

ZERO CARBON
STEPCODE

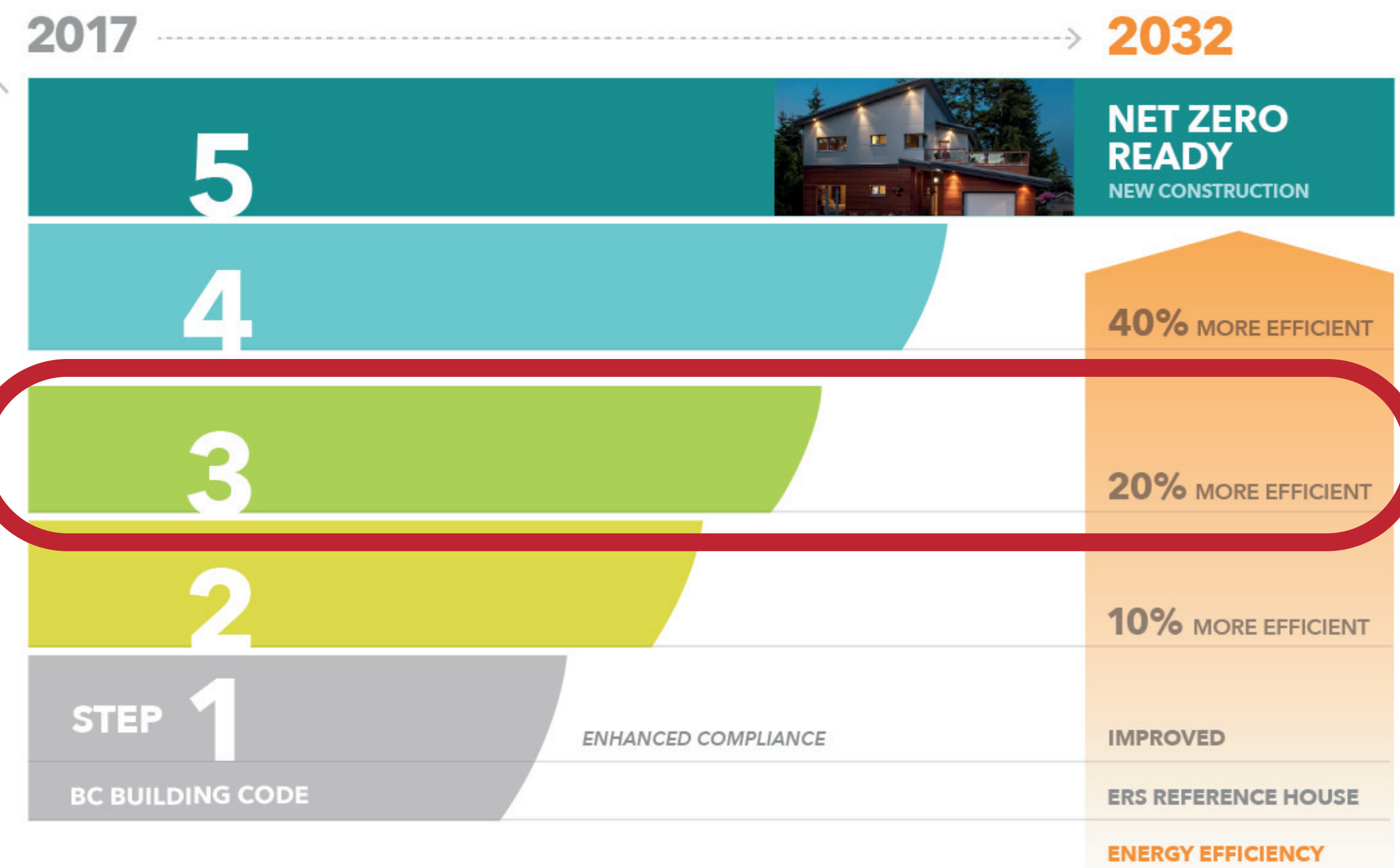
Community Open House

August 27 2024

Zero Carbon Step Code Vs. Energy Step Code

The **BC Energy Step Code** is a provincial standard that sets energy efficiency requirements for **NEW** buildings, grouped into 5 “steps” towards a net zero ready construction standard by 2032.

