



## Step Code Information

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### **RECOMMENDATION:**

THAT the Committee of the Whole receive the Step Code Details report for information; and

THAT the Committee of the Whole provide direction on the desired Step Code implementation.

### **Previous Council Action:**

At the February 18, 2020, Committee of the Whole meeting the draft Building Bylaw was presented for review and comment. A concern was noted surrounding Step Code implementation and associated impact on developers. At the meeting it was mentioned that a formal presentation from a Step Code expert may be advantageous.

### **Report:**

The BC Energy Step Code is a provincial regulation that is a voluntary compliance path within the BC Building Code. It establishes a set of progressive performance steps for new construction projects to support builders to transition from the current energy efficiency requirements in the BC Building Code to the target of a net-zero-energy-ready building by 2032. Builders currently have the option of either a "prescriptive" or "performance" approach.

### **Prescriptive**

Builders must meet specific requirements for:

- Insulation
- Windows
- Furnaces
- Water Heaters
- Lighting and other equipment and systems

### **Performance**

Establishes a desired outcome and leaves it to the builder to decide how to achieve it.

The Province has been taking incremental steps to increase the energy-efficiency requirements within the BC Building Code. Achieving "Net-Zero Energy Ready" structures means a building is designed to be ultra-efficient, with the goal of being net-zero at some point in the future when it makes sense financially to add renewable energy sources.

The rationale for including the phased Energy Step Code:

- Allow builders the opportunity to ease into adaptation toward increased energy-efficient buildings.
- Resolution from April 8, 2019 Council meeting:
  - THAT Council declare a climate emergency in the District of Sooke:
    - District of Sooke aspire to be carbon neutral by 2030
    - The climate be a priority to Strategic Planning
    - Reactivate the Climate Change Action Committee
- Council Strategic Plan
  - Core Values & Principles: Environmental Leadership
    - Respond to the climate change boldly
    - Redefine and implement Sooke Smart Growth
    - Become a leader in ecologically-sustainable corporate practices
  - Goals: Demonstrate leadership in climate action
    - Prioritize community and corporate strategies to address the climate emergency
    - Identify and plan for green infrastructure opportunities

### Building Code Requirements

The BC Building Code has defined a level of energy efficiency which deals with the Energy Step Code. There are two (2) conditions:

- Local governments may not require buildings to be constructed except in conformance with a step described in Article 9.36.6.3. or 10.2.3.3. of Division B of the BC Building Code.
- Local governments may not modify a requirement of, or impose requirements in addition to those set out in, Subsection 9.36.6. or 10.2.3. of Division B of the BC Building Code.

### Options

There are several options presented below, for consideration, on the implementation of the BC Energy Step Code within the District of Sooke.

A	Implement District Step Code Phasing	<p>Include phasing into the District's new Building Bylaw.</p> <p>For the years 2020 – 2025:</p> <p>(a) A <i>building</i>, which is a wood framed residential building six (6) stories or less in <i>building height</i>, or regulated by Part 9 of the <i>building code</i>, must be designed and <i>constructed</i> to meet the minimum performance requirements specified in step three (3) of the <i>energy step code</i>; or</p> <p>(b) All other <i>buildings</i> regulated by Part 3 of the <i>building code</i>, must be designed and <i>constructed</i> to meet the minimum performance requirements specified in step two (2) of the <i>energy step code</i>;</p>
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		<p>For the years 2025 – 2027:</p> <ul style="list-style-type: none"> <li>(a) A <i>building</i> which is a wood framed residential building six (6) stories or less in <i>building height</i>, or regulated by Part 9 of the <i>building code</i>, must be designed and <i>constructed</i> to meet the minimum performance requirements specified in step four (4) of the <i>energy step code</i>; or</li> <li>(b) All other <i>buildings</i> regulated by Part 3 of the <i>building code</i>, must be designed and <i>constructed</i> to meet the minimum performance requirements specified in step three (3) of the <i>energy step code</i>.</li> </ul> <p>For the year years 2027 onward:</p> <ul style="list-style-type: none"> <li>(a) A <i>building</i> which is a wood framed residential building six (6) stories or less in <i>building height</i>, or regulated by Part 9 of the <i>building code</i>, must be designed and <i>constructed</i> to meet the minimum performance requirements specified in step five (5) of the <i>energy step code</i>; or</li> <li>(b) All other <i>buildings</i> regulated by Part 3 of the <i>building code</i>, must be designed and <i>constructed</i> to meet the minimum performance requirements specified in step four (4) of the <i>energy step code</i>.</li> </ul>
B	Follow the BC Building Code Requirements	By 2032 the BC Building Code will move toward higher steps of the BC Energy Step Code as a minimum requirement. The District can utilize the BC Building Code compliance and application of the Energy Step Code.
C	Addition of Incentive Program	Through bylaw/ policy, incentives can be created such as density bonuses or fast tracking of applications, to encourage the utilization of the Step Code in new buildings.
D	Combination of A,B,C	Council could select a variety of any of the above options.

Further information is available at the below link, including a builders guide, design guide, handbook for building officials, technical bulletins, metrics research, survey results and other reports.

<https://energystepcode.ca/publications/#guides>

Next steps will include:

- Council direction on desired implementation of the BC Energy Step Code
- Staff notification to the Energy Step Code Council
- Engagement with the Development community, on the step code and building bylaw
- Legal review
- Implementation

**Strategic Relevance:**

- Build a reputable organization - Improve communication and engagement with the public and community partners
- Build a reputable organization - Support Council and staff with the necessary tools to provide excellent governance and customer service
- Demonstrate leadership in climate action - Build additional trail infrastructure, connectivity, and amenities
- Demonstrate leadership in climate action - Identify and plan for green infrastructure opportunities
- Demonstrate leadership in climate action - Prioritize community and corporate strategies to address the climate emergency
- Demonstrate leadership in climate action - View municipal decision-making through a 'green' lens
- Manage long-term growth while enhancing community identity, vitality and safety - Continue to address housing affordability and accessibility for all income levels
- Manage long-term growth while enhancing community identity, vitality and safety - Develop a regulatory framework to promote more sustainable land use patterns and development practices

**Attached Documents:**

[Authority to set technical requirements-Information](#)

[BC Step Code Best Practices Guide](#)

[Municipalities](#)

[Implementation Efforts by Municipalities](#)

[Current BC Energy Step Code Requirements](#)

[New Building Bylaw-Excerpt](#)

[BC Building Code - Energy Section](#)

[Compliance Bulletin](#)

Approved by





## BC Building Act

When local governments authority to set technical building requirements by bylaw will change under the Building Act.

<https://www2.gov.bc.ca/gov/content/industry/construction-industry/building-codes-standards/building-act/consistency>

A key objective of the Building Act is to bring greater consistency to the technical building requirements in force across B.C. To achieve this, the Building Act gives the Province sole authority to establish technical building requirements.

Technical building requirements are the technical requirements for the construction, alteration, repair and demolition of buildings. A technical building requirement can define the methods, materials, products, assemblies, dimensions or performance required by the regulation. Technical building requirements can be found in the BC Building Code and in other provincial building regulations.

Under section 5 of the Act, if a matter is regulated in a provincial building regulation, any technical building requirements for that matter established in local government bylaws will be of no legal force at the end of a two-year transition period ending December 15, 2017.

The Province recognizes the goal of greater consistency needs to be balanced against reasonable flexibility for local governments to set technical building requirements to meet local needs. Under the Building Act, local governments have three options for doing so.

**Option 1 - Unrestricted Matters:** Under section 5 (4) of the Act, local governments can set technical building requirements for a limited number of matters the Province identifies as unrestricted. Unrestricted matters are matters regulated in the BC Building Code (or other provincial building regulations) for which local governments will have authority to set their own requirements in bylaws.

Unrestricted matters are listed in the Building Act General Regulation which came into force in June 2016. The list below includes matters added when the regulation was amended in February 2017.

### List of Unrestricted Matters

- Fire access route design
- Parking spaces for use by persons with disabilities
- Form, exterior design and finish of buildings and other structures, as they relate to the character of the development, in a development permit area established for one of the following purposes:
  - Revitalization of an area in which commercial use is permitted
  - Establishment of objectives for the form and character of intensive residential development

- Establishment of objectives for the form and character of commercial, industrial, or multi-family residential development
  - In relation to an area in a resort region, establishment of objectives for form and character of development in the resort region
- Form and exterior design of buildings and other structures; and machinery, equipment and systems external to buildings and other structures, to provide for energy and water conservation and the reduction of greenhouse gas emissions, in a development permit area established for one of the following purposes:
  - Energy conservation
  - Water conservation, or
  - The reduction of greenhouse gas emissions
- District energy systems and connections
- Protection of designated heritage properties

### **List of Temporarily Unrestricted Matters**

- Transmission of sound into a building from external sources
- In-building radio repeaters
- Exterior design and finish of buildings in relation to wildfire hazard within a development permit area
- Firefighting water supply (fire-flow demand)
- Flood construction level requirements

### **List of Temporarily Unrestricted Matters with Time Limitations**

These matters are temporarily unrestricted only if the bylaw(s) specifying the technical building requirement(s) for the matter is enacted on or before December 15, 2017 and is not amended after that date, as it relates to the matter:

- Fire sprinklers and fire sprinkler systems
- Accessibility of a building
- Adaptable dwelling units

### **List of Unrestricted Matters with Conditions: BC Energy Step Code**

Two matters are unrestricted, with two conditions, to support the implementation of the BC Energy Step Code by local governments:

- The conservation of energy
- The reduction of greenhouse gases

The two conditions are:

- Local governments may not require buildings to be constructed except in conformance with a step described in Article 9.36.6.3. or 10.2.3.3. of Division B of the BC Building Code; and
- Local governments may not modify a requirement of, or impose requirements in addition to those set out in, Subsection 9.36.6. or 10.2.3. of Division B of the BC Building Code.

The Province will advise stakeholders when it intends to remove a matter from the unrestricted matters list.

Detailed information about the unrestricted matters list is available in the [revised B1 Appendix](#) section of the Building Act Guide and the Building Act General Regulation, and the [BC Energy Step Code web page on this site](#).

**Option 2 - Apply for a Local Authority Variation:** Local governments and other local authorities can request a variation under section 7 of the Building Act. A [local authority variation](#) is a building requirement or set of requirements that:

- differs from requirements in provincial building regulations (primarily the BC Building Code);
- is requested of the Province by one or more local authorities;
- requires the Minister's approval; and
- if approved, is enacted through a provincial building regulation that applies in the jurisdiction(s) of the local government(s) making the request.

**Option 3 - Change to the Building Code:** If the variation a local government is seeking is broadly applicable to other jurisdictions across the province, the local government may wish to consider requesting a change to the BC Building Code.

# BC Energy Step Code

## A Best Practices Guide for Local Governments



**Version: 2.0** July 2019

A publication of the Energy Step Code Council and the Building and Safety Standards Branch.



Photo: Passive House, Surrey BC (Part 9, Step 5).

## Acknowledgements

This Guide was made possible through the generous contributions from numerous organizations that dedicated resources of financial contributions, guidance, and time. The Energy Step Code Council and the Building and Safety Standards acknowledge the contributions of the following organizations: The BC Innovative Clean Energy (ICE) Fund, Building Branch and BC Hydro Sustainable Communities

## Energy Step Code Council Members

This Guide was made possible through the generous input and contributions from numerous organizations:



# Letter from the Executive Director of the Building and Safety Standards Branch

**The British Columbia Energy Step Code and this local government best practices guide represent an important milestone for energy efficient buildings and climate leadership in British Columbia. They are excellent examples of collaboration between the Province, local governments, the construction industry, professional associations, energy utilities, and other stakeholders.**

As the information in this guide demonstrates, improving energy efficiency requires careful consideration of long-term affordability, consumer acceptance, capacity in the industry, and other conditions that can be unique to each community.

The Building and Safety Standards Branch is committed to the **Building Act** objective of improving the consistency of technical building requirements in British Columbia, while supporting local governments in pursuing improved energy efficiency and reducing greenhouse gas emissions from buildings.

The **BC Energy Step Code** provides local governments with another tool to achieve their policy objectives, while also providing the construction industry with a single set of consistent standards for energy efficiency across British Columbia. This improved consistency ensures that as we innovate with energy efficient designs, we are also avoiding unnecessary costs associated with the current patchwork of unique standards to each community – enabling a balance of energy efficiency and housing affordability. Much effort has

been invested by the Energy Step Code Council to establish a consensus approach to responsible implementation of the **BC Energy Step Code**, reflected in this guide.

I would like to acknowledge the significant contributions of all those involved in the development of this guide, and I look forward to continuing in the spirit of open collaboration in the future.



**Andrew Pape-Salmon, P.Eng., MRM, FCAE**  
*Executive Director, Building and Safety Standards Branch*  
*Office of Housing and Construction Standards*  
*Ministry of Municipal Affairs and Housing*





# Executive Summary

In April 2017, the Province of British Columbia adopted the **BC Energy Step Code** as regulation. The standard is a tool designed to help both government and industry chart a course to a future in which all new construction across the province is “net-zero energy-ready” by 2032.

In late 2018, the Province established new deadlines for increased energy efficiency performance via its *CleanBC* plan. Local governments may use the **BC Energy Step Code** to increase capacity so that their builders will be ready to deliver on these requirements before they come into force. Along the way, they will facilitate demand for energy-efficient buildings, help the market mature, and grow industry capacity for high-performance products and practices across British Columbia.

The Energy Step Code Council, a multi-stakeholder body tasked with facilitating the implementation of the **BC Energy Step Code**, believes the standard will enjoy a greater chance of success if local governments implement it thoughtfully and prudently, with attention to appropriate incentives and industry capacity.

For this reason, the Energy Step Code Council strongly encourages local governments to follow the practices and processes outlined in this Best Practices Guide (Guide) – for the benefit of all. The pages that follow outline a wealth of information on the **BC Energy Step Code**. The recommendations are not regulatory requirements and not intended as legal advice regarding the authorities of local governments and Authorities Having Jurisdiction under the **Local Government Act** or the **Community Charter**.

Here are some of the most important considerations:

- The **BC Energy Step Code** is a **performance-based standard**. It establishes measurable requirements for energy efficiency in new construction. To demonstrate compliance, a builder must prove to local building officials that the building meets or exceeds a set of defined metrics for building envelope, equipment and systems, and airtightness testing.
- The **Energy Step Code Council** exists to support local governments as they develop a **BC Energy Step Code** strategy. The Energy Step Code Council has no regulatory authority; rather, it serves as a “bridge” between local governments, the Province, and the design, building, development, and construction sectors, offering advice and providing support and resources, such as this Guide.
- Local governments who choose to pursue establishing the **BC Energy Step Code** in their communities may select from a **broad spectrum of policy tools** including tools that raise awareness, provide incentives, institute bylaw requirements, remove barriers to energy efficient building, and/or demonstrate leadership. Each jurisdiction will need to select the tools most suitable to its community.
- If your local government is considering referencing one or more steps, you will need to establish a **consultation process with appropriate stakeholders** to select a strategy that will be successful for your community, including obtaining input to define the: policy and/or incentive tool(s), building type(s), geographic scale, and step(s).
- When developing your strategy, your staff and industry partners will need to be notified of considerations for enforcement. Other jurisdictions have experienced challenges with enforcement and instances of reference to this Guide.
- Your government can support the transition to net-zero energy buildings by encouraging the development of new projects in your community to meet the goals of the **BC Building Resilient Future** strategy.

The above points represent key considerations for your community. The explanation you will find in this document serves as a valuable resource for understanding the co-benefits of high-performance buildings in your community and the direction of the **BC Building Resilient Future** strategy.

To stay abreast of additional developments, be sure to visit [energystepcode.ca](#).





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Broadway and F





Photo: North Park Passive House, Victoria BC, photo by Ryan Hamilton (Part 9, Step 5).

# About This Document

This Guide is a resource for all local governments in British Columbia that are interested in referencing the **BC Energy Step Code** in policies, programs, or bylaws. For this Guide, the term **local governments** includes: municipalities, regional districts, and the University of British Columbia Board of Governors who administer the **BC Building Code**. The **BC Energy Step Code** applies to the same jurisdictions as the **BC Building Code** and does not apply to construction in the City of Vancouver, or on federal land.

**The BC Energy Step Code is a new standard designed to help both government and industry chart a course to a future in which all new construction across the province is “net-zero energy-ready” by 2032, as reiterated in the government’s CleanBC plan.<sup>1</sup>**

By gradually adopting one or more steps of the standard, local governments can increase building performance requirements in their communities. They can do so at an appropriate pace for their communities, enabling demand to grow, the market to mature, and industry capacity to increase as services and products for the design and construction of high-performance buildings become more widely available.

The **BC Energy Step Code** provides more consistency to industry, establishing a standard set of performance requirements, while offering local governments a simple and effective set of standards to support their energy conservation and greenhouse gas reduction goals.

This Guide is for local government officials who are starting nuts and bolts of the standard information on the characteristics anticipated costs and benefits suggested timelines and a community-specific **Step Code**.

The new standard will help local governments implement to stakeholder engagement capacity. For this reason, encouraged to follow the While local governments the best practices outlining governments are autonomous authorities.

If you are a local government and cannot find an answer, please visit **energy** continue to be shared as and technical questions. Standards Branch at **building** Finally, various agencies, illustrated guides that are requirements of the **BC Energy** the “resources” section of

<sup>1</sup>. <https://cleanbc.gov.bc.ca>

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# 1

## Introducing the BC Energy Step Code

### 1.1 What is the BC Energy Step Code?

The **BC Energy Step Code** is a provincial standard that provides an incremental and consistent approach to achieving more energy-efficient buildings. It provides a common pathway that local governments may use to ensure British Columbia delivers on its goal of net-zero energy-ready performance by 2032. It does so by establishing a series of measurable, performance-based energy-efficiency requirements for construction that communities may choose to adopt when ready.

#### **The BC Energy Step Code groups these energy-efficiency requirements into a series of “steps.”**

Step 1 entails modelling energy performance and measuring airtightness to ensure that a building will meet or exceed the minimum energy-efficiency requirements in the base **BC Building Code**. Meanwhile, at the opposite end of the scale, the highest step represents a “net-zero energy-ready” standard – a standard that is being met by the most energy-efficient projects being developed today.

TODAY

STEP 1  
BC BUILDING  
CODE

The **BC Energy Step Code** also aligns with the Government of Canada's **Pan-Canadian Framework on Clean Growth and Climate Change** (2016) and Build Smart: Canada's Buildings Strategy (2017). Both establish a goal that provinces and territories adopt a net-zero energy-ready model building code by 2030: the **BC Energy Step Code** provides a path to incrementally prepare British Columbia for this coming change.

The **BC Energy Step Code** provides more consistency to industry, establishing a standard set of performance requirements, while offering local governments a simple and effective set of standards to support their energy conservation and greenhouse gas reduction goals. It also supports co-benefits such as improved occupant comfort, lower utility bills, and reduced noise inside buildings.

Local governments in BC (except the City of Vancouver) may now reference the **BC Energy Step Code** in their policies and bylaws, and may begin enforcing requirements as of **December 15, 2017**<sup>1</sup>. This Guide provides notification timelines and guidance for completing appropriate consultation and preparation prior to beginning enforcement of the **BC Energy Step Code**.

The **BC Energy Step Code** is also available for industry to voluntarily adopt as a compliance path in the **BC Building Code** by meeting the minimum performance set out in Step 1 (or the Step set out in the applicable local bylaw).

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1. The City of Vancouver sets its own building efficiency standards, within the Vancouver Building Bylaw, under the Vancouver Charter. In 2018 the city aligned its approach with the BC Energy Step Code.

## What is a Net-Zero Energy-Ready Building?

Net-zero energy buildings produce as much clean energy as they consume. They are up to 10% more energy efficient than a typical new building, and use on-site (or near-site) renewable energy to meet the remaining energy they need. A net-zero energy-ready building is one that has been designed to a level of performance such that it could, with the addition of solar panels or other renewable energy, achieve net-zero energy performance.



*Highly energy-efficient home currently under construction in Kelowna BC (Part 9, Step 5).*



*The Heights, a highly energy-efficient building under construction in Kelowna BC (Part 9, Step 5).*





“ In 2018, New Westminster City Council endorsed adoption of the BC Energy Step Code, with requirements for smaller buildings included within our Building Bylaw as of 2019, and those for larger buildings effective 2020. The standard will ensure that our residents enjoy the health and occupant-comfort benefits while allowing us to make a major leap closer to our community greenhouse gas targets. We’ve been pleased to support our builder, developer, and design community in preparing for the Step Code and transitioning to ultra-low energy construction by 2032.

*Norm Connolly, Community Energy Manager,  
City of New Westminster*

*Photo: Two infill homes by a builder participating in Natural Resources Canada's Local Energy Efficiency Partnership (LEEP), New Westminster BC (Part 9, Step 4; Energy Star Rating: R2000 Rating).*

## Supporting Local Government Climate Action

Since 2010, Sections 429(2)(d) and 473(3) of the *Local Government Act* require local governments to develop and implement climate change targets, policies, and actions to address climate change. Furthermore, governments have signed on to the Province's *BC Climate Action Plan*, which sets out a range of actions, including developing strategies and programs to support a complete, compact, more energy-efficient rural and urban community. Many local governments adopted policies, bylaws, and incentives to improve building energy efficiency, because buildings typically contribute a significant portion of a community's greenhouse gas emissions.<sup>1</sup> These programs encourage different approaches, which created a patchwork of requirements that have turned made it challenging for industry to keep track of what the various requirements where they applied.

To improve consistency and address this policy patchwork, **Section 429(2)(d) of the *Local Government Act* was amended to require local governments to make local bylaws that establish technical building requirements by December 2017, unless the requirements were for "unrestricted use buildings".<sup>2</sup> The *BC Energy Step Code* provides a technical standard that encourages or enforces a higher energy-efficiency standard in new buildings and bylaws referencing the *BC Energy Step Code* are now enforced consistently and clarity across different jurisdictions.**

<sup>1</sup> *BC Community Energy and Emissions Inventory 2012 (CEEI)*, BC Ministry of Environment.

<sup>2</sup> For more information on unrestricted matters, visit [gov.bc.ca/buildingcodes](http://gov.bc.ca/buildingcodes).

## Supporting Industry Leadership

Builders anywhere in the province can voluntarily use the **BC Energy Step Code** as a new compliance path for meeting the energy efficiency requirements of the **BC Building Code**.

A number of the province's builders already build to advanced performance standards voluntarily. However, with notable exceptions, high-performance buildings remain a niche product. The **BC Energy Step Code** provides a consistent approach that allows the market to gradually build capacity and skills, and reduce costs over time.

## High-Performance Profits

A March 2019 Vancouver Economic Commission study concluded that the **BC Energy Step Code** could help unlock a \$3.3 billion market for high-performance building products and materials in Metro Vancouver by 2032<sup>1</sup>. In doing so, the study says the region could:

- Drive a \$3.3 billion market for building products;
- Create 925 jobs in manufacturing, on average, each year; and
- Support 770 installation jobs, on average, each year.

The study notes that a concerted effort to build on BC's strengths and increase the proportion of high performance building products manufactured or assembled in the province would allow BC to capture a wide range of economic opportunities from re-localizing the supply chain. These include creating locally-held technology and intellectual property, driving investment in BC's manufacturing infrastructure, and developing the workforce.

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<sup>1</sup>. *Green Building Market Forecast (2019 - 2032)*, Vancouver Economic Commission, March 2019. Available via [vancouvereconomic.com](http://vancouvereconomic.com).







unintended consequences that may arise. The ESCC also establishes best practices for the local government sector to support local governments in the judicious use of the **BC Energy Step Code**. The Province may act to resolve issues that arise. Issues identified by the ESCC may also inform future changes to the technical content of the **BC Energy Step Code**, or how it is implemented.

The ESCC does not have any formal regulatory or administrative authority, however, it provides a venue for stakeholders to gather and share information, and work collaboratively to resolve issues as they arise. The ESCC provides the Province with an opportunity to monitor and track implementation of the **BC Energy Step Code**, which could inform future changes to the energy-efficiency requirements in the **BC Building Code**.

The role of the ESCC is to:

- Share information and support the Province with the implementation of the **BC Energy Step Code** in line with the **Provincial Policy**.
- Advise and make recommendations on technical aspects of the **BC Energy Step Code**.
- Provide input to the Province and local governments on policy and regulation related to the **BC Energy Step Code**.
- Identify industry, local government, and provincial needs for successful adoption of the **BC Energy Step Code**.
- Monitor adoption of the **BC Energy Step Code**.
- Coordinate and direct research, communication, and training related to the **BC Energy Step Code**.



The ESCC is comprised of associations representing industry professions and trades, local government and public sector organizations, and utilities and consumer interests (see logos of Energy Step Code Council members on page 2 of this Guide). Representatives of three departments at the Province of British Columbia provide guidance.

The ESCC is committed to providing guidance and support to local governments in implementing the BC Energy Step Code. The new standard will have local governments implement to appropriate incentives to market conditions. This C achieve these outcomes.

# 2

## How the BC Energy Step Code Works

### 2.1 Relation to the BC Building Code

Local governments can choose to require or incentivize builders to meet one or more steps of the **BC Energy Step Code**, as an alternative to the compliance paths set out in the base **BC Building Code**. For local governments, the **BC Energy Step Code** offers greater assurance that new buildings are designed for energy efficiency and are constructed as designed. Meanwhile, builders have a consistent set of performance standards throughout the province and flexibility in how they achieve the higher standards.

The **BC Building Code** separates all buildings into two basic categories – Part 9 and Part 3. The requirements of the **BC Energy Step Code** are also defined according to these building types, so it is important to understand the difference between them. These categories will be used throughout this Guide.

### What are Part 9 and Part 3 Buildings?



**Part 9 – Houses**  
These buildings are the smallest and have a building area of less than 600 square metres (approx. 650 square feet). This category includes single detached houses, duplexes, townhomes, and small stores, offices,



**Part 3 – Large and Complex Buildings**  
These buildings are for commercial, institutional, or industrial use and have a building area greater than 600 square metres (approx. 650 square feet). This category includes apartment buildings, commercial office buildings, hospitals, churches, theatres, and schools.

Photos: Top: Townhome in Township of Langley BC.  
Bottom: 10-storey residential building in Vancouver BC, photo by Derek Lepper Photography.



Figure 1: Definition of Lower and Upper Steps by building type (Part 9 and Part 3)

## 2.2 How Many Step

The steps are categorized into L according to building types (see builders need to use a whole-building energy use of the building at test, but the performance of the good as the base BC Building Code efficiency. The purpose of Step a new way of measuring energy construction of the building remains construction.

To achieve the Lower Steps, builders and trades can rely on conventional careful air-sealing practices, and some key elements in the design equipment and systems. Builders to collaborate with the energy professionals effective way to meet the requirements give builders new flexibility in how in efficiency – through improved systems.

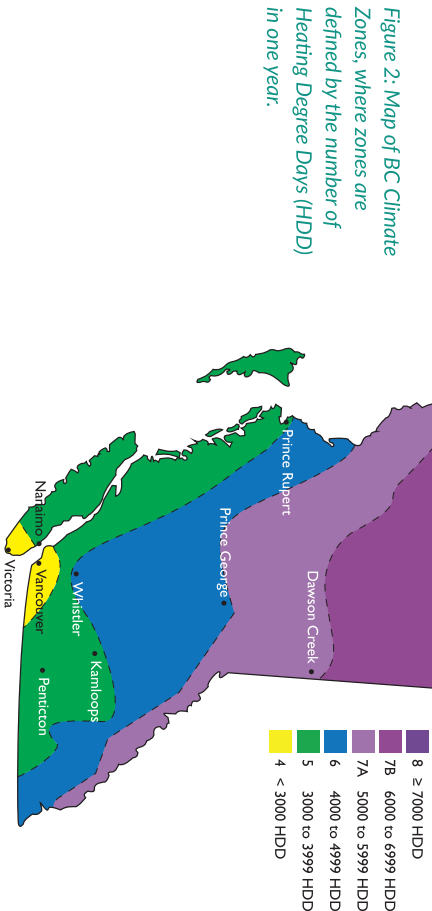
To achieve the Upper Steps, builders may need to adopt a more integrated approach to design, layout, framing techniques and materials. These techniques and and challenging without additional

## 2.3 Transition Period

The *Provincial Policy* states that the initial years of the BC Energy Step Code, ending in 2020, would serve as a transition period. The Energy Step Code Council and member organizations have used this time to provide support to communities as they implement the regulation. The policy also states that, during this period, local governments should only adopt the Upper Steps in specific circumstances and in conjunction with appropriate incentives (more details are provided in section 4.3).

## 2.4 Geographic Application

The *BC Energy Step Code* is now available to communities in all climate zones across British Columbia for both Part 9 and Part 3 buildings.



## 2.5 Technical Requirements

The *BC Energy Step Code* establishes requirements for **whole-building energy modelling**, including modelling the performance of building envelopes and equipment and heating systems. The energy model must demonstrate how the building design will meet a set of requirements that represent increasing levels of energy efficiency. Once constructed and before occupancy, the building must undergo **on-site airtightness testing** to ensure the building is constructed as designed and meets airtightness expectations.

A primer on each of these key elements is provided in section 5 of this Guide, to help local governments better understand the technical requirements of the *BC Energy Step Code*. The actual performance metrics requirements are also summarized in the tables in Appendix A for different climate zones and different building types. There are many resources available on **energystepcode.ca** that provide more in-depth guidance about building to meet the *BC Energy Step Code* requirements.

## 2.6 Considering Costs and Benefits

The *BC Energy Step Code* is at its core a market transformation tool; it aims to help to ensure that new buildings will be designed and built, from the ground up, to be as energy efficient as possible. **The most cost-effective time to invest in a building's energy efficiency is when it is first built.** Policy and regulation can help ensure that new buildings will be designed and built to be efficient.

However, communities are sensitive to any regulations that could impact builder costs in addition to those already incurred through fees such as development cost charges, and that potentially increase barriers to development. To better understand the financial implications of the *BC Energy Step Code*, in late 2017, BC Housing published one of the most sophisticated high-performance building costing assessments ever developed in Canada. The study showed how the various steps may impact construction costs in various building types,

and in different climate zones. In most situations, achieving the requirements could reach the requirements of 2 percent. We offer our findings in this section. First, we characterize Step Code buildings that involve demonstrating energy-efficiency targets who have not previously been included in the *BC Building Code* requires energy modelling. Generally:



Second, buildings built to the Lower Steps of the **BC Energy Step Code** will incur slightly higher costs than those built to the prescriptive requirements of the **BC Building Code** (approximately 1–3% of construction cost, depending on building type and location in the province; note that this is different than the final cost, which also includes cost of land and other costs).

Finally, those built to Upper Steps will involve more of an investment in training and building components, and costs vary more widely than for Lower Steps. This is why local governments should not require Upper Steps community-wide for several years, and should instead be using incentives to encourage their construction. The Energy Step Code Council is also encouraging local and senior governments to demonstrate leadership by building public buildings to these Upper Steps.

Other findings from the BC Housing costing study include:

- It is generally easier and more cost-effective to achieve the steps in buildings that have simple forms and that share common walls, such as townhomes and apartments.
- Wood-frame multi-unit residential buildings will meet the standard more easily than similar concrete buildings. In fact, 4–6 storey wood-frame buildings built to the base **BC Building Code** are roughly equivalent to Step 2 for this building type.

- A building's form and orientation will have a significant impact on its performance. A simple design facing south will have an easier time meeting the steps than the same building facing north.

Over time, as industry gains experience with these practices and energy-efficient products become more prevalent, cost discrepancies are likely to decrease. But the transition will not happen overnight.

To help support the industry through the transition to net-zero energy-ready construction, BC Housing has published **An Illustrated Guide on Cost Effective Tips and Optimization for High-Performance Homes and Buildings**. Find this resource and others at [energystepcode.ca](http://energystepcode.ca).

### Benefits of the BC Energy Step Code

Buildings built to higher energy efficiency standards also provide multiple benefits – to home and building owners and occupants, to industry, and to the community.

Occupants often prefer these buildings as they:

- Better manage temperature, improving comfort.
- Better manage fresh air throughout the building, improving health.
- Better manage soundproofing, reducing exterior noise.
- Require less energy, reducing utility bills.

Industry will be able to appreciate a new level of consistency in the market and predictability throughout the province as we move to net-zero energy-ready by 2032. In this environment, construction industry practitioners, vendors, and manufacturers can invest in developing products, services, and best practices to deliver competitive services and products for high-performance buildings.

Together, the benefits to occupants and industry combine with a stronger green economy, which benefits communities across the province. It also helps the province and communities meet the goals and targets they have set to reduce our contributions to climate change.



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Applying the BC Energy Step Code: Policy Tools and Ex

In April 2017, the **BC Energy Step Code** became available to local governments to reference through bylaw and/or through policy to provide an incremental and consistent approach to achieving more energy-efficient buildings that go beyond the requirements of the base **BC Building Code**. To provide authority for local governments to reference the **BC Energy Step Code**, two matters were unrestricted (with conditions) per Section 5 of the **Building Act**: conservation of energy and the reduction of greenhouse gases.

This section of the Guide provides hypothetical approaches that local governments may select to apply the **BC Energy Step Code** using a combination of tools appropriate for their circumstances – each demonstrating how to incrementally apply the Lower and Upper Steps. This is followed by a listing of policy tools that could be used by local governments to support, remove barriers, incentivize, or establish a requirement for specific step(s) across the community, by building type, by geographic area, and/or by approval mechanism (e.g., rezoning). Adjacent to the policy tools, related examples of programs in place in BC communities are provided to demonstrate how the tools can be employed to support increased energy efficiency in new buildings, demonstrating a variety of approaches suitable to individual communities.

		A LOCAL GOVERNMENT	B LOCAL GOVERNMENT
UPPER STEPS			STATE INTENT F CITY-WIDE BYLAW AFTER 2025
LOWER STEPS		INCENTIVE BASED PROGRAM	STATE INTENT F CITY-WIDE BYLAW AFTER 2020
STEP 1	BC BUILDING CODE		CITY-WIDE BUI BYLAW
		ENERGY EFFICIENCY	

Figure 3: Three examples of BC Energy Step Code strategies for local government

3.1 Example BC Energy Step Code Approach

The **BC Energy Step Code**’s flexible framework allows each local government policy mechanisms, scale, and types of incentives suitable to each comm local government capacity to administer the program and local industry standards. Figure 3 below shows three example approaches that could b communities. Guidance for selecting your community’s approach is prov

**Local Government A** may be new to requiring energy efficiency in buildings, in this example. Perhaps this government has reviewed local capacity, and has determined that capacity is insufficient to implement Upper Steps, but sees the value in preparing for future changes in the **BC Building Code** as the province moves towards net-zero energy-ready buildings by 2032. This government may decide to begin with a cautious approach, offering a voluntary, incentive-based program. This government might achieve its objectives via an Energy Advisor rebate program, building permit rebate, fast tracking of building permits, density bonus, or other voluntary incentives.

**Local Government B** may find through consultation with local industry that there is sufficient capacity to achieve Step 1 across the community, because there is familiarity with and expertise for energy modelling, airtightness testing, and meeting performance-based requirements. The local government may have previously provided an incentive program for these elements, supported capacity-building initiatives, or found industry has met these requirements in several existing buildings in the community to date. Also following consultation with industry, the local government may determine that, with appropriate capacity-building efforts and successful implementation of Step 1, they intend to require the Lower Steps for all buildings after three years. The local government may also decide to indicate the intent to require Upper Steps, if Lower Steps are successfully implemented, after 8–10 years of implementation. This provides a clear indication to industry how the local government is supporting the transition to net-zero energy-ready buildings over the next decade or more.

**Local Government C** may understand through internal and external consultation that the community has more experience with high-performance buildings, and more industry and internal administrative capacity to deliver them. This local government may be ready to take a more ambitious, multi-faceted approach, building on previous programs that support energy-efficient buildings in the community. In this case the local government may adopt several steps as follows: Step 1 could be introduced in a jurisdiction-wide building bylaw. Step 3 could be a mandatory requirement for rezoning across the jurisdiction, and Upper Steps could be negotiated in select circumstances or locations. To encourage the highest level of energy efficiency that supports the community's sustainability, affordability, and health objectives, the government might also introduce a design competition. This local government would also likely provide an indication of timing for future requirements.

