

# Lessons From the BC Energy Step Code

How British Columbia became the first North American jurisdiction  
to create a regulated pathway to net-zero energy-ready buildings

June 2019

# Credits and Acknowledgements

James Glave and Robyn Wark wrote this report in early 2019 with funding support from Natural Resources Canada and BC Hydro.

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The authors would like to thank the staff at the Building and Safety Standards Branch at the Province of British Columbia's Office of Housing and Construction Standards for sharing Energy Step Code Council meeting minutes and organizational documents. We also recognize the various building code officials from across Canada who offered feedback and comments on early drafts. Finally, we would like to thank the 12 individuals we interviewed to research this document, each of whom played an active role in the standard's development.



Cover Photo: The City of Surrey, British Columbia is building the Clayton Community Centre to the Passive House standard. When complete in mid-2020, the facility will exceed the requirements of the top step of the BC Energy Step Code for complex buildings. Photo by Jessika MacDonald, HCMA Architecture and Design.





## About this Report

This report documents the story of how the Canadian province of British Columbia developed a building code designed to steadily improve energy efficiency and transform the market towards the ultimate goal of net-zero energy-ready performance. It is intended for any jurisdiction that may be considering a performance-based stepped energy code, or any jurisdiction interested in a market-transformation model that is grounded in shared leadership.

We divide this report into three sections:

**SECTION ONE:** *The Making of the BC Energy Step Code* explains how the standard operates as a market-transformation tool and its core characteristics. It outlines governance structure, emerging adoption trends, and relevant local government and industry survey results.

**SECTION TWO:** *Lessons from the BC Energy Step Code* provides eight broad insights into the code development process, gleaned from interviews with 13 active participants. We conducted the interviews under the Chatham House Rule. For more on our methodology and a list of the interviewees, please see Appendix A.

**SECTION THREE:** *Parting Thoughts* compiles interviewee insights and reflections that did not readily lend themselves to any one of the key lessons learned, but that nonetheless may prove beneficial to other jurisdictions considering a performance-based code.

For a list of documents and recommended resources that provide a more detailed explanation of the **BC Energy Step Code** and high-performance buildings, please see Appendix B.



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## Section 1: The Making of the BC Energy Step Code

# 1.1 Introduction: A ‘Revolution’ in Code Development

Traditionally, building-code development has been an incremental process. It has focused on “present conditions” and the modest changes that policy makers perceived would be acceptable – that is, as close to cost-neutral as possible – to industry. It has not challenged the fundamental foundation of what energy efficiency actually means.

In contrast, the Province of British Columbia has established a long-term performance goal, and specific tiers that the construction industry will be required to meet along the way. It has given builders a clear picture of that goal, and clarified expectations, timelines, and costs.

“I don’t know that I have ever seen truly revolutionary code development in my career,” one of our interview participants said, “but this is what it looks like.”<sup>1</sup>

British Columbia’s ongoing experiment is demonstrating that if builders are given a long lead time for a high-performance level and interim thresholds, and given adequate supports, they will step up to the task. They will investigate techniques,

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<sup>1</sup> The approach is certainly innovative in North American jurisdictions, but less so in the European Union.

materials, and strategies, and they will innovate practices and optimize costs so they will be ready to deliver on the requirements before they come into force. Meanwhile, local manufacturers will begin delivering higher performance products and materials to meet the demand.

In this way, the **BC Energy Step Code** is a market transformation tool that is steadily building industry capacity to deliver exceptionally energy-efficient buildings. As the sector increases its familiarity and comfort with new practices, all stakeholders interviewed for this report believe the associated incremental construction cost premiums of these buildings will come down. Eventually, very high-performance homes, offices, stores and other buildings will not be the “boutique” products they are in British Columbia today. They’ll be the norm.

The Government of Canada established a range of built-environment objectives in the **Pan Canadian Framework on Clean Growth and Climate Change**, and is currently developing a national net-zero energy-ready model building code. British Columbia’s experience offers a number of lessons that could inform the development of that process, or that of any jurisdiction pursuing a similar agenda.

We have sought to capture the most salient ones in this report.



# 1.2 How it Works

**Note:** We provide this brief summary for those unfamiliar with the BC Energy Step Code’s core functionality. For a deeper dive into metrics, compliance mechanisms, costs, construction strategies, and more, visit [energystepcode.ca](http://energystepcode.ca). We also recommend resources in Appendix B.

The **BC Energy Step Code** is a performance standard designed to drive steady increases in the energy performance of new buildings. It is not a stand-alone code, but a part of the *BC Building Code*. Local governments in the province may use it, if they wish, to incentivize or require a level of energy efficiency in new construction that would exceed the minimum requirements specified in the *BC Building Code*.

The standard is configured as a metaphorical staircase. Each “step” represents a higher level of energy efficiency performance. Step 1, for example, requires builders to demonstrate they are meeting the existing minimum requirements of the *BC Building Code*. The top step represents a net-zero energy-ready performance level – roughly equivalent to the rigorous Passive House standard, or Canadian Home Builders Association Net Zero Energy Ready certification.

The Energy Step Code Council, a multi-stakeholder advisory body (see Section 1.5), developed implementation guidelines and asks local governments to follow them to ensure smooth implementation and uptake.

The *BC Building Code* now allows builders to voluntarily meet any step of the **BC Energy Step Code** and receive a permit, rather than follow the base code’s prescriptive approach.

In late 2018, the Government of British Columbia established a timeline for increasing the energy efficiency requirements of the base *BC Building Code*. These increases follow the steps of the **BC Energy Step Code**. This effectively gives industry and local governments notice of the coming changes, allowing industry to train up accordingly.

Once builders learn new techniques and understand new considerations, they can deliver on the requirements of the initial lower “steps” using widely available materials and existing suppliers.

Meanwhile, local governments that have referenced the standard in their bylaws have been offering incentives to help offset the modest additional up-front costs the industry must incur.

In other words, starting in 2022, the base code will begin “catching up” to the **BC Energy Step Code**. The entire province will reach the “top of the staircase” by 2032, when net-zero energy-ready construction will be the law of the land. At that point, at least in theory, the **BC Energy Step Code** will have done its market transformation work, and will wind down.

## The BC Energy Step Code has three foundational attributes.

### PRIORITIZE THE BUILDING ENVELOPE

Through its choice of building-science metrics, the **BC Energy Step Code** prioritizes passive approaches to performance. For Part 9 buildings, such as single detached homes, four of the six metrics focus on the building envelope – the walls, roof, floors, windows, skylights, and doors that separate conditioned interior spaces from the outside elements. A high-performance building envelope will feature continuous insulation, minimal thermal bridging, high-quality windows, and careful attention to sealing the air barrier.

**Rationale:** *Upgrading the envelope of a completed building is difficult and expensive, because insulation and air barriers are hidden behind siding and finishes. An envelope-first approach designs a measurable level of performance into the very fabric of the building, permanently wedding energy efficiency to the structure without relying on equipment that in turn requires ongoing adjustment and maintenance, and that occupants may at a later date downgrade.*

### LET THE LEADERS LEAD

Though the **BC Energy Step Code** is built on a common policy framework, the decision not only to use it – but *how* to use it – rests at the community level. Local governments each choose which steps they will require, and on what schedule in advance of a step being adopted as the new base code. For example, one municipality might require all builders to meet the requirements of Step 1, Part 9. At the same time, it might offer an incentive to builders who meet the requirements of Step 3, Part 9 today. Another local government might choose a completely different approach.

**Rationale:** *Some cities have more experience with high-performance construction, and are ready to move forward, while other communities will likely need more time to build industry capacity and familiarity with the practices of higher-performance building. The early adopters (generally, larger communities) help seed the market for those that follow. If given clear guidance on industry engagement and notification timelines, communities will follow them, and act in a prudent manner.*

### PRESCRIBE OUTCOMES, NOT PROCESSES

Unlike the prescriptive approach to energy efficiency in the *BC Building Code*, the **BC Energy Step Code** does not oblige builders to follow prescribed combinations of materials and wall assemblies. Instead, it sets requirements across a range of metrics, and then leaves it up to the builder to work with his or her energy advisor to figure out the most cost-effective way to meet them. It also establishes a long-term goal, instead of incremental improvements.

**Rationale:** *This approach puts the builder in the driver’s seat, spurring him or her to innovate and apply a wide variety of strategies, approaches, and materials to meet the requirements of a given step. It provides long-term certainty on the direction of the code, which allows strategic planning. “The Step Code encourages builders to keep working on their building science knowledge; they can see they are going to have to build better and better,” said one industry representative interviewed for this report. The approach also gives consumers a layer of quality assurance because local governments using the standard require builders to demonstrate that they have met a given step’s requirements.*

## 1.3 Increasing Capacity and Monitoring Implementation

Stakeholders representing the full spectrum of British Columbia's built environment volunteered thousands of hours of their time to develop and implement the BC Energy Step Code. It is almost certainly the largest mobilization of its kind in Canada to date.

### The Energy Step Code Council

The Energy Step Code Council meets quarterly to monitor how local governments are implementing the standard, including any impacts on housing affordability and technical building requirements.

Since the province first established it as the Energy Efficiency Working Group, the Council has grown to now include representatives of 23 organizations and governments (including the federal government and two provincial ministries), three subcommittees and two Peer Learning Networks, 11 chairs and co-chairs, and the involvement of more than 150 organizations. Its ranks include all major industry organizations and professional associations, including the Canadian Home Builders Association, Urban Development Institute, British Columbia Construction Association, Building Owners and Managers Association, Engineers and Geoscientists BC, and the Planning Institute of British Columbia. Taken together, these associations reach more than 55,000 members across the province.

It is an engaged network of organizations committed to smoothly implementing this new energy-efficiency standard in consideration of other industry priorities – housing affordability, training and capacity building, fairness, and effective compliance.

Officially, the Energy Step Code Council is an unincorporated advisory body that serves as a forum for local government, utility, and industry stakeholders to share information and work collaboratively to resolve issues as they arise.

Under its Terms of Reference, the council:

- Supports the creation and dissemination of training and capacity-building opportunities for local governments, industry, and other stakeholders;
- Provides advice and clarification of technical aspects of the **BC Energy Step Code**; and
- Seeks resolution of implementation issues.

The Energy Step Code Council is chaired by a representative of the Province of British Columbia, and has two vice chairs, who represent the homebuilding industry and the province's crown electricity utility. Three subcommittees support the council; their members include Energy Step Code Council members, but also other professionals and non-profit organization leaders who do not sit on the council, but who have specialized expertise.

The Energy Step Code Council invites any and all British Columbia local government staff members to join one of the two dedicated **BC Energy Step Code** Peer Learning Networks.

The networks provide strategic, administrative, and technical support to planners, energy managers, and other local government staff that might advise elected officials or senior staff on implementation aspects of the **BC Energy Step Code**. The BC Hydro Sustainable Communities program funds these peer-learning networks, and manages the larger of the two. The utility also resources the Community Energy Association, a charitable organization supporting local governments on climate and energy, to support smaller communities. Though they are not formal subcommittees of the Energy Step Code Council, they are an integral part of the larger story, and closely aligned with the larger story.



Third parties are beginning to recognize the volunteer work of the Energy Step Code Council in the service of market transformation. The Community Energy Association recognized the Energy Step Code Council with its Climate & Energy Action Award in late 2017, for multi-sector collaboration. A year later, the Real Estate Foundation of BC awarded the Energy Step Code Council its prestigious LAND Award for Built Environment.<sup>1</sup>

<sup>1</sup> The LAND Awards ([refbc.com/land-awards](http://refbc.com/land-awards)) recognize innovation, collaboration, and sustainability in land use and real estate.

# 1.3 Increasing Capacity and Monitoring Implementation

**Table 1.1** Energy Step Code Council governance, advisory committees, and leadership.

ENERGY STEP CODE COUNCIL		
<p><b>Chair:</b> Zachary May, Ministry of Municipal Affairs and Housing, Province of British Columbia</p> <hr/> <p><b>Co-Vice Chair:</b> Bob Deeks, Canadian Home Builders' Association of British Columbia  <b>Co-Vice Chair:</b> Robyn Wark, BC Hydro</p> <hr/> <p>Membership consists of representatives of 53 organizations and governments, collectively representing 55,000+ members.</p>		
ENERGY STEP CODE COUNCIL SUBCOMMITTEES		
Technical	Compliance + Energy Advisor	Capacity Building and Communications
<p><b>Co-Chairs:</b> Toby Lau, BC Hydro and Norm Connolly, City of New Westminster</p> <p><b>43 members</b></p> <hr/> <p><i>Provides advice on technical requirements of the BC Energy Step Code.</i></p>	<p><b>Co-Chairs:</b> Vanessa Joehl, Canadian Home Builders Association - British Columbia, and Nicholas Heap, City of Richmond</p> <p><b>55 members</b></p> <hr/> <p><i>Provides advice on issues related to Part 9 buildings, and helps support consistent compliance with, and interpretation and enforcement of, the BC Energy Step Code as it applies to homes and other simple buildings.</i></p>	<p><b>Co-Chairs:</b> Mary McWilliam, British Columbia Institute of Technology, Christian Cianfrone, ZEBx, and Dale Andersson, Province of British Columbia</p> <p><b>52 members</b></p> <hr/> <p><i>Provides advice on capacity building and communications needed for the successful transition to the BC Energy Step Code and/or high-performance buildings.</i></p>
ENERGY STEP CODE PEER LEARNING NETWORKS		
<p><b>Chair:</b> Maxwell Sykes, City of Surrey</p> <hr/> <p><b>Chair:</b> Maya Chorobik, Community Energy Association</p>	<p>Larger Communities, over 75,000 population <b>62 members</b></p> <hr/> <p>Smaller Communities, up to 75,000 population <b>80 members</b></p>	



## 1.4 Notable Adoption Trends

As of the publication of this report in June 2019, 24 communities have referenced the **BC Energy Step Code** in their building bylaws. These communities collectively represent 70 per cent of all building permits issued in the province. They include the province's main population centres – on Vancouver Island, in and around the Lower Mainland, and up the Sea to Sky Corridor from Vancouver towards Whistler, and across the province's Southern Interior region.

As a result of ongoing communications and outreach efforts, awareness of the standard is growing rapidly among the province's builders and local governments (See Figures 1.2 and 1.3). Virtually all are aware that the standard is available to them.

With respect to adoption, those interviewed for this report identified the following trends.

### RAPID UPTAKE IN EARLY-ADOPTER COMMUNITIES

In the seven months after the standard first became available to them, 13 local governments referenced the **BC Energy Step Code** in their policies. Though there are exceptions, these were generally large or medium-sized communities with in-house capacity and expertise. As intended, the **BC Energy Step Code** allowed those communities with the capacity to lead to do so. Staff shared their experiences with other local governments through the Peer Learning Networks, allowing them to watch, learn, and follow at their own pace. This second wave of communities is now referencing the standard in bylaws.

### ADOPTION IN SMALLER COMMUNITIES

While large- and medium-sized communities have dominated the adoption curve, some key smaller local governments, located in colder climates, have also stepped on to the high-performance staircase. Notable examples include the City of Kimberly (pop. 7,425), District Municipality of Sparwood (pop. 3,784), and the Resort Municipality of Whistler (pop. 11,894). These are communities that had staff expertise and past experience with energy-efficiency policies, and/or political leadership. They have helped demonstrate that communities of all sizes and climate zones can use the **BC Energy Step Code** to increase building performance.<sup>1</sup>

### VOLUNTARY ADOPTION

In 2017, BC Housing, the provincial agency responsible for delivering multi-family social housing, began requiring that all new residential projects it principally funds meet the requirements of the Upper Steps. In its 2017/2018 fiscal year, the agency created about 3,000 new affordable housing units in approximately 35 communities across the province.

In addition, at least one major developer of residential multi-family homes now voluntarily builds to meet the requirements of Step 3.

### ADHERENCE TO IMPLEMENTATION FRAMEWORK

Every one of the communities that have referenced the standard in their bylaws have followed the **BC Energy Step Code** Implementation Framework, as detailed in the *Energy*

<sup>1</sup> The Village of New Denver (pop. 473) is the smallest British Columbia community to reference the BC Energy Step Code to date.

*Step Code Best Practices Guide for Local Governments* (See Appendix E: "Designing the Implementation Framework"). In recent Energy Step Code Council meetings, industry representatives have expressed appreciation – and relief – that local governments have been using the standard in a judicious and prudent manner.

Local governments have demonstrated robust consultation with their local builder communities. Larger Metro Vancouver member communities such as the City of New Westminster, City of Richmond, Township of Langley, and City of Surrey, have hosted "builder breakfasts." These events allow an informal exchange of information and concerns. In some cases, extensive engagement lengthened the adoption process.

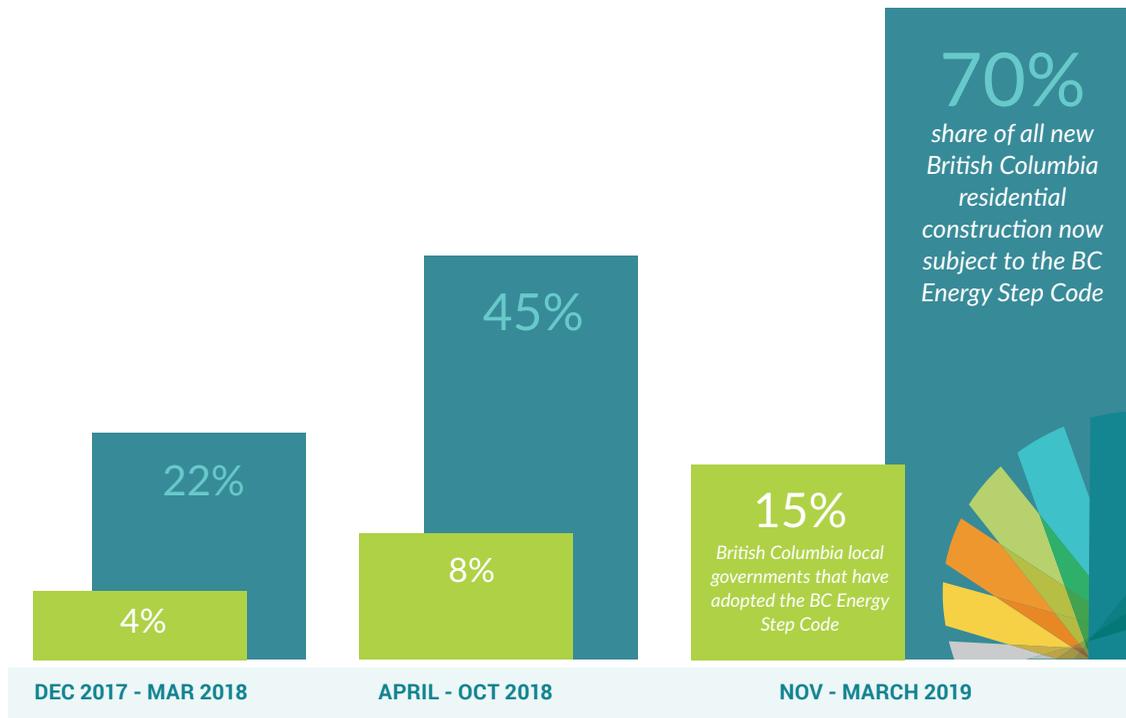
### CONTIGUOUS COMMUNITIES

Some contiguous local governments have opted to align their approaches to the **BC Energy Step Code**. For example, the District of West Vancouver, the City of North Vancouver, and the District of North Vancouver on the same day in 2018 required all builders to meet Step 3, Part 9. Combined, these communities are home to more than 180,000 residents across the North Shore of Metro Vancouver.

The move effectively created an "Efficient New Home Zone," within which all builders and developers have common expectations on energy efficiency.

# 1.4 Notable Adoption Trends

**FIGURE 1.2** ADOPTION AS SHARE OF TOTAL LOCAL GOVERNMENTS AND RESIDENTIAL BUILDING ACTIVITY, AS OF MARCH 2019



While only 24 of the province's 162 local governments have to date adopted the BC Energy Step Code, those that have done so oversee the lion's share of new residential construction. Lower-capacity communities are learning from the leaders, and more are adopting every month.

**FIGURE 1.3** INDUSTRY AWARENESS

	2017	2018
Aware of the <i>BC Energy Step Code</i>	52%	78%
Have worked with an energy advisor in the past year	32%	38%

Source: 2018 BC Residential Building Statistics and Trends Report, BC Housing

**FIGURE 1.4** LOCAL GOVERNMENT AWARENESS

	2017	2018
"Would you say that your local government has 'moderate,' 'good,' or 'excellent' knowledge of the <i>BC Energy Step Code</i> ?"	61%	82%
"Have you watched, or participated in, an information session on the <i>BC Energy Step Code</i> ?"	66%	91%
"Have you accessed or referenced the <i>BC Energy Step Code Best Practices Guide for Local Governments</i> ?"	N/A	83%

Data this page: 2018 BC Energy Step Code Local Government Survey, BC Housing, and BC Energy Step Code Peer Learning Networks.

A photograph of three people sitting at a table in a bright, modern office or meeting space. They are engaged in a conversation. The man on the left is wearing a dark blue shirt and is gesturing with his hands. The man in the middle is wearing a light blue shirt and glasses. The woman on the right is wearing a dark patterned top. There are white coffee cups on the table. The background shows large windows and office furniture. The entire image has a light blue overlay.

## Section 2: Lessons from the BC Energy Step Code

# Lesson 1

## Pitch a Big Tent, and Embrace Shared Leadership

Access industry and local-government professional organizations and associations, and resource them to educate and mobilize their respective members.

Interviewees recommended that other jurisdictions considering a tiered or stepped energy code understand the relative strengths and vulnerabilities of each built-environment stakeholder group – and equip them, as needed, to serve as champions.

For example governments have strong regulatory powers and resources, but are politically constrained. Professional associations of engineers, architects, builders, and building officials have extensive reach through their internal channels, but limited budgets. Utilities have excellent technical capacity, but no regulatory authority. “Take an honest look at the actors around the table, and figure out who the leaders are, and what they need to take up the code and run with it,” one source said.

In the British Columbia experience, several interviewees confirmed that professional associations help get information and education out to members, and share back experiences and issues with the larger group. For example, the Council representative from the Urban Development Institute, which represents the interests of developers, worked to actively share information about the regulation with other stakeholders and with members via breakfast events.

Another interviewee highlighted how regional chapters of the Canadian Home Builders Association - British Columbia have consulted with their members to identify specific local concerns. One such leader applied for funding from the province’s two energy utilities to create a Performance Path Training Program to help members get up to speed on the performance-based approach to energy efficiency. It’s providing the association with a snapshot of how well builders are doing against **BC Energy Step Code** metrics using their existing practices and materials.

Similarly, the Building Officials’ Association of British Columbia - which represents the building inspectors and plan checkers who work inside local governments – is creating an Energy Foundations program to help local government staff understand the compliance requirements. “[The association’s] CEO joined the Energy Step Code Council, and offered input into a proposed compliance framework,” one interviewee said. The Energy Foundations program seeks to empower building inspectors to become champions of high-performance buildings in their communities.

“We created a process to nurture and elevate leaders by giving them the confidence to speak about the work we were doing, and tools to help them do so – such as presentation decks and clear language,” one interviewee noted. “We really invested in ‘soft skills’ development.”



# Lesson 1

## The Importance of Shared Leadership

*Everyone Has A Role to Play: Understand the key players on your advisory council, and their respective capacities and limitations*

	STRENGTHS	CONSTRAINTS	CONTRIBUTIONS
<b>THE PROVINCE OF BRITISH COLUMBIA</b>	<ul style="list-style-type: none"> <li>Regulatory authority on building code</li> <li>Provides long-term direction on policies and regulations that impact the construction industry</li> </ul>	<ul style="list-style-type: none"> <li>Does not directly enforce the BC Building Code on the ground</li> </ul>	<ul style="list-style-type: none"> <li>Chair, Energy Step Code Council</li> <li>Leads Code language and requirements through <i>BC Building Act</i></li> <li>Issues advisory bulletins</li> </ul>
<b>LOCAL GOVERNMENTS</b>	<ul style="list-style-type: none"> <li>Enforces building code</li> <li>Direct contact with owners and builders at time of permitting – an effective point of training</li> <li>Can access financial and non-financial tools to incentivize higher steps</li> </ul>	<ul style="list-style-type: none"> <li>Low financial resources</li> <li>Competing policy priorities</li> </ul>	<ul style="list-style-type: none"> <li>Rolls out <b>BC Energy Step Code</b> requirements and training ahead of provincial building code</li> <li>Lead peer learning networks to share lessons and experiences</li> <li>Focus on enforcement through building departments</li> </ul>
<b>BUILDING INDUSTRY AND DESIGN PROFESSION ASSOCIATIONS</b>	<ul style="list-style-type: none"> <li>Direct connections to on-the-ground experience</li> <li>Credibility</li> <li>Access to leading practitioners</li> </ul>	<ul style="list-style-type: none"> <li>Deep reliance on volunteer capacity</li> <li>Membership often optional</li> </ul>	<ul style="list-style-type: none"> <li>Guides appropriate pace and scale of roll-out</li> <li>Leads peer-to-peer industry training</li> <li>Provides direct conduit for member feedback to advisory council</li> </ul>
<b>THE GOVERNMENT OF CANADA</b>	<ul style="list-style-type: none"> <li>Creates national building code for voluntary adoption by provinces and territories</li> <li>Maintains EnerGuide Rating System for homes, including modelling software and energy-advisor certification</li> </ul>	<ul style="list-style-type: none"> <li>Cannot require provinces and territories to adopt national building code</li> </ul>	<ul style="list-style-type: none"> <li>Links province into national code-development process</li> </ul>
<b>UTILITIES</b>	<ul style="list-style-type: none"> <li>Creates and implements incentive and support programs under demand side management mandate</li> </ul>	<ul style="list-style-type: none"> <li>No regulatory powers</li> </ul>	<ul style="list-style-type: none"> <li>Supports organizational design and structure for effective implementation</li> <li>Aligns all incentives and support programs to <b>BC Energy Step Code</b></li> <li>Provides technical leadership</li> </ul>
<b>EDUCATION AND TRAINING ORGANIZATIONS</b>	<ul style="list-style-type: none"> <li>Long-term core training</li> </ul>	<ul style="list-style-type: none"> <li>Often touch emerging, rather than mid-career, professionals</li> </ul>	<ul style="list-style-type: none"> <li>Integrate <b>BC Energy Step Code</b> into curricula</li> </ul>

# Lesson 2

## Set Your End Game, then Backcast

**Incremental code changes will not unleash market transformation. A jurisdiction that wants to reach a net-zero energy-ready performance must define the goal and work backwards from it.**

“Typically, code development is incremental,” one government interviewee explained. “It focuses on present conditions, ‘where we are today,’ and what little changes we could make, but never challenges the fundamental foundation of what is energy efficiency, what are we trying to achieve.”

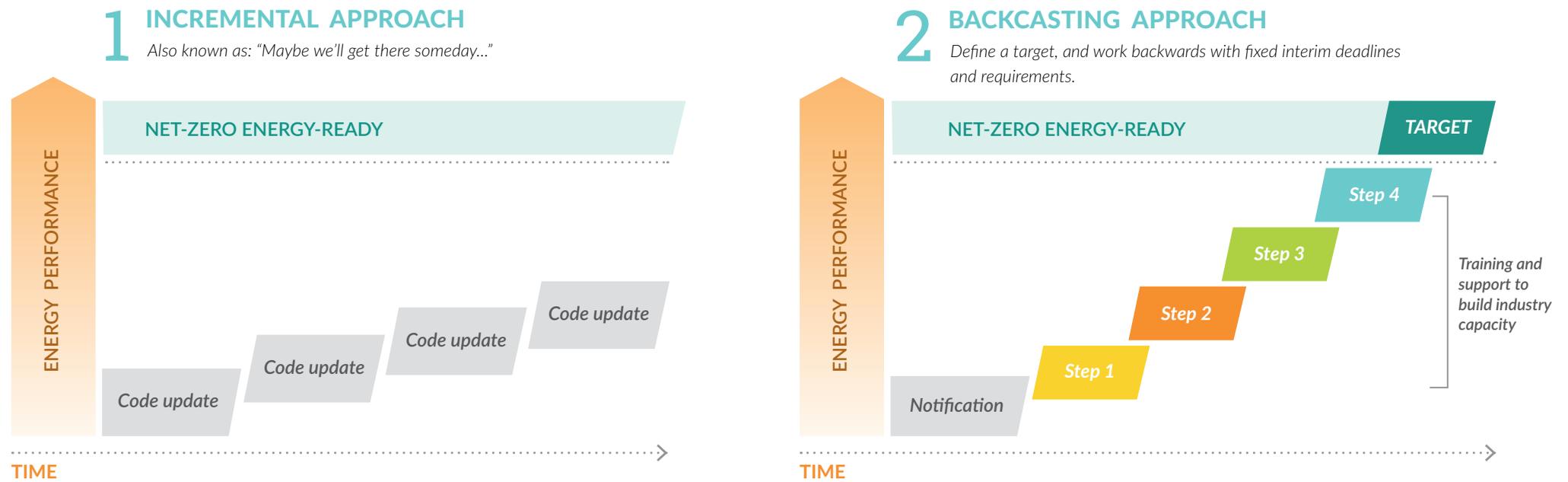
But following early work done by the City of Vancouver, and following research conducted by the Pembina Institute, B.C.’s code authorities concluded that “twiddling around the edges” of building codes would never get them to the ambitious target their government had set: By 2032, code will require net-zero energy-ready performance in all buildings, across the board.

“We started the process by explaining what we wanted the outcome to be,” one provincial government source said.

“And we said to to the stakeholders, ‘This is what we think the regulation should be in 10 or 15 years from now, now get to it. Work towards this very specific point.’”

That really snapped all the players into focus, and brought people on board who otherwise would not have been wild about the idea, one interviewee said. “We’re no longer talking about fuzzy ideas of what might happen down the road, far off in the future. It’s real.”

Interviewees expressed consensus that this backcasting approach produced much more ambitious and certain outcomes than would have been possible with a traditional mixture of incremental changes and incentives. See Figure 2 to understand the backcasting approach.



**The Power of Backcasting:** Traditional code development will not bring a jurisdiction up to a net-zero energy-ready performance in a timely manner.

# Lesson 3

## Fear Not Your Local Governments

**If given clear guidance and good peer support, local governments will prudently and responsibly help drive market transformation.**

**Traditional incremental code development** asks, “What is the minimum performance level that builders could achieve in all communities, regardless of their size, capacity, and resources?”

While this approach provides consistency across a province, territory, or state, it does not allow local governments that may have the capacity and resources to drive market transformation – often, these are large and medium-size communities – to do so.



Traditionally, many provincial, territorial, and state-level code authorities have hesitated to give local governments powers to regulate energy efficiency and lead a transformation of the built environment. But British Columbia’s recent experience suggests those concerns may be misplaced, interviewees said.

With respect to the BC Energy Step Code roll-out, the province’s 162 local governments represent a wide range of experience and capacity. And, of course, the 15 large and medium-sized cities have more capacity and tools available to them than the remaining 147. The City of Vancouver, the province’s largest, has its own building code, and has long championed high-performance buildings (see Appendix E). “Larger communities have more resources for things like builder forums, and they can leverage rezoning or density bonusing policies, or building permit policies,” one source confirmed.

When introducing code updates, provincial, territorial, or state authorities typically move at the pace of the “slowest common denominator.” But interviewees said this conventional approach overlooks the fact that larger and medium-sized communities have more capacity, experience, and interest in market transformation.

Most interview participants agreed that, given bandwidth, resources, and peer support channels, local governments can

*In contrast, a step code provides all governments with a long-term regulatory pathway to net-zero energy-ready buildings. The leaders who are ready to get started can do so.*

*A step code empowers leading local governments to take the reins, build industry capacity, and share lessons, effectively blazing the trail that the rest that will follow.*

be powerful and collaborative thought leaders, working with their local builders and using the regulatory and incentive tools at their disposal. “Don’t be afraid to let leading local governments go beyond the code,” one interviewee said. “Embrace it. Give them a rule book to follow, and watch what happens.”<sup>1</sup>

BC Hydro, the province’s leading electrical utility, had supported much of that capacity-building work long before the first iteration of the **BC Energy Step Code** working group convened. As detailed in Section 1.3, the utility provided matching funding to large- and medium-sized municipalities, allowing them to employ community energy managers dedicated to reducing energy use through local government tools, policies, and incentives. The utility also supports a similar network of local government staff at smaller communities.

These community energy managers work as a tight network, sharing findings and feedback as their employers reference the **BC Energy Step Code** in policy. They are demonstrating that local governments can responsibly test the waters for future code updates. “We’ve shown that you can start transforming the market – in areas that have the capacity to do so – by using standards developed by multi-stakeholder committees,” the interviewee said.

With one isolated exception,<sup>2</sup> every British Columbia community that has implemented a **BC Energy Step Code** strategy has done so in accordance with this guide – whether they have a community energy manager on staff, or have joined a Peer Learning Network, or not.

<sup>1</sup> See Section 1.3 for background on the Implementation Framework and Energy Step Code Best Practices Guide for Local Governments.

<sup>2</sup> One British Columbia local government attracted the attention of the Energy Step Code Council in 2018 when it announced it had passed a strategy specifying an ascent from Step 1 to 3 within the space of just a few months. Local-government representatives on the Energy Step Code Council engaged with the community. After realizing its mistake, the community revoked its strategy and replaced it with an implementation schedule aligned with the recommendations of the Best Practices Guide for Local Governments.

# Lesson 4

## Provide Simple, Clear, and Accessible Materials

Produce plain-language explanations, presentation templates, and diagrams that champions can use to explain the code to time-pressed industry and government decision makers.

Government and industry leaders are typically busy, non-technical people who have limited bandwidth to wrap their heads around something as obscure as a performance-based building code. As one interviewee explained, “A [local-government] colleague told me that the new code will never make it past his desk if his mayor and council didn’t understand it.”

Interviewees agreed that clear, consistent, and accurate information, including “explainer” diagrams, played a critical role in the **BC Energy Step Code**’s adoption by builders and local governments.

The Energy Step Code Council retained a consultant to develop an outreach plan. The plan included separate plain-language

descriptions of the standard and its capabilities for use with both industry and local-government audiences. The consultant also steered a branding process that yielded a logo and clear explainer diagrams that helped simplify technical concepts. (For examples, see Appendix C). All Council members had early access to a presentation template, and they used them at conferences, webinars, and briefings.

These materials were “hugely helpful,” one local-government interviewee said. “My city council, the building inspectors, all of them now know what the Step Code is, they are talking about it,” the interviewee said. “The logo, the identity, it was a great way to move it beyond the world of code geeks.”

To be clear, the materials were not “marketing.” They introduced the standard with a neutral, informational tone, conveyed what it could do, and how it might be used. As a result, local governments did not feel like they were getting a “hard sell.”

“I am proudly non-technical,” said one source. “I am just like a politician, and I knew it needed to be something I could get my head around. The fact that we branded [the **BC Energy Step Code**] was so important. I am convinced it would not have gotten into place without that sense that it was an actual tangible thing.”

Though stakeholders are now largely up to speed on the **BC Energy Step Code**, the Council still keeps them apprised of new studies, developments, programs, and upcoming events with regular updates. It manages social media accounts, and produces a blog and popular monthly newsletter.<sup>12</sup>



BC Energy Step Code mini-brochure featuring an explainer diagram.

1. Anyone may subscribe to the Energy Step Code Stakeholder Update via <https://mailchi.mp/energystepcode/subscribe>  
2. Though the Energy Step Code Council shares significant updates with trade media, the provincial government retains authority over any BC Energy Step Code outreach to, and queries from, traditional media.

## Lesson 5

# Encourage Collective Ownership

**Encourage stakeholders to bring in their own research teams to help fill in research and knowledge gaps. Invite guest speakers from other jurisdictions to share perspectives.**

The provincial government relied on the built-environment stakeholders that co-developed the *BC Energy Step Code* both for in-kind contributions of building-science expertise and funding for studies. This collective investment in the process imbued shared ownership of the outcome.

“The province was very supportive of small groups of members going out and doing a bunch of research or using their resources to help one aspect of the code development,” one source said. “You can’t do it all around the table just by being at the meetings; the process works a lot better if you can encourage members to bring forward their own research. The subcommittees, that informal work done behind the scenes, all that was encouraged, and that really helped create a robust standard and a clean implementation plan.”

“Collaboration is the key, in developing the standard, and providing accountability as a group,” another stakeholder confirmed. All interviewees expressed an appreciation for the team’s collective problem-solving approach. When a stakeholder was concerned about implementation or another issue, the team would delegate one of its subcommittees to undertake or commission research.

This could be as simple as assigning one of the subcommittees to undertake a policy scan, or bringing in a guest speaker to talk about how other jurisdictions were approaching market transformation.

Other projects required members to marshal significant tranches of funding, either as funding partners or in-kind contributions. For example, industry groups, local governments, professional associations, and utilities all pooled funding for the 2017 and 2018 editions of the *BC Energy Step Code Metrics Research Report*. The BC Housing Research Centre led this work. The centre also published design and builder guides, hosted homebuilder training workshops around the province, and conducted an annual survey of local-government awareness.



# Lesson 6

## Offer an Easy On-Ramp to Performance Codes

Provide industry with opportunities to upgrade skills and increase familiarity and comfort with the strategies, practices, and materials associated with higher-performance construction.

By design, the **BC Energy Step Code** allows local governments to adopt higher energy-efficiency requirements at a pace that works for them. Experienced communities skipped straight to Step 3. But many more, after careful consultation with industry, have used Step 1 as a starting point to create a baseline, and increase builder familiarity with new expectations, before transitioning to higher steps within six to 18 months.

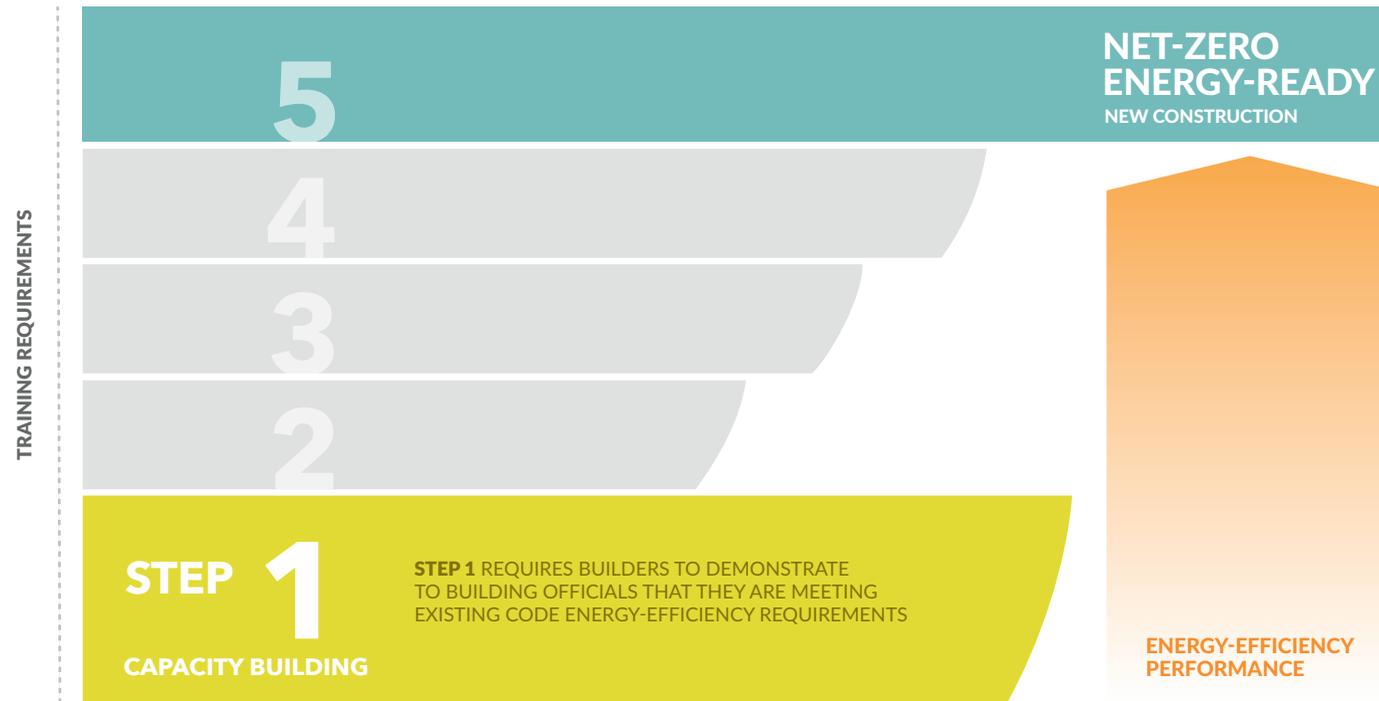
Step 1 is actually a misnomer, because it is the “ground floor” of the high performance staircase. Local governments using Step 1 are not actually requiring their builders deliver a level of energy efficiency that exceeds what the base building code already expects of them. It just requires them to prove to a building official, via energy modeling on-site air tightness testing, that they are meeting existing minimum requirements.

With Step 1, builders will work with an energy advisor, many for the first time, to identify cost-effective opportunities to improve the energy performance of their designs. They’ll also learn how a blower-door test, paired with a thermographic camera, identifies otherwise invisible opportunities to tighten up their air barrier. Because it’s a capacity-building step that allows builders to get their feet wet in high-performance practices, one industry interviewee pronounced Step 1 “one of the master strokes of implementation.”

“In municipalities where builders do not have any experience in higher energy-efficiency construction, simply getting them to understand what an energy model is, how to employ an energy advisor in the design and permitting process, how to do a blower-door test and inspections... those are foreign concepts,” one interviewee explained. “Step 1 demystifies all that.”

Step 1 also gives local governments a clear sense of where the gaps lie and where training is needed. For example, it includes an airtightness test. If a building doesn’t meet the required level of airtightness, and fails, the building official could require that the builder does everything reasonable to improve it. If it fails a second time, the official may issue the builder with an occupancy permit, on the condition that he or she pays for and attends a one day air-tightness training workshop.

Whether a jurisdiction moves quickly, or more slowly, ultimately, “we will all get to the same place,” one source reflected. “If you have the capacity to move ahead earlier you will see the advantages. You will have the more skilled planners and designers, and your new buildings will be far more future-proof.”



## Lesson 7

# Identify and Tackle Cost 'Pain Points'

**Cost will be the number one issue of energy-efficiency regulation. Tackle costs directly with training programs, targeted incentives, and good information.**

In 2017, BC Housing, the provincial public agency that oversees residential builder licensing and education, published what is likely the most detailed analysis of the costs of higher-performing buildings undertaken in Canada to date.<sup>1</sup> It found that, in most situations, builders could deliver on the requirements of the Lower Steps for about two per cent more than what they would pay to comply with existing code requirements on energy.

This premium is in line with the costs of previous code updates, stakeholders confirmed. "Just as with seismic standards, fire prevention and egress measures, and public health requirements, energy performance is not cost-neutral," one interviewee said. "Rather, is an investment for societal good."

Knowing that costs would nonetheless be contentious – especially amongst those who might not consider energy performance a societal good – the Council identified the specific cost pain points, and worked to mitigate them as much as possible. For example, Fortis Energy, the province's natural gas utility, revamped its incentive program to align directly with the steps of the **BC Energy Step Code**.

<sup>1</sup> *Energy Step Code Metrics Research Report 2018, BC Housing. Available via [energystepcode.ca](http://energystepcode.ca).*

During consultations, builders identified the learning-curve cost – the time needed to learn new practices and techniques, as one of the larger costs associated with higher-performance construction. While interviews with "real-world" studies were showing that they could meet the requirements of the Lower Steps with readily available materials such as continuous insulation and good windows, learning the strategies takes time, and time is money.

BC Housing, the provincial agency responsible for builder licensing and education, developed courses on the practices and approaches to higher-performance construction, and began delivering workshops to builders around the province. As of early 2019, more than 1,600 professionals had completed some training, with more courses planned. The agency also published illustrated guides for builders and architects, offering detailed technical information on the relative performance characteristics of wall and roof assemblies in various climate zones (see Appendix B).

The Council also targeted other costs. For example builders must hire an energy advisor to help optimize project designs and demonstrate compliance with the standard's metrics. Their fees can add \$800 to \$1,200 to construction costs.<sup>2</sup> However, a growing number of local governments now offer rebate programs, co-funded by utility incentive programs, to offset or eliminate that up-front expense for their first BC Energy Step Code project.

<sup>2</sup> *These fees can be higher in rural, lower density areas where there is less development activity and, as a result, fewer energy advisors.*



*Home builders in Vancouver, British Columbia participate in an air-barrier installation workshop.*

## Lesson 8

# Consider Elections and Seasonal Factors in your Roll-Out Plan

**Segment your engagement work into phases, planning around political pinch points and industry crunch times. Ask yourself: “What needs to happen, and who needs to be there?”**

With a long-term target established, and with a best-practices guide in the hands of local governments, some members of the team worked to map out key phases of engagement and outreach work, and consider key milestones, constraints, and opportunities.

“Remember, this is not a race,” one interviewee said. “Market transformation is the long game.” The source recommended that anyone considering a performance-based tiered energy code plan ahead and map out the initial years of implementation. “Take account of political deadlines, such as elections, and major events and milestones when it might be prudent to ‘press pause’ on outreach and engagement or, on the other end, catalyze a lot of interest and engagement,” the source said.

In British Columbia’s case, local-government elections were scheduled for less than a year after the **BC Energy Step Code** had entered into legal force as a part of the *BC Building Code*. The Energy Step Code Council knew that, if local governments were to have access to the new standard, they would need quick, clear, sources of information, starting with the *Best Practices Guide for Local Governments*.

The team also knew that following the election, local government staff around the province would need to bring hundreds of new councillors and dozens of new mayors up to speed.

Team members representing both local governments and builder associations ensured staff and members had resources and guidance as needed, and provided them with ongoing updates and information on who was using the standard, and how it was being put to work.

They commissioned capacity studies and ran ongoing surveys to understand information gaps and address them, and track increasing awareness. The broad uptake of the **BC Energy Step Code** was not an accident; though there was never a “hard sell” going on anywhere, Council members took steps to ensure that both communities and their builders had good information, in a useful form, at the right time.



# Lesson 9

## This is a Change-Management Process

Identify industry friction points, and patch in support and resources where they are most needed.

“More than anything else, the move to net-zero energy-ready codes is a change-management process,” one interviewee said. “It’s a question of, ‘How do you get to people to change the practices they have used for years, when many don’t really even want to?’”

The team knew that there would be speed bumps on the road to market transformation, and so they worked to create a pathway for everyone, one interviewee said. Though developers of commercial office buildings and residential towers had their own challenges, the Energy Step Code Council recognized that the biggest change management issue may be for the province’s 7,300 or so licensed homebuilders.

The team situated these builders on a bell curve, divided into four groups. On the left-hand side, they placed the relatively small crew of early-adopter builders who had experience with programs such as Natural Resources Canada’s ENERGY STAR, the higher levels of Built Green Canada’s BUILT GREEN program, or the Passive House Institute’s Passive House standard.

Members of the province’s broader homebuilding industry populated the middle portions of the curve. “There were builders who were already voluntarily building to at least Step 3, and there were two middle groups of willing people who might grumble a bit, but who were willing to upgrade their skills,” one stakeholder said. BC Housing research data confirmed strong interest in training on the *BC Energy Step Code*.<sup>1</sup>

Finally, at the far right-hand side, they placed a smaller group of late-adopters. This group would only change their practices when required to do so. “We knew they would probably make a lot of noise, and dig in their heels, but they were a part of the picture,” the interviewee said.

The Council sought to offer something for each of these groups. They offered the early adopters profile by inviting them to co-host webinars and speak at conferences, and by encouraging them to contribute op-eds to media.<sup>2</sup>

Knowing that the middle group were interested in training, the team coordinated with agencies, institutions, companies, and local governments to co-sponsor hands-on workshops, guides, and other resources, and promoted them through its communications channels. Further, local governments offered incentives and some training support. (See Lesson 5.)

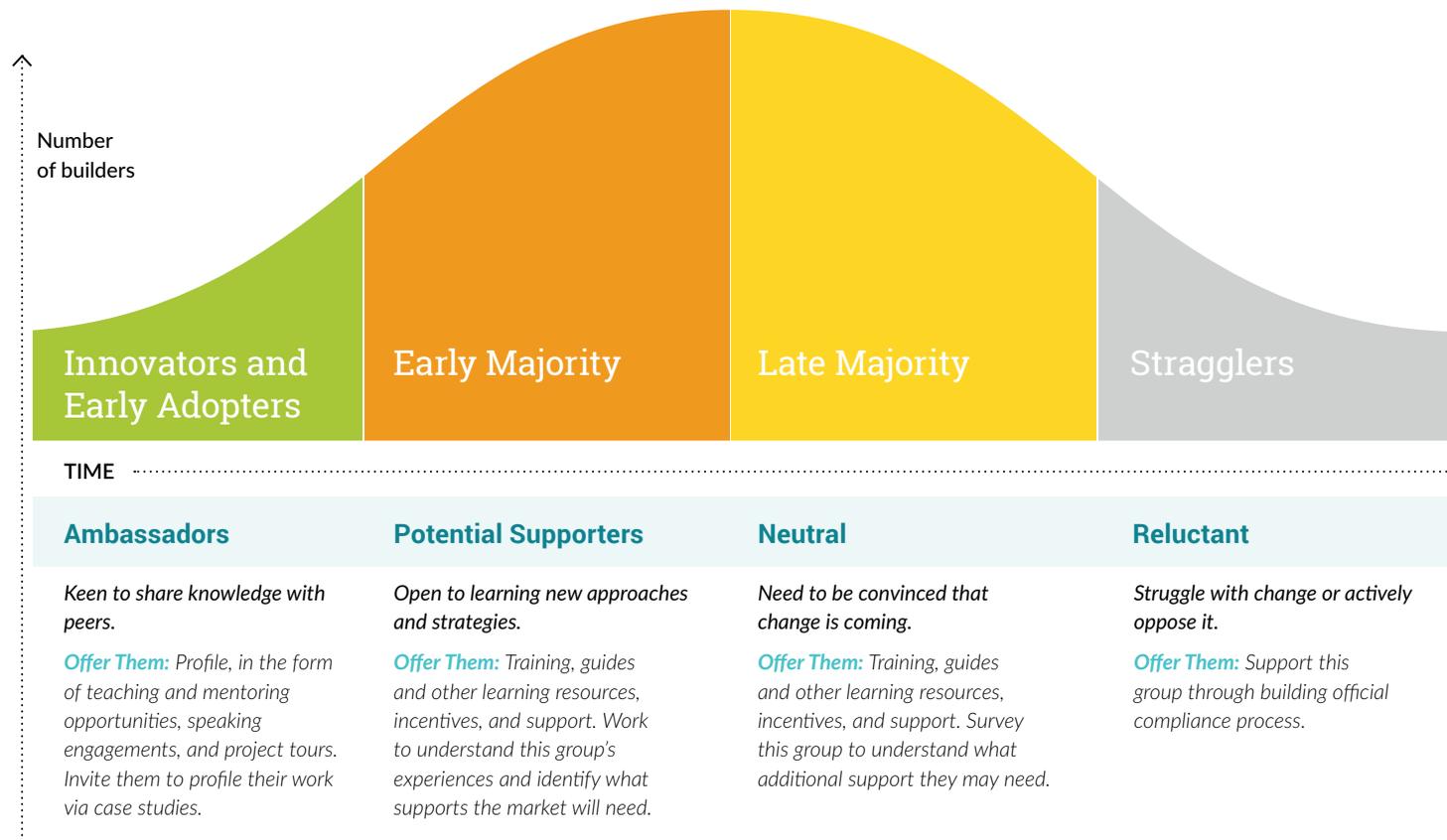
And the stragglers? “It’s important to let this group know that you hear them,” one interviewee said. “But also important to not disproportionately invest in them, because they’re dug in, and vocal, and will fight new regulations.” The BC Hydro Community Energy Managers group helped counterbalance these vocal voices by producing a series of case studies of “real-world” home builders who are cost-effectively meeting the requirements of Step 3, Part 9.<sup>3</sup>

In summary, “it’s going to be a change for everyone,” said one interviewee. “This is a big market transformation. But if you are honest with all the stakeholders, if you tell them that you are aware that it will be tough for some, and you are still proceeding, then you can get people to come to the table.”

### Meet People Where they Are:

Builders span a wide range of knowledge, skill, and readiness to learn new approaches. Offer something for everyone.

**Note:** This diagram explains how to support builders under a regulated pathway to net-zero energy-ready buildings. The same approach applies to other industry trades and professions and/or local government professionals – e.g. architects, engineers, building officials, or elected officials.



1. In a 2018 BC Housing survey of licensed residential builders, 49 per cent of respondents expressed interest in BC Energy Step Code training.  
2. “Opinion: In the push for better buildings, B.C. leads the pack,” Nathan Stone, Sam Zirnhelt, and Damon Gray, *The Vancouver Sun*, February 15, 2018.  
3. Available via [energystepcode.ca/case-studies](http://energystepcode.ca/case-studies)

# Lesson 10

## Continue to Refine and Improve the Standard Over Time

Access existing industry and local government professional organizations and associations, and resource them, if need be, to educate and mobilize their respective members.

As the shift to performance-based codes is a multi-year process, interviewees recommended thinking of the advisory committee as an enduring body. The team that will hammer out implementation details should continue meeting to share insights, track results, and troubleshoot any issues that come up as local governments climb the high-performance staircase.

The Energy Step Code Council's Local Government Peer Learning Networks serve as the "eyes and ears on the ground" as local governments reference the standard in bylaws.

The 2017 Metrics Report revealed some minor issues and loopholes with the standard. For example, the team discovered that, without adjustments, builders in the province's subarctic northern communities would not practically be able to reach the net-zero energy-ready target. The spreadsheets also revealed that, in certain circumstances, larger detached homes

built to meet the requirements of the **BC Energy Step Code** could potentially use more energy than those built to minimum code requirements.

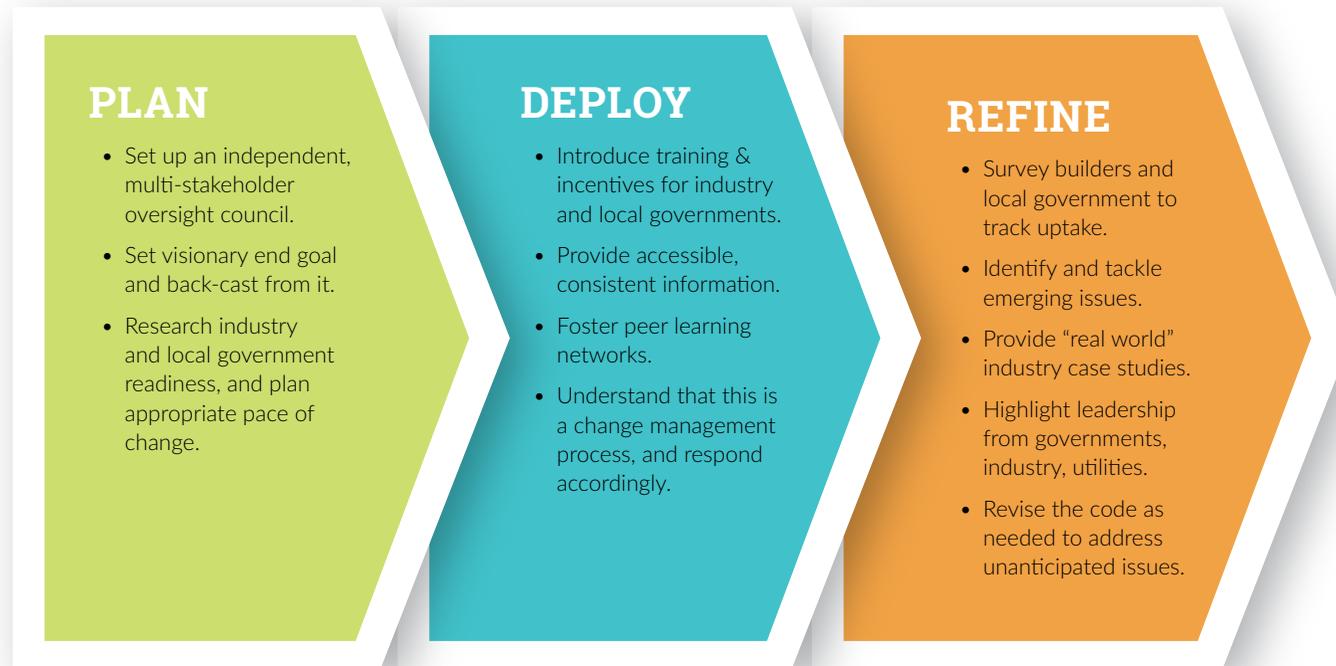
The Council's Technical Subcommittee investigated, recommended a series of adjustments, and, after a bit of back and forth, the Council forwarded a set of proposed adjustments to the province. The province adopted them in late 2018. "It is important to build in some flexibility," one interviewee said. "There is no possible way we can get everything right and that acknowledgement will be important for others."

"We have already said [the metrics] are not carved in stone; as we learn more about how these buildings are built, we are going to learn more about whether they are achievable without dramatic increases in cost," noted one interviewee. If others follow a similar path, the source said, "it will be important to monitor how the metrics play out, and how they look on the ground."

"We have made a number of changes; we didn't get it right in version 1.0 but that is the whole point of setting that 2032 timeline and working our way along it," said one interviewee.

Further, it isn't just the standard's technical metrics that have evolved and expanded – they are now available for many more building types in all areas of the province. The Energy Step Code Council itself has expanded and welcomed new members. In short, the body is continuing to evolve in response to feedback from within its ranks and the larger stakeholder community.

One interviewee expressed hope that the processes established for the **BC Energy Step Code** could potentially open the door to a wider range of opportunities. "Now that we know we have a good structure for energy, it might not be too difficult to leverage the Step Code model to make buildings even better, for example, to decarbonize the existing building sector," the source said.



*Planning for Success:* Any jurisdiction considering a regulated pathway to net-zero energy-ready buildings should consider three broad phases of work.

## Section 3 Parting Thoughts

Here we compile a variety of insights and reflections, shared by interviewees, that did not readily lend themselves to any one of the key lessons learned, but that may nonetheless prove beneficial to other jurisdictions.

*"The job is not done unless others take it up. In British Columbia, we are such a small jurisdiction, and we don't talk ourselves up. But we have some sense of responsibility to be able to share [our story] with other jurisdictions. We have created a market transformation pathway. That is what others need to get to. I hope to give others the confidence that they can, too."*

*"For British Columbia's reputation [for climate leadership], this is gangbusters. Megacorporations are looking for the sexy places to set up shop, to attract talent, and that offer good integrated land use and good transportation services, and a strong reputation on the climate front is part of that."*

*"Now that we have done this for new construction, how do we do it for the other fundamental building blocks of climate action? How do we continue to nurture and grow? I'll be exploring how we can stand on the shoulders of the Step Code and use the networks and relationships we have established to drive other things, like electrifying vehicles and buildings."*

*"Incremental changes are so painful for industry. Whether it is a leap ahead, or an inch forward, it is almost the same amount of effort because change costs time, money, and confusion. So [industry] said, limit the changes and tell us where we are going, and we will grow up and move on with it."*

*"Part 3 developers prefer performance based regulations rather than prescriptive rules, because technologies change over time, and they are better able to cost effectively figure out what works for their site."*

*"There is still some angst out there. We are going to have to change the design of buildings; we aren't going to be living in the 'City of Glass' anymore. Will there be acceptance of [net-zero energy-ready] buildings from neighborhood groups, design panels, and consumers? We don't know."*

*"Good builders do not expect to be building the same product year after year, they want legislation to support them to create better and better projects. Even those who have been hesitant to do it, once they have done it, they will be more proud of their product."*

*"There are lots of different players in the building sector that are not working together, and part of what we are doing is modernizing the sector by bringing those professional and groups together with a shared vision of more efficient buildings. This is solving multiple problems; it is not just tacking energy efficiency onto the top of a troubled industry; it is using it to modernize the industry."*

*"If there is anything to brag about, it's how multiple levels of government, utilities, builders and developers all got together and tried to figure out a solution to a big challenge. That is the single biggest lesson for other jurisdictions."*

*"It could have been local governments getting together with the province and saying, 'This is what we want to do,' and then imposing it on industry. And my peers would have yelled and screamed for two years. Instead, we were invited in from the beginning, and asked, 'How can this be implemented on the ground in a way that is as least destructive as possible?'"*

*"The process and progress to date with the Step Code has been fantastic. Still, it's important for all parties to stay focussed on the remaining challenging work ahead. We've had great success so far, and the transformation of the construction sector is well underway, but to actually hit a 2032 net-zero energy-ready code that's seeing strong compliance province-wide is still a massive task, and will require building upon the lessons learned and really ramping up our successful strategies."*





Appendices

## Appendix A: Methodology

We based this report on interviews with 13 government, industry, and utility-sector representatives, each of whom played a direct role in developing the **BC Energy Step Code**. We interviewed the participants under the Chatham House Rule.<sup>1</sup> As such, while we quote from the interviews throughout this report, we do not attribute any specific comment to any one source.

We invited the participants, whom we list below, to share their own impressions of the circumstances that gave rise to the standard, the team's approach to consensus building and conflict resolution and the core characteristics that emerged from the process. We also asked participants to reflect on how their constituents, members, or customers received the **BC Energy Step Code**, what they would do differently were they to start all over again, and their impressions of the overall process and result.

We also reviewed minutes of Energy Step Code Council meetings, and the white papers and other resources that the core team and subcommittees commissioned to inform their work. We list these resources in Appendix B.

### INTERVIEWEES

- **Emilie Adin**, City of New Westminster
- **Bea Bains**, FortisBC
- **Tom Berkhout**, Ministry of Energy, Mines and Petroleum Resources, Province of British Columbia
- **Jeff Fisher**, Urban Development Institute
- **Maura Gatensby**, Architectural Institute of British Columbia
- **Toby Lau**, BC Hydro
- **Wilma Leung**, BC Housing
- **Zachary May**, Ministry of Municipal Affairs and Housing, Province of British Columbia
- **Sean Pander**, City of Vancouver
- **Dave Ramslie**, Concert Properties
- **Mark Sakai**, Homebuilders Association Vancouver
- **Rory Tooke**, City of Victoria

<sup>1</sup>. When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed.

## B: Useful Resources

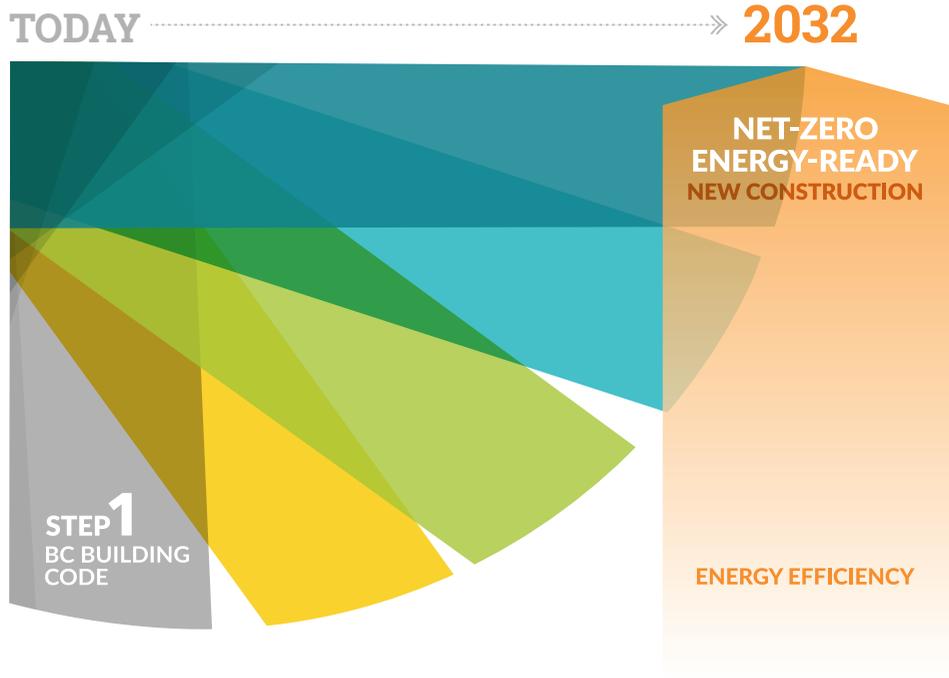
The following resources offer additional detail on implementation, building strategies and practices, market gaps, policies, and costing. Unless otherwise noted, these documents are available via [energystepcode.ca](http://energystepcode.ca).

- *Energy Step Code Metrics Research Report 2017*, BC Housing.
- *Energy Step Code Metrics Research Report 2018*, BC Housing.
- *BC Energy Step Code: A Best Practices Guide for Local Governments*, Energy Step Code Council and the Province of British Columbia, 2018.
- *Energy Step Code Training and Capacity Project Report*, Community Energy Association and BC Hydro, 2017.
- *BC Energy Step Code Builder Guide*, BC Housing, 2018.
- *BC Energy Step Code Design Guide*, BC Housing, 2018.
- *BC Energy Step Code Brand Handbook Volume 1: Design Guidelines and Volume 2: Style and Brand Usage Guidelines*, Energy Step Code Council, 2018.
- *Energy Step Code Implementation Recommendations - Stretch Code Implementation Working Group*, Pinna Sustainability for the Building and Safety Standards Branch, Office of Housing and Construction Standards, Province of British Columbia, 2016.
- "BC Energy Step Code Case Studies Series 1 – Five B.C. Communities," BC Hydro Community Energy Managers, 2018.
- *Advanced Energy Efficiency Requirements for Buildings in BC*, Integral Group (White Paper), 2015. [integralgroup.com/projects/bc-energy-step-code/](http://integralgroup.com/projects/bc-energy-step-code/)
- *Evolution of Energy Efficiency Requirements in the BC Building Code*, Tom-Pierre Frappé-Sénéclauze and Josha MacNab, The Pembina Institute, 2015. [pembina.org/pub/evolution-of-energy-efficiency-requirements-in-the-bc-building-code](http://pembina.org/pub/evolution-of-energy-efficiency-requirements-in-the-bc-building-code).
- *Pathways to Net-Zero Buildings in B.C.: Policy Proposal – Getting New Part 3 Buildings Net-Zero Ready*, Tom-Pierre Frappé-Sénéclauze, Karen Tam Wu, The Pembina Institute, 2015. [pembina.org/pub/pathways-to-net-zero-bc-policy-2015](http://pembina.org/pub/pathways-to-net-zero-bc-policy-2015).
- *From Brussels to British Columbia: An analysis of the proliferation of Passive House in Brussels*, 2015, Karen Tam Wu, The Pembina Institute. [pembina.org/pub/from-brussels-to-british-columbia](http://pembina.org/pub/from-brussels-to-british-columbia).

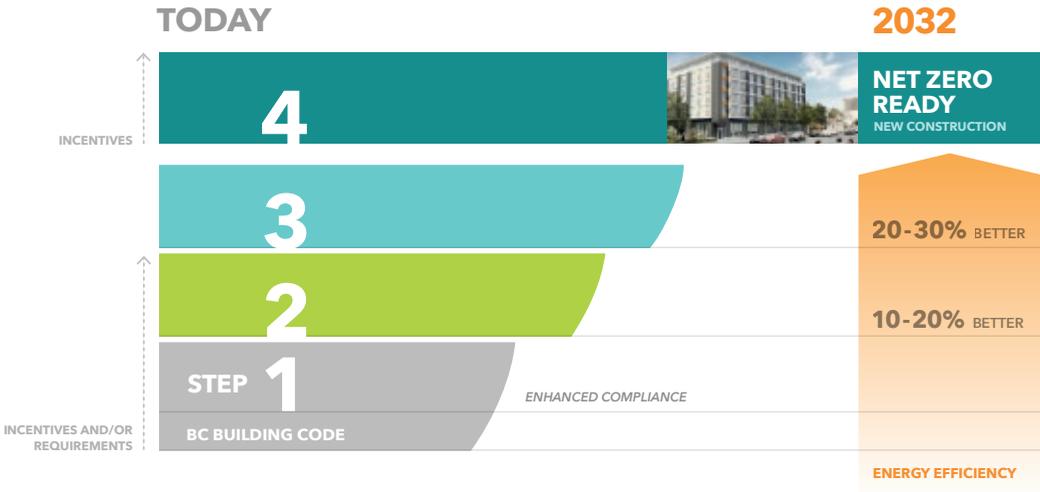
# Appendix C: Explanatory Graphics

We provide here examples of the explanatory graphics and diagrams that the Energy Step Code Council made available to local government and industry associations to help them explain the BC Energy Step Code to their respective constituents and members.

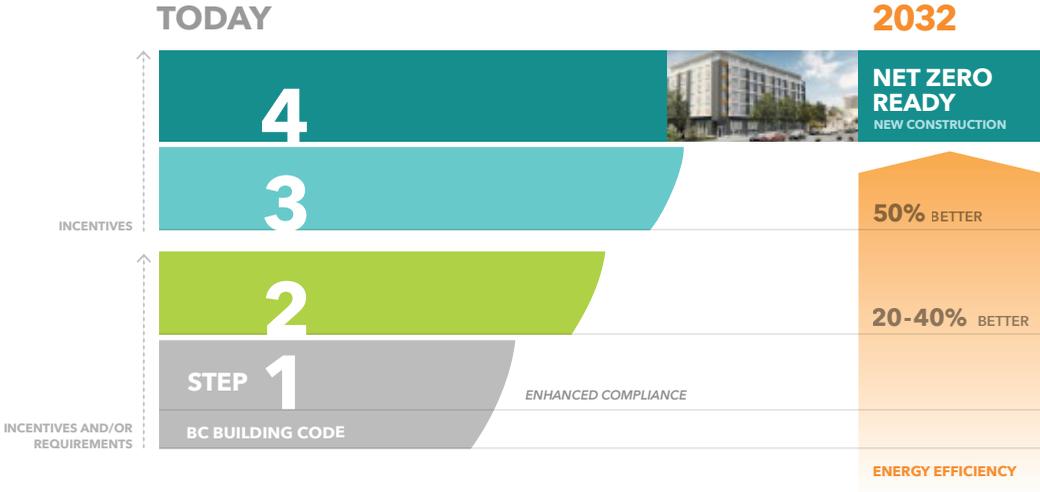
Simplified Steps Explainer Diagram



Steps Diagram: Tall and Complex Wood Buildings



Steps Diagram: Tall and Complex Concrete Buildings



# Appendix D: Stretch Code Implementation Working Group Recommendations

In May 2016, the Province of British Columbia convened a Stretch Code Implementation Working Group to seek stakeholder input and offer guidance on how to best implement a step code to achieve consistent building energy performance beyond the *BC Building Code*. The working group met five times. Its final report, released August 2016, including the following recommendations for provincial government, utilities, local governments, and industry.

## For the Government of British Columbia

- Adopt the Step Code into a voluntary provincial regulation as per the technical appendices for Part 3 and Part 9 buildings.
- Create a process for local governments to reference the Step Code.
- Provide a clear link between performance requirements of the Step Code and future building code requirements.
- Designate and commit resources to support provincial coordination of the ongoing implementation and uptake of the Step Code.
- Designate and commit resources to support an advisory committee to play an ongoing role in implementation for local governments and the development community, as well as monitoring and reporting.
- Make any necessary changes to the Step Code over time, as recommended by the committee.
- Establish an alternative solutions process to streamline the use of new and innovative materials and assemblies used in high-performance buildings.
- Consult with other Provincial departments to adopt changes to Demand-side Measures Regulation that enable utilities to provide incentives for the Step Code that is enacted by bylaw.
- Demonstrate leadership by consulting with other Provincial departments to require higher step requirements for Provincial buildings/public sector.
- Support training and capacity development of industry and local governments to implement the Step Code.
- Work with partners to ensure adequate incentives are in place to support successful implementation of the Step Code.
- Align policy across Ministries to incent Step Code implementation.

- Coordinate discussion and efforts with other Ministries to develop supports required to advance Step Code implementation.
- Consult with other Provincial departments to use the Energy Efficiency Act to improve the industry's adoption of more energy efficient devices, such as windows for both current and new stock.
- Designate funding and resources to accomplish the Step Code 18-month work plan.
- Support local governments in establishing a standardized approach and database for benchmarking of actual energy use in buildings.

## For Utilities

- Work with the advisory committee to align existing incentive programs with the Step Code to support market transformation.
- Communicate and provide guidance on how programs and incentives support the Step Code.
- As new incentive programs are developed, consider providing appropriate financial and nonfinancial supports to enable market transformation.
- Align timing and availability of new programs to Step Code requirements.

## For Local Governments

- Proactively engage in capacity development opportunities to ensure planning and building inspection readiness to recognize and inspect for new requirements of the Step Code.
- Follow the Local Government Implementation Guide (more detail in Section 3.2).

## For Industry

- Engage and share communications materials on Step Code technical requirements, training opportunities, incentives, and industry best practices across the building industry.
- Proactively engage in capacity development opportunities to ensure readiness for offering services that support energy performance requirements in communities that have adopted the Step Code.

# Appendix E: History of the BC Energy Step Code

The **BC Energy Step Code** is the end result of a collaborative multi-stakeholder process, led by the Province of British Columbia, that in recent years brought together government, utility, and industry representatives. But its beginnings go back further.

With this Appendix, we outline the specific stages and milestones that led to the standard's creation and implementation as government policy.

## Local Governments Act on Climate

In 2008, British Columbia's provincial government began requiring local governments include greenhouse-gas targets and actions in official community plans and regional growth strategies. In addition, many local governments signed on to the *Climate Action Charter*, which offered them a range of incentives in exchange for their commitment to create "complete, compact, more energy efficient communities." Communities dutifully began doing so, but lacked the capacity, expertise, and/or political will necessary to meaningfully tackle building energy, a leading source of greenhouse gas emissions.

As a result, aspirational statements and soft language on energy efficiency began appearing in community plans. Many British Columbia local governments produced voluntary "sustainability checklists" that encouraged, but did not require, builders to deliver higher energy performance. As these guidelines were voluntary, and governments offered industry no incentives to meet them, builders generally ignored them. Given development cost charges and other fees that municipalities were expecting industry to pay, the modest cost premiums associated with higher-performing homes and other buildings limited adoption to a small cohort of high-end builders.

"It was hard to market energy performance, because there was no buyer education," one industry source explained. "When you are building a high-end product, adding a bit of energy efficiency won't even be noticed. It was like the first bunch of guys who bought Teslas. It didn't go broader because there was no consistent approach, and there was no public education. It just wasn't something you could market."

The government of the day also directed BC Hydro, the crown electricity utility, to meet a defined proportion of new-generation capacity through efficiency and conservation measures. To deliver on this mandate, the utility began resourcing local governments by co-funding in-house professionals called Community Energy Managers. It also supported a peer-learning network to help the managers develop more effective building-energy policies while learning from one another's experiences. Once equipped with this in-house professional expertise, local governments began to use much stronger tools such as re-zoning policies, density bonusing,

and building permit rebates to drive higher energy efficiency requirements in new construction. These bylaws were effective, but the local governments struggled to identify what energy efficiency standards they should set as targets.

For example, many of the resulting local-government plans and policies referenced "per cent above" codes, such as those published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) or National Energy Code of Canada for Buildings (NECB). Others referenced third-party programs, standards, and certifications, such as the Canada Green Building Council's LEED, Built Green Canada's Bronze, Gold, and Platinum certifications, Natural Resources Canada's ENERGY STAR, or the Passive House Institute's Passive House standard.

These programs had varying degrees of industry uptake and effectiveness. Some had the unintended impact of increasing greenhouse gas emissions, one interviewee reported, as they allowed fuel switching from electricity to natural gas. But all were hampered by the fact that each took a different approach to addressing energy efficiency.

## The Province Takes the Wheel

For many years, since well before 2008, builders and developers had struggled to comply with a patchwork of at-times conflicting local government rules on everything from accessibility, to tree retention, to green roofs. The challenge was particularly acute in urban areas such as Metro Vancouver, where 21 local governments rub shoulders with one another. When a critical number of local governments began regulating energy efficiency for buildings, industry asked the province to intervene.

In response, the Government of British Columbia in March 2015 passed the *Building Act*, which clarified that it had sole authority to establish technical requirements for buildings, including energy-performance requirements.

From their perspective, local governments had been using legitimate policy tools to reduce greenhouse gas emissions, as the province had asked them to. But the provincial government responded to industry concerns that communities had inadvertently created a complex web of requirements. *The Building Act* effectively put the local governments on notice: As of December 15, 2017, any local policies that departed from the provincial building code – not just on energy efficiency, but also fire protection and accessibility – would be unenforceable. The province added similar language to the Community Charter, which details authorities held by local governments other than the City of Vancouver. "We were having our knees cut out from under us," one local-government interviewee recalled.

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Fortunately, the province heard, loud and clear, that local governments still wanted to reduce built-environment emissions – and correctly deduced that a shared set of technical building requirements would be the best way to go about it. It embarked on a process that aimed to give communities the flexibility they sought to increase energy efficiency, but to do so in a way that gave industry both consistency between jurisdictions and a “long-range forecast” on where the code was headed on energy efficiency.

### The Box in the Basement

Meanwhile, and separately, since early 2015, the City of Vancouver – the only British Columbia local government with its own building code – had begun research on what questions it would need to ask and answer to deliver on very-high-performance buildings. It was the very start of what would ultimately become the city’s Zero Emissions Building Plan, which aims to deliver on the city’s goal to transition to zero-emissions buildings in all new construction by 2030.

With funding support from BC Hydro and the Carbon Neutral Cities Alliance, and in consultation with the Urban Development Institute and the Pembina Institute, city staff and private sector leaders began to engage with local industry and global regulatory leaders on what the city would need to put in place to reach its goal.

A team of four experts from BC Hydro, the City of Vancouver, the Urban Development Institute, and Integral Group began identifying regulatory barriers to high-performance buildings, exploring appropriate incentives, and understanding how best to boost industry capacity through training and peer learning. They focused on residential buildings, because they were the city’s highest source of emissions and the overwhelming focus of development activity. “We realized that the problem we needed to fix, fast, was residential buildings” said one interviewee.

The major challenge was that building designers were largely leaning on mechanical systems – that is, heating, cooling, and ventilation equipment – to meet the code’s energy efficiency requirements. But once the buildings were occupied, building owners were neither operating nor maintaining those systems properly. Operational experience by BC Housing and others has confirmed that they frequently do not deliver their promised efficiencies, and have proven very challenging for those entrusted with running them. The City of Toronto’s Office of Energy Efficiency shared its own research, which corroborated this finding, one of the team recalled:

“To reach the target, you just had to spec a different box in the basement, and you were good to go. But that box never worked as designed, because it required commissioning and ongoing optimization.” Unfortunately, these were skills that the person usually assigned to manage building operations often lacked. Strata councils were a real issue. One source reported that they had so little education about how the systems worked that they occasionally turned them off altogether.

“If you had one of these in a dedicated rental or commercial building, that was less of an issue, because they had professionals who knew what they were doing,” one interview reported. “But the strata councils? They don’t run buildings; they have lives to live and jobs to go to.”

### The Backcasting Approach

Their first conclusion: Governments needed to change the way they were measuring building energy efficiency because evidence was piling up that the solutions builders were adopting to comply with them didn’t perform in the field as hoped. Instead of a “per cent better” approach, they adopted a metric known as TEDI, or Thermal Energy Demand Intensity. TEDI measures the annual heating energy needed to maintain a stable temperature inside a building, and it takes into account both heat lost through the envelope and so-called “passive” heat gains. These are temperature gains from, for example, sunlight coming through windows and body heat from occupants.

The four experts reached out to industry for feedback, and met with the construction consultants that high-rise-tower builders work with to share feedback on a range of building techniques.

“Developers and builders told us that just telling them the incremental changes in requirements would not enable industry leaders – from developers to all those in the supply chain – to prepare for the end state,” one of the group members said. “The city’s Zero Emissions Building Plan set out steps and one specific end goal.”

This backcasting approach was, and remains, completely different to traditional code development. “We realized that the traditional incremental process was never going to get us to net-zero; it lacked strategy,” one participant noted. Also, one interviewee emphasised that the changing global context played a role. “This wasn’t just cooked up here, this was coming out of Paris,” one interviewee said. “I told my members, ‘Look, the whole country is going this way.’ The target wasn’t just Vancouver’s end state, it was a provincial end state and a federal end state. I’m not going to just stand there while that train runs me over.”

For inspiration, the team looked to the Passive House standard, which is built atop a rigorous set of energy-performance targets. Following further research and consultation with utilities, industry, and NGOs active on built environment issues, such as the Pembina Institute, the team landed on the core technical elements of Vancouver’s Zero Emissions Building Plan. In the spring of 2015, the provincial government, which recognized the rigour of the City of Vancouver’s underlying research and had listened in as the team built consensus with industry, asked the Integral Group representative to capture them in a white paper. As a result, “Advanced Energy Efficiency Requirements for Buildings in BC” appeared in May 2015.

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A few months later, the province convened an Energy Efficiency Working Group and chartered it to develop a set of technical recommendations for stretch codes for Part 3 buildings that could be enacted as a provincial regulation and enforced by local governments on a voluntary basis. The Integral Group white paper served as the starting point for the conversations.

## Building on Vancouver's Foundation

The province asked the Energy Efficiency Working Group to review the Integral Group white paper, and other energy-efficiency policies and regulations, and offer guidance on how to best implement a stretch code, or step code, that would transition the industry to deliver net-zero energy-ready buildings by 2032.

At first, the Energy Efficiency Working Group focused exclusively on a code that would apply to Part 3 buildings. But it soon formed a dedicated subcommittee to recommend corresponding metrics and requirements for Part 9 buildings.

The working group adopted the City of Vancouver's metrics, but revised the targets. It also decided to make the first step of the **BC Energy Step Code** a capacity-building option (see Lesson 7). It considered a greenhouse-gas intensity metric, lighting requirements, and a single energy modeling platform – although none of those ended up in the final standard.

## Designing the Implementation Framework

As the **BC Energy Step Code's** technical requirements came into focus – including metrics for each building type, in each region of the province – the Energy Efficiency Working Group began sorting out how local governments might reference them in their bylaws.

Industry representatives expressed concern that the province was about to give 162 local governments free license to reference the different steps as they pleased. They knew some communities were chomping at the bit to improve building energy efficiency and, once given this powerful new tool, might introduce requirements that builders weren't ready to deliver on. They had a point: In some areas of the province, builders struggled to comply with even the minimal energy efficiency requirements that are already written into the base *BC Building Code*.<sup>1</sup>

The working group discussed what would constitute a “prudent” or “responsible” use of the **BC Energy Step Code**. Some industry representatives suggested local governments should have to apply to the province for permission to adopt it. But both provincial and local government representatives worried that such a process would be overly cumbersome, bureaucratic, ineffective and a nightmare to administer. It might well strangle the **BC Energy Step Code** in red tape, they argued.

<sup>1</sup> A 2011 survey conducted by BC Hydro concluded that as much as one-third of all new construction had building code energy efficiency compliance issues.

The larger working group convened a smaller team to identify solutions and then report back. Representatives of the provincial government, the City of Surrey, and the City of Richmond worked closely with BC Hydro and a range of industry representatives to hash out an approach that would provide local governments with appropriate guidance and oversight. Working together, they developed an implementation framework based on trust and bottom-up capacity building, and presented it to the larger working group, which refined it further.

The resulting **BC Energy Step Code** Implementation Framework includes the following:

- Clear rules about when local governments could adopt the steps. For example, the group established an initial transition period, during which local governments could only reference the Lower Steps. This would effectively put brakes on governments that might otherwise rush quickly towards very high-performance requirements. The rules also specified that local governments must provide industry with minimal notice periods prior to using the standard.
- A commitment to publish and distribute two essential resources:
  1. An **Energy Step Code Best Practices Guide for Local Governments** that would clearly explain the rules to local government staff. In the end, the group sent a copy of this guide to every local government in the province.
  2. An **Energy Step Code Metrics Research Report** that would model the anticipated additional build costs needed to meet the requirements of each step in each of the province's six climate zones. BC Housing led its development, in partnership with BC Hydro, the province, the City of Vancouver, and Natural Resources Canada. It remains one of the most extensive energy analyses of buildings conducted in Canada to date.
- A commitment to establish a multi-stakeholder “council” that would oversee **BC Energy Step Code** implementation. This effectively morphed the energy efficiency working group into an enduring advisory body; all members agreed to join.

In addition to the above official elements, BC Hydro's Community Energy Manager Network of local government staff – its numbers include several members of the Energy Efficiency Working Group – gave local governments additional resources and supports. These included:

- A region-by-region provincial assessment of industry capacity to deliver higher-performance buildings. This study shed light on capacity gaps where industry needed additional training. It helped inform an extensive industry training program led by BC Housing. (One interviewee confirmed that this program was critical, especially for Part 9 homebuilders: “This was a whole new way of building; you can't just throw them into the deep end.”)

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- A Communications and Outreach Strategy that helped local government staff clearly explain the standard to elected officials and senior staff. The suite of tools included a professional visual identity with a logo, explanatory diagrams, and a standard presentation template, as well as a monthly update newsletter, and website.<sup>2</sup>
- A series of webinars explaining the new standard that shared results from ongoing research. Representatives from industry, professional associations, utilities, and governments presented on these to highlight the diversity of viewpoints and considerations.
- A pair of **BC Energy Step Code** Peer Learning Networks to provide local government staff that had either adopted the standard or hoped to do so with bottom-up training, support, and information sharing. These networks helped reassure industry that local-governments would not run amok with the **BC Energy Step Code**. They also served as a forum where industry could informally present concerns if they felt that a local government was not following the guidance set out in the Best Practices Guide for Local Governments.

While the technical team sorted out the metrics, the team working on the **BC Energy Step Code** Implementation Framework established a critical layer of trust and relationships. It has played a critical role in the **BC Energy Step Code's** high uptake and broad industry support.

After eight meetings, in August 2016, the Working Group released 24 recommendations. (See Appendix C.) That same month, the province included a reference to a forthcoming stretch code in its **Climate Leadership Plan**.<sup>3</sup>

<sup>2</sup>. At this point the group formally renamed the "stretch code" the BC Energy Step Code. Its members agreed that the word "step" suggested clear stages of progress towards a clear goal, while "stretch" implied an uncomfortable and uncertain reach.  
<sup>3</sup>. British Columbia's 2016 Climate Leadership Plan included commitments to "accelerating increased energy requirements in the BC Building Code by taking incremental steps to make buildings ready to be net zero by 2032" and "developing energy efficiency requirements for new buildings that go beyond those in the BC Building Code, called Stretch Codes, that interested local governments could implement in their communities." This plan is now defunct; a subsequent government replaced it with the current CleanBC plan, available via [cleanbc.gov.bc.ca](http://cleanbc.gov.bc.ca).

## Market Transformation Begins

On April 6, 2017, without fanfare, the minister responsible for housing officially launched British Columbia's market transformation when he signed a pair of ministerial orders that brought the **BC Energy Step Code** into regulation. The first granted local governments authority to reference the new standard in their policies; the second added its technical requirements to the *BC Building Code*.

British Columbia had become the first North American jurisdiction to create a regulated pathway to net-zero energy-ready buildings. And just in the nick of time.

A few days after the Minister signed the regulation, the then-premier asked the Lieutenant Governor of British Columbia to call a general election. The May 9 election produced a rare hung parliament. In the end, following a two-month delay, a new minority government took the reins. The new government supported the **BC Energy Step Code** but, in part because of the timing of its signing and extended transition period, the regulation debuted without a proclamation, but with a whisper – at least politically speaking.

Even so, the Energy Step Code Council activated its own outreach plan, and began getting solid information and materials into the hands of local governments. Early-adopter communities, such as the City of North Vancouver, which had participated in its development, immediately began referencing it in their bylaws. The City of Vancouver soon began aligning its own Zero Emissions Building Standard with the new standard.

Within a remarkably short time period, the Stretch Code Implementation Working Group – and its successor, the Energy Step Code Council – reached consensus on a long-term policy road map for improved energy-efficiency performance for buildings. And thanks to a well-developed and strategic implementation plan, local governments were starting to use it. The transition to net-zero energy-ready buildings was underway.



“If there is anything to brag about, it’s how multiple levels of government, utilities, builders and developers all got together and tried to figure out a solution to a big challenge. That is the single biggest lesson for other jurisdictions.”