PATHWAY TO 2032: PART 9 (HOMES)



PATHWAY TO 2032: PART 3 (WOOD-FRAME RESIDENTIAL)

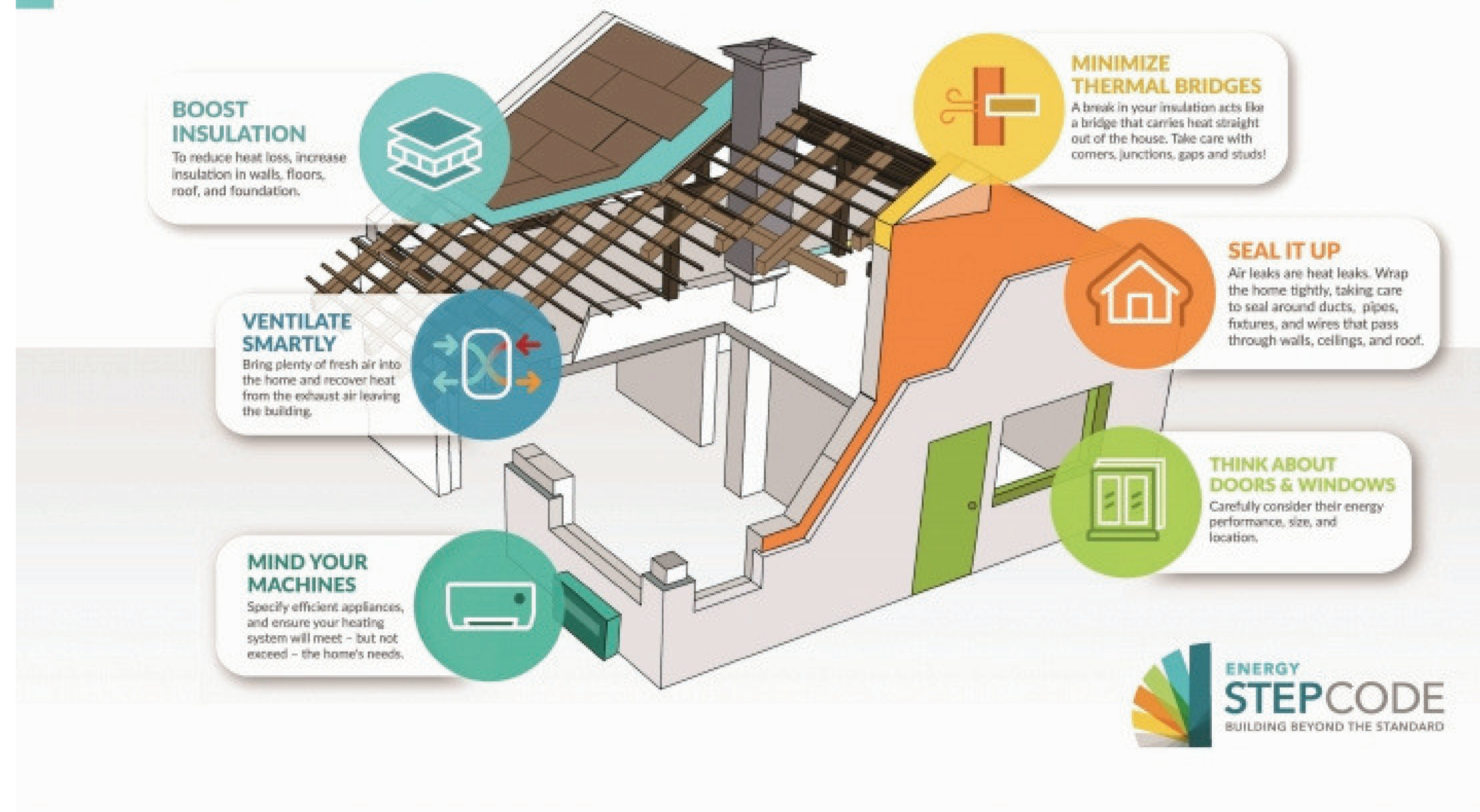


What does the Province mandate?

Part 3 Homes (complex residential homes): Energy Step Code Level 2
Part 9 Homes (single family, row homes, duplexes etc): Energy Step Code Level 3