## A Role for the Regional District

With respect to **BC Energy Step Code**, regional districts may play two separate roles: first, the regional district may consider the applicability of adopting these higher building requirements where it administers and enforces the **BC Building Code**, and second, the regional district may play a role in coordination and communication among all local governments in a region. Although each member municipality will determine an appropriate approach for its community, the regional district can keep members informed of activities, successes, challenges, and other important information to support successful incremental adoption of the new performance standards. Where industry works across several municipal boundaries in a region, a regional district can host conversations to support coordinated or staggered implementation of requirements, taking into consideration capacity at a region-wide scale.

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### 3.2 Outline of Policy and Bylaw Tools

Several policy tools are available to local governments to reference the **BC Energy Step Code**, as outlined in this section. Some of these tools provide **general awareness and policy support**, others are suitable for **providing incentives** to achieve specified steps, some may be used to **require targeted buildings** to achieve specified steps, and finally, others are important to review to **remove barriers** to achieving the requirements of the **BC Energy Step Code**. Governments may also employ some tools to **demonstrate leadership** and support adoption of the **BC Energy Step Code**. It is prudent to conduct a legal review prior to moving forward with one or more of these tools, particularly if you are considering the use of a tool that your local government has not employed previously.

Many tools have already been used in communities around the province to support energy efficiency in buildings. This section also provides examples demonstrating how the tools have been put into practice in BC communities, supporting a range of energy efficiency equivalent to Lower and Upper Steps.

### How One Tool can Achieve Various Outcomes

Several of the tools identified in this section may be applied in different manners with varying outcomes. Depending on how it is implemented, one tool could be applied to simply encourage a building to conform to the identified steps, or to incentivize a moderate to substantial uptake of the steps to **each local government to work with community stakeholders to select the tool(s) to achieve their circumstances**.

For example, a density bonus tool can be applied to obtain a range of results. A density bonus permits developers to build more floor space than would otherwise be allowed – therefore, from their project – in exchange for providing community amenities, which may include a density bonus. When the bonus floor space offered entails only a small increase in value over current value, the bonus is best as a voluntary encouragement for energy-efficient buildings among a minority of new buildings. However, when the bonus floor space offered amounts to a significant increase in value (e.g., 95% or more), the bonus is best as a significant uptake, with the vast majority of new buildings opting to meet the higher energy efficiency requirements.

When applying a density bonus tool to incentivize achieving a particular step, it is important to ensure the "new" and be commensurate in value to the incremental investment being made in energy efficiency.

<sup>1</sup> For more information about best practices for community amenity contributions, refer to the Ministry of Municipalities and Government's *Balancing Community Planning: Public Benefits and Housing Affordability*.





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## A. Tools for general awareness and policy support

TOOL DESCRIPTION	
<p>The <i>Local Government Act</i> authorizes the development of <b>official community plans (OCPs)</b> to provide a vision for the community over a minimum 5-year time period. OCPs are significant because, after their adoption, all bylaws and works undertaken by a Council or Board must be consistent with the plan.</p>	<ul style="list-style-type: none"> <li>• Include a policy statement about <i>BC Energy Step Code</i> provide a <b>clear signal</b> to the community and energy efficiency is important.</li> </ul>
<p>A <b>community energy and emissions plan (CEEP)</b>, also sometimes called a <b>community energy plan</b> or <b>climate action plan</b>, provides a vision and sets a target for how a community will reduce its energy use and greenhouse gas emissions over time. It provides specific actions and implementation plans for achieving the target, and is useful to indicate the policy direction a community will take.</p>	<ul style="list-style-type: none"> <li>• Include <i>BC Energy Step Code</i> as an action in the plan to provide a <b>clear signal</b> to the community about expectations with respect to new buildings.</li> </ul>
<p>A <b>neighbourhood plan</b> or <b>local area plan</b> sets out a strategy for the planning of a specific area within a local government and for a timescale as specified by the local government. The plan must consist of a written statement and map, which set out the local government's objectives for the plan area.</p>	<ul style="list-style-type: none"> <li>• <b>Pilot a new energy efficiency policy in one geographic region</b> before expanding to cover the whole region.</li> </ul>
<p>Local governments may provide <b>tools</b> for building assessment and performance measurement and <b>learning forums</b> to connect industry with energy efficiency expertise, practitioners and products.</p>	<ul style="list-style-type: none"> <li>• Provide learning forums and tools to <b>support energy efficiency transformation</b> in your community.</li> </ul>
<p>A <b>sustainability checklist</b> is a non-regulatory tool used to encourage new development and buildings that support and advance community sustainability objectives. Local governments may require development applications include submission of a checklist as part of the approvals process.</p>	<ul style="list-style-type: none"> <li>• Include the <i>BC Energy Step Code</i> on your sustainability checklist to <b>signal</b> that energy efficiency is important to the community and to <b>support voluntary uptake</b> of the <i>BC Energy Step Code</i>.</li> </ul>

## Regional Alignment of Approaches

District of North Vancouver, City of North Vancouver, District of West Vancouver, District of Squamish, Resort Municipality of Whistler, District

### STEP 3, PART 9 AND STEP 2, PART 3

A number of adjoining British Columbia communities have worked together to adopt identical **BC Energy Step Code** strategies. This "regional alignment" approach helps reduce paperwork for builders active in these communities by establishing uniform timelines and requirements across a broad geographic area.

The District of West Vancouver, the City of North Vancouver, and the District of North Vancouver required all builders to meet the requirements of Step 3, Part 9 and Step 2, Part 3 on July 1, 2018. These communities on the North Shore of Metro Vancouver are home to about 180,000 residents, and will host a good deal of development activity in the coming years.

The District of Squamish and the Resort Municipality of Whistler soon followed suit, extending what had become a de facto Efficient New Home Zone beyond the North Shore and up the Sea-to-Sky Corridor. Further, adjoining local governments in the Capital Regional District adopted a similar approach on Southern Vancouver island. All of these local governments have made life a little easier for builders who once struggled a patchwork of energy requirements across the region.



*Photos: Buildings that would meet the performance requirements of the Upper Steps generally have thicker walls than those built to minimum code requirements. Numerous local governments have relaxed zoning rules to ensure builders are not unfairly disadvantaged.*



B. Tools to provide incentives

TOOL DESCRIPTION	BC ENERGY STEP CODE CONSIDERATIONS
<p><b>Greenstreaming</b>, or “fast-tracking,” is an incentive that local governments can offer developers to achieve energy efficiency (or other environmental objectives) in new developments.</p>	<ul style="list-style-type: none"><li>• Fast-track <b>BC Energy Step Code</b> applications as a <b>valuable incentive</b> Upper Steps (ensuring the wait times actually decrease for these applications).</li><li>• Be sure to consider potential impacts on wait times for non-<b>BC Energy Step Code</b> applications.</li></ul>
<p>The <b>climate action revenue incentive program (CARIP)</b> provides a grant to BC Climate Action Charter signatories that meet a set of requirements - including a requirement to publicly report progress toward carbon neutrality in their operations. The grant is equivalent to 100% of the local government’s direct expenditure on the carbon tax.</p>	<ul style="list-style-type: none"><li>• Redirect CARIP grant to <b>fund a program that incentivizes compliant Energy Step Code</b> (e.g., to fund a building permit or Energy Advisor rebate program).</li></ul>
<p>A <b>building permit rebate program</b>, or “feebate,” is an incentive program that rebates a portion or all of a fee for achieving environmental objectives, including higher energy-efficiency standards in buildings. Funding may be available for these programs from BC Hydro and FortisBC.</p>	<ul style="list-style-type: none"><li>• In most cases, provide a <b>modest incentive</b> to support uptake of the <b>Code</b>, particularly Lower Steps.</li><li>• May be used with other benefits to incent Upper Steps.</li><li>• Consider using the local government’s CARIP grant to fund this program.</li></ul>
<p>An <b>Energy Advisor rebate program</b> can be developed to subsidize engaging an Energy Advisor/modeller, encouraging residents and industry to adopt a performance-based approach to energy efficiency.</p>	<ul style="list-style-type: none"><li>• Provide a <b>significant incentive</b> toward uptake of <b>Step 1</b>, supporting transformation and preparing industry for higher steps.</li></ul>
<p>A <b>revitalization tax exemption (RTE)</b> is a tool for local governments to encourage various types of revitalization to achieve a range of social, economic, and environmental objectives by offering relief from property tax for a prescribed term. A revitalization program may apply to a small area(s), a certain type(s) of property, a particular activity or circumstance related to a property(ies), or an entire municipality. In 2007, the <b>Community Charter</b> [RS45], which establishes authority to create RTE bylaws, was changed to make it easier for green development to apply for RTEs.</p>	<ul style="list-style-type: none"><li>• Provide a <b>moderate to high level of incentive</b> to support uptake of <b>Step 1</b> <b>Step Code</b>.</li><li>• May be suitable to encourage Upper Steps in some circumstances.</li></ul>



## Supporting builders through the learning curve

City of Vancouver, City of Richmond

### STEP 1, PART 9

The City of Vancouver offers a textbook example of how a local government can support its builders as they adapt to new performance-based codes such as the **BC Energy Step Code**.

In early 2015, the city began enforcing specific air-tightness requirements for new homes – but many builders lacked the skills and knowledge needed to comply. As a result, at least at first, plenty fell short of the mark. In response, the city offered to relax enforcement of its air-tightness rule on non-complying projects, so long as the builder in question paid for, and had at least two staff attend, a one-day course on installing effective air barriers.

The city partnered with Small Planet Supply, RDH Building Science, and Red Door Energy Advisors to offer hands-on training.<sup>1</sup> And it worked. In March 2019, with a significant percentage of its builders up to speed, the city began rigidly enforcing its air-tightness requirement. And 100+ builders have acquired new skills that will serve them well in the transition to net-zero energy-ready or zero-emissions construction.

The City of Richmond began offering complementary air-barrier training to local homebuilders nine months before referencing the **BC Energy Step Code** in its bylaws. Richmond also offers free blower door tests to any home builder who received a building permit for a detached house, duplex, or townhouse project prior to the city's adoption of the standard.

<sup>1</sup> Small Planet Supply initially delivered and organized the course. The British Columbia Institute of Technology now hosts the course at its High Performance Building Lab, or via its mobile air-tightness learning truck.

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

City of Burnaby, City of Vancouver, City of Richmond, City of Surrey, and University of British Columbia

### STEP 2, PART 3 AND STEP 3, PART 3

The **BC Energy Step Code** targets overall energy efficiency, rather than specific greenhouse gas outcomes. However, a number of local governments are taking advantage of the standard's inherent flexibility and pairing it with greenhouse gas intensity policies.

These communities require developers to meet Step 3, but in lieu of doing so, the governments offer a relaxation clause as a voluntary option that also advances their greenhouse gas objectives. Under the clause, they can meet the requirements of Step 2 provided they install a city-approved low-carbon energy system in the building – such as a ground- or air-source heat pump.

In short, these communities relax their requirements and allow residential developers to take a lower step, but only if they can demonstrate that the proposed building will emit less carbon.

Photos: Top: Builders learn the techniques of effective air-barrier installation via a one-day hands-on workshop. Bottom: Energy efficient home in Langley BC that participated in the Township's program.







C. Tools to provide incentives or mandate requirements

TOOL DESCRIPTION	BC ENERGY STEP CODE CONSIDERATIONS
<p><b>Zoning bylaws</b> define how specific areas of land can be used by implementing land-use policies set out in Official Community Plans and Regional Growth Strategies. A local government's core zoning authority is set out in the <i>Local Government Act</i>, Section 479. A rezoning is a legal change to the zoning bylaw to permit an alternate type of development. Rezonings typically occur in response to objectives set out in an OCP or neighbourhood plan. Local governments have considerable influence and opportunity to encourage sustainable development through rezoning. A <b>rezoning policy</b> sets out objectives or criteria that the local government wishes to achieve in projects undergoing rezoning.</p>	<ul style="list-style-type: none"><li>• When used as an incentive mechanism, identify opportunities to density (above and beyond that already available to the property) specific steps, where the increased value is at least commensurate incremental investment in energy efficiency.</li><li>• See also density bonus and Phased Development Agreements.</li></ul>
<p>A <b>density bonus</b> allows development at a level of density that surpasses the allowable FSR under the OCP or neighbourhood plan in exchange for providing Community Amenities (which help a community meet its goals). These amenities typically include parks, heritage preservation, and affordable housing. One may also offer increased density in exchange for greener development as an amenity to the community. Density bonuses must be established in <b>zoning bylaws</b> that set out the specific conditions needed in order to receive the increased FSR.</p>	<ul style="list-style-type: none"><li>• Can provide a <b>significant incentive</b>, and may be useful for either <b>or Upper Steps</b>.</li><li>• Especially effective where land values are high.</li></ul>
<p>Section 516 of the <i>Local Government Act</i> permits local governments to enter into <b>phased development agreements (PDAs)</b>. These have the effect of protecting developments from subsequent zoning and development permit changes for a specified period of time. As PDAs replace zoning by way of bylaw for the term of the agreement, the process required to enter into such an agreement is consistent with that for a zoning bylaw.</p>	<ul style="list-style-type: none"><li>• Negotiate a PDA requiring buildings reach specified steps (best at sites).</li><li>• Could be employed for <b>Lower or Upper Steps</b>, depending on the circumstances of the development.</li><li>• May be particularly useful when a community is <b>introducing a new</b> not been broadly met in the community to date.</li></ul>
<p>Local governments are authorized to use <b>building bylaws</b> to regulate construction and to administer and enforce the <i>BC Building Code</i>. Building bylaws are applicable across the community. Building bylaws may have sections applicable only to specific building types and/or geographic areas. Sentence 8 (3) (l) and Division 8 of the <i>Community Charter</i> govern this authority.</p>	<ul style="list-style-type: none"><li>• Can <b>require compliance</b> with a <b>Lower Step</b> across the whole community during the transition period (as defined in section 2.3), where the community industry have sufficient capacity. Or, the Building Bylaw may specify by building type and/or by geographic region.</li><li>• Following successful completion of the transition period, the Building Bylaw can be useful for applying <b>Upper Steps</b>; however, at this time it is more useful for Lower Steps.</li></ul>



## Amending zoning bylaws to remove barriers

The City of New Westminster

### STEP 3, 4, OR 5, PART 9

Local governments use zoning bylaws to dictate minimum and maximum requirements for a new building's allowable floor area, height, and setbacks. Unfortunately, the rules often unintentionally disadvantage those who wish to voluntarily built to Upper Steps of the **BC Energy Step Code**.

The issue? A Part 9 home built to meet the requirements of the Upper Steps will generally have slightly thicker walls, and for the top step, a deeper insulated roof. Typical floor-space rules, which dictate density allowed on a given lot, may force builders to sacrifice allowable floor area to insulation, creating a disincentive. Numerous local governments are identifying these zoning barriers to high performance buildings, and lowering them via housekeeping amendments.

As an illustrative example, in early 2018 the City of New Westminster amended its zoning bylaw to exempt the area occupied by additional wall insulation for single-detached homes that achieve Step 3, 4, or 5 for single-detached homes, including detached dwellings such as laneway and carriage homes<sup>1</sup>.

For single detached homes achieving Step 5, New Westminster also relaxed maximum building heights by up to 1.22 meters (4 feet), to support deeper insulation in the roof assembly and foundation. At the time of publication, British Columbia communities that in 2018 collectively issued 30 per cent of building permits for new Part 9 homes, and 26 per cent of those for new Part 3 buildings, have adopted thick wall or roof zoning amendments.

1. City of New Westminster, Zoning Amendment Bylaw No. 7953, 2018, available via [newwestcity.ca](http://newwestcity.ca)

## Supplementing the standard with an energy labeling requirement

District of Saanich, City of Surrey, City of Richmond, City of New Westminster, City of Kimberley, District of Sparwood

### ALL STEPS, PART 9

As local governments implement bylaws to require and/or incentivize steps of the **BC Energy Step Code**, some are taking the opportunity to add a useful regulatory and engagement tool to the mix: A sticker.

Specifically, an energy label that conveys the specifics of a new home's performance upon its completion. Typically, communities mandating home-energy labeling require a builder to affix the label to the inside door of an electrical service panel, where it is unlikely to be removed. Its benefits include:

- **Energy Literacy:** Labelling helps educate new-home buyers by giving them direct access to performance data. When the residence passes to a new owner, the info stays with the building.
  - **Valuing Efficiency:** Inconsistent and missing data is limiting industry's ability to effectively market energy-efficient homes. By providing consistent, reliable, and accessible information on the energy efficiency of one home versus another, energy labeling could help close that gap.
  - **Market Differentiator:** Home energy labelling offers builders a way to differentiate their product from that of the competition. By increasing consumer awareness, labelling could motivate builders to innovate and drive demand for above-code construction.
- As of spring 2019, communities that have adopted a home energy labeling requirement or incentive collectively represent 28.5% of building permits issued for Part 9 homes in 2018. A **BC Energy Step Code** strategy offers a local government an ideal time to introduce them.<sup>12</sup>

1. For more, see "Put a Label On It: The BC Energy Step Code and Home Labeling Disclosure," *City Green Solutions*, July 2018, and "Bulletin 1: The BC Energy Step Code and Home Energy Labeling." Both are available via [energystepcode.ca](http://energystepcode.ca).

2. As of early 2019, the Real Estate Board of Greater Vancouver and its partners were exploring how to add home energy labelling scores to property listings. If adopted, homebuyers would be able to factor energy efficiency into their purchase decisions.

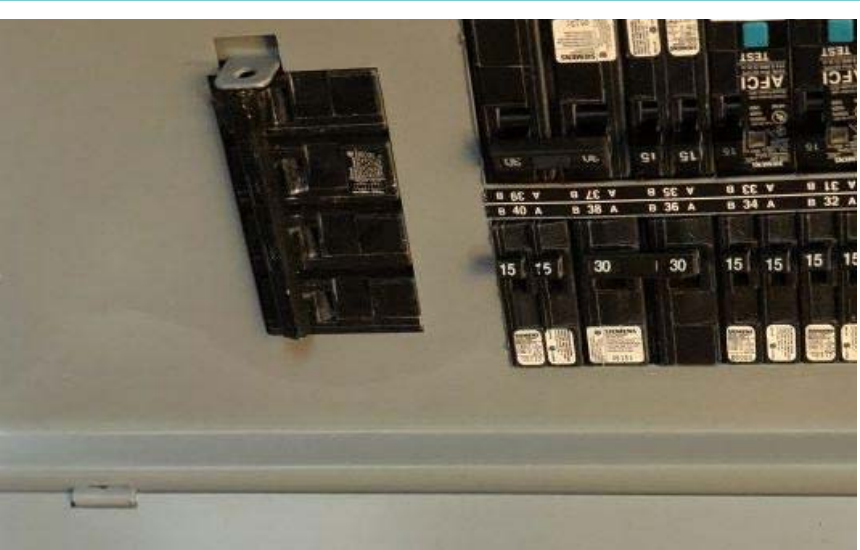


Photo: An example of an energy label that conveys the specific performance of a building upon its completion.



D. Tools to remove barriers

TOOL DESCRIPTION	BC ENERGY STEP CODE CONSIDERATIONS
<p>Local governments may adopt <b>design guidelines</b> and policies to achieve certain objectives with new developments, ranging from accessibility, to heritage preservation, to view protection, to landscaping, and many more.</p>	<ul style="list-style-type: none"><li>• Review to ensure guidelines do not <b>unintentionally make more costly</b> or unachievable (e.g., by encouraging building inherently energy inefficient).</li><li>• <b>Align</b> design guidelines with best practices in energy efficient design.</li></ul>
<p><b>Floor Space Ratios (FSRs)</b> are established in zoning bylaws and they dictate the total floor area permitted in buildings, based on the size of the subject properties. Often, FSR is calculated to the exterior perimeter of the building (including exterior walls). This can effectively penalize buildings for featuring more highly insulated walls - they will have less habitable floor area-unless energy-performance-related FSR exclusions are implemented.</p>	<ul style="list-style-type: none"><li>• Adjust FSR calculation methodologies to <b>ensure thicker walls insulation are not penalized</b>, by basing calculations on the area (inside exterior walls).</li></ul>
<p>Local governments are authorized to use <b>building bylaws</b> to regulate construction and to administer and enforce the <b>BC Building Code</b>. Building bylaws are applicable across the community. Building bylaws may have sections applicable only to specific building types and/or geographic areas. Sentence 8 (3) (l) and Division 8 of the <b>Community Charter</b> govern this authority.</p>	<ul style="list-style-type: none"><li>• Review your Building Bylaw to <b>remove any procedures that unintentionally inhibit</b> the <b>BC Energy Step Code</b> (e.g., procedural compliance with prescriptive requirements).</li></ul>





Photos: Top: Spruce Grove Passive House in Whistler BC, photos by Kristen McGaughey Photography (Part 9, Step 5). Bottom: Thickness of a wall from a pre-fabricated panel built in Agassiz BC to Passive House standards, photo by Monte Paulsen (Part 9, Step 5).





E. Tools to demonstrate leadership

TOOL DESCRIPTION	
A <b>corporate policy</b> can be put into place to require all new civic buildings meet a particular standard that supports a corporate or community objective.	
Local governments may have opportunities to encourage other <b>public sector buildings</b> to achieve particular standards for new buildings in their community boundaries.	<ul style="list-style-type: none"><li>• Include <b>requirements in tenders</b> for new facilities to achieve the</li><li>• Help <b>transform the local market</b> by providing valuable experience</li></ul> <i>BC Energy Step Code.</i>
<b>Provision of local government-owned land</b> for re-development to meet OCP or neighbourhood plan objectives that are not likely to be achieved without support from the local government (for example, if the land requires remediation and renewal, or there is a desire for mixed-use development, social housing, energy efficiency, renewable energy, or other features that may be cost-prohibitive in the existing market). The price for the land can be set at a rate that is financially viable for both the local government and for the developer undertaking the project, while conforming to requirements of the <i>Community Charter</i> and <i>Local Government Act</i> .	<ul style="list-style-type: none"><li>• Identify performance standards for institutional buildings in policies (e.g., OCP, Local Area Plan).</li><li>• Encourage applicable provincial or federal agencies to voluntarily <i>BC Energy Step Code</i> standards or equivalent.</li><li>• Where additional density is proposed (particularly residential development) incorporate <i>BC Energy Step Code</i> requirements in the rezoning plan.</li><li>• Include <b>requirements</b> in development approval for buildings to achieve the</li><li>• Help <b>transform the local market</b> by providing valuable experience</li></ul> <i>BC Energy Step Code.</i>

# An early adopter in the B.C. interior

Regional District of East Kootenay

## PART 9, ALL STEPS

Market transformation isn't just for big cities: a number of the province's smaller communities are actively preparing their builders for the shift to high-performance construction – including several in the Regional District of East Kootenay (RDEK).

The district began officially consulting with builders on a proposed **BC Energy Step Code** strategy in March 2019. (Three of its member municipalities are ahead of the curve, and have already adopted the standard.) This is the result of engagement and education work by the district's dedicated community energy manager. As a result of the manager's work, staff and builders across the province's southwest corner are remarkably energy literate. The region leads the province for builders who report that they have built to at least Step 1, Part 9<sup>1</sup>. Recent initiatives and activities include:

- Hands-on builder workshops with 20+ mobile wall assemblies, showcasing a variety of approaches to achieving above-code performance in new homes.
- A four-part training series for building officials that included building-science basics, on-site home inspections with a mid-construction blower door test, and Q&As with energy advisors
- Numerous "Tailgate meetings," which welcome trades, builders, realtors, building officials, and others to visit a mid-construction blower door test.

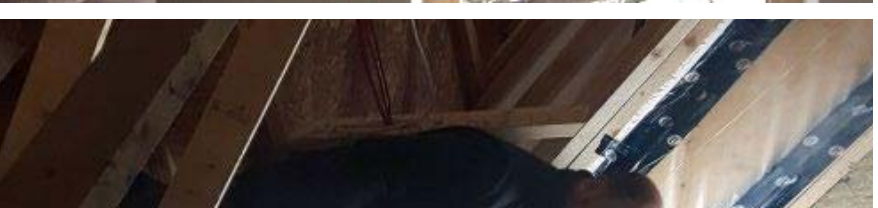
Builder capacity-building workshops across the District now regularly engage more than 80 participants at a time: the RDEK's community energy manager customizes them to target specific identified gaps in training. The shift to net-zero energy-ready buildings is well underway across British Columbia, and by adopting a **BC Energy Step Code** strategy, the Regional District of East Kootenay is playing an active role.

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1. BC Residential Building Statistics and Trend Report 2017. BC Housing. Available via [bchousing.org/research-centre](http://bchousing.org/research-centre)



Photos: Left: Thermal image being taken during a builders' workshop in Fernie BC; the home is designed to achieve at least Part 9, Step 3.



Right: Energy advisor Regional District building to pinpoint leaks in where outside air is the window.

# 4

## Developing Your BC Energy Step Code Strategy

### 4.1 Key Steps to Develop Your Strategy

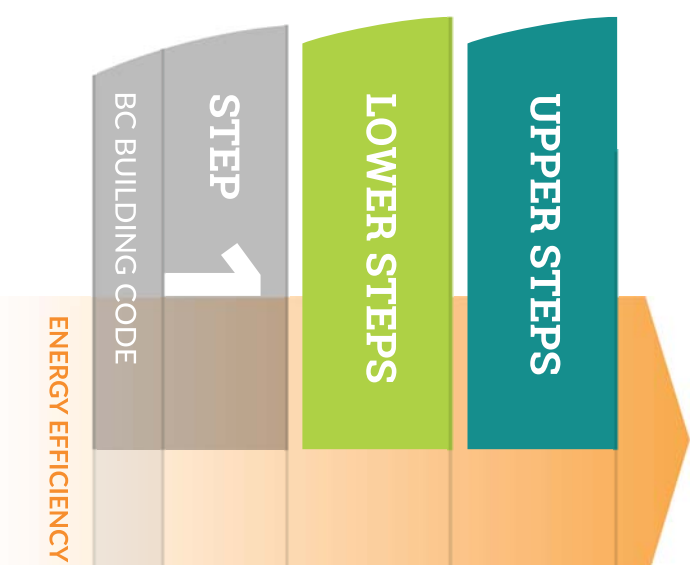
All local governments are encouraged to develop a comprehensive strategy when incentivizing or requiring one or more steps.

Taking a strategic approach to the **BC Energy Step Code** will involve understanding the scope and opportunity provided by the legislation, as well as consulting with relevant stakeholders in your organization and community to identify and assess risks and opportunities.

**These discussions will inform the approach that is most suitable to your community, and will give your local building community time to plan and prepare for the coming changes.**

For the transition period – at least until 2020 – local governments that are considering the application of the **BC Energy Step Code** on a community-wide scale should only require the Lower Steps, except in specific circumstances where Upper Steps might be required when paired with appropriate benefits.

The following section outlines the key steps to defining an approach to the **BC Energy Step Code** suitable to your community. Each community will need to establish a specific process that fits its circumstances.



### Consultation to instituting new

It is important to provide government staff (planning Officials) with sufficient notice for new you notify the ESCC of launch and enforce the

**Lower Steps: 6 months**  
**Upper Steps: 12 months**





The BC Energy Step Code web site ([energystepcode.ca](http://energystepcode.ca)) offers a wealth of resources including:

- A calendar of upcoming events and training opportunities.
- Recent additions and updates to the standard.
- Information on incentive programs.
- Case studies of “real world” projects that meet the requirements of Step 3, Part 9.

1

## Review resources.

- Review communications, awareness and training publications, and webinars available on the BC Energy Step Code website.
  - Contact BC Housing to help identify energy-efficient buildings and energy-efficient retrofits opportunities.
  - Join a local government Peer Network to work together on effective **BC Energy Step Code** implementation.
- Contact BC Hydro for more information ([sustainablecommunities@bchydro.ca](mailto:sustainablecommunities@bchydro.ca))

2

## Notify the ESCC of intent to consult and reference the BC Energy Step Code.

Visit [energystepcode.ca](http://energystepcode.ca) to obtain the form and instructions on how to notify the ESCC.

3

## Consult, define your program details and prepare policies and/or bylaws.

- A. Conduct consultation**
  - Establish a process and determine who you need to engage and why (see 4.2)
  - Develop clear timelines that meet the Provincial policy (see 4.3)
  - Re-engage as needed, being sure to incorporate sufficient time should your approach change.
- B. Consider appropriate tools**
  - Identify **tools** to reduce barriers, mandate changes, and/or demonstrate leadership.
- C. Review policies and processes**
  - Streamline affected development approvals
  - Minimize the impact on building permit approval timelines (see 4.4)
  - Harmonize with district or alternative energy policies (see 4.5)
- D. Identify communications and awareness needs**
  - Which staff, elected officials and advisory members need training?
  - How can your local government support industry to connect with training resources?
  - What local communication materials need to be updated or created?
- E. Adopt policies and bylaws, based on consultation outcomes**
- F. Identify clear timeframes and indicate future intentions (see 4.6)**
- G. Identify how to monitor your program's success (see 4.7)**
- H. Identify opportunities to demonstrate leadership**
  - Local government corporate policies and tenders (see 4.8)

4

## Notify the ESCC once plan is approved and ready.

5

## Launch and administer the BC Energy Step Code as defined for your community.

## 4.2 Consultation: Who to Engage and Why

Engaging with the appropriate stakeholders while defining your strategy will shape an approach that is suitable to your local building culture. The level of engagement needed will vary by community and by the type and extent of the proposed new policy, program, or bylaw.

**Conducting meaningful engagement with the stakeholders identified not only helps you develop a suitable approach, it helps raise awareness and prepare industry for changes that will be coming in your community and across the province.**

An overview of important stakeholders, and their role in strategy development and implementation includes:

- **Staff:** Planning, development, and building compliance staff will help define the strategy. Staff can identify potential alignments or conflicts with existing policies, processes, and bylaws, and identify preferred policy tools. Staff can also identify opportunities for communicating about the **BC Energy Step Code** with the community – through front-desk inquiries, at pre-application meetings, during building permit application, and others.
- **Elected officials and approval bodies:** Elected officials need to understand the **BC Energy Step Code**'s purpose and objectives, be briefed on the outcomes of the consultation process, provide support for the program, and communicate the community's approach and priorities with respect to energy efficiency and the **BC Energy Step Code**. Approval bodies, including design review panels and planning commissions, will need to understand the purpose and objectives, and how increasing energy efficiency may change the form and design of new buildings.
- **Industry:** Representatives from the appropriate building sector (Part 3, Part 9, or both – including designers, builders, energy professionals, trades, and suppliers) will be key participants in identifying the types of policy tools and incentives that are appropriate for the steps being proposed, and identifying potential conflicts with existing policies, processes, and bylaws that need to be addressed. As a best practice, local governments may also consider using forums to facilitate connections among Energy Advisors, builders, designers, construction companies, and suppliers.
- **Neighbouring local governments:** Many industry professionals and trades work across several municipalities, so an important aspect of understanding how available industry is to deliver services in your community is knowing what demand there may be for these services in the region. Neighbouring communities can provide information on type and scale of programs being put in place, and may be interested in aligning programs to enhance regional consistency.
- **Public:** Public engagement helps share messages, gauge support for new objectives, and gather input during strategy development. The public should be introduced to alternative building designs that may appear more frequently, and the benefits of energy-efficient buildings.

## Ideas and Engaging :

- The Energy a Microsoft to local go presentation how it came government high-perfor "resources"
- Host an "al event to br planners, d trades, and will deal w provisions interpretat
- Collaborat associatio and notice
- Have build builder of t materials a
- Create info City Hall, a suppliers, a may conve





## 4.3 Provincial Policy: Timelines and Grace Periods

The **Provincial Policy** provides guidance for the successful implementation of the **BC Energy Step Code**, based on input from the multi-stakeholder members of Energy Step Code Council. The following summarizes key guidelines from the **Provincial Policy** with respect to notifying the ESSC of your plans, providing sufficient time to industry to prepare for new requirements, and providing appropriate grace periods for applications in place prior to new requirements coming into force.

### Notifying the Energy Step Code Council

It is important to **notify the Energy Step Code Council through the Building and Safety Standards Branch** at two (2) key points in your process:

1. When you plan to begin consultation with industry on your proposed approach.
2. When you have established or ratified a bylaw, policy, or program that references the **BC Energy Step Code**.

To notify the ESSC of your intentions, complete the notification form available through the Building and Safety Standards Branch, or by visiting [energystepcode.ca](http://energystepcode.ca). Keeping the ESSC informed ensures you have access to the most recent information and resources available, and it allows the ESSC to track and monitor the **BC Energy Step Code** implementation province-wide.

### Minimum Timelines for Requiring the BC Energy Step Code

It is also important to **provide industry and local government staff** (planning department and building officials) **with sufficient time to prepare for change**. The **Provincial Policy** establishes minimum timelines for implementing new requirements, beginning when your local government gives notice to the Energy Step Code Council that you are initiating consultation with industry on a proposed approach, and ending at the time the new requirement comes into force.

These timelines are summarized as follows:

- **Lower Steps:** New or expanded requirements for Lower Steps may be enforced no sooner than six months after notification.
- **Upper Steps:** New or expanded requirements for Upper Steps may be enforced no sooner than one year after notification.

Local governments may adjust these timelines in consultation with local industry and may obtain guidance from the Energy Step Code Council. If a local government chooses to adopt a higher step than was put out during consultation, or plans to change an existing program by broadening the scope, increasing step level, or changing the approach, then the minimum notification timeline should be reset.

### Grace Period for In-Stream Applicants

At the time a local government enacts the **BC Energy Step Code**, applicants that have previously initiated an application for a new building(s) – rezoning, development permit, development variance permit, or building permit – with detailed design drawings, are considered “in-stream” and should be permitted to build to the energy standards in place at the time of application, as long as they have submitted an application for a full building permit application within one year.

Planners will need to incorporate the new **BC Energy Step Code** provisions into discussions as early as possible when discussing complex applications that are not ready for development application submittal prior to enforcement of the **BC Energy Step Code**.



“The BC develop performance prescribed energy BC Building from it to align requirements require Institution table s remain

Anne Mc Urban De

The **BC Energy Step Code** represents a significant change to how buildings demonstrate compliance with energy-efficiency requirements, and local governments administering and

Under the **BC Energy Step Code**, each building will require an energy model, and the model must demonstrate the building is designed to meet the requirements set out for the specified step (see Appendix A for the list of requirements). New procedures may include evaluating whether the documentation is complete and meets the standards for energy models that are set out in the regulation.



To prepare for these changes, local governments may wish to:

- inspections will no longer need to verify prescriptive requirements (for example, there are no minimum or maximum requirements for insulation, door/window/sky/light U-values, or equipment efficiency in the **BC Energy Step Code**). Instead, the requirements for components are dictated by the energy model submitted with the permit application.
- To prepare for these changes, local governments may wish to:
- **Have building officials complete the BC Energy Step Code** training webinars for building officials (available at [energy.stepcode.ca](https://energy.stepcode.ca)).
  - **Review** and update compliance procedures to accommodate the change in approach. Look for standardized compliance forms and checklists at [energy.stepcode.ca](https://energy.stepcode.ca).
  - **Review** best practices in energy modelling (see resources noted in section 5).
  - **Develop** a policy that clearly defines the "due diligence" requirements for your local government.
  - **Stipulate requirements** related to documentation of final compliance (other than those required for Part 3 buildings in the **BC Building Code**) to verify the energy model details are the same as the actual construction of the building.
  - **Obtain guidance** from legal counsel on appropriate procedures for accepting assurances.
  - **Define procedures** for completing airtightness testing.
  - **Establish** the level of interaction needed with the Energy Advisor on site for the inspection.
  - **Identify** procedures for what happens if a building fails to meet the airtightness requirements.
  - **For Part 9 buildings**, check that air and vapour barrier products and materials conform to a standard listed in the **BC Building Code**.
  - **Check** that the building has a ducted supply ventilation system (as the **BC Energy Step Code** does not permit the use of a passive ventilation system).

Building to the **BC Energy** in the use of alternative to increase the airtightness building envelope, equipment design approaches, materials currently listed as accepted. The **BC Building Code** proposed to the Authority these requests can be tried. Local governments should solution requests and have efficiently. This will be more building performance is better practices.

Local governments are w multiple objectives. Two implementing the **BC Ener strategies to maintain affi district energy and/or alt**

During the development of the Energy Step Code Council, one of the primary goals was on identifying an incremental path to building standards that can be achieved under a wide range of circumstances. Some of the challenges in achieving this goal in a cost-effective manner include the need for training, or higher initial investment, and the need for BC faces different contexts of building, affordability, and equity. Under these conditions, each local government has different resources, tools and approaches are needed to achieve these goals. This is why there are multiple

government can introduce energy efficiency in a step-wise manner that works for the community.

Consider the following tips to help minimize impacts on affordability as you develop your **BC Energy Step Code** strategy:

- **Familiarize** yourself with the incremental costs of achieving the steps for different building types and climate zones by reviewing the results of BC Housing's costing study (discussed in section 2.6).
- **Review** BC Housing's *An Illustrated Guide on Cost-Effective Tips and Optimization for High-Performance Homes and Buildings* at [energystepcode.ca](http://energystepcode.ca).
- **Check [efficiencybc.ca](http://efficiencybc.ca)** for links to information about provincial or utility incentives and financial mechanisms that may be available to industry.
- **Review** the tools in section 3.2 and consult with local industry and real estate to determine a suitable level of incentive for your community.
- **Support** industry learning through builder forums, linking to listings of energy modellers and airtightness testers, promoting training events, etc.
- **Ensure** design guidelines align with cost-effective and energy-efficient building forms.
- **Exclude** additional wall thickness related to increased insulation from floor space ratio (FSR) calculations.
- **Start with Lower Steps** because these can use conventional materials and approaches.
- **Ensure** that new regulations and permitting processes do not negatively impact approval timelines.
- **Provide a clear direction** for the future so industry can prepare for upcoming changes to local building requirements.

More energy-efficient homes are likely to experience reduced energy costs and lower maintenance expenses, which can help improve affordability for home occupants.

## District Energy, On-Site Renewable Energy, and the BC Energy Step Code

Encouraging renewable district energy systems and on-site renewable energy generation are two actions that BC local governments have pursued in support of their climate action goals. Some communities have developed renewable district energy systems that require certain adjacent buildings to connect to the system, while other communities have encouraged or required a certain amount of on-site renewable energy generation be installed. Meeting these requirements can involve increased capital investment beyond that required to meet the base **BC Building Code**.

The **BC Energy Step Code** focuses on making buildings need less energy, regardless of the source of energy, which can also involve increased capital investment (especially for the Upper Steps). Since highly energy-efficient buildings have much lower heat demand, it may be challenging to maintain a financially viable renewable district energy system that serves very efficient buildings. Moreover, requiring investments in both the energy supply and demand may involve higher costs.

Local governments need to consider these policies in tandem. Where a building is required to connect to a renewable district energy system, the local government should carefully review the implications before setting **BC Energy Step Code** requirements. The province has signalled that the shift to net-zero energy-ready buildings will occur over three code cycles, with progressively greater levels of energy efficiency requirements over 2018 base building code in 2022 (20% more energy efficient), 2027 (40% more energy efficient) and 2032 (80% more energy efficient).

For some building designs, Upper Steps of the **BC Energy Step Code** requirements may be challenging to meet (e.g., a south-facing building designed with a high ratio of glass). In these cases, developers may offer to invest in on-site renewable energy as an alternative to reaching higher energy efficiency standards. It is important for local governments to develop policies that are flexible to accommodate these types of cases.



“By incorporating energy efficiency into the design and construction of new buildings, we can allow for a more sustainable future. This is a great opportunity for our community to lead the way in sustainable building practices.”

Jay Nordmark  
NAIMA C

Photo: Bullitt Center  
in Seattle, Wash

## 4.6 CleanBC Introduces New Interim Performance Targets

In its December 2018 **CleanBC** plan, the Province of British Columbia reaffirmed its commitment that builders must deliver net-zero energy-ready new construction by 2032.

It also established clear timelines for increased building energy performance.

As the table opposite indicates, starting in 2022, all builders will need to demonstrate that their projects perform 20 per cent better on energy efficiency than what was required of them under the 2018 **BC Building Code**. This target matches the requirements of Step 3, Part 9 and Step 2, Part 3 of the **BC Energy Step Code**.

Five years later, in 2027, the province will again tighten up energy-efficiency requirements, and move the whole province another step up the high-performance staircase. As of that year, builders will be required to demonstrate that their projects perform 40 per cent better than 2018 **BC Building Code** requirements. This second target lines up with Step 4, Part 9 and Step 3, Part 3.

By now, many British Columbia local governments have adopted at least Step 1 of the *BC Energy Step Code*. This has positioned them well for the upcoming new performance deadlines, because their builders will be already familiar with the new requirements before the province requires them in the base building code.

Those local governments that have yet to begin consulting industry on possible **BC Energy Step Code** strategy now have an added incentive to do so. As outlined elsewhere in this guide, local governments, and training institutions are offering support, education resources, and incentives to help the province's builders get up to speed.

## Timeline for Energy Efficiency Regulatory Requirements in the Province of BC



## 4.7 Monitoring, Evaluating, and Adjusting

Once you have developed your strategy, it will be important to monitor progress to see if you are reaching your community's objectives with respect to the **BC Energy Step Code**. An annual assessment of progress will provide you with critical information that may lead you to either make adjustments to your strategy, or to keep a steady course. Monitoring and evaluation will also indicate the appropriate time to increase performance requirements.

Here are some factors to consider tracking to support your program evaluation:

- Industry and local governments find the steps clear.
- Steps are reported to enhance consistency in development industry.
- Anticipated costs (including time) and benefits are realized.
- There is good awareness and education across industry.
- Continuous learning is happening in industry and at the local government.
- Processing times have not slowed down.
- The number of development applications and building permit values have not gone down.
- Economic opportunities are realized.

As numerous staff will be responsible for implementing various elements of the strategy, defining a clear monitoring and evaluation process during the strategy, including required data needs, will help ensure evaluations are based on accurate quantitative and qualitative data, and that this information is regularly collected and tracked.

To support a smooth transition toward net-zero energy-ready buildings by 2032 across the province, the Energy Step Code Council will also be tracking key information about the uptake of the **BC Energy Step Code** in all communities. Be sure to provide the ESCC with monitoring and evaluation results from your community, as well as relay any pertinent case studies and lessons, to support the province-wide transition, by responding to ESCC surveys and requests for information (likely to be conducted annually).

## 4.8 Take Leadership in Civic Facilities

### The Energy Step Code Council is encouraging local governments to consider specifying the Upper Steps as a tender requirement for new public amenities, such as a community centre or recreation complex.

In the past decade, a number of governments across Canada (local, provincial, and federal) have helped increase industry familiarity with high-performance building techniques and products by requiring high-performance building standards, through green-building rating and certification systems, as a condition of public tender. This is a proven way of using public sector leadership to help prepare the local market for broader uptake. The Province and BC Housing are taking steps towards leadership in new public sector buildings and affordable housing projects. Local governments can also work with provincial and federal agencies to encourage new institutional buildings to be built to the Upper Steps, further supporting market transformation toward high-performance buildings in the community.

“The BC government and cities are working together to achieve our goals. The BC government is doing a great job of leading by example and encouraging other governments to do the same. We are proud to be part of this effort and to be working with the BC government to achieve our goals.”

Mark Bennett  
Victoria, BC



# 5

## A Primer on the Technical Requirements

### 5.1 Whole-Building Energy Modelling

To meet the requirements of a given step of the **BC Energy**

**Step Code**, a whole-building energy model of the proposed building design must be completed prior to construction to demonstrate to local government building officials that the building's modelled design meets or exceeds a set of defined requirements. Energy models are usually prepared by trained energy modellers, who work in collaboration with builders and/or designers to demonstrate how the energy-efficiency requirements will be met. This is already common practice for high-efficiency buildings in BC, and is an optional compliance path for meeting the energy-efficiency requirements in the base **BC Building Code**.

After construction, the responsible party must prepare documentation that the building meets the specifications set out in the energy model. The responsible party varies depending on the building type:

**Part 9 buildings:** the owner is responsible for preparing the appropriate documentation. In practice, this responsibility is likely to be delegated to the designer, builder, or Energy Advisor.

**Part 3 buildings:** the qualified professional (architect or engineer) is responsible for preparing letters of assurance.<sup>1</sup>

To improve consistency, transparency, and comparability, the **BC Energy Step Code** uses the same metrics for each step, with progressively increasing performance requirements at each step (see Appendix A for a summary of these requirements). The metrics represent modelled energy use in relation to the building envelope and the equipment and systems.

<sup>1</sup>. *Letters of assurance, introduced in the 1992 BC Building Code, are uniform, mandatory documents intended to clearly identify the responsibilities of key professionals in a building project.*

### What is an Energy Model?

An energy model calculates how much energy a proposed building is expected to use. It relates to space heating, hot water heating, ventilation, lighting, appliances, and plug loads. A trained energy modeller who understands modelling software, construction details, an energy model accounts for the size and geometry of the building, the climate location, the assemblies such as walls, ceilings, and windows, and the mechanical systems that heat. Standard operating conditions are assumed for the quantity and living habits of the occupants. Identifies acceptable modelling and procedures (for acceptable practice) refer to Part 8 of the National Energy Code of Canada (NECB) and City of Vancouver Engineering **Professional Practice Guidelines – Whole Building Energy Modelling Services** from Engineering AIBC will provide guidance for using energy models to comply with regulations, incentives, a design tool in developing higher performing buildings.

### Who Prepares Energy Models?



**For Part 9 buildings:** an Energy Advisor can provide both energy model testing - the two compliance services needed for Part 9 buildings. Registered third-party consultants who have been trained and licensed through Natural Resources Canada, and there are numerous registered in BC, Registered Energy Advisors varies by region, it is important to ensure to a Registered Energy Advisor when considering adopting the **BC Energy Step Code**. Find one via [energystepcode.ca/energy-advisors](http://energystepcode.ca/energy-advisors)



**For Part 3 buildings:** an architect, engineer, or trained energy modeller modelling needed to achieve the steps, and numerous architectural firms currently provide these services throughout BC. Many new construction use this approach and are already capable of achieving the Lower Step



## 5.2 The Building Envelope

The "building envelope" refers to the physical barrier separating a building's heated or cooled interior from the outside elements. It includes the walls, roof, floors, windows, skylights, and doors (see Figure 5). If the temperature inside a building is different than the outside, heat will naturally move through the envelope. If a lot of outdoor air seeps into the building, heating or cooling systems may kick in to bring the air to room temperature (especially if it is much colder or warmer outside compared to inside), and this can use a lot of energy. A high-quality building envelope manages the air that moves between indoors and outdoors, and reduces the requirements on a building's mechanical systems.

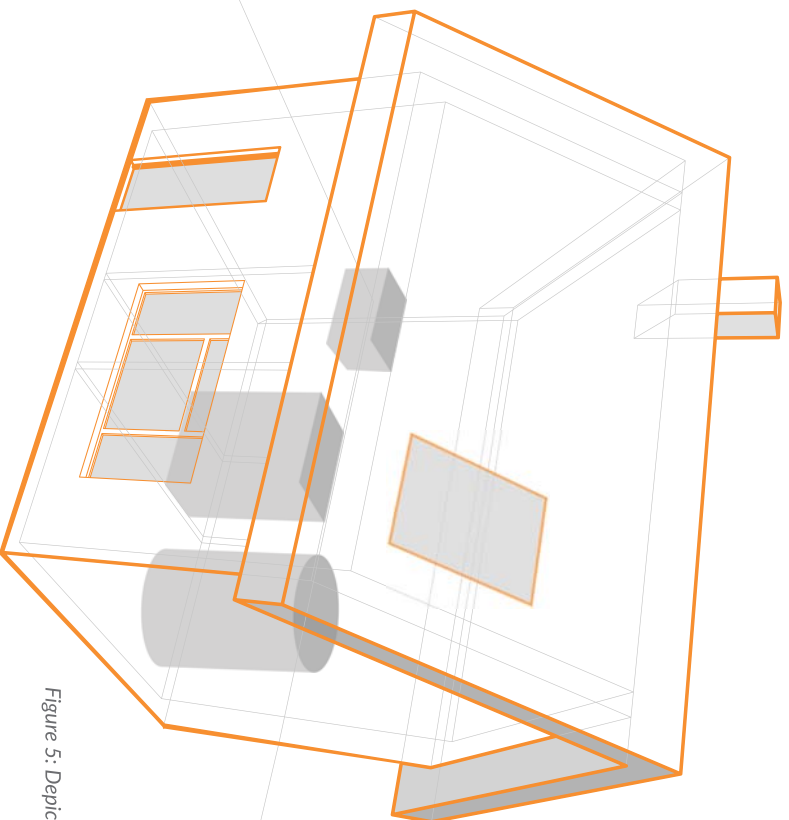


Figure 5: Depiction of the building envelope

The key elements of a high-performance building envelope include:

- **Insulation** that helps to slow the movement of energy through the walls and keeps the building at a comfortable temperature – warm during cold months and cool during warm months.
- **Windows, doors, and skylights** that are well positioned to make optimal use of the sunlight and reduce heat loss on north-facing sides. They are also highly insulated to reduce flow of heat/energy through the glass and frames.
- **Minimized thermal bridges** using special framing techniques, or by installing a continuous layer of insulation around the outside of the whole building. Slab extensions (e.g., for balconies) should be minimized, or use support materials that vastly reduce thermal bridges.
- **Airtightness** that maintains a continuous air barrier around the building, where possible, then seals up any necessary seams – such as those around windows, doors, balconies, and other protrusions.

More information is available in BC Housing's *An Illustrated Guide to Achieving Airtight Buildings*, on [energystepcode.ca](https://energystepcode.ca).

## What is a

A thermal bridge is a path through which heat can escape more quickly than through the rest of the building. For example, a metal roof structure can become a thermal bridge because metal conducts heat much better than the studs. With proper insulation, these bridges can be eliminated. Figure 6 shows the thermal bridges in a house where heat is lost. On the top, the thermal bridge is highlighted in red, as well as the heat loss through the roof. On the bottom, the thermal bridge is highlighted in red, as well as the heat loss through the roof. The thermal bridge has reduced the heat loss through the roof.

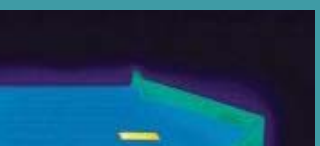


Figure 6: Examples of thermal bridges escaping through the roof, resulting in much less heat

## 5.3 The Equipment and Systems

An energy-efficient building will minimize the energy needed to run all of the heating, cooling, ventilation, and hot water equipment and systems. By focusing first on a high-quality envelope, the energy needed for heating and cooling is already greatly reduced and will require less energy from equipment and systems. That said, there are still significant opportunities to reduce energy use with efficient equipment (see Figure 7 for a depiction of the equipment and systems in a building).

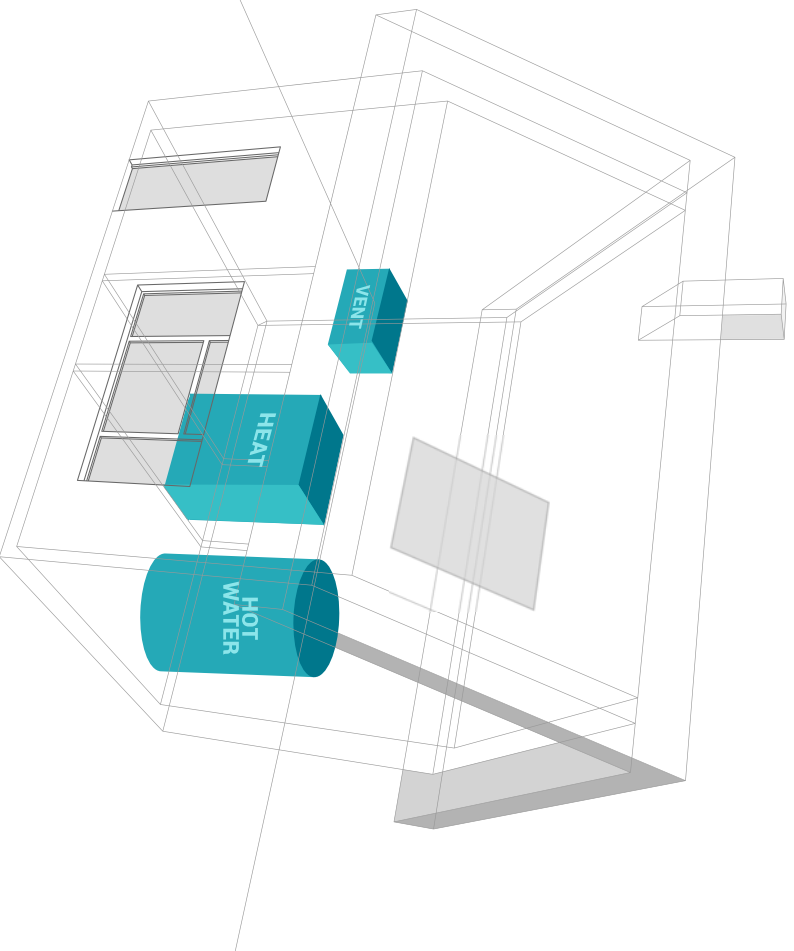


Figure 7: Depiction of the equipment and systems in a building

The key elements of high-performance equipment and systems include:

- **Heating systems** in efficient buildings vary greatly from high-efficiency furnaces and boilers to heat pumps or electric baseboard heating (where the building envelope is very efficient and only a small amount of baseboard heat is needed). An important consideration when selecting a heating system is to ensure it is sized to match the needs of the building.
- **Cooling systems** play a smaller role in energy use in BC, though they may become more important over time as summer peak temperatures increase due to global climate change. While they currently have limited use in homes, they are typically quite efficient in commercial applications. In energy-efficient buildings, cooling can be provided through high-efficiency air conditioning systems, or through heat pumps. Cooling needs are reduced with efficient building envelopes, together with windows that cut solar gain.
- **Ventilation systems** are important for providing fresh air to a building. To be most energy-efficient, these systems will capture and transfer heat from the air exiting the building to the new replacement air entering the building through the use of a Heat or Energy Recovery Ventilator (HRV or ERV). This is also a chance to filter the new air to reduce pollutants.
- **Hot water systems** in efficient buildings vary from high-efficiency tanks and boilers, to on-demand systems that heat water only as needed, to heat-pump systems. Efficient systems may also capture heat from the drainwater and transfer it to preheat the hot water.

Heat-recovery  
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Photo: Spru  
by Kristen M

## 5.4 Airtightness Testing

Airtight construction minimizes air leaks through holes, cracks, or gaps in the building envelope. In addition to reducing the loss of heated air, it also reduces drafts, making the building much more comfortable. Airtight construction involves maintaining a continuous air barrier around the building where possible, then sealing up any necessary seams – such as those around windows, doors, balconies, and other protrusions. **This means paying attention to detail during the construction process to reduce or eliminate holes or gaps in the building's air barrier.** This is already required in the base *BC Building Code*, but there is no requirement to test it.

In the *BC Energy Step Code*, airtightness testing is required for all steps and all building types before occupancy. Part 9 buildings must meet escalating levels of airtightness for Steps 2 to 5. In homes, a "blower door test" is used to evaluate airtightness (see text box to the right for a depiction of an airtightness test).

Although airtightness testing has been used in homes for many years (including as a requirement for Federal and Provincial incentive programs in the past), the testing of airtightness in large commercial buildings is a newer practice in BC.<sup>1</sup> The *BC Energy Step Code* introduces required airtightness testing and reporting using specific methods for all Part 3 buildings, but there are no required levels of airtightness that must be met to achieve the steps. Note that the building energy model must account for the result of the airtightness tests for Part 3 buildings in Steps 2 to 4.

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1. Although newer to BC, all commercial and residential buildings over three stories have required whole-building airtightness testing in Washington State and Seattle building codes since 2009.

### What is a Blower Door Test?

A **blower door test** is a standardized test to measure how tightly a building is sealed against air loss. To perform the test, a technician closes all doors and temporarily installs that uses an integrated fan (see Figure 8). The fan changes the pressure inside the building to measure how quickly air is entering or leaving the building via cracks and leaks. The test air passes through the building envelope, when the building is at a specified pressure. When required pre-occupancy, it may also be helpful at a midpoint inspection to ensure any leaks repaired before drywall is in place.



Figure 8: Blower door test in action

## 5.5 Metrics used in the BC Energy Step Code

The following metrics are used in the **BC Energy Step Code** to assess which step a building achieves. The Building Envelope Metrics and the Equipment and Systems Metrics demonstrated through a whole-building energy model of the design, while the Airtightness Metric is demonstrated through an on-site test of the building before occupation. See **Appendix A** for a table of the required values by step for different climate zones and different building types.

	PART 9	PART 3
<b>Building envelope metrics</b>	<b>Thermal Energy Demand Intensity (TEDI):</b> The amount of annual heating energy needed to maintain a stable interior temperature, through the envelope and passive gains (i.e., the amount of heat gained from solar energy passing through the envelope or from lights, and body heat). It is calculated per unit of area of the conditioned space over the course of a year, and expressed in kWh/(m <sup>2</sup> -year).	
<b>Equipment and systems metrics</b>	<p><b>Percent Lower than EnerGuide Reference House:</b> An EnerGuide reference house establishes how much energy a home would use if it was built to base building code standards. This metric identifies how much less energy - stated as a percentage - the new home will require compared to the reference house.</p> <p><b>Mechanical Energy Use Intensity:</b> The modelled amount of energy used by space heating and cooling, ventilation, and domestic hot water systems, per unit of area, over the course of a year, expressed in kWh/(m<sup>2</sup>-year).</p>	<b>Total Energy Use Intensity:</b> The modelled amount of energy used by the building, per unit of area, over the course of a year. It includes plug loads - appliances, lighting, and other equipment - on - and process loads, namely heating, cooling, and ventilation systems. Some exceptions for unique situations (e.g., electric vehicle charging), as outlined in the <b>BC Energy Step Code</b> regulation. This metric is used for specific buildings that have high process loads, such as hospitals, or large computer server farms).
<b>Airtightness metrics</b>	<b>Air Changes per Hour at a 50 Pa Pressure Differential (ACH<sub>50</sub>):</b> The number of times the full volume of air in the building exchanges in an hour when a building is at a specified pressure, different than the outdoor air pressure, as measured by a "blower door test". This measures the airtightness of the building (or how much air leaks through the building envelope).	<b>Air Leakage Rate:</b> A measure of the rate that air leaks through the building envelope per unit area of the building envelope at a 75 Pa pressure differential.

For a detailed current listing of the **BC Energy Step Code** metrics and technical requirements, please visit [energystepcode.ca/requirements](https://energystepcode.ca/requirements)





# 6

## Conclusion

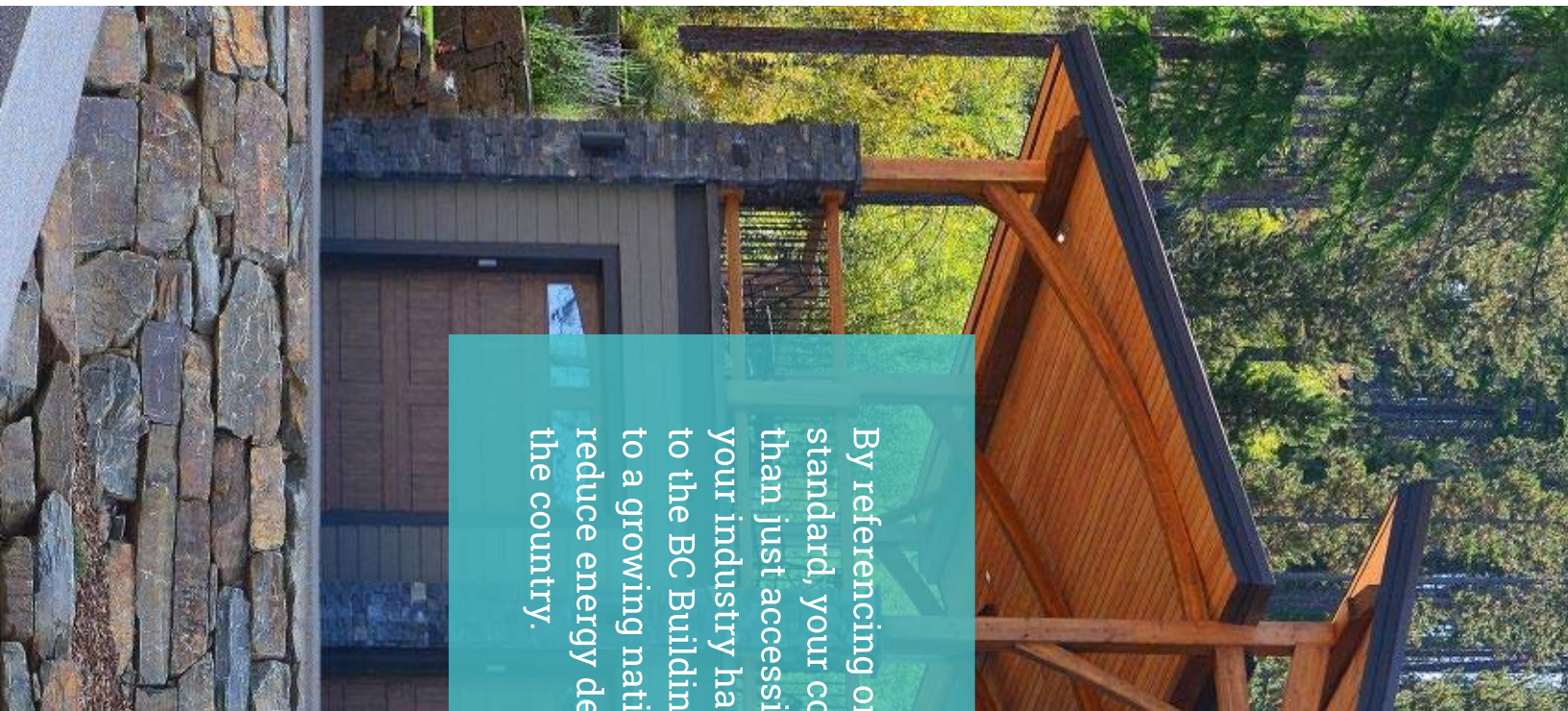
The **BC Energy Step Code** emerged from a desire to provide a consistent set of higher-efficiency standards for the building industry, while offering local governments a simple and effective set of standards to support their efforts to meet targets for energy efficiency and greenhouse gas emissions. The Energy Step Code Council is keenly interested in ensuring the **BC Energy Step Code** is adopted in a coordinated and thoughtful manner to ensure these benefits come to fruition for all parties. For that reason, it is important that local governments follow the guidance offered in this document.

Governments that do adopt one or more steps of the **BC Energy Step Code** will be getting a head start on coming revisions to the base **BC Building Code**. In its December 2018 CleanBC plan, the province signalled that the shift to net-zero energy-ready buildings will occur over three code cycles, with progressively greater levels of energy efficiency requirements over 2018 base building code in 2022 (20% more energy efficient), 2027 (40% more energy efficient) and 2032 (80% more energy efficient).

The Energy Step Code Council is also encouraging local government leadership by requiring the Upper Steps for any public-building project that may be on the horizon, such as a community centre or public-safety complex. These buildings will serve as high-profile case studies – building local capacity while demonstrating to the market what can be accomplished.

By referencing one or more steps of the standard, your community is doing more than just accessing co-benefits and ensuring your industry has a head start on changes to the **BC Building Code**. It is contributing to a growing national effort to dramatically reduce energy demand in buildings across the country.

*Photo: Energy efficient home in Kimberley BC, that participated in the City's program. Photo by Chris Pullen, Cranbrook Photo (Part 9, at least Step 2).*



By referencing one standard, your community has more access than just access to the BC Building Code. It is contributing to a growing national effort to dramatically reduce energy demand in buildings across the country.

# Appendix A: Relation Between BC Energy Step Code and Other Certification Programs

The following table provides an approximate “equivalency” between certification standards developed by third parties and the **BC Energy Step Code**, where such a comparison is possible. The table may assist with local governments that are transitioning existing programs and bylaws to conform with the changes to the **Building Act**. Compliance or certifications to third-party standards do not guarantee compliance with the **BC Energy Step Code**.

Part 9:

STEP 1	EnerGuide Rating System, Built Green Bronze
STEP 2	Built Green Silver
STEP 3	ENERGY STAR, Built Green Gold and Platinum
STEP 4	R2000
STEP 5	Passive House, Net-Zero Energy-Ready

There are several certification programs and rating systems that support greater energy efficiency, but equivalencies to the **BC Energy Step Code** have not been established for every program. Some also address aspects of building design that are beyond the scope of the **BC Energy Step Code**. Programs such as LEED and Built Green take a holistic approach, addressing a broad spectrum of direct and indirect sources of GHG emissions as well as important aspects of sustainability such as water efficiency, ecological impact, and the health and wellness of occupants. The energy efficiency requirements of the available certification programs and rating systems may align and contribute to the achievement of the **BC Energy Step Code**. For example, the EnerGuide rating system can be the basis for demonstrating compliance to steps 1, 2, 3 and 4 of the **BC Energy Step Code** for Part 9 buildings, as detailed earlier in this document. In turn, the LEED rating system leverages the EnerGuide Rating System to establish a minimum required level of energy performance and award points for greater efficiency; this facilitates the voluntary application of LEED in conjunction with the **BC Energy Step Code**.





“ The BC and ac to ach The Ur aligne with th aggres as we : simult both e  
John Ma  
Engineer



A photograph of a row of brick townhouses with a teal overlay. The townhouses have multiple windows and balconies. A small tree is in the foreground. A teal rectangular box is positioned on the right side of the image, containing white text.

Visit the BC Energy Step Code  
([energystepcode.ca](http://energystepcode.ca)) for resour  
training publications, and wel



# Consulting on the BC Energy Step Code

Information retrieved from the following location: [https://energystepcode.ca/implementation\\_updates/](https://energystepcode.ca/implementation_updates/)

These local governments have submitted their [initial notification](#), indicating they have started to consult on the BC Energy Step Code (listed by date of submission).

The \* symbol in this list means the local government now references the BC Energy Step Code in a policy, program or bylaw.

1. City of Richmond – June 16, 2017\*
2. City of North Vancouver – July 4, 2017\*
3. City of Campbell River – July 10, 2017\*
4. City of Duncan – August 24, 2017\*
5. District of North Vancouver – September 1, 2017\*
6. City of Victoria – September 27, 2017\*
7. District of Saanich – September 27, 2017\*
8. Comox Valley Regional District – October 3, 2017\*
9. District of North Saanich – October 4, 2017\*
10. Resort Municipality of Whistler – October 5, 2017\*
11. District of West Vancouver – October 24, 2017 \*
12. Township of Langley – November 7, 2017\*
13. District of Squamish – November 9, 2017\*
14. City of New Westminster – November 28, 2017\*
15. City of Surrey – December 7, 2017\*
16. City of Kelowna – January 22, 2018\*
17. City of Penticton – January 27, 2018\*
18. City of Burnaby – March 1, 2018\* (resubmitted April 10, 2019 to add Part 9 consultation)
19. City of Kimberley – March 12, 2018\*
20. City of Vernon – March 19, 2018
21. Village of Belcarra – March 27, 2018\*
22. District of Peachland – March 28, 2018
23. District of Oak Bay – April 11, 2018\*
24. City of West Kelowna – April 12, 2018
25. District of Sparwood – April 23, 2018\*
26. District of Summerland – June 5, 2018
27. District of Lake Country – June 7, 2018\*
28. City of Nanaimo – June 25, 2018
29. City of Kamloops – July 17, 2018\*
30. District of Central Saanich – July 17, 2018\*
31. City of Port Moody – September 24, 2018\*
32. City of Nelson – October 9, 2018\*
33. Village of Anmore – October 22, 2018\*
34. District of Elkford – November 6, 2018
35. City of Abbotsford – January 28, 2019

36. City of Rossland – February 8, 2019\*
37. Town of Creston – February 22, 2019
38. Village of New Denver – February 28, 2019
39. Bowen Island Municipality – March 4, 2019\*
40. Regional District of East Kootenay – March 12, 2019
41. Village of Kaslo – March 25, 2019
42. City of Port Coquitlam – April 23, 2019
43. City of Maple Ridge – May 31, 2019
44. Village of Pemberton – June 21, 2019\*
45. Municipality of North Cowichan – August 21, 2019
46. City of Powell River – September 4, 2019
47. Town of Smithers – September 4, 2019
48. City of Salmon Arm – September 11, 2019
49. Regional District of Central Kootenay – September 13, 2019
50. City of Terrace – September 13, 2019
51. City of Courtenay – October 3, 2019
52. City of Colwood – October 9, 2019
53. Village of Golden – October 15, 2019
54. Village of Nakusp – October 16, 2019
55. Village of Slocan – October 17, 2019
56. Town of View Royal – October 25, 2019
57. Town of Comox – October 25, 2019
58. City of Fernie – October 29, 2019
59. District of Ucluelet – October 31, 2019
60. City of Pitt Meadows – Jan. 29, 2020
61. City of Prince George – Feb. 19, 2020
62. Town of Gibsons – Feb. 20, 2020

## **Bowen Island Municipality**

Starting October 9, 2019, all new construction and substantial renovations on Bowen Island will need to meet Step 1 of the BC Energy Step Code. By assuring building energy efficiency, we are contributing to our goal of reducing greenhouse gas emissions by 33% from 2007 by 2020. This is part of Bowen's [Climate Action Program](#).

By using the provincial standard, Bowen Island is joining [44 other municipalities](#) (and growing) across the province in working towards a single, performance-based standard.

In 2020, the requirement will increase to Step 3, which mandates good building energy performance.

Bowen Island Municipality has been awarded \$12,000 in rebate funds from BC Hydro's Energy Step Code Building Incentive Offer. To be eligible, the project must be a Part 9 (i.e. residential) building with a building permit application submitted on or after BC Energy Code regulations become mandatory. Rebates of up to \$250 will be available for energy modeling costs and up to another \$250 for the post-construction blower door test, with a maximum of \$500 per project.

- For more information, visit the [Bowen Island Municipality website](#).

## **City of Burnaby**

The City of Burnaby is taking a phased approach to the implementation of the BC Energy Step Code, starting with Part 3 policy. Part 9 policy is currently in development.

- Read the [City of Burnaby's Council Report for New Part 3 buildings](#) approved Nov. 19, 2018
- Learn more from the City of Burnaby's [Green Buildings web page](#)

## **City of Campbell River**

The City of Campbell River offers financial incentives for new energy-efficient residential buildings constructed to meet the BC Energy Step Code. Incentives are available starting April 1, 2018, while funding is available.

- Learn about the [City of Campbell River's incentive program](#)

## **City of Duncan**

A density bonus is permitted in several residential and commercial zones (Medium Density Residential Zone, High Density Residential Zone, Downtown Comprehensive Zone, and Neighbourhood Commercial Zone) that permit medium to high density development if the developer meets at least one of three conditions. One condition is that "the entire development achieves or exceeds British Columbia Energy Step Code Level 3 energy efficient requirements."

The City is currently considering future Step Code requirements.

- Learn more about the [City of Duncan's zoning bylaws \(PDF, 1.7 MB\)](#)

## City of Kamloops

The City of Kamloops will implement a voluntary BC Energy Step Code compliance program Oct. 1, 2019 with incentives for builders who choose to participate. Effective January 1, 2022, the City of Kamloops will require all Part 9 buildings to meet Step 3. This date was chosen to provide a clear date of adoption to give the building community adequate time to prepare.

- Visit the [City of Kamloops' BC Energy Step Code website](#) for more information

## City of Kelowna

Kelowna's BC Energy Step Code Implementation Strategy for Part 9 residential buildings was endorsed by Council on May 6th, 2019, with the following key dates:

- December 1, 2019: Step 1 implementation – Part 9 residential buildings must be designed and constructed to meet or exceed Step 1 performance requirements
- June 1, 2021: Step 3 implementation – Part 9 residential buildings must be designed and constructed to meet or exceed Step 3 performance requirements

Visit the [City of Kelowna's website](#) to learn more, sign up for email updates or find out about Building Permit rebate opportunities.

## City of Kimberley

The City of Kimberley's Energy Efficient Building Incentive Program (EEBIP) is a simple and pragmatic approach to help local builders learn and adapt to new methods and materials to reduce the energy demand and carbon emissions associated with the heating and cooling of buildings. Since the program was modified in 2017 to reference the BC Energy Step Code, each completed project has achieved at least Step 3 or better. The City of Kimberley's program has been effective in helping improve the knowledge and expertise of local builders in high-performance building construction, and the quality and energy efficiency of new buildings .

- Learn about [Kimberley's Energy Efficiency Building Incentive Program](#)
- Read the [City of Kimberley's Building Bylaw 2620](#)

## City of Nelson

All new applications for single and small multi-family dwellings received on or after August 1, 2019 will have to achieve minimum Step 1 of the BC Energy Step Code. All applications will have to include a pre-construction report from a certified energy advisor and building permits will not be closed until a post-construction report and confirmation is provided that Step 1 has been achieved. The City is considering moving to Step 2 or 3 within 6 to 12 months of Step 1 adoption, depending on rollout.

- Read the [City of Nelson's Building Bylaw 3456, 2019](#)
- Review the [City of Nelson Council Report](#)



## **City of New Westminster**

On February 25, 2019, City of New Westminster Council gave final reading and officially adopted Building Bylaw Amendment No. 8084, 2019, requiring new buildings to achieve a minimum level of the BC Energy Step Code effective March 31, 2019 for Part 9 residential buildings, and effective January 1, 2020 for Part 3 multi-unit residential and commercial buildings. This capped 18 months of industry and City staff engagement, as well as background analysis to develop a BC Energy Step Code framework. In tandem, the City is delivering a comprehensive program of industry training, builder/developer Breakfasts, and incentives on energy modeling to support implementation. Watch for the City's new BC Energy Step Code website coming fall 2019.

- Read about the [City of New Westminster's intended approach](#)
- Visit [Energy Save New West](#) to learn more

## **City of North Vancouver**

The City of North Vancouver has put into place a robust and visionary implementation approach that targets buildings city-wide at lower levels of the BC Energy Step Code, with incrementally higher steps within the city's Rezoning Policy, and at highest steps in exchange for density in specific neighbourhoods.

- Learn about the [City of North Vancouver's approach to the BC Energy Step Code](#)

## **City of Penticton**

The City of Penticton will be implementing Step 1 on March 15, 2019 for all Part 9 residential buildings as regulated within City of Penticton Building Bylaw No. 2018-01 Part 26. This timeline is based on initial Building Bylaw amendment feedback and will allow for more education for industry in working with Energy Advisors and on detailing for air barriers.

- Learn more about the [City's Building Bylaw](#) and the [Bylaw modernization process](#)
- Find out about the [City's final public engagement](#)

## **City of Port Moody**

The City of Port Moody endorsed an early adoption strategy for the BC Energy Step Code on July 9, 2019.

Starting Sept. 1, 2019:

- Part 9 rezoning applications must meet Step 3 of the BC Energy Step Code
- Part 3 rezoning applications must meet Step 3 of the BC Energy Step Code OR Step 2 with the installation of a low-carbon energy system

Starting Jan. 1, 2020:

- Part 9 and Part 3 (office, retail, and hotel) building permit applications must meet Step 1 of the Energy Step Code; and
- Part 3 large residential building permit applications must meet Step 2 of the BC Energy Step Code OR Step 1 with the installation of a low carbon energy system

The full report can be found from pages 85-112 [here](#) (PDF, 43.4 MB).

### **City of Richmond**

The City of Richmond formally adopted bylaws enacting the BC Energy Step Code at a Public Hearing held July 16, 2018. The BC Energy Step Code will enter into force for new Building Permit applications as of September 1, 2018 (noting that there are in-stream provisions for projects with Development Permits issued or in process).

- Learn about the [City of Richmond's stakeholder consultation process](#) and [Airtightness Training Program](#)
- Read the [City of Richmond's Report to Council](#)
- Review the [City of Richmond's bylaw changes](#) (re: Building Development Bylaw, Zoning Bylaw, Richmond Official Community Plan bylaw)
- City of Richmond Building Bulletins:
  - Bulletin 37 – [Energy Step Code: Overview for Part 9 Buildings](#)
  - Bulletin 38 – [Building to the Energy Step Code: Single-Family Dwellings and Duplexes](#)
  - Bulletin 39 – [Building to the Energy Step Code: Part 9 Townhouses and Apartments](#)
  - Bulletin 40 – [Building to the Energy Step Code: Part 3 Buildings](#)

### **City of Rossland**

The City of Rossland passed a resolution to adopt Step 1 by December 15, 2019 and is offering an incentive and rebate program to help builders/designers learn and adapt to the coming change. Rossland offers a \$500 incentive grant for the services of an Energy Advisor, and further incremental discounts on Building Permit fees to promote the BC Energy Step Code for new home construction.

- Learn more about the [City of Rossland's Energy Efficient Building Incentive Program](#)
- Read the [City of Rossland's incentive policy](#)

## City of Surrey

The City of Surrey has adopted the [BC Energy Step Code](#) effective April 2019. Starting April 1, 2019, the Step Code will apply to new, BC Building Code Part 3 and Part 9 commercial and residential buildings in Surrey, changing the City's inspection, permitting and review processes and requirements for new construction.

- Visit the [City of Surrey's BC Energy Step Code website](#)
- Review the [City of Surrey's Corporate Report](#)
- Sign up for [Email Alerts](#) to stay up-to-date on what's happening in Surrey
- Email [stepcode@surrey.ca](mailto:stepcode@surrey.ca) if you have questions about Surrey's approach

## City of Victoria

Victoria City Council adopted the BC Energy Step Code on April 26, 2018, and ratified the Bylaw on October 4, 2018. Beginning November 1, 2018, there is an interim transition period during which builders and developers will need to meet Step 1, meaning they will need to use an energy model and conduct airtightness testing in the building. Then, beginning January 1, 2020, all new construction will be built to be 20% more energy efficient than current code requirements. The City will support builders to use an energy model, conduct a mid-construction blower door test, a post-construction blower door test, and secure a home energy label through a \$500 rebate supported by BC Hydro.

- Review the [City of Victoria's council report describing the adoption approach](#)
- Review the [City's updated website information](#)

## Comox Valley Regional District

The [Comox Valley Regional District is offering rebates](#) for new residential dwellings that achieve at least Step 3 of the BC Energy Step Code. The rebates will range from 25% for achieving Step 3 to 100% for achieving Step 5. The program started on January 1, 2018.

- Learn about Comox Valley Regional District's [Planning and Building Application Fee Rebates Policy](#)

## District of Central Saanich

The District of Central Saanich is moving forward requiring Step 1 of the BC Energy Step Code in 2020. Starting January 1, 2021, Step 2 or 3 construction will be required, depending on building type. These bylaw requirements followed a public consultation, which included reaching out to the building industry and the general community.

To encourage higher step code construction, the District is offering rebates on building permit fees ranging from 25% for achieving Step 3 to 100% for reaching Step 5, when building to a higher step than required. The District of Central Saanich currently requires Step 3 compliant construction for those buildings constructed following a rezoning approval.

- Learn more about the [District of Central Saanich's approach](#)

## **District of Lake Country**

District of Lake Country adopted a new Building Regulation Bylaw effective March 5, 2019 and will be implementing Step 1 of the BC Energy Step Code for all Part 9 buildings effective April 1, 2019. Step 3 will be implemented for all Part 9 buildings other than accessory suites effective October 1, 2020. Accessory Suites will be required to meet Step 2, effective Oct 1, 2020 and Step 3 effective January 1, 2022.

- Read the [February 2019 Report to Council about the Building Bylaw amendments](#)
- Visit the [District of Lake Country's website](#)

## **District of North Saanich**

The District of North Saanich formally adopted bylaws enacting the BC Energy Step Code on October 22, 2018. Effective January 1, 2019, all Part 9 and Part 3 buildings will be required to be built to Step 1 requirements. Effective January 1, 2020, Part 9 and Part 3 buildings will be required to meet Step 3 requirements, except Part 9 buildings equal or less than 92 square meters in size, which will only require Step 2 compliance.

- Learn more about the [District of Saanich's approach](#)

## **District of North Vancouver**

The District of North Vancouver has a new Construction Bylaw that also adopts the BC Energy Step Code in the following manner, effective July 1, 2018:

- All Part 3 Commercial Buildings are required to meet Step 1
- All Part 3 Residential Buildings are required to meet Step 2
- Part 3 Residential Projects that require rezoning will be required to meet Step 3
- All Part 9 Residential Buildings are required to meet Step 3
- Learn more about the [District of North Vancouver's BC Energy Step Code actions](#)

## **District of Oak Bay**

On October 9, 2018, the District of Oak Bay Council adopted the BC Energy Step Code. As of November 1, 2018 all new Part 3 and Part 9 buildings are required to meet Step 1 of the BC Energy Step Code. This will transition up to Step 2 for Part 3 buildings and Step 3 for Part 9 buildings effective January 1, 2020.

- Visit the [District of Oak Bay's website](#) for more information
- Review the District of Oak Bay's [May 2018 Council Report](#) and [July 2018 Council Report](#) outlining their approach



## **District of Saanich**

From June 1 to December 31, 2019, building permits for new buildings (Part 9 and Part 3 buildings) in the District of Saanich will need to demonstrate compliance with Step 1 of the BC Energy Step Code. Building permits applied for on or after January 1, 2020 will need to demonstrate compliance with the steps adopted for their particular building typology.

- Learn more about the [District of Saanich's program](#)

## **District of Sparwood**

The District of Sparwood Energy Step Code Policy is designed to encourage builders to choose the performance path when complying with BC Building Code energy-efficiency requirements. This will assist in understanding and adapting to BC Energy Step Code requirements. Rebates range from \$500 plus a contribution to Energy Advisor Fees for Step 1 compliance, to 100% of Building Permit fees plus a contribution to Energy Advisor Fees for Step 5 compliance.

- Learn about [Sparwood's rebate program](#)
- Review [Sparwood's Energy Step Code Policy](#) (prepared 2018) or read the [2018 Report to Council](#)

## **District of Squamish**

The BC Energy Step Code went into effect in the District of Squamish on July 1, 2018.

- Visit the [District of Squamish's BC Energy Step Code web page](#)
- Read the [District of Squamish's building bylaw](#)
- Learn more on the [District of Squamish's builders' corner blog](#)

## **District of Tofino**

The District of Tofino adopted a BC Energy Step Code policy June 11, 2019 that all new residential buildings will be built to a minimum of Step 1 no later than January 31, 2020. This will increase to Step 2 by January 2021, and Step 3 by January 2022.

- Read the [District of Tofino's Report to Council](#)
- Read [Tofino's draft Step Code Policy](#) approved June 11, 2019

## **District of West Vancouver**

The North Shore municipalities (City and District of North Vancouver and District of West Vancouver) have aligned the minimum bylaw requirement for almost all building types, effective July 1, 2018. In support of high-performance buildings, West Vancouver Council has directed staff to bring forward bylaw amendments to remove barriers, and to formalize common deliverables through rezoning into a policy that increases clarity for applicants, staff and the community.

- Learn about the [District of West Vancouver's Building Bylaw amendments](#)

## **Resort Municipality of Whistler**

The Resort Municipality of Whistler will require all Part 9 residential buildings to meet Step 3 of the BC Energy Step Code effective January 1, 2019. Step 4 of the Energy Step Code will apply to all new Part 9 residential buildings on properties applying for rezoning to increase density or permit additional uses, and any new residential buildings that include construction of additional in-ground basement floor area excluded from gross floor area calculations.

- Visit the [Resort Municipality of Whistler's website](#) to learn more about their approach

## **Township of Langley**

The Township of Langley adopted the BC Energy Step Code for use in new residential construction within the Township, effective January 1, 2019. The approach consists of:

- Applying varying lower-step requirements in different areas of the community based on industry capacity to support market transformation, with an intent to apply harmonized requirements community wide within five years
- Clearly identifying the roadmap for the intended timeline to incrementally adopt lower steps within the community using a gradual transition for the next five years, with an intent to monitor progress during these transitional years before considering progression to adoption of higher steps
- Providing a six-month transition grace period for in-stream projects
- Transitioning the existing Green Building Rebate program by continuing to offer financial incentives for voluntary performance beyond the applicable required level of performance
- Continuing to offer financial incentives to encourage ongoing training and education to support capacity building in industry
- Visit the [Township of Langley's website](#) or read the [Report to Council](#) for more details

## **University of British Columbia**

The UBC Residential Environmental Assessment Program (REAP) is UBC's green building rating system and REAP gold certification is required in UBC's neighbourhoods. On September 27, 2018, the UBC Board of Governors approved amendments to REAP, requiring new Part 3 residential construction at UBC Point Grey campus to meet a minimum of Step 2 of the BC Energy Step Code. Optional credits within REAP can be obtained for projects that achieve higher steps.

- Visit [UBC's green buildings website](#)
- Learn more about UBC's [Residential Environmental Assessment Program \(page 55\)](#)

## **Village of Anmore**

On February 19, 2019, the Council of the Village of Anmore approved an amendment to the Village of Anmore Building Bylaw to require compliance with Step 1 of the BC Energy Step Code for construction of all new single family dwellings.

- Review the [Village of Anmore Builder Advisory Notice](#) for more information
- Visit the [Village of Anmore's website](#)

## **Village of Belcarra**

The Village of Belcarra updated its zoning bylaw based on the recommendations of a Zoning Advisory Committee. The updated bylaw requires all new construction for principal and conditioned accessory buildings built under Part 9 of the BC Building Code to fulfill the requirements of Step 3 of the BC Energy Step Code, and for all new construction for principal and conditioned accessory buildings built under Part 3 of the BC Building Code to fulfill the requirements of Step 2 of the BC Energy Step Code. The updated bylaw was adopted by Council in April 2018, with BC Energy Step Code requirements taking effect September 27, 2018.

- Review the [Village of Belcarra's Bylaw 510 – Zoning Bylaw](#)
- Visit the [Village of Belcarra's website](#)

## **Village of Pemberton**

The Village of Pemberton has set requirements for Part 9 buildings effective January 1, 2020, with higher steps required starting in 2021.

- Read the [Village of Pemberton's Building Bylaw No. 867, 2019](#)
- Visit the [Village of Pemberton's website](#)

## **City of Vancouver**

While not subject to the BC Energy Step Code, the City of Vancouver has its own zero emissions building plan. The Plan has four strategies to require the majority of new buildings to have no operational greenhouse gas emissions by 2025, and all new buildings to have no greenhouse gas emissions by 2030.

- Learn more about the [City of Vancouver's zero emissions building plan](#)

## **BC Energy Step Code Requirements**

### **BCBC 2018 Revision 2: Effective December 12, 2019**

#### **Application**

Applies to building permits applied for on or after December 12, 2019.

#### **Code Requirements**

- [Ministerial Order BA 2019 6 \(PDF\)](#), amending the British Columbia Building Code, amended the requirements of the BC Energy Step Code effective December 12, 2019
- You can also find the requirements in the [free online BC Building Code 2018](#)

#### **Summary – Part 3 Buildings**

- Climate zone 4 (Degree Days below 18°C less than 3000)
  - No change to the TEDI and TEUI requirements for Group C, D and E occupancies established in BCBC 2018 Revision 1
- Climate zones outside of climate zone 4 (Degree Days below 18°C is greater than or equal to 3000)
  - New distinct TEDI and TEUI requirements based on climate zone for Group C, D and E occupancies across the province
- All climate zones
  - The introduction of Step 1 for some Group A (Assembly) and Group B, Divisions 2 and 3 (Treatment and Care) occupancies but no intensity requirements yet
- Requirements available for these occupancies only:
  - Group A (Assembly) – Step 1 only for schools (other than universities or colleges), libraries, colleges (other than schools or universities), recreation centres
  - Group B, Divisions 2 and 3 (Treatment and Care) – Step 1 only for hospitals and care centres
  - Group C (Residential) – with unique metrics for hotels/motels that reflect the heavier energy loads of these Group C occupancies
  - Group D (Business and Personal Services) – with unique metrics for offices that reflect the lighter energy loads of these Group D occupancies
  - Group E (Mercantile)
- Learn more by reading [Technical Bulletin 19-08 \(PDF\)](#).

#### **Summary – Part 9 Buildings**

- All climate zones
- Residential occupancies only
- No change to the TEDI requirements introduced in BCBC 2018 Revision 1, but two additional compliance options now available:
  - Using an adjusted TEDI based on Degree Days below 18°C or
  - Using a percent better (than the EnerGuide Reference House) approach for annual heating demand for the performance requirement of the building envelope



## PART 16: ENERGY CONSERVATION AND GHG EMISSION REDUCTION

- 16.1 In relation to the conservation of energy and the reduction of *GHG* emissions, the District incorporates by reference the *energy step code* in accordance with sections 16.2 through 16.4.
- 16.2 For the years 2020 – 2025:
- (a) A *building*, which is a wood framed residential building six (6) stories or less in *building height*, or regulated by Part 9 of the *building code*, *must* be designed and *constructed* to meet the minimum performance requirements specified in step three (3) of the *energy step code*; or
  - (b) All other *buildings* regulated by Part 3 of the *building code*, *must* be designed and *constructed* to meet the minimum performance requirements specified in step two (2) of the *energy step code*.
- 16.3 For the years 2025 – 2027:
- (a) A *building* which is a wood framed residential building six (6) stories or less in *building height*, or regulated by Part 9 of the *building code*, *must* be designed and *constructed* to meet the minimum performance requirements specified in step four (4) of the *energy step code*; or
  - (b) All other *buildings* regulated by Part 3 of the *building code*, *must* be designed and *constructed* to meet the minimum performance requirements specified in step three (3) of the *energy step code*.
- 16.4 For the year years 2027 onward:
- (a) A *building* which is a wood framed residential building six (6) stories or less in *building height*, or regulated by Part 9 of the *building code*, *must* be designed and *constructed* to meet the minimum performance requirements specified in step five (5) of the *energy step code*; or
  - (b) All other *buildings* regulated by Part 3 of the *building code*, *must* be designed and *constructed* to meet the minimum performance requirements specified in step four (4) of the *energy step code*.

**From the 2018 BCBC**  
As amended in December 2019

**Section 9.36. Energy Efficiency (Part 9 Buildings)**

9.36.1. General

9.36.1.1. Scope

- 1) This Section is concerned with the energy used by buildings as a result of
- a) the design and construction of the building envelope, and
  - b) the design and construction or specification of systems and equipment for
    - i) heating, ventilating or air-conditioning, and
    - ii) service water heating. (See Note A-9.36.1.1.(1).)

9.36.1.2. Definitions

- 1) For the purpose of this Section, the term “common space” shall mean all spaces required to be conditioned spaces by Article 9.33.2.1. that are not within a suite but shall not include crawl spaces and vertical service spaces. (See Note A-9.36.1.3.(3).)
- 2) For the purpose of this Section, the term “overall thermal transmittance,” or U-value, shall mean the rate,  $\text{inW}/(\text{m}^2\cdot\text{K})$ , at which heat is transferred through a building assembly that is subject to temperature differences. (See Note A-9.36.1.2.(2).)
- 3) For the purpose of this Section, the term “effective thermal resistance,” or RSI value, shall mean the inverse of the overall thermal transmittance of an assembly, in  $(\text{m}^2\cdot\text{K})/\text{W}$ . (See Note A-9.36.1.2.(3).)
- 4) For the purpose of this Section, the term “fenestration” shall mean all building envelope assemblies, including their frames, that transfer visible light, such as windows, clerestories, skylights, translucent wall panels, glass block assemblies, transoms, sidelights, sliding, overhead or swinging glass doors, and glazed inserts in doors, etc. (See Note A-9.36.1.2.(4).)

**9.36.1.3. Compliance and Application**

(See Note A-9.36.1.3.)

- 1) Except as provided in Sentences (2) to (5), buildings shall comply with
- a) the prescriptive or trade-off requirements in Subsections 9.36.2. to 9.36.4.,
  - b) the performance requirements in Subsection 9.36.5.,
  - c) notwithstanding Article 1.1.1.1. of Division A of the NECB, the NECB, **or**
  - d) Subsection 9.36.6.**
- 2) Subsections 9.36.2. to 9.36.4. apply to
- a) buildings of residential occupancy to which Part 9 applies,
  - b) buildings containing business and personal services, mercantile or low-hazard industrial occupancies to which Part 9 applies whose combined total floor area does not exceed 300 m<sup>2</sup>, excluding parking garages that serve residential occupancies, and
  - c) buildings containing a mix of the residential and non-residential occupancies described in Clauses (a) and (b).

- 3) Subsections 9.36.5. and 9.36.6. apply only to
- a) houses with or without a secondary suite, and
  - b) buildings containing only dwelling units and common spaces whose total floor area does not exceed 20% of the total floor area of the building. (See Note A-9.36.1.3.(3).)
- 4) Buildings containing non-residential occupancies whose combined total floor area exceeds 300 m<sup>2</sup> or medium-hazard industrial occupancies shall comply with the NECB.
- 5) Buildings or portions of buildings that are not conditioned spaces, and residential buildings that are not intended for use in the winter months on a continuing basis, are exempted from the requirements of this Section. (See Note A-9.36.1.3.(5).)

### **9.36.6. Energy Step Code**

#### **9.36.6.1. Application**

- 1) Where a building contains more than one dwelling unit, the requirements of this Subsection shall apply to the energy performance of the building and not to individual dwelling units.

#### **9.36.6.2. Definitions (See Note A-9.36.6.2.)**

- 1) For the purpose of this Subsection, the term “mechanical energy use intensity” shall mean a metric of the energy used over a year by the building, estimated by using an energy model in accordance with Article 9.36.6.4., normalized per square metre of floor area of conditioned space and expressed in kWh/(m<sup>2</sup>•year), for all of the following combined:

- a) space-heating equipment,
- b) space-cooling equipment,
- c) fans,
- d) service water heating equipment,
- e) pumps, and
- f) auxiliary HVAC equipment (see Note A-9.36.6.2.(1)(f)).

- 2) For the purpose of this Subsection, the term “EnerGuide Rating % lower than EnerGuide Reference House” shall mean the metric that results when, using HOT2000 software, version 11 or newer and Natural Resources Canada’s EnerGuide Rating System, version 15 or newer, the energy consumption of the following are compared:

- a) the proposed building, not including the EnerGuide assumed electric base loads, and
- b) the corresponding automatically-generated reference house, not including the EnerGuide assumed electric base loads.

## **Section 10.2. Energy Efficiency (Part 3 Buildings)**

### **10.2.1. General**

#### **10.2.1.1. Application**

- 1) This Section does not apply to **(Part 9)** buildings described in Sentence 1.3.3.3.(1) of Division A.

## 10.2.2. Design and Construction

### 10.2.2.1. Design and Construction

1) Except as permitted in Article 10.2.2.2., buildings shall be designed and constructed to conform to

a) ANSI/ASHRAE/IES 90.1, "Energy Standard for Buildings Except Low-Rise Residential Buildings" (except Subsection 8.4.2.),

b) the NECB, **or**

**c) Subsection 10.2.3.**

2) Where a building contains one or more major occupancies that conform to **Subsection 10.2.3.**, the remaining major occupancies shall comply with Clause(1)(a) or (b).

### 10.2.2.2. Application to Existing Buildings (See Note A-10.2.2.2.)

1) Where a building or major occupancy designed and constructed to conform to any version of ANSI/ASHRAE/IES 90.1, "Energy Standard for Buildings Except Low-Rise Residential Buildings" is altered, rehabilitated, or renovated, or there is a change in occupancy, the energy performance of the alteration, rehabilitation, renovation, or change in occupancy shall comply with Clause 10.2.2.1.(1)(a) or (c).

2) Notwithstanding Article 1.1.1.1. of Division A of the NECB, where a building or major occupancy designed and constructed to conform to any version of the NECB is altered, rehabilitated, or renovated, or there is a change in occupancy, the energy performance of the alteration, rehabilitation, renovation or change in occupancy, shall comply with Clause 10.2.2.1.(1)(b) or (c).

3) Notwithstanding Article 1.1.1.1. of Division A of the NECB, where a building or major occupancy designed and constructed to conform to any version of **Subsection 10.2.3.** is altered, rehabilitated, renovated, or there is a change in occupancy, the energy performance of the alteration, rehabilitation, renovation, or change in occupancy, shall comply Clauses 10.2.2.1.(1)(b) or (c).

4) Notwithstanding Article 1.1.1.1. of Division A of the NECB, where a building or major occupancy that is not described in Sentences (1) through (3) is altered, rehabilitated, renovated, or there is a change in occupancy, the energy performance of the alteration, rehabilitation, renovation, or change in occupancy shall comply with Sentence 10.2.2.1.(1).

## 10.2.3. Energy Step Code

### 10.2.3.1. Application

1) This Subsection applies to buildings containing any of the following major occupancies:

a) assembly, as described in Tables 10.2.3.3.-A, 10.2.3.3.-B, 10.2.3.3.-C and 10.2.3.3.-D,

b) treatment, as described in Table 10.2.3.3.-E,

c) care, as described in Table 10.2.3.3.-F,

d) residential,

e) business and personal service, or

f) mercantile. (See Sentence 1.1.3.1.(1) and Table C-2 in Appendix C.)



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April 30, 2019

## **Complying with Step 1 of the BC Energy Step Code for Part 9 Buildings**

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This bulletin clarifies the purpose of Step 1 and provides suggestions to assist building officials, Energy Advisors and builders working on Step 1 buildings. It is part of a series of three bulletins about the BC Energy Step Code that includes:

- B19 – 02: Step 1 in the BC Energy Step Code: Airtightness, Enhanced Compliance and Compliance Paths, and
- B19 – 03: Guidelines for Energy Advisors – Setting Airtightness Values for Energy Modelling of Part 9 Buildings for Compliance with the BC Energy Step Code.

Bulletin B18 – 03 (released July 2018) is a companion bulletin that provides information on the BC Energy Compliance Reports - Performance Paths for Part 9 Buildings.

### **What is the BC Energy Step Code?**

The BC Energy Step Code is an optional performance-based compliance path in the BC Building Code (BCBC). For Part 9 buildings, it applies to residential occupancies only. Local governments may use the BC Energy Step Code, if they wish, to incentivize or require a level of energy efficiency in new construction above the requirements of the base BCBC.

### **What is Step 1 of the BC Energy Step Code and How is it Achieved?**

Achieving Step 1 of the BC Energy Step Code requires understanding how buildings comply with the BC Building Code (BCBC). Traditionally, builders complied with the BCBC by following the BCBC's prescriptive requirements. To improve flexibility and achieve desired outcomes, building codes have begun to move towards performance-based compliance. With this approach, codes specify the designed performance the building must achieve, and the building team determines how to achieve the performance level.

A building constructed to Step 1 is intended to have as good or better energy performance as a reference building constructed to the BCBC's minimum prescriptive requirements for energy efficiency in Subsections 9.36.2. through 9.36.4. As such, Step 1 of the BC Energy Step Code is intended to help builders familiar with traditional prescriptive codes make a smooth transition to building to performance codes that are focused on outcomes.

To comply with Step 1 of the BC Energy Step Code for Part 9 buildings, the builder is required to do the following:

**At the Building Permit Application stage:**

- Submit an energy model of the building. The energy model can be created either in accordance with Natural Resources Canada's (NRCan) EnerGuide Rating System (ERS) by an Energy Advisor<sup>1</sup> qualified by NRCan, or in accordance with the requirements of Subsection 9.36.5. by an energy modeller. To comply with Step 1 of the BC Energy Step Code, builders must submit a proposed house<sup>2</sup> energy model demonstrating that the building's energy performance will be no worse than a reference house.<sup>3</sup> The airtightness value of the proposed house is determined by following the guidance in Bulletin B19 – 03.
- Local building departments may require the submission of Pre-Construction BC Energy Compliance Report, described in Bulletin B18 – 03 and developed based on the requirements in Division C, Subsection 2.2.8. of the BC Building Code.
- The building plans, building energy model and Pre-Construction Compliance Report must all be consistent with each other.

**At building completion (see Table 1 below):**

- Conduct a blower door test to assess the airtightness of the building. This airtightness score must be reported to the Authority Having Jurisdiction (AHJ). In the ERS compliance path, the airtightness value must be incorporated into the as-built energy model, which is used to determine whether the Step 1 targets have been achieved. Under the Subsection 9.36.5. compliance path, there is no requirement to incorporate the airtightness test result into the as-built energy model. This is discussed further in Bulletin B19 – 02.
- Submit an energy model of the building as constructed, produced by an Energy Advisor or an energy modeler. This model must show that the completed building has an energy performance as well or better than the reference house.
- Local building departments may require the submission of an As-Built BC Energy Compliance Report, a companion report to the Pre-Construction Report submitted at Building Permit Application stage.

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<sup>1</sup> An Energy Advisor, in the context of this Bulletin, is "an individual registered with Natural Resources Canada to deliver the EnerGuide Rating System Basic Service and additional services," as per NRCan's "EnerGuide Rating System Standard Version 15.6," p. 6. The term energy modellers is used in a generic sense in this Bulletin.

<sup>2</sup> The proposed house, in the context of energy modelling, is the house as designed, with standard operating conditions such as number of occupants, appliance and hot water loads, and operating schedules as defined either by HOT2000 or by Subsection 9.36.5.

<sup>3</sup> An ERS reference house, according to the EnerGuide Rating System's HOT2000 User Guide, is a "copy of the (proposed) house with standard operating conditions. It is then manipulated to represent the modelled house as if it were built to the National Building Code of Canada (NBC) Section 9.36 energy-efficiency requirements." A Subsection 9.36.5. reference house shares many of the same properties as the reference house in the ERS, but is not identical to the Reference House referred to in the ERS. The differences are discussed further in Bulletin B19 – 02.

*Table 1. Step 1 compliance requirements for ERS and Subsection 9.36.5. compliance paths.*

Compliance Path	Building Energy Model Needed?	Airtightness Requirement		Performance Requirement of Building Equipment and Systems	Performance Requirement of Building Envelope
		Blower Door Test Needed?	Air Changes Per Hour at 50 Pa Pressure Differential (ACH <sub>50</sub> ) for As-Built House		
ERS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	As tested	Report % better than ERS v15 reference house	
9.36.5.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4.5 ACH <sub>50</sub> , 3.5 ACH <sub>50</sub> or as tested, as determined in Sentence 9.36.5.10.(9)*	Report % better than reference house of Articles 9.36.5.13. through 9.36.5.16.	

\* For more details on which airtightness value should be used, see Bulletin B19 – 03.

## The Importance of Airtightness

Airtight buildings are much more likely to have better energy performance and durability, and are more likely to comply with the BC Energy Step Code. While there is no minimum requirement for airtightness at Step 1 of the BC Energy Step Code, the reference house in both the ERS path and the Subsection 9.36.5. path assumes an airtightness of 2.5 ACH<sub>50</sub>. A building that is designed to and achieves an airtightness of 2.5 ACH<sub>50</sub> may not need any upgrades relative to prescriptive code minimums. However, buildings modeled with a proposed airtightness higher than 2.5 ACH<sub>50</sub> will likely need to incorporate energy efficiency upgrades relative to prescriptive code minimums to achieve Step 1 of the BC Energy Step Code.

New buildings in British Columbia that have gone through the ERS between 2010 and mid-2018 averaged an airtightness of 4 ACH<sub>50</sub>. Builders may find that their first building projects under the BC Energy Step Code will bring new challenges if they have not had their buildings tested for airtightness in prior projects. Builders new to airtightness testing should not assume they have been meeting the prescriptive expectation of 2.5 ACH<sub>50</sub> in the absence of data. Achieving 2.5 ACH<sub>50</sub> can be accomplished with attention to air barrier details, training and practice.

## Information to Help Building Officials

There are two energy modelling compliance paths for Step 1 of the BC Energy Step Code: the ERS and Subsection 9.36.5. Subsection 9.36.5. is a no-fail compliance path. While both paths require airtightness testing and reporting of results, the results of this test are not required to be part of the energy modelling in the Subsection 9.36.5. path. The ERS offers quality assurance and quality control (QA/QC) procedures, which gives building officials greater confidence in submissions, while the Subsection 9.36.5. path does not.

The Energy Advisor modelling a building using the ERS has more flexibility to set an airtightness value for the proposed house than if they follow the Subsection 9.36.5. path, which

prescribes airtightness values for proposed houses. The reference house in both paths must be modelled at 2.5 ACH<sub>50</sub>. More details can be found in Bulletin B19 – 03.

It may be challenging to meet the Step 1 energy performance requirements in the earliest projects if builders cannot achieve the airtightness values used in their proposed house energy models. The no-fail compliance path helps to avoid a bottleneck at the time of occupancy. Building teams will be able to learn from these early projects how to improve air barrier details, leading to improved airtightness performance in the medium term. For more details, see Bulletins B19 – 02 and B19 – 03.

AHJs may have different administrative requirements for the two compliance paths, and may seek further assurance that the building complies with the Code for a Subsection 9.36.5. submission. Examples include:

- Requiring builders to attend an airtightness course at their own time and expense;
- Requiring a professional engineer sign-off plans for a BC Energy Step Code building that follows Subsection 9.36.5., to provide further confidence to Local Governments that the model is compliant with the Code (though this may add additional cost); and
- Requiring mid-construction/pre-drywall blower door testing, in addition to post-completion airtightness testing.

### **Information to Help Energy Advisors and Energy Modellers**

Energy Advisors and energy modellers should review Technical Bulletins B19 – 02 and B19 – 03 for guidance on achieving Step 1 and setting airtightness values for all Part 9 BC Energy Step Code buildings. They should consult with the building team about previous projects done by the builder and the builder's experience with improving building airtightness, as this can help determine the default airtightness values to use.

Energy Advisors should consider using airtightness values for the pre-construction models for buildings complying with the ERS path that are achievable for the building team, and support builders new to airtightness testing to help them identify cost-effective energy efficient building solutions. The Energy Advisor should work with the building team to identify additional energy efficiency measures when energy modelling to help meet the energy performance requirements, to compensate for the possibility of a proposed house air leakage rate that is higher than that of the reference house. This will help avoid an energy model at building completion that does not comply, causing delays or unexpected costs.

The building team should identify in advance how a local government will respond if they need to utilize Subsection 9.36.5. as a 'No Fail Step Code Compliance Path' should the ACH<sub>50</sub> result make it impossible to comply with Step 1 using the ERS, so they can prepare accordingly.

### **Information to Help Builders**

A builder seeking to comply with the BC Energy Step Code should work with an Energy Advisor at the outset of a project to identify strategies to construct more airtight and energy efficient buildings. Building an airtight house with proper ventilation is often the most cost-effective way of meeting BC Energy Step Code requirements and reduces the number of other energy efficiency measures required. It also results in a more comfortable and durable home for future



occupants, with reduced risk of building envelope failure due to moisture problems from air leakage.

If the builder has not focused on meeting an airtightness requirement in previous projects, they may want to speak with building officials regarding the 'No Fail Step Code Compliance Path' option. If there is a possibility that airtightness may cause the building to fail the energy performance requirements of Step 1, the builder should review the options for complying using Subsection 9.36.5.

## Resources for Airtightness

The following resources give more guidance on airtightness.

**Illustrated Guide: Achieving Airtight Buildings** - This BC Housing guide describes how to design, build and test airtight buildings, and is available online at <https://www.bchousing.org/research-centre/library/residential-design-construction/achieving-airtight-buildings>.

**BC Energy Step Code Builder Guide** – This BC Housing guide provides information on the key strategies and approaches that builders can use to meet the BC Energy Step Code for houses and low-rise (Part 3 and Part 9) wood-frame residential buildings up to six storeys. It is available online at <https://www.bchousing.org/research-centre/library/residential-design-construction/bc-energy-step-code-builder-guide&sortType=sortByDate>.

**BCIT's Airtightness Training Course** – This one-day workshop covers airtightness from top to bottom in a day. It starts with a discussion of what an air barrier is and how to define it on a project, and then shifts to a hands-on workshop that details all aspects of how an air barrier is made. More information about the course is available online at <http://www.smallplanetsupply.com/vancouver-airtightness-1>.

**Vendors** – Vendors of air sealing products may offer training opportunities on the job site or in product-knowledge training sessions.

## More Information

Please visit [www.gov.bc.ca/buildingcodes](http://www.gov.bc.ca/buildingcodes) or [www.energystepcode.ca](http://www.energystepcode.ca).

Questions related to this bulletin can be directed to [CodeQuestion@gov.bc.ca](mailto:CodeQuestion@gov.bc.ca).

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