

Zero Carbon Step Code

Key considerations to move from intent to implementation.

November 2025

AT A GLANCE

This Policy Planning Companion document serves as a practical reference for local government staff involved in planning, building policy, or climate action. It consolidates current information about the Zero Carbon Step Code (ZCSC) and explains how it interacts with the Energy Step Code and other provincial building requirements.

For local governments with limited capacity, this document can serve as a starting point for developing a ZCSC implementation pathway. It does not replace technical documentation or provincial guidance such as the [Best Practices Guide for Local Governments](#), but provides a helpful bridge between policy intent and on-the-ground application.

KEY TAKEAWAY

Effective implementation of the ZCSC requires an approach that combines local context awareness, industry capacity building, regional coordination, and clear public communication. Local governments that understand their community's housing needs, engage builders early, align with neighbouring municipalities, and frame ZCSC within broader goals like health, resilience, and affordability are better positioned to adopt the Code smoothly and gain community support.

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Context

With the exception of the City of Vancouver, which is required to meet the Vancouver Building By-Law, all BC municipalities are required to build at a minimum to the specifications of BC Building Code as a base standard. While the Energy Step Code (ESC) was introduced in 2017 on a voluntary basis, Step 3 of the Energy Step Code became minimum base code in May 2023. At the same time, the Province of British Columbia released the Zero Carbon Step Code (ZCSC), a provincial Code designed to reduce operational emissions from new construction. ESC sets out energy efficiency standards for new construction whereas the ZCSC targets operational greenhouse gas (GHG) emissions.¹ While separate standards, they are meant to work in tandem to advance overall building performance, improve broader community health and resilience, and achieve community and provincial targets related to emissions reduction and climate action.² When it was introduced in 2023, local governments could opt-in to beyond provincial code minimums, but as of March 10, 2025, Emissions Level 1, or “EL-1” of the ZCSC, is required across the province. EL-1 is measure-only and does not include any carbon performance targets. Building beyond the Code now means achieving Step 4 or 5 of the ESC (the upper steps) and/or Emissions Level 2 and above of the ZCSC.

Introduction

Prior to the development of ZCSC, many local governments were exploring tools to limit operational emissions from new construction. This led to the creation and implementation of the step-up/step-down (or two-tiered) approach where local governments would adopt a higher step of ESC but relax the ESC requirement with conditions, such as implementing a low carbon energy system (e.g., Step 5 is required, or Step 3 with a low carbon energy system). This enabled communities to encourage emissions reductions from new construction by offering the choice of a more energy efficient build or one that prioritized low carbon energy.

Now that local governments have the ZCSC as a framework, they can outright require limits to carbon emissions from new construction, but the step up/step down approach can still be useful to encourage higher Steps and emissions levels via different pathways for compliance (e.g., Step 5 and EL-2 is required, or Step 3 and EL-4), allowing builders and homeowners to have choice in their construction design. Many communities have also opted to prioritize emissions over efficiency and have fully required EL-4 while aligning with provincial timelines for ESC (Step 4 by 2027 and Step 5 by 2032). For example, communities like the City of Burnaby, the City of Colwood, and the Township of Esquimalt require Part 9 buildings to reach ESC Step 3 and ZCSC EL-4. CEA’s Climate Action Dashboard includes a [page dedicate to Step Codes](#) and a database of BC communities that have adopted various Steps and Emissions Levels.

¹ [Community Energy Association – ESC and ZCSC Explainer](#)

² While the ZCSC offers a choice of a prescriptive approach or a performance-based approach to compliance for Part 9 buildings, only a performance-based approach is available for Part 3 buildings. **Appendix A provides a summary of these compliance pathways.**

Considerations for Implementation

A local government's approach to support ZCSC adoption and implementation timelines should be informed by several factors:

1. Community context (e.g., climate zone, population growth projections, and housing stock needs)
2. Capacity of the local industry
3. Regional alignment
4. ZCSC communications and framing
5. Complementary policies and plans

1. Understand the Community Context

Every community's context, needs, and priorities are different. Understanding these will help inform the approach to ZCSC. Some communities are not connected to gas infrastructure, and as such, may have already been building to Emissions Level 4 standards by default, while others are currently more reliant on fossil fuel sources.