INSIDE THE STEP 3 HOME

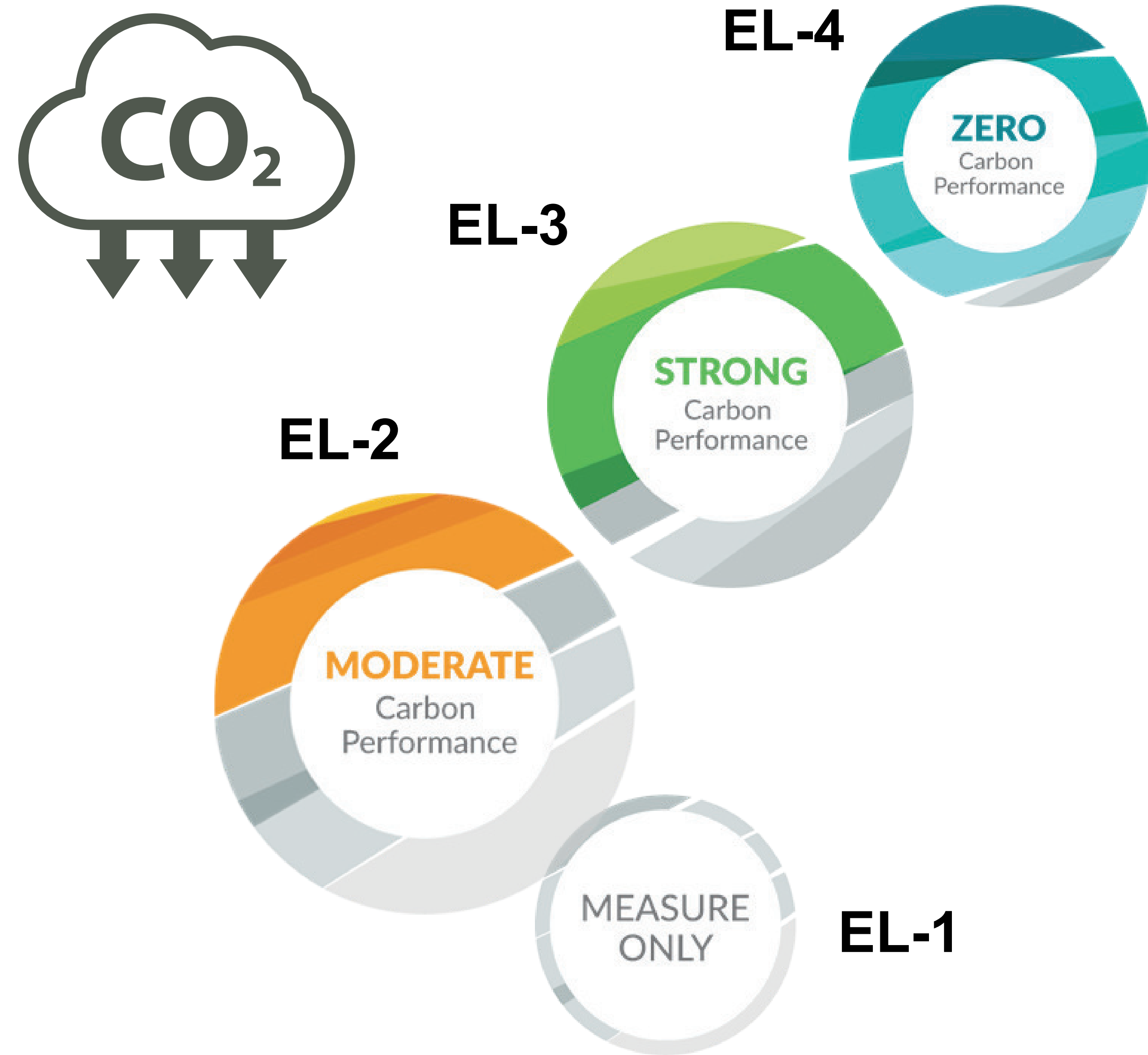
Six strategies to boost energy-efficiency performance



Zero Carbon Step Code Vs. Energy Step Code



The **Zero Carbon Step Code** is a provincial BC Building Code standard which prescribes greenhouse gas emissions targets for **NEW** buildings. There are 4 levels to the new step code.



What does the Province mandate?

Currently the Province has not announced a minimum level to be met for the Zero Carbon Step Code. The ZCSC is 'opt in' at this time for local governments, allowing them to set their own minimum standard to be met.

As of April 2024 27 municipalities across B.C. have become early adopters of the ZCSC. Many adopting a tiered approach, with new EL-3 being the minimum, then a year later EL-4.

The Zero Carbon Step Code has four Steps (also referred to as levels):

1. **Measure-only (GHG Emission Level 1)** - requires measurement of a building's emissions without reductions
2. **Moderate carbon (GHG Emission Level 2)** - in most cases, will require electrification of **either** space heating or domestic hot water systems
3. **Strong carbon (GHG Emission Level 3)** - in most cases, will require electrification of **both** space heating and domestic hot water systems
4. **Zero Carbon (GHG Emission Level 4)** - in most cases, will require the full electrification of a building.

Most buildings at the Zero Carbon Emission Level 4 will use electricity for all building systems (dependent upon design).

Why is the District concerned about reducing residential home emissions?

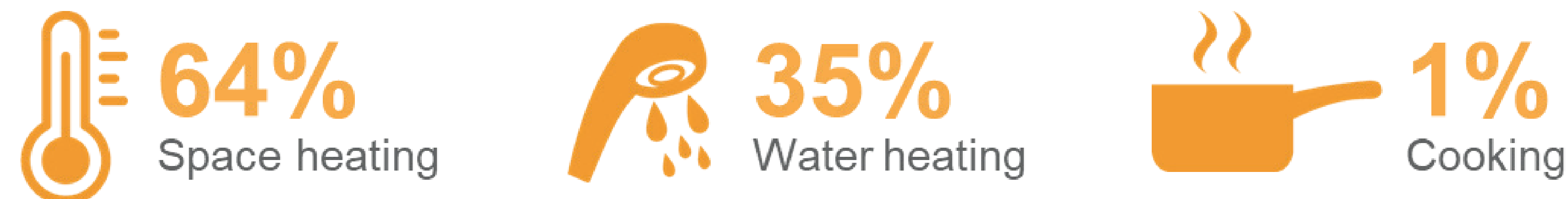
Buildings are the second highest contributor to greenhouse gas emissions in Summerland



33%

District of Summerland

Natural gas space and water heating equipment contributes the majority of household carbon pollution.



