Energy Step Code Equivalent	Geographic Limits	Policy Tool
<b>City of North Vancouver</b>	<p>For Part 3 buildings, developers achieving an ASHRAE rating of 90.1-2007 are permitted to increase their density from a base density to the full density permitted within the zoning by-law and Official Community Plan (OCP).</p> <p>For Part 9 buildings, North Vancouver provides a density bonus for new buildings that achieve a minimum rating of EnerGuide 80. Single family homes and duplexes are permitted to exempt cellar floor space from floor space ratio (FSR) calculations, while all other building types are permitted to increase density from a base density to the full density permitted within the Zoning Bylaw and OCP.</p> <p>Developers must submit a copy of the energy audit, a letter of compliance from a CEA, and a Performance Bond of 1% of construction costs (refunded when compliance is verified).</p> <p>Participation in this program for both Part 3 and Part 9 buildings is close to 100%.</p>	Step 1 (Part 3) Step 2 (Part 9)	City wide	Density Bonus
	<p>As a condition of receiving a density bonus in the Moodyville Area, new developments must achieve one of the following:</p> <ul style="list-style-type: none"> <li>▪ Passive House certification;</li> <li>▪ LEED-Gold standard with enhanced energy efficiency (i.e. 15% better than ASHRAE 90.1 2010, 10% better than NECB 2011, or EnerGuide 86) and a commitment to a noise mitigation strategy; or LEED-Gold standard with the highest step (similar to Passive House) of the Energy Step Code and a commitment to a noise mitigation strategy.</li> </ul> <p>Most of the buildings (90 to 95%) in the Moodyville Area will be Part 9.</p>	Step 5 (Part 9) Step 4 (Part 3)	Neighbourhood specific	Density Bonus
<b>City of Richmond</b>	<p>Richmond has an OCP rezoning policy that new townhouses be solar hot-water ready, and achieve one of the following: 1) an EnerGuide 82 level of performance; or 2) the Energy Star for New Homes Standard.</p> <p>New townhouses are exempt from the above if they connect to a district energy utility or install industry proven renewable energy systems that provide at least 51% of heating, cooling and/or electrical energy load requirements.</p>	Step 3 (Part 9)	City wide	Rezoning
	<p>The City Centre Area Plan includes a policy that projects greater than 2000m<sup>2</sup> in the City Centre undergoing rezoning be built to a LEED Silver equivalent level of performance.</p>	Step 1 (Part 3)	Neighbourhood specific	Rezoning
<b>City of Surrey</b>	<p>Surrey offers a density bonus for developers to achieve higher energy performance homes in the West Clayton area. Part 9 buildings are allowed to increase the Units per Acre beyond the base density if they are certified to Energy Star standard. Part 3 buildings are allowed to increase Floor Area Ratio above the base density if they are constructed with compartmentalized suites, are equipped with in-suite heat recovery ventilators, undertake building commissioning (Cx), and conduct airtightness testing of the building envelope and a minimum of five selected suites to confirm air leakage less than or equal to 1.3 L/s/m<sup>2</sup> at 50 P.</p>	Step 3 (Part 9) Step 1 (Part 3)	Neighbourhood specific	Density Bonus

<b>Township of Langley</b>	<p>The Green Building Permit Rebate Program encourages more energy efficient homes by subsidizing the cost of a CEA for new home construction:</p> <ul style="list-style-type: none"> <li>Single Family Units: \$500 if achieve 10% lower than the EnerGuide Rating System (ERS) reference home or Built Green Silver Certification; \$750 if achieve 15% lower than ERS reference home; \$1,000 if achieve 20% lower than the ERS reference home, ESNH Standard, or Built Green Gold or Platinum Certification; or \$1,500 if achieve 40% lower than the ERS reference home, R-2000, Passive House, or Net Zero Energy Building Certification (NZEB).</li> <li>Row/Townhouse/Duplex: \$100 per unit if achieve 10% lower than the ERS reference home or Built Green Silver Certification; \$200 per unit if achieve 15% lower than ERS reference home; \$300 per unit if achieve 20% lower than the ERS reference home, ESNH Standard, or Built Green Gold or Platinum Certification; or \$500 per unit if achieve 40% lower than the ERS reference home, R-2000, Passive House, or NZEB.</li> </ul>	Steps 2-5 (Part 9)	City wide	Building Permit Rebate
<b>City of New Westminster</b>	<p>Under Energy Save New West, the Driving Demand for Energy Star New Homes program covers the full cost of an EnerGuide plan drawing assessment, mid-stage (pre-drywall) blower door test, final airtightness test and EnerGuide rating at completion. This incentive program is available to local homebuilders, as well as architects for low-rise Part 9 residential projects. The intent of the program is to prepare the local market for the “performance path” energy modeling approach to building design, and prepare the builder/designer community for implementation of the Energy Step Code.</p> <p>New Westminister also offers a variety of workshops, Builder &amp; Designer Breakfasts, and other learning opportunities on constructing high performance buildings and understanding the performance levels associated with the new Energy Step Code.</p>	Step 3 (Part 9)	City wide	Cash Incentive
<b>East Kootenay (District of Sparwood City of Kimberley District of Invermere)</b>	<p>Sparwood offers building permit rebates up to 50% of building permit fees and 100% of energy audit fees for homes that achieve an EnerGuide rating of 80 or better. A CEA must be hired to test the homes and produce an EnerGuide rating.</p> <p>Kimberly offers rebates of building permit fees. Eligible projects are refunded a percentage of the fees based on the EnerGuide Rating of the building post construction. A 20% rebate or EnerGuide rating in the range of 80 to 82 is the most common savings but some new builds have achieved a 40% rebate by reaching an EnerGuide rating in the range of 83 to 85.</p> <p>Invermere offers a building permit rebate of \$5,000 for single family homes that achieve an EnerGuide rating of 83 or greater. Two rebates are available per year.</p>	Step 2-3 (Part 9)	City wide	Building Permit Rebate
<b>Vancouver Island (Central)</b>	<p>District of Saanich, Municipality of North Cowichan, City of Langford, City of Nanaimo, and Regional District of Nanaimo were identified as promoting higher performance energy efficient homes. The Regional District of Nanaimo (RDN) provides a Sustainable Development Checklist to encourage high-performance buildings. Homeowners/owner-builders who achieve a high score on the completed checklist may qualify for incentives valued between \$500 and \$1,000. High points are given to LEED, Built Green and Energy Star rated homes. The RDN has also amended the definition of floor area to allow thicker insulation without restricting livable floor area. The District of Saanich typically negotiates Built Green Gold for Part 9 buildings and LEED Gold for Part 3 buildings. The nearby Capital Regional District is actively looking to provide an incentives program.</p>	BC Building Code – Step 3 (Part 9)	Region-wide	Cash Incentive Rezoning
<b>City of Kamloops</b>	<p>No current incentives to promote higher energy efficient homes.</p>	BC Building Code	--	--
<b>City of Prince George &amp; Vanderhoof area</b>	<p>No current incentives to promote higher energy efficient homes.</p>	BC Building Code	--	--

## OVERVIEW OF INCENTIVE TYPES AND KEY PRACTICES

Table 2 shows incentives that were identified as encouraging builders to achieve higher performance energy efficient homes. While faster approval processes and reduced DCCs were appealing to some builders, they have some important drawbacks for municipalities. Overall, interviewed municipalities used rebates/cash incentives, density bonuses, and/or rezoning.

**Table 2. Overview of Existing Programs Strengths and Weaknesses**

Incentive	Where Used	Strengths	Weaknesses
<b>Rebates/Cash</b>	<ul style="list-style-type: none"> <li>▪ East Kootenay (Sparwood, Kimberly, Invermere)</li> <li>▪ Township of Langley</li> <li>▪ City of New Westminster</li> <li>▪ Regional District of Nanaimo</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provides immediate and tangible results that lower costs for builders</li> <li>▪ Depending on design, can be relatively easy for local governments to administer</li> </ul>	<ul style="list-style-type: none"> <li>▪ Depend on program funding</li> </ul>
<b>Density Bonus</b>	<ul style="list-style-type: none"> <li>▪ City of North Vancouver</li> <li>▪ City of Surrey</li> </ul>	<ul style="list-style-type: none"> <li>▪ Works well in areas with limited land and high residential demand</li> <li>▪ Does not require program funding</li> </ul>	<ul style="list-style-type: none"> <li>▪ Requires a market where land is scarce e.g. urban areas</li> </ul>
<b>Rezoning Policy</b>	<ul style="list-style-type: none"> <li>▪ City of Richmond</li> <li>▪ District of Saanich</li> </ul>	<ul style="list-style-type: none"> <li>▪ A significant incentive</li> <li>▪ The value of upzoning offsets additional costs that may be incurred for Energy Step Code</li> <li>▪ Does not require program funding</li> </ul>	<ul style="list-style-type: none"> <li>▪ Depends on number of rezoning applications</li> <li>▪ Requires a market where land use is restricted or scarce e.g. urban areas</li> </ul>
<b>Priority for Approvals process/clearer timelines</b>		<ul style="list-style-type: none"> <li>▪ May provide an incentive in areas where there are long wait times</li> </ul>	<ul style="list-style-type: none"> <li>▪ If normal wait times are not long, this may not be much of an incentive</li> <li>▪ Municipalities may not have the capacity to reduce wait times or provide clear timelines</li> <li>▪ Potentially viewed as unfair by other builders</li> </ul>
<b>Reduce DCCs</b>		<ul style="list-style-type: none"> <li>▪ Could be a significant incentive</li> </ul>	<ul style="list-style-type: none"> <li>▪ May not be consistent with the DCC legislative framework</li> </ul>

North Vancouver is using the following process for Part 9 buildings, which has worked well to ensure compliance:<sup>1</sup>

- a. Applicant submits a model prepared by the CEA that shows how the home design will comply with the energy requirements.
- b. Plan checker ensures this information is on the drawings.
- c. Building inspector checks the building against the drawings i.e. what the CEA designed and is it in the building.
- d. Upon completion of the building, the CEA determines what level of EnerGuide has been achieved. The CEA conducts a blower door test and provides an Energy Modelling report based on the actual construction of the building (Hot2000).
- e. This information is provided to the Building Inspector.
- f. Upon successful provision of the verification documents to the satisfaction of the Chief Building Official, the Performance Bond is released.

In addition to incentive programs, the following practices have been identified as helping to encourage builders to achieve higher performance energy efficient homes:

<sup>1</sup> For Part 9 buildings, out of a total of 129 building permits, between January 1, 2011 and April 2, 2013, 98% participated in the program and were required to meet or exceed the EnerGuide 80 energy standard. As of April 2, 2013, there was only one builder who did not initially meet the required EnerGuide 80 rating upon its blower test. Staff worked with the owner to find ways to increase the home's energy performance and reach the EnerGuide 80 rating. There were no other cases of non-compliance with the energy standard.

- **Builder forums:** Provide an opportunity to engage with builders and discuss ways to improve building performance and design for energy efficient homes. Meetings can be half an hour to two hours and generally involve breakfast or coffee or take place after work. The cities of New Westminster, Nanaimo, North Vancouver and Maple Ridge were identified as holding these forums. [North Vancouver modeled its program on what was being done in Maple Ridge].
- **Pre-construction meetings:** When North Vancouver first began its work to promote more energy efficient homes, staff introduced pre-consultation project meetings that brought together all the key players who would be involved in the development of a new home. This included the builder, trades (contractors, plumbing, gas, and electrician), building inspector and plan checker. They discussed how they would work together and how the house would work a system. It took about 12 months of these meeting to increase the level of understanding among key players of what was involved in developing energy efficient homes that would meet North Vancouver’s requirements.

## MOVING FORWARD WITH THE ENERGY STEP CODE

### EXPECTED STEP CODE LEVEL

Most interview participants expect their local government will maintain current performance levels with the introduction of the Energy Step Code. Some participants reported that they are exploring options to increase performance targets and that their community may increase performance targets after transitioning their existing policies and programs to the Energy Step Code. For Part 9 residential buildings, the range of policy tools is expected to include: building permit rebate programs to encourage builders to work with CEAs, offering a density bonus, policies to require a higher level of performance upon a rezoning, and financial incentives. Two local governments are developing policies to facilitate the use of thicker wall envelopes beyond what is required in the current Building Code, without restricting livable floor area. Table 3 shows some of the tools and targeted Step levels being considered for Part 9 buildings.

**Table 3. Energy Step Code Targets Considered for Part 9 Buildings**

Policy Tool	Anticipated Step
Building permit rebates City-wide	Step 1-2
Base requirement City-wide	Step 1-2
Density bonus City-wide	Step 3
Density bonus Neighbourhood specific	Step 3-5
Rezoning policy City-wide	Step 3
Financial incentives Region-wide	Step 1-5

For Part 3 buildings, most participants believe their local governments will likely start with targets to achieve Steps 1 or 2 as a base requirement, and possibly even Step 3. It was also suggested that Steps 2 or 3 may be considered for rezoning and Step 4 for civic facilities in one community.

## CHALLENGES IN PROMOTING ENERGY EFFICIENT HOMES AND THE ENERGY STEP CODE

Interview participants were asked about current challenges in achieving higher energy performance in new homes, and challenges they anticipate specific to the adoption of the Energy Step Code. They considered it important to provide adequate support to key stakeholders, as many of the current challenges may still persist for a period of time despite the growth in industry capacity through consistencies brought about by the implementation of the Energy Step Code.

### Local Government

Current Challenges	Anticipated Challenges with Energy Step Code
<b>Participation and Engagement</b>	
<ul style="list-style-type: none"> <li>▪ With the exception of programs in the City of North Vancouver and Richmond (where participation is effectively required), municipal officials reported it was challenging to anticipate the level of participation in voluntary incentives before the program was launched. Encouraging participation of builders who were not already interested in achieving better energy performance was also identified as a challenge.</li> <li>▪ Municipalities varied in their ability to attract builders to educational events or meetings. While many municipalities reported that building inspectors are able to get builder attendance, others reported that only the higher-performing builders attend. The size of community was identified as a potential factor, with smaller communities having greater success with outreach.</li> <li>▪ A municipal official identified that they had been unable to engage with house plan designers, as they have no licensing, professional designation, or organizational representation. Many builders rely on designers for their house designs, and there are missed opportunities to obtain greater energy performance through better design.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mayor and council may get ‘push back’ from builders and developers concerned about moving beyond the BC Building Code and decide not to implement the Energy Step Code. Housing affordability and cost concerns from both builders and consumers are likely to be an important factor in choosing when and how to implement the Energy Step Code.</li> </ul>
<b>Municipal Resources</b>	
<ul style="list-style-type: none"> <li>▪ Several municipal officials noted that existing incentive programs required substantial municipal resources to develop and would not have been possible without program assistance and funding. However, the administrative demand generally declined as municipalities developed greater experience and refined their processes. In North Vancouver, processes were streamlined through greater involvement of building officials and creation of reporting templates for CEAs to use.</li> <li>▪ Concerns were raised in some communities that there are not enough municipal inspectors and plan checkers who are knowledgeable about energy efficient homes, and that building officials do not have the capacity to take on additional work. For example, one building official indicated they were concerned about providing guidance on higher energy performance building techniques and the potential liability issues that could arise. A builder also noted that his municipality has struggled to provide an informed inspector.</li> </ul>	<ul style="list-style-type: none"> <li>▪ For municipalities with experience using CEAs to confirm compliance, officials were generally comfortable with relying on CEAs to assess energy performance and how CEAs and building officials would work together in enforcing compliance with the Energy Step Code. For municipalities who were less comfortable relying on CEAs, there was concern inspectors will not be able to determine if energy efficient performance requirements have been achieved.</li> <li>▪ In addition, some CEAs do not carry professional liability insurance, which could expose local governments to liability. Concern was expressed by one municipality that because CEAs are not professionals, they cannot “sign-off” for Building Permits through the Certified Professional Program. Ultimately, building officials need to do the inspection and hence could potentially be liable.<sup>2</sup></li> <li>▪ Municipalities may require additional resources and training (see section on training below).</li> </ul>

<sup>2</sup> It was suggested that it would be helpful if the Province could develop a Certified Professional program for energy, similar to what is available for other professionals. If a CEA could officially carry liability for energy aspects of the code, local governments could make the case that this would remove the burden from local building officials, allowing them to focus on life safety and speed up permitting/inspection times. It was also suggested that this could achieve better compliance and education for builders as this should be the mandate of a CEA. Municipal inspectors are not mandated to help/explain to builders how to meet code - even though they often do try to help.



### Program Tracking and Enforcement

- Tracking and monitoring of current incentive program success was inconsistent in several municipalities, with some programs relying solely on the modeling results and not confirming actual performance.
- Even where the final energy performance is confirmed, tracking was still difficult as occupancy was granted even when the standard was not achieved. In the case of North Vancouver, current software systems do not allow for easy extraction of the data.
- Some municipalities were unclear about what actions they can or should take if performance targets are not achieved e.g. if a builder does not meet airtightness requirements. Municipalities will not want to hold up occupancy on a building that otherwise meets the BC Building Code.

## Building Community

### Current Challenges

- Some builders resist change and new approaches in part because they are concerned their lack of experience in using the new methods could result in unforeseen problems/costs. As a result, some builders install over-sized mechanical or redundant equipment “just in case”. For example, a builder may install a larger boiler than needed because this is what the trades are familiar with and they do not want to risk not getting their occupancy permit.
- Municipal officials indicated that when designing incentive programs, it is important to assure builders that failure to meet the energy performance standard will not affect their occupancy permit.

### Anticipated Challenges with Energy Step Code

#### Risk Aversion

- In instances where building permits take years to obtain, builders would like certainty that the required Step will not change over that time period.

#### Information and Training Gaps

- While builders are required to have on-going training through their licensing, the trades may not have any requirement to do so.
- Some builders do not have the confidence to push-back on their trades when they use a more conventional and less energy efficient approach (i.e. oversized HVAC, or thermal bridges in framing).
- A shortage of appropriately skilled trades was identified in smaller communities. Trades may be unwilling to travel between communities, and when they do travel it involves higher costs.
- Some builders and trades have language barriers, including limited literacy skills and English as a second language.
- Many builders are still working to address other changes in BC Building Code requirements and new requirements may create information overload.
- Builders are currently unable to start planning because they do not know what level of performance will be required in the communities where they build. Builders will need time to plan so they can consider new requirements when purchasing properties for development.
- Builders and trades will need training on energy efficiency (see training and education), including information on what are the benefits of more energy efficient homes.

#### Additional Cost and Effort

- Builders find energy efficiency ‘a hard sell’. There is general consensus that consumers do not want to pay more for energy efficient homes, but are more interested in the aesthetics (e.g. granite countertops) and size of home. Many consumers are very price sensitive, such that an extra few thousand dollars in price would prevent a purchase. Energy costs are low, also limiting the incentive to purchase a better energy performing home.
- Builders who want to build more energy-efficient homes, such as Energy Star, are competing with the existing housing stock and with other builders who can offer a home at a lower price (or for the same price but with more upscale features).
- Builders familiar with higher energy building techniques reported that cost differences decline with experience, but that initial building costs are higher during the learning phase.
- Builders noted that some energy efficiency programs and incentives require significant paper-work that they do not consider worth their time. Other frustrations with existing and previous incentive programs included program changes and uncertainty if they would receive the incentive at the end.
- Builders have expressed concerns that building high performance energy efficient homes will cost more, and that they will not be able to pass these costs onto the consumer. Costs are increasing for building supplies (e.g. drywall), and additional costs for energy efficient materials will make the situation worse. However, there are differences of opinion about what extra costs for higher energy performance homes might be. Additional research is needed to determine the costs and benefits of implementing each of the Steps of the Energy Step Code (for builders and consumers).
- Energy Step Code requirements may be implemented differently among municipalities that are close to each other. If the Energy Step Code implementation increases costs, consumers may choose to buy a less expensive, less-energy efficient home in a different community.
- Some interviewees observed that additional cost and effort decline with greater experience in energy efficient techniques and that the costs for more energy-efficient products may decline as they become more common practice.

### Certified Energy Advisors

- Interview participants in the East Kootenay, Prince George and Metro Vancouver region believe there are currently enough CEAs available in their communities who could work with the local builders to achieve higher energy performance homes.
- CEAs in central Vancouver Island were considered busy and likely without extra capacity. Kamloops does not have a CEA in the community and relies on one travelling from Vernon. Prince George has a CEA who is willing to travel to other nearby communities. Richmond identified a need for existing CEAs to receive additional training as quality level varied substantially. Richmond also found that most CEAs were not submitting their files to NRCan to be quality assured, and now requires notification when files have been submitted.
- Many CEAs do not have sufficient work, and as a result have excess capacity. While there could be a lack of CEAs in central Vancouver Island if Energy Step Code adoption increases demand, it is possible to bring CEAs in from the Lower Mainland.
- If more CEAs are needed, confidence is high that the infrastructure is in place to train more people quickly in response.
- Additional training of CEAs may be required to ensure consistent quality.

### Access to Materials and Equipment

- **Local Suppliers:** Local suppliers in smaller communities may not stock energy efficient products. Reasons cited for this include a lack of demand for these products from builders as well as discounts on large orders for other, more conventional products. In this situation, builders may purchase what is readily available rather than wait for a more energy efficient product to be delivered. Supply issues were generally identified in smaller communities located further away from supply hubs.
- **Windows:** Builders in the East Kootenay and Vanderhoof expressed concern that there is a lack of energy efficient windows at affordable prices and that some window ratings are unreliable. Window supply was not identified as a problem on Central Vancouver Island or in the Metro Vancouver region, where several study participants are located. In Prince George, a builder estimated that using triple glazed windows adds approximately 25% to the window packaging cost. In contrast, a builder in Central Vancouver Island noted that the cost of triple glazed windows has come down and is now similar to double-glazed.
- **Doors:** Can be harder to install because their design has been changing to achieve higher certification ratings.
- **HRVs:** Participants in the East Kootenay, Prince George, Central Vancouver Island and Metro Vancouver regions stated that HRVs are often not installed and balanced properly, or are sometimes unplugged by the homeowner. In some areas, builders are struggling with where to place HRVs and HVAC systems, and sometimes choose inappropriate locations.
- General concern in communities with existing supply issues that achieving higher levels of the Energy Step Code would be challenging.

## Consumers and Realtors

### Current Challenges

- Consumers do not know how much an energy efficient home will save in utility costs, and are unfamiliar with other benefits such as healthier, quieter, and more comfortable homes.
- Some builders reported success in convincing consumers of the benefits of a higher performing home by focusing on improved health and comfort as well as cost savings. They do this simply by having a conversation with them – but noted that it would be helpful to have more facts about the benefits of higher performance energy efficient homes to support them.
- Consumers do not understand energy efficient systems and how to use them (e.g. HRV has been found unplugged).
- Realtors are not knowledgeable enough to sell the benefits of energy efficiency to potential buyers.

### Anticipated Challenges with Energy Step Code

#### Lack of Information

- Without more information, consumers will not know how to use and maintain their higher energy efficient homes.

## FACTORS FOR SUCCESS

### Well Designed Buildings

The focus should be on well designed buildings, including the building envelope, exterior insulation, good air sealing, good ductwork, and good quality mechanical systems, but perhaps most importantly energy-conserving architectural design with good placement and performance of windows. It was also suggested that builders and trades in some smaller communities may need help in obtaining higher performance windows at a reasonable cost.

### Certified Energy Advisors

A good, collaborative working relationship between builders and CEAs, particularly at the initial planning and design stage was identified as a key factor for success. It was suggested that CEAs can often help identify cost savings (e.g. thicker walls and proper window sizing mean a smaller HVAC). A commonality across incentive programs was the requirement to work with CEAs to achieve higher energy performance homes, and this has worked well.

While most of the select communities in this report believe they currently have sufficient capacity for CEAs (mostly due to the mobility of CEAs in denser regions, and the limited uptake of existing programs in some communities), they expect a short-term shortage as the Energy Step Code is implemented. Several CEAs in smaller communities consider themselves underemployed at the moment and are wary of additional competition in a small market.

CHBABC has reported that it has the infrastructure to train more CEAs, and suggested that the anticipated gradual pace of implementation of the Energy Step Code would allow time for more people to receive the training they need to become CEAs. There is also a need to get more CEAs trained and become highly skilled in supporting the higher steps in the Energy Step Code.

### Effective Incentive Programs

Several municipalities have valuable experience encouraging and requiring higher energy performance in homes. The development of these programs required substantial resources, and was supported by program assistance and funding. There is an opportunity to use this experience to guide other municipalities on how best to develop and implement incentive programs that will work for their communities.

Density bonuses and up-zoning have been effective in communities such as North Vancouver and Richmond, and would be good models for other communities to follow. Developing standardized processes and templates based on the experiences of North Vancouver would help new communities adopt similar incentives for the Energy Step Code. However, for communities that do not experience land scarcity and where low-density housing dominates, density bonuses and up-zoning will not be attractive to builders and consumers. While smaller communities may be interested in adopting rebate programs (such as Langley or Sparwood) or providing educational opportunities, they are likely to be more sensitive to resource and funding constraints. There may be an opportunity for a review of how incentives or supports are provided to target these communities.

### Training and Education

Training and education was identified as a key priority for the groups identified below. It was suggested that partnerships should be explored with local colleges (e.g. in Prince George and Kelowna) to provide training.

**Table 5. Training and Education Needs**

Stakeholder Group		Description
Local Government	Building Officials	<ul style="list-style-type: none"> <li>What is the Energy Step Code.</li> <li>What are the implications of moving from a prescriptive to performance-based approach.</li> <li>What is their role in monitoring and enforcing compliance with the Energy Step Code, particularly around reliance on third party CEAs and potential liability.</li> <li>What should they know about energy efficient building techniques so they can guide builders and inspect homes with confidence.</li> </ul>
	Planners	<ul style="list-style-type: none"> <li>What is the Energy Step Code.</li> <li>What are some best practices municipalities have done to encourage more high performance energy efficient homes in their communities.</li> <li>How should municipalities implement the Energy Step Code.</li> </ul>
Building Community	Builders	<ul style="list-style-type: none"> <li>What is the Energy Step Code, how does it fit with existing programs, and what levels will be required in the municipalities where they build.</li> <li>How to achieve high performance energy efficient homes.</li> <li>How to market high performance energy homes to consumers.</li> <li>Benefits of working with a Certified Energy Advisor (CEA) and how to contact one in their region.</li> </ul>
	Trades	<p>Trades-specific training has been identified as critical. The emphasis should be on hands-on, peer training and demonstration approaches rather than highly technical classroom settings. Topics to be addressed include:</p> <ul style="list-style-type: none"> <li>The house as a system</li> <li>Airtightness/sealing</li> <li>Blower-door tests (effective to illustrate problem areas)</li> <li>Insulation</li> <li>Heating/cooling (HRVs)</li> <li>Plumbing</li> </ul> <p>Note:</p> <ul style="list-style-type: none"> <li>While training is available for builders on higher energy performance homes, these sessions are not targeted/available to the trades. As a result, builders are often put in the position of needing to educate their own trades. Builders felt that this was placing too much of a burden on them.</li> <li>Literacy/ESL has been identified as a concern, and training/materials should be made as accessible as possible.</li> <li>Workshops organized by Community Energy Association (Cranbrook, Invermere and Fernie) which included trades-specific sessions and hands-on, blower door test demonstrations in a home, were very well received by participants, and participants identified a need for more of this type of training.</li> <li>Builder forums and mandatory pre-construction meetings have been used by many different municipalities. Builder forums appear most successful in communities where building officials are in a position to strongly encourage attendance and understand energy efficient building techniques. Mandatory pre-construction meetings were very successful in North Vancouver, but may not be possible in larger communities.</li> </ul>
Consumers and Realtors	Consumers	<ul style="list-style-type: none"> <li>What to look for in a house.</li> <li>What are the benefits of a high performance energy efficient home, e.g. health and comfort.</li> <li>What are the financial benefits of investing in higher performance energy homes (e.g. reduced energy bills).</li> <li>What are the energy efficient features and products in their home and how to use and maintain them.</li> <li>Suggested need for an 'Owners Manual' for consumers about energy efficient features in their homes and how to maintain them. Note: See BC Housing Bulletin on Maintaining Your Heat Recovery Ventilation System.<sup>3</sup></li> </ul>
	Realtors	<ul style="list-style-type: none"> <li>What are high performance homes and why will buyers benefit from them.</li> </ul> <p>Note:</p> <ul style="list-style-type: none"> <li>The Vancouver Island Real Estate Board offers the Real Estate Energy Efficiency Program (REEP) for realtors. The program consists of a two-hour in-home session, facilitated by both a Certified Energy Advisor (CEA) and a REEP project team member. The program has been available in Nanaimo and will expand to include Victoria and Vancouver in 2017 (<a href="http://www.vireb.com/reep">http://www.vireb.com/reep</a>).</li> </ul>
Others		<ul style="list-style-type: none"> <li><b>Appraisers:</b> What is the value of high performance homes relative to similar homes that are energy inefficient.</li> <li><b>Lenders:</b> Explore the potential to increase borrowing capacity as a result of lower utility costs with a high performance energy efficient home.</li> <li><b>Suppliers:</b> What products should they be stocking and making available to local builders and trades to build high performance energy homes.</li> </ul>

<sup>3</sup> [https://www.bchousing.org/publications/MaintenanceMatters16\\_MaintainingHeatRecoveryVentilationSystem.pdf](https://www.bchousing.org/publications/MaintenanceMatters16_MaintainingHeatRecoveryVentilationSystem.pdf)

## Addressing Information Gaps

Additional information was requested on the potential cost impacts of the Energy Step Code for each of the steps, including:

- Additional costs incurred by builders, and changes in the factors affecting them over time.
- Impact on affordability for home buyers. For example, will builders have to absorb the extra costs, will they pass them on to buyers, or can increased costs be addressed through local government incentives or rezoning.
- Expected savings and benefits for buyers from a high performance home (e.g. lower utility bills, health, and comfort).

Additional costs will depend on which step of the Energy Step Code is being implemented and on the level of experience of the builder. However, potential cost drivers for high performance homes identified in this research include:

- Additional time for planning and design, explaining energy efficient features to clients, and bringing in specialty products not available locally
- Additional time to inspect for airtightness and sealing up the house
- Obtaining equipment such as high performance windows (in some communities)
- Mechanical systems
- Consulting fees

It was noted that CEAs would be able to help builders identify savings, such as reducing the size of mechanical systems, which would mitigate other additional costs.

## Marketing and Communications

Builders identified a need for marketing and communications materials that demonstrate the value of high performance energy efficient homes to consumers. It was suggested that materials should:

- Focus on quality building: comfortable and quiet homes.
- Include testimonials from consumers about the positive impacts of high performance energy efficient homes. [Noted that word of mouth is critical in a small community and among cultural groups.]
- Include consistent ratings of energy efficient homes – to make it clear what the consumer is actually getting. This could be similar to car ratings e.g. we are saving you \$x/month on utilities.
- Demonstrate the length of time it will take for an investment in energy-efficient products to pay off. Or if the upgrade requires the buyer to increase their monthly mortgage payments, what are the monthly savings for utilities that would help offset this. It would be helpful to identify the savings according to the Step level of the home.
- Non-energy-efficient homes should be portrayed as “gas guzzlers” to increase consumer preference for high performance energy efficient homes.

It was also suggested that materials should be prepared for consumers and realtors, and that Real Estate listings should make more use of EnerGuide and other energy efficient labels.

## MEASURES OF SUCCESS

It was suggested that a province-wide database be developed to gather and report on data as follows:

- The Step levels adopted by municipalities (i.e. number that require Step 1, 2, 3, 4, 5)
- GHG savings before and after implementation of the Energy Step Code
- Number/percentage of new homes that pass/fail the 3.5 airtightness test
- Number/percentage of new buildings that achieve the required Step level
- Number/percentage of builders that use a CEA
- Uptake of incentives to achieve higher performance

It is also suggested that annual surveys be conducted with local governments and industry to monitor implementation of the Energy Step Code.