Climate zone and geography

Where a community is located may also impact the ZCSC approach. Colder and more rural regions face unique barriers to high performance building, including fewer available technologies that can meet heating demand loads, higher costs, supply chain issues, lack of qualified and/or knowledgeable builders and contractors, concerns about power supply, and lack of trust in the electricity grid. These barriers underscore the need for rural and remote communities to begin engagement and dialogue with the local industry early in the implementation pathway (see part 2, below).³

Since the ZCSC encourages the adoption of heat pumps for heating and cooling, local governments should ensure their implementation approach considers any potential need for supplemental heating (e.g., electric baseboards or the gas furnace of a hybrid/dual-fuel heating system) and related increase in energy demand and/or emissions. The 2025 report, [Heat Pump Performance in Part 9 Residential Homes Across Climate Zones](#), found that there are many heat pump models that can meet the heating demand of homes built to Steps 3-5 in climate zones 4 and 5. However, as of the publication date of the report, in colder climate zones (climate zones 6 and above) *if a home is built only to Steps 3 or 4*, there are no heat pump models that can meet the heating demands. Whereas a step 5 highly energy efficient home will not need supplemental heating no matter what

³ Page 20 of the [Province's Best Practice Guide for Local Governments](#) outlines the different combination of tools local governments may apply to ensure their policy pathway is appropriate for their circumstances.

climate zone it's in. Simply, homes that are built to meet upper Steps of the ESC often have lower demand for heating simply by being more energy efficient.

Current and future housing needs

How fast a community's population is growing will inform the kind of housing and buildings that need to be constructed to meet the demand. If there is fast growth and trends indicate that the number of multi-unit residential buildings is increasing, it may be beneficial to prioritize ZCSC for Part 3 buildings to ensure greater emissions reductions. If single-family homes and duplexes are more popular, prioritizing ZCSC for those archetypes may be more impactful.

Analyzing current permit data is a helpful approach to understand the current state of the local industry including which levels builders are currently achieving. This understanding can help set the baseline for performance and inform builder engagement and industry capacity-building efforts.

2. Build Capacity of the Local Industry

Baseline data

Industry needs to be up to speed on ZCSC requirements if they are to build to these standards and comply with regulations. It's helpful to know where your community is starting. Check permitting data to see if and where standards are already being achieved. This will provide a baseline to inform industry engagement and the ZCSC implementation pathway. You may find that a high number of homes are already reaching higher Steps and Emissions Levels, indicating that industry already has a certain level of comfort and familiarity with ZCSC, so bringing in policy may not be as challenging. If buildings are not reaching these levels, it will illustrate the need for more investment and efforts to support industry capacity.

Engage your local industry to understand their knowledge, awareness, and perspectives of ZCSC. This early engagement and dialogue can identify the types of training or education that is needed and, when done before mandating compliance, can build buy-in and support. Hearing from your local industry will also help you design an implementation timeline that is ambitious yet realistic. If industry is less ready, a longer lead time or tiered approach may be helpful as it will signal to the market that this change is coming while ensuring industry has adequate time to adjust and prepare.

In communities where there is no history of engagement on ESC or ZCSC, industry engagement programs often start with information sessions explaining what the Codes are and how they support municipal and provincial targets, while creating safer, better homes.

Training and education

Local governments can promote existing training opportunities and, where appropriate, subsidize or incentive local industry to participate. Local governments can also explore partnering with neighbouring communities to provide training that will help ensure industry will acquire the knowledge and skills to meet compliance. Industry organizations, such as the Canadian Home Builders Association (CHBA) and BC Housing, and educational institutions like BC Institute of Technology (BCIT), offer robust industry training and education programs.

Local governments can hire outside experts to design and facilitate engagement with homebuilders and developers, or, if internal capacity and expertise is available, staff can do so. The City of Richmond delivered training and education through 2020 (often in partnership with neighbouring communities such as the City of New Westminster) using a series of “Virtual Builder Breakfasts.”⁴ And the Resort Municipality of Whistler’s [engagement program](#) with hotel owners had several learnings about how to learn from local industry and tailor training to meet their needs.

CASE STUDY HIGHLIGHT

The Township of Langley has invested heavily into the education and training of their local building community through their [Builder Forum Series](#). [Their deep engagement](#) with industry has enabled them to build meaningful relationships and trust with local homebuilders and developers and has accelerated their adoption of the ZCSC. Their ongoing engagement efforts include a newsletter and detailed resources on their municipal website.

KEY TAKEAWAY FOR LOCAL GOVERNMENTS

- Engage your local industry early to understand their needs and perspectives on ZCSC
- Checking permitting data to see which standards are being achieved already
- Where appropriate, subsidize training opportunities and/or offer incentives. Collaborate with neighbouring communities to reach more builders.
- Develop an implementation timeline that is ambitious yet realistic, and informed by data and engagement

3. Align with Regional Neighbours

Aligning with neighbouring communities creates consistency across the region and supports local homebuilders and developers who work across municipal boundaries. By coordinating and aligning approaches, communities can share and leverage knowledge and resources, such as policy documents and reports, communications materials, and training opportunities. A consistent approach and messaging can help minimize confusion and build confidence in ZCSC. In their [informational document about Code adoption](#) for local builders, the Township of Esquimalt highlighted how their “opt-in schedule” would align them with neighbouring communities.

The City of Victoria, District of Saanich and District of Central Saanich, with support from the Capital Regional District (CRD), enabled them to become the first communities to adopt and implement ZCSC. Their [Step Code Engagement Report](#) is a helpful resource that outlines their engagement

⁴ In [a Report to Committee](#), City staff outline the topics and outcomes of their four virtual sessions (see “Attachment 2” of the linked report).

process, from information sessions, to surveys, to deeper dialogues. A [case study published in May 2025](#) outlines the benefits and outcomes of the CRD's shared, regional service.



KEY RESOURCES

CEA's [Local Government Climate Action Dashboard](#) contains up-to-date information about the Step and Emissions Level adopted by communities across BC.

Join the [Step Code Peer Network](#) to learn from other municipalities that have adopted or are working towards adoption ZCSC.

4. ZCSC Communications and Framing

The ZCSC challenges building norms and can initially be confusing for those who are unfamiliar with it, especially as coordinated misinformation campaigns continue to infiltrate local information systems⁵ and misrepresent its scope and intention. Be aware of the concerns of your local industry, community, and Council members related to low carbon and energy efficient building practices and understand how ZCSC exacerbates or nullifies these concerns. Framing ZCSC in ways that will resonate with your community and emphasizing messaging that is aligned with community priorities will help create support and mitigate backlash.

Common Concerns

Common concerns and points of confusion regarding ZCSC often relate to:

- Having choice in energy and heating options
- Reliability of the electric grid including power outages and whether there is enough (clean) electricity
- Impacts on housing affordability and construction costs including electrical services upgrades
- Affordability of electric systems (capital and operating costs) and whether they work in colder climates
- The role of renewable natural gas (RNG) and hydrogen

There are resources available to help address these concerns including this [study on power outages](#), this [report on the role of RNG](#), and various costing studies, including the [provincial report](#) that informed the development of the ZCSC.⁶

ADDITIONAL RESOURCE

Appendix B outlines ideas for addressing common concerns.

⁵ The Zero Emissions Innovation Centre (ZEIC) is developing a messaging resource based on extensive research. This document will be updated when it is published.

⁶ This provincial metrics report is being updated, and the new version is anticipated for 2026.

Framing ZCSC

Highlighting how the ZCSC is a strategy to support community priorities, including health, safety, and resilience, can help build awareness and buy-in. The ESC and ZCSC challenge building norms and this can lead to resistance, especially during uncertain times. Communications and engagement—whether with council, builders, colleagues or the public—should bring benefits to the forefront and address common concerns and local priorities.

In some cases, it can also be helpful to emphasize that Building Codes have always been updated when we have new knowledge about safety and building science, or when new technologies arrive in market. The fact that we have energy efficiency and zero carbon systems now integrated in the BCBC reflects advances in technology and building practices.

ADDITIONAL RESOURCE

Appendix C provides ideas on messages and framing that connects to common local priorities such as affordability, housing, and resilience.

4. Align with Existing Policies and Plans

Community plans and policies

Consider how ZCSC fits into your community's current policies, plans, and targets. Does your OCP include commitments to reducing emissions from new buildings? Aligning ZCSC adoption with building bylaw updates, community plans, and other complementary policies and plans (e.g., climate action and climate resilience plans that outline how a community intends to adapt to a changing climate), is an effective way to introduce ZCSC and demonstrate how it is a tool to support community goals and priorities. For example, the City of Maple Ridge recently adopted their first ever climate action plan, [Resilient Future 2050](#), which includes accelerated adoption of ZCSC as a key action.

It is also important to be aware how other policy tools can enable ZCSC or unintentionally become a barrier for ZCSC implementation.⁷ For example, many zoning policies, such as setback requirements and noise bylaws, unintentionally penalize high performance buildings. Revising these policies or allowing exemptions will remove policy barriers to ZCSC implementation.

ADDITIONAL RESOURCE

Appendix D provides for more information on these policy tools and how they can be a barrier to ZCSC.

⁷ [Local Government Low Carbon Building Toolkit \(March 2021\)](#)

Provincial Codes and Requirements

While ESC and ZCSC are separate standards, they work together to reduce energy and emissions from new construction. It is important to consider how ESC and ZCSC interact and how this could impact implementation. For example, heat pumps are an energy efficient and low carbon way to heat and cool a home.⁸ Therefore, they are a reliable strategy to meet efficiency targets for ESC and emissions targets to satisfy ZCSC. Furthermore, since heat pumps also provide efficient cooling, they can easily meet the 2024 BC Building Code’s new [overheating protection requirement](#) —at least one living space must be able to maintain a maximum temperature of 26° Celsius

During [industry engagement, the Township of Langley](#) highlighted how ZCSC compliance is in harmony with other BC Building Code measures like cooling requirements. They also created a helpful graphic to show that while adding central air conditioning can achieve overheating protection, a heat pump can meet the ZCSC’s EL-2 requirement as well as the Province’s cooling requirement with no additional reporting needed.

Compliance Matrix

	Step 4	Step 5	EL-2 Prescriptive	EL-2 GHG	9.33.3.1. Cooling
 Gas Heat Only	✓	⚠	✗	⚠	✗
 Direct Electric Heat Only	✓	✓	✓	✓	✗
 with Air Conditioner					✓
 Heat Pump	✓	✓	✓	✓	✓

Figure 1: From the Township of Langley's bulletin to explain how heat pumps comply with ESC, ZCSC, and cooling requirements.



KEY RESOURCE

BOABC’s [BC Energy Step Code and Zero Carbon Step Code Handbook for Building Officials](#) includes helpful tables (pages 68-69 of the BOABC Handbook) illustrating how different combinations of energy sources for space and water heating and appliances may or may not comply with various ZCSC pathways. These tables can also be found in [Appendix E](#) of this document.

Conclusion

The ZCSC represents an important next step in reducing GHG emissions in BC and ensuring new buildings are ready for the future. While the framework introduces new expectations for local governments, builders, and homeowners, it also provides flexibility in how communities can meet provincial climate targets. By understanding local conditions, coordinating regionally, engaging and supporting industry, and aligning the ZCSC with existing policies and plans, local governments can implement the Code in a way that is practical, equitable, and responsive to community needs. Continued collaboration and knowledge sharing among municipalities will help build consistency and confidence as the province accelerates zero carbon new construction.

⁸ See the section title “Climate Zone and Geography” in section 1 of this document which overviews the potential need for supplementary heat sources when installing heat pumps in colder climates. New homes that only meet lower ESC steps will have higher heating demands simply by virtue of being less energy efficient. In colder climates, this is a consideration for industry training and education.

Appendix A: ZCSC Compliance Pathways

While ZCSC offers a choice of a prescriptive approach or a performance-based approach to compliance for Part 9 buildings, only a performance-based approach is available for Part 3 buildings. The table below provides a summary of compliance pathways.

	Prescriptive			Performance		
	EL-2	EL-3	EL-4	EL-2	EL-3	EL-4
Part 9	Electric space heating	Electric space heating + electric water heating	Electric space heating + electric water heating + electric cooking	Annual GHG: <1050 kgCO ₂ e/year or GHGi: ⁹ <6 kgCO ₂ e/m ² /year <i>and</i> Annual GHG: <2400 kgCO ₂ e/year	Annual GHG: <440 kgCO ₂ e/year or GHGi: <2.5 kgCO ₂ e/m ² /year <i>and</i> Annual GHG: <800 kgCO ₂ e/year	Annual GHG: <265 kgCO ₂ e/year or GHGi: <1.5 kgCO ₂ e/m ² /year <i>and</i> Annual GHG: <500 kgCO ₂ e/year
Part 3 – residential	N/A	N/A	N/A	GHGi: <7 kgCO ₂ e/m ² /year	GHGi: <3 kgCO ₂ e/m ² /year	GHGi: <1.8 kgCO ₂ e/m ² /year
Part 3 – commercial-office	N/A	N/A	N/A	GHGi: <5 kgCO ₂ e/m ² /year	GHGi: <3 kgCO ₂ e/m ² /year	GHGi: <1.5 kgCO ₂ e/m ² /year
Part 3 – commercial-hotels, motels	N/A	N/A	N/A	GHGi: <9 kgCO ₂ e/m ² /year	GHGi: <4 kgCO ₂ e/m ² /year	GHGi: <2 kgCO ₂ e/m ² /year
Part 3 – commercial-retail, services	N/A	N/A	N/A	GHGi: <6 kgCO ₂ e/m ² /year	GHGi: <3 kgCO ₂ e/m ² /year	GHGi: <2 kgCO ₂ e/m ² /year

⁹ GHGi, or Greenhouse Gas Intensity, refers to a measurement of greenhouse gas emissions associated with a building's operational energy use. It's calculated as the amount of greenhouse gas emissions (expressed in kilograms of carbon dioxide equivalent) produced by a building annually for every square meter of conditioned floor space.

Appendix B: Common Concerns

Theme	Concern	How to address
Choice	British Columbians should have the choice in how to heat their homes and cook their food.	British Columbians can still choose. Gas is permitted under the performance pathway as a cooking fuel, in decorative fireplaces and in dual fuel heat pumps. Enabling a tiered approach to ZCSC and ESC allows builders and homeowners to choose which pathway to comply with.
	ZCSC is a gas ban.	ZCSC is not a gas ban. Gas is still permitted under the performance pathway and under some levels of the prescriptive pathway of ZCSC. ZCSC also does not apply to gas fireplaces or outdoor barbecues and other appliances. Dual-fuel heating systems are permitted.
Grid availability and reliability	BC Hydro does not have enough power, even with Site C.	BC Hydro is planning and preparing for electricity needs in the future. It is predicted that an extra 5,000 GWh/yr will be needed by 2030 and 10,000 GWh/yr by 2041. ¹⁰ Site C will add 5,000 GWh/yr when it becomes fully operational by 2026, and the 2024 Call for Power will add another 3,000 GWh/yr by 2028. ¹¹ The recent 2025 Call for Power will add another 5,000 GWh/year. ¹² New generation opportunities and continually improving energy efficiency will allow for more available electricity.
	BC Hydro has to import dirty power to meet demand.	Only 3% of energy imports are from Alberta; most of BC's energy imports come from Washington state (hydroelectricity). ¹³ BC Hydro is a net exporter.
	What happens in the event of a power outage?	Gas furnaces do not work safely in a power outage as they require electricity to run key components like the ignition system and blower motor.

¹⁰ <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/integrated-resource-plans/current-plan/integrated-resource-plan-2021.pdf>

¹¹ <https://www.bchydro.com/work-with-us/selling-clean-energy/2024-call-for-power.html>

¹² <https://www.bchydro.com/work-with-us/selling-clean-energy/2025-call-for-power.html>

¹³ <https://www.bchydro.com/energy-in-bc/operations/power-trading-and-its-benefits-to-b-c-.html>

		<p>A high-performance home can keep its occupants comfortable for up to 72 hours¹⁴ – more reason to build better with ESC and ZCSC.</p> <p>A report by B2E¹⁵ found that very few power outages last more than 4 hours, and power outages longer than 24 hours are extremely rare.</p> <p>There are many strategies to increase the energy resilience of an all-electric home, including solar and battery backup.</p>
Distrust of heat pumps	Heat pumps alone are not sufficient in cold climate and/or are too expensive to run.	<p>There are many examples of all-electric homes and homes with heat pumps working well and affordably in cold climates, including a home in Cranbrook¹⁶ where a 6-day cold snap with temperatures as low as -35°C only cost an estimated extra \$4.</p> <p>When new homes built in cold climates are constructed to be very energy efficient, they don't necessarily need supplementary heating. That's why we need to combine home energy efficiency standards with low carbon systems like heat pumps.</p>
Affordability	<p>It's too expensive to build all-electric, including costly service upgrades and delays getting connected.</p> <p>More regulation will not only increase construction costs, but it will also slow down much-needed new housing supply.</p>	<p>High performance buildings can be built at or below cost of conventional, lower performance buildings.¹⁷</p> <p>Heat pumps, which provide efficient heating <i>and</i> cooling, are less expensive to operate than gas heating and air conditioning (the overheating protection requirement in BCBC means most homes will need an air conditioning system).</p> <p>Every home needs electricity. There will be connection fees regardless of the amperage, and upgrades are an incremental cost. If you are putting in AC to meet the overheating protection requirement, upgrading to a heat pump (which provides heating and cooling) does not require any more electricity.</p> <p>Homes are being built to be increasingly efficient, with higher step homes needing less energy. Plus, there are ways to avoid needing service upgrades including time-of-use billing and other demand management strategies.</p> <p>Local governments can also play a role to support new housing by improving permitting processes to expedite ZCSC applications and encouraging the building industry</p>

¹⁴ [All Electric Homes and Power Outages: What you need to know | B2E](#)

¹⁵ [Power Outage Risks | B2E](#)

¹⁶ [Lessons Learned at -40 °C - Community Energy Association](#)

¹⁷ [Does High Performance Construction Have to Cost More? | BC Housing](#)

		to reach out to BC Hydro at the start of the project to avoid unnecessary delays.
Alternative fuels	Why not use RNG?	<p>While FortisBC has goals of decarbonizing their gas supply – 15% by 2030, and 75% by 2050¹⁸ – this analysis shows that available RNG supply will only meet 17-35% of demand by 2025¹⁹. This is not nearly enough to reach BC’s climate targets. Also, as we transition to a low carbon future, RNG should be reserved for sectors that are difficult to electrify.²⁰</p> <p>Heating with RNG can also be more expensive. Heating with an electric heat pump is less expensive than an efficient gas furnace,²¹ and RNG is more expensive than conventional gas (an additional \$50/month on average).²²</p>
	What about hydrogen?	<p>Hydrogen is an odourless, tasteless, and colourless gas that can be used in energy systems to generate electricity and heat.²³</p> <p>While there is potential to blend hydrogen in existing natural gas networks, it is unclear what infrastructure upgrades may be needed, and hydrogen may best be used for hard-to-decarbonize sectors, including medium and heavy-duty transportation and industrial processes.²⁴</p>
Provincial leadership	If the Provincial timeline is for ZCSC to be mandated by 2030, what is the point of adopting early? Isn’t it preferable to go by provincial recommendations?	The Province does not recommend following their timeline. The timeline of 2030 serves as a catch-all and exists to ensure every community can and meet this standard. Communities that are better positioned (i.e., have more capacity, resources, support) to adopt early are encouraged to do so.

¹⁸ [FortisBC to supply all new British Columbia homes with 100% renewable natural gas | Urbanized](#)
¹⁹ [Renewal Natural Gas Role in Building Decarbonization in B.C. by Introba - Issuu](#)
²⁰ [The Role of RNG in the ZCSC | Pembina Institute](#)
²¹ [Bringing the Heat | BC Hydro](#)
²² [How much does RNG Cost? | FortisBC](#)
²³ [Hydrogen gas | FortisBC](#)
²⁴ [Hydrogen-Fact-Sheet.pdf](#)

Appendix C: Framing Examples

Priority	Framing examples
Health, safety, affordability	<ul style="list-style-type: none"> • Heat pumps are the most efficient way to heat and cool a home year-round. Plus, it’s just one system instead of two. When you upgrade a furnace to a heat pump, you get more efficient heating with the bonus of air conditioning. That means you can keep your windows closed during hot, smoky nights, and still stay cool and safe. • Portable AC units are expensive to operate, even more so now that extreme heat events are more common and last longer. Installing heat pumps provides efficient, year-round heating and cooling. • Efficient mechanical systems like heat pumps often have air filtration systems. Well insulated, energy efficient homes keep indoor air quality safe during extreme weather like wildfires and smoke events. • Gas cooking has been shown to have a negative impact on indoor air quality and is linked to higher risk of asthma²⁵ and cancers.²⁶ • We have always updated building codes to keep current and future residents safe and incorporate modern technological advances. ESC and ZCSC reflect modern building science and advances in technology.
Climate change mitigation	<ul style="list-style-type: none"> • Decarbonizing our communities is more important than ever and our buildings represent 40-60% of community emissions. Reducing emissions from new construction by improving energy efficiency and using clean electricity for space and water heating is one of the most effective ways to reduce emissions and avoid locking in future emissions.
Resilience and adaptation	<ul style="list-style-type: none"> • Climate change is already impacting our community – we are experiencing hotter and longer heat waves, greater wildfires and smoke, and more intense storms. ZCSC can help create more resilient homes with efficient heat pumps that keep you warm in the winter and cool in the summer and helps keep the indoor air quality safe.
Housing	<ul style="list-style-type: none"> • We need housing that is safe, affordable, and resilient. It is crucial that we invest in building homes that can withstand future conditions and avoid costly retrofits in the long term.

²⁵ [After seeing how gas stoves pollute homes, these researchers are ditching theirs | CBC News](#)

²⁶ [Gas stoves emit benzene, linked to cancer, a new Stanford study shows : NPR](#)

	<ul style="list-style-type: none"> • ZCSC will be mandated by the Province by 2030. Adopting early and starting now ensures our local industry and community will be set up for success. • Retrofitting homes down the road is a lot more expensive and intrusive. We should be building homes that are ready for the future.
<p>Energy security and stability/made-in-BC energy source</p>	<ul style="list-style-type: none"> • Clean electricity is produced and supplied locally. It is a made-in-BC energy source. • Gas, RNG, and hydrogen might have to come from elsewhere to meet demand. As such, these are subject to market volatility and other global factors (for example, the war in Ukraine²⁷). • Local, publicly-owned electric utilities offer rate stability, whereas the rates for imported fuels can be more volatile and unpredictable.

²⁷ <https://www.iea.org/commentaries/what-drives-natural-gas-price-volatility-in-europe-and-beyond>

Appendix D: Policy Tools

Policy tool	How it can be a barrier	How it can enable
<p>Mechanical permitting</p> <p>A requirement for the installation of heating and cooling equipment in buildings to make sure the design, installation, and commissioning of heating and cooling systems meet the established minimum code requirements, and promotes efficiency and longevity of these systems</p>	<p>More permitting requirements may be seen as more paperwork and bureaucracy, leading to perceived or real delayed timelines and adding to costs</p>	<p>Find ways to streamline or bundle permit applications, such as prioritizing and expediting applications with mechanical permitting.</p> <p>The City of Vancouver requires a mechanical permit for all new installations of heating and cooling systems in new and existing buildings: Mechanical permit City of Vancouver</p>
<p>Noise bylaw</p> <p>Regulates noise or sound within municipal boundaries</p>	<p>Most outdoor units for heat pumps have a sound rating of around 60 decibels (similar to a refrigerator). Noise bylaws that restrict noise levels to below 60 dB for mechanical systems may present challenges for homeowners and builders to find suitable heat pumps.</p>	<p>Consider including exemptions for heat pumps.</p> <p>Set noise limits in accordance with average heat pump noise levels.</p>
<p>Floor space ratio (FSR)/ floor area ratio (FAR)</p> <p>The ratio of a building’s total floor area relative to the lot area</p>	<p>Depending on how FSR/FAR is calculated, higher performance homes may unintentionally be penalized as thicker walls may be included as part of the total floor area</p>	<p>Consider including exemptions or making changes to how FSR/FAR is calculated, such as measuring floor space from interior side of walls vs the exterior so that wall thickness isn’t included.</p> <p>Consider exempting allowable area for mechanical rooms for heat pumps from FSR/FAR. The City of Vancouver has guidelines for mechanical room exemptions from floor area calculations.</p>
<p>Setback requirements</p> <p>Refers to the distance that a structure needs to be from property lines</p>	<p>While setback requirements do not typically apply to appliances such as heat pump outdoor units, setbacks and FSR/FAR policies may</p>	<p>Consider developing heat pump siting guidelines to clarify where heat pumps can be installed on a lot and in</p>

	influence size and placement of a building on any given lot. This in turn may impact placement of heat pump outdoor units, especially if there are noise bylaws or character guidelines that limit where heat pumps can be installed.	relation to the building and neighbouring lots. Consider exemptions or allowable space for outdoor heat pump units.
Height limits Restrict building heights	Depending on how building heights are calculated, height limits may unintentionally penalize high performance buildings with thicker roofs that are better insulated or buildings with rooftop mechanical systems or renewable energy systems, such as photovoltaic installations, as these features may be included in overall building height.	Consider including exemptions for thicker roof assemblies and rooftop mechanical equipment and renewable energy systems

Appendix E: Compliance Examples

The tables on the following pages are adapted from [BOABC's Handbook for Building Officials](#) (pages 68-69), and illustrate how different combinations of energy sources for space and water heating and appliances may or may not comply with various ZCSC pathways.

Figure 2: Table 3.4 from BOABC's Handbook showing examples of ZCSC compliance using gas and electric resistance space heating, and heat pump, gas, and electric appliances.

Example	Energy Source			Energy Step Code	Zero Carbon Step Code Emission Level					
	Building System				Performance Pathway			Prescriptive Pathway		
	Heating*	Hot Water	Appliances		EL-2	EL-3	EL-4	EL-2	EL-3	EL-4
A				STEP 3	!	!	!			
				STEP 4	-	!	!	×	×	×
				STEP 5	✓	-	!			
B				STEP 3	-	!	!			
				STEP 4	✓	-	!	×	×	×
				STEP 5	✓	-	-			
C				STEP 3	Defer to Prescriptive Pathway	-	!			
				STEP 4		-	-	✓	×	×
				STEP 5		-	-			
D				STEP 3	Defer to Prescriptive Pathway	-				
				STEP 4		✓	✓	✓	×	
				STEP 5		✓				

*includes supplemental heating

Legend:

Energy Source Types			Zero Carbon Step Code Compliance				
Combustion Fuel	Electric Resistance	Electric Heat Pump	Complies	Likely complies	May not comply	Likely does not comply	Not compliant

Figure 3: Table 3.5 from BOABC's Handbook showing examples of ZCSC compliance using heat pump space heating and heat pump, gas, and electric appliances.

Example	Energy Source			Energy Step Code	Zero Carbon Step Code Emission Level					
	Building System				Performance Pathway			Prescriptive Pathway		
	Heating*	Hot Water	Appliances		EL-2	EL-3	EL-4	EL-2	EL-3	EL-4
F	 	 	 	STEP 3						
				STEP 4						
				STEP 5						
F	 	 	 	STEP 3	Defer to Pre-scriptive Pathway					
				STEP 4						
				STEP 5						
G	 OR 	 OR 	 	STEP 3	Defer to Prescriptive Pathway					
				STEP 4						
				STEP 5						
H	 OR 	 OR 	 	STEP 3	Defer to Prescriptive Pathway					
				STEP 4						
				STEP 5						

Legend:

Energy Source Types			Zero Carbon Step Code Compliance				
 Combustion Fuel	 Electric Resistance	 Electric Heat Pump	 Complies	 Likely complies	 May not comply	 Likely does not comply	 Not compliant