1. Supports the Districts Community Emission reduction goals for 2025 and 2040.
2. **Earlier adoption of the ZCSC can contribute to an accelerated avoidance of building emissions for the District.**
3. Building trends in Summerland in 2024 show many new builds are close to meeting EL-2 of the ZCSC, or with a fuel change of a single primary heat source, meet EL-3.
4. **The cost of future home retrofits to governments and homeowners could be significant. Building homes NOW to be low emission or net zero ready is more cost effective.**
5. Supporting development standards that could reduce energy costs to homeowners. High efficiency heat pumps will cost less than heating with natural gas given the higher efficiency.

Province of BC Goals and Targets



“By 2030, all new buildings will be zero carbon, and all new space and water heating equipment will meet the highest standards for efficiency.”

– CleanBC Roadmap to 2030



How does the ZCSC work?

Part 9: Prescriptive Pathway

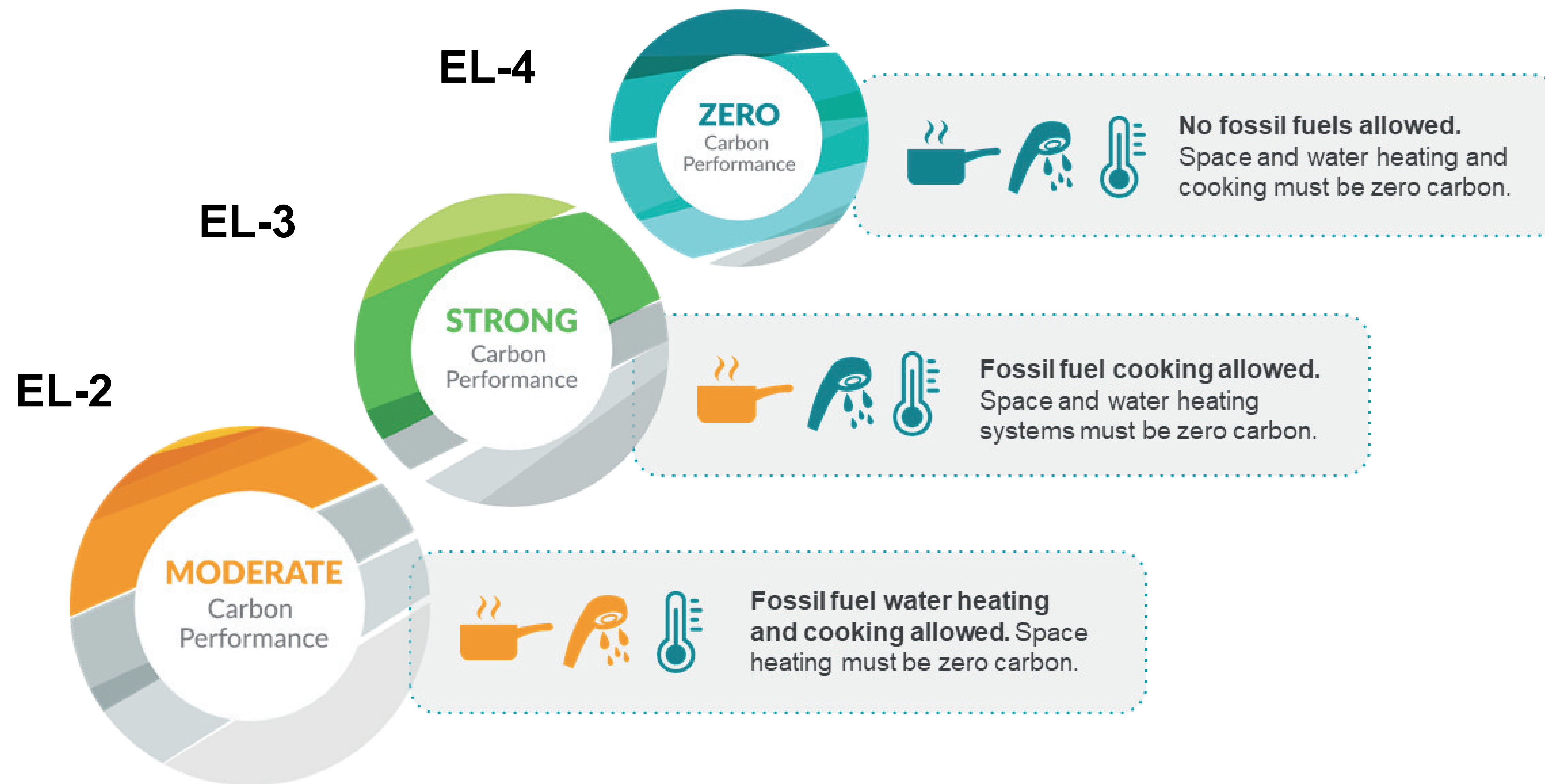


Part 9:
Smaller + simpler
buildings, specifically...



Homes and smaller
residential buildings

The Prescriptive Pathway is an option for Part 9 builds. This pathway requires builders to comply with the permitted fossil fuel requirements for space heating, hot water heating, or cooking appliances depending on the permitted ZCSC Emissions Level.



How does the ZCSC work?

Part 9: Performance Pathway

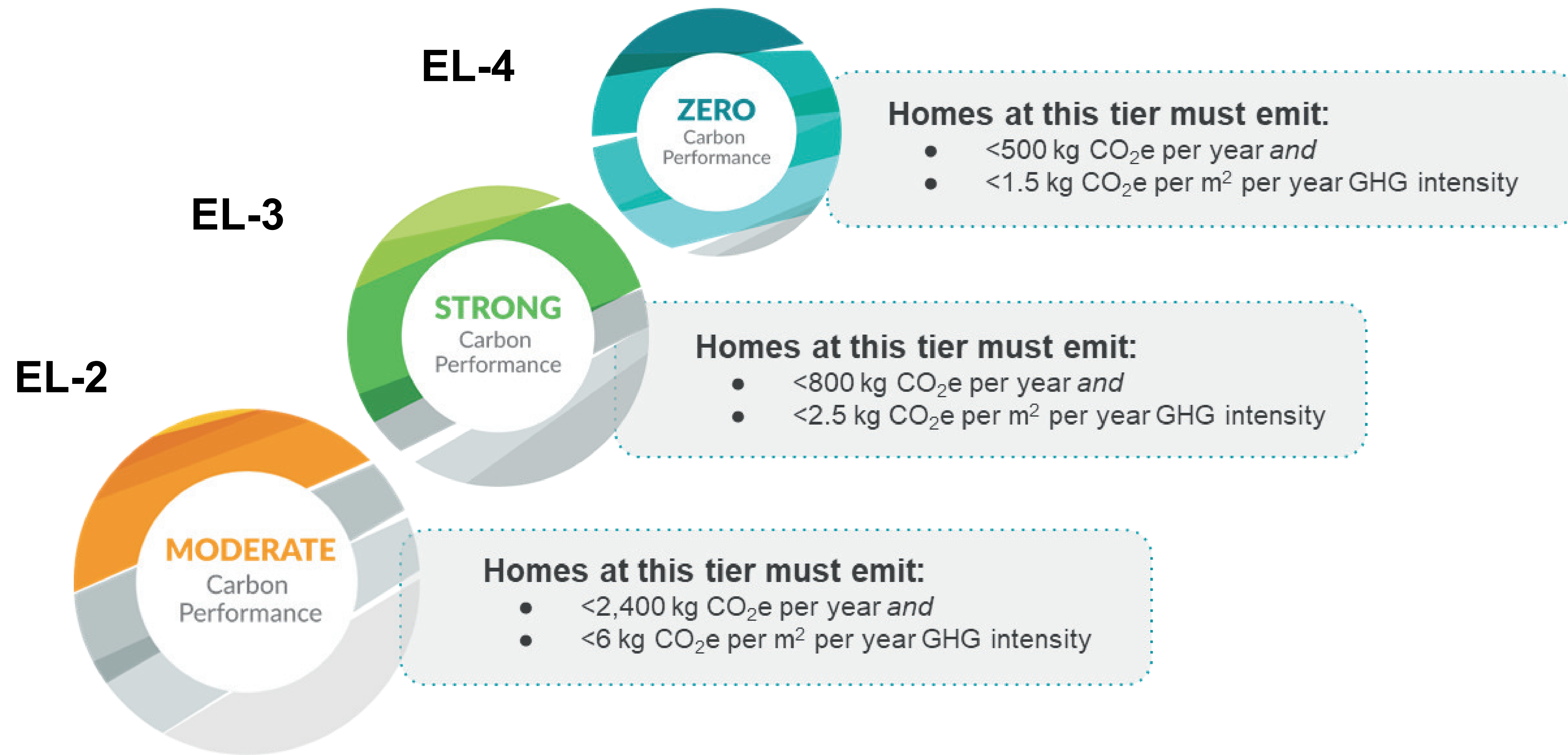


The Performance Pathway provides greater flexibility for builders to meet the prescribed emission targets for the minimum Emission Level prescribed by a local government. Builders can determine the best fuel source combination for space heating, cooking, and or hot water heating fuel options to meet the minimum emission target.

Part 9:
Smaller + simpler
buildings, specifically...



Homes and smaller
residential buildings



How much more will it cost to build homes that meet Zero Carbon Step Code?



A technical report from the BC Building Safety and Standards Branch examined the potential incremental costs associated with building new homes to EL-2, EL-3 and EL-4.

Part 3 Buildings (Energy Step Code 2)

0% to 1.4%



0% to 1.4%

1.2% to 1.3%



Not Modelled

-0.1% to 2.1%



0% to 1.9%

Part 9 Buildings (Energy Step Code 3)

What is calculated in the emissions calculations?



The emissions calculations for the ZCSC focus primarily on the **principle heating system** and the **supplementary back up heating system**.

Therefore other systems such as decorative fireplaces, pools, BBQ's, laundry, emergency back up equipment are not part of those calculations.

You can have decorative fireplaces (natural gas or wood) so long as they are not used to meet the space heating load of the house

Depending on the pathway used, cooking appliances could be restricted.

- **Principle Heating System**

- Heat Pump
- Gas Furnace
- Combo system



- **Supplementary Heating Equipment**

- Hybrid (gas)
- Electric supplement in heat pump



- **Hot water**

- tank
- boiler



- **Redundant backup systems**

- generator
- gas or wood fireplace



- **Equipment and Appliances**

- cooking
- laundry



Myth Busting: Natural Gas



Does complying with the highest level of the Zero Carbon Step Code effectively ban the use of Natural Gas?

No. The Zero Carbon Step Code does not ban the use of natural gas, but it can significantly reduce the amount of natural gas used in a new home. Natural gas can still be hooked up in a new build and be used in other parts of a home that would not conflict with the emission targets or requirements of the ZCSC minimum required.

27 communities in B.C. are early adopters of the ZCSC and many have adopted the highest Emission Level (EL)-4, which limits the ability for natural gas to be used for the principle heating systems.

Can renewable natural gas be used to comply with the Zero Carbon Step Code?

The Zero Carbon Step Code allows local governments to decide if they want to recognize renewable natural gas (RNG) as a compliance option. Therefore unless a community does not recognize the use of RNG in new buildings, if a home decides to connect with and use RNG in their home, and meet the GHG emission minimum, it can be used.

Are the use of gas stoves in new building construction permitted?

Depends. For Part 9 buildings (such as single family homes and townhouses), the Zero Carbon Step Code gives builders the option of choosing performance- or prescriptive-based carbon emission requirements. The performance option could allow natural gas for cooking so long as it meets emission targets. The prescriptive option does not allow the use of natural gas for cooking at EL-4.

For Part 3 buildings (mid- and high-rise apartment buildings), GHG emissions from natural gas cooking equipment are included in a building's total GHG emission calculation. Therefore if the



Part 3 Buildings: Performance Pathway

Large Residential Buildings



The Performance Pathway for Part 3 buildings operates in the same way as Part 9 buildings. Builders can determine the best fuel source combination for space heating, cooking, and or hot water heating fuel options to meet the minimum emission target.

Part 3:
Larger and more complex buildings, including...



Offices

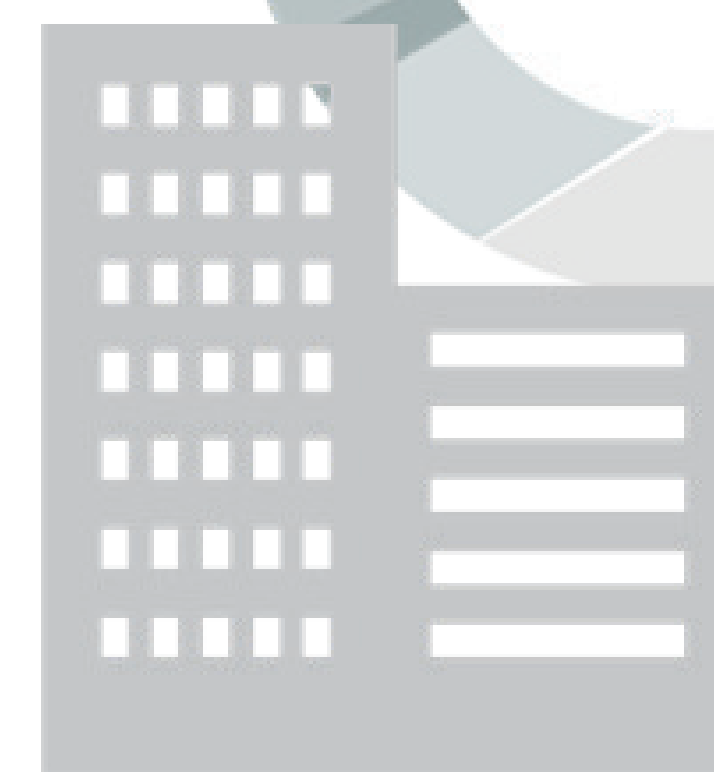
Condos + apartments

Financial institutions

Retail + grocery stores

Larger residential buildings

Offices



MODERATE
Carbon Performance

- Larger residential buildings: <math><7 \text{ kg CO}_2\text{e} / \text{m}^2 \text{ per year}</math>
- Offices: <math><5 \text{ kg CO}_2\text{e} / \text{m}^2 \text{ per year}</math>

STRONG
Carbon Performance

- Larger residential buildings: <math><3 \text{ kg CO}_2\text{e} / \text{m}^2 \text{ per year}</math>
- Offices: <math><3 \text{ kg CO}_2\text{e} / \text{m}^2 \text{ per year}</math>

ZERO
Carbon Performance

- Larger residential buildings: <math><1.8 \text{ kg CO}_2\text{e} / \text{m}^2 \text{ per year}</math>
- Offices: <math><1.5 \text{ kg CO}_2\text{e} / \text{m}^2 \text{ per year}</math>

Part 3 Buildings: Performance Pathway

Hotels, Motels and Retail buildings



The Performance Pathway for Part 3 buildings operates in the same way as Part 9 buildings. Builders can determine the best fuel source combination for space heating, cooking, and or hot water heating fuel options to meet the minimum emission target.

Part 3:
Larger and more complex buildings, including...



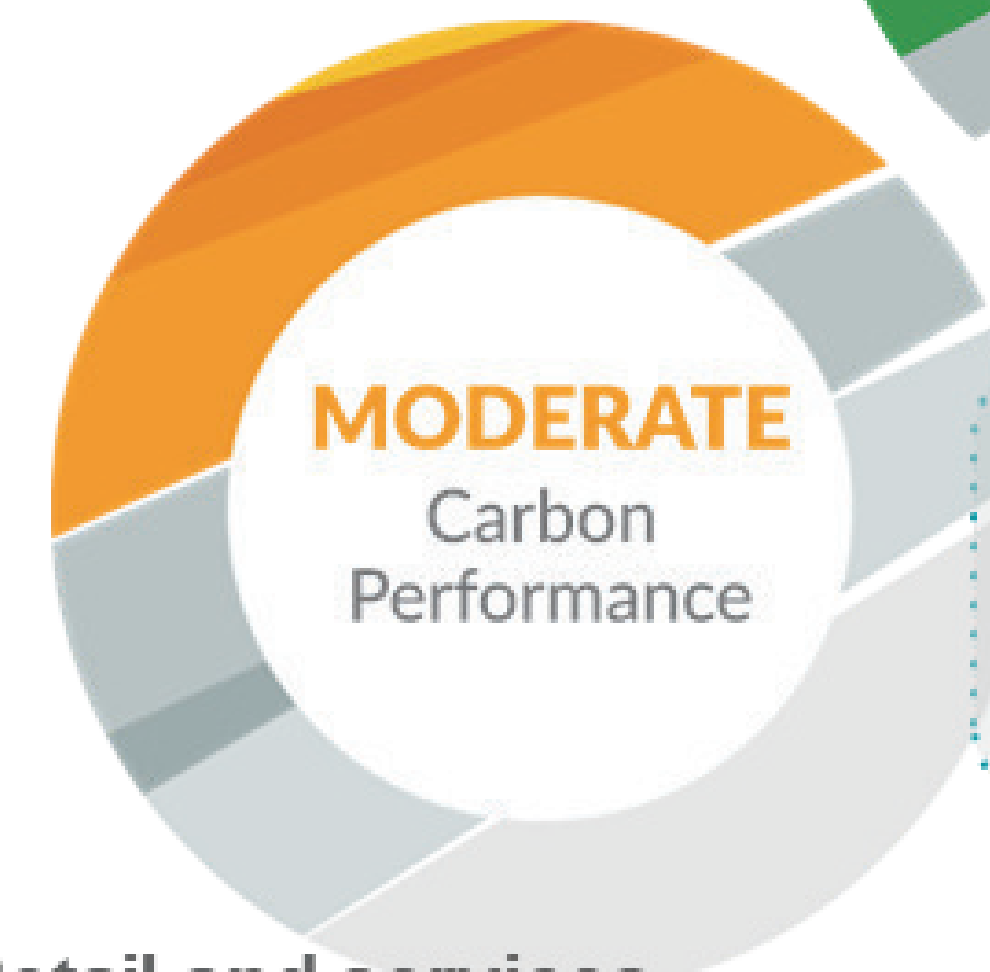
Offices Condos + apartments Financial institutions Retail + grocery stores



- Hotels and motels: $<2 \text{ kg CO}_2\text{e} / \text{m}^2 / \text{year}$
- Retail and services buildings: $<2 \text{ kg CO}_2\text{e} / \text{m}^2 / \text{year}$



- Hotels and motels: $<4 \text{ kg CO}_2\text{e} / \text{m}^2 / \text{year}$
- Retail and services buildings: $<3 \text{ kg CO}_2\text{e} / \text{m}^2 / \text{year}$



- Hotels and motels: $<9 \text{ kg CO}_2\text{e} / \text{m}^2 / \text{year}$
- Retail and services buildings: $<6 \text{ kg CO}_2\text{e} / \text{m}^2 / \text{year}$

Myth Busting: Going Electric



Will we run out of electricity if all new homes and communities implement the Zero Carbon Step Code?

No. The District of Summerland currently purchases electricity from FortisBC, then resells it to Summerland customers. At this point in time FortisBC nor the District of Summerland have indicated concerns with electrical capacity to support new buildings and homes that would be required to more fully electrify their home heating, hot water or cooking systems as per the Zero Carbon Step Code.

Is heating with natural gas cheaper than electricity?

Maybe. All-electric heat pump systems are more efficient than natural gas heating systems (typically 2-3 times more efficient) and, therefore, result in energy savings.

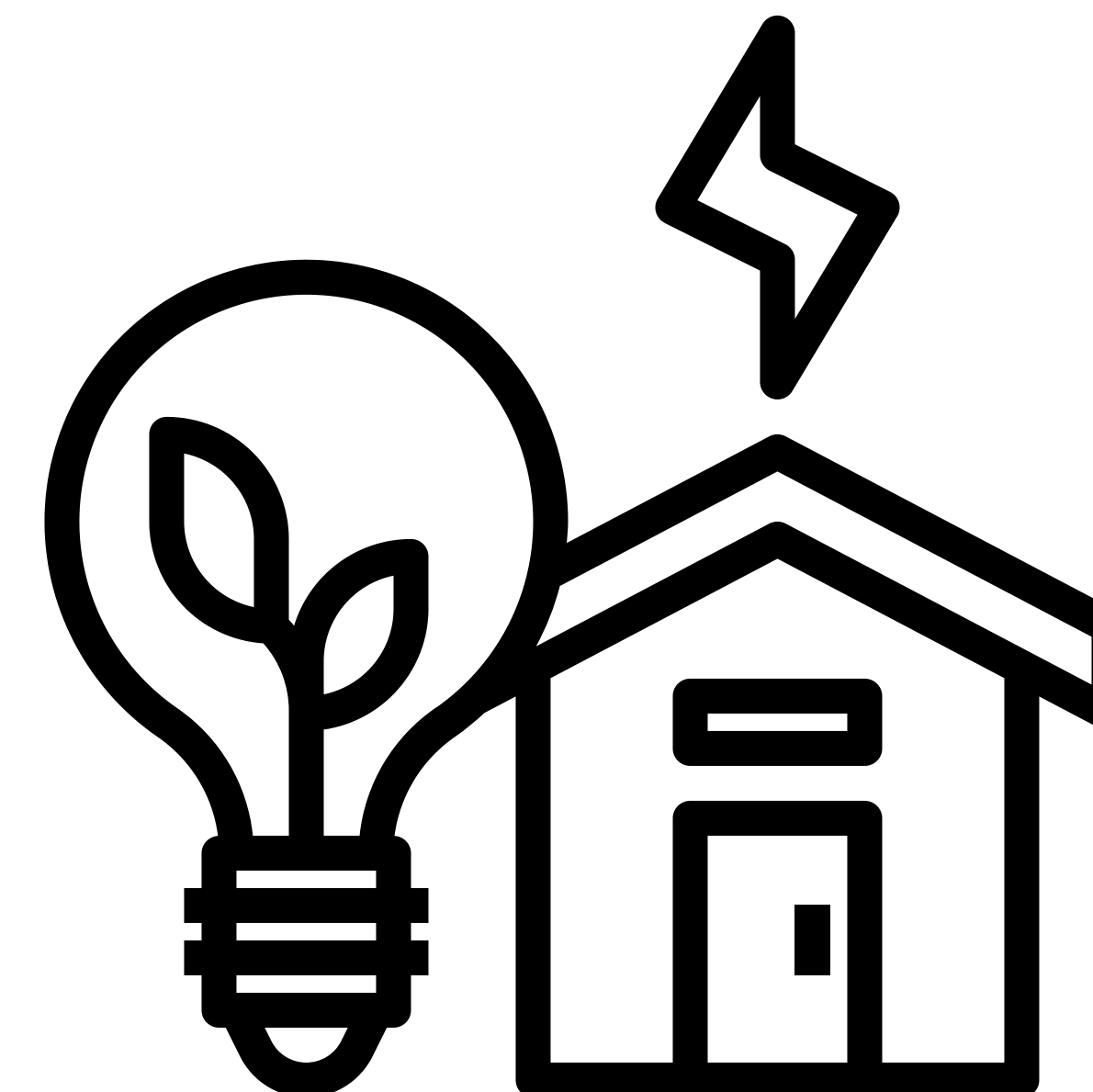
Whether the energy savings translate to energy cost savings is dependent on several factors, including the price of electricity, the price of natural gas, the efficiency of the heat pump system (which varies with outdoor air temperature and therefore climate/location), and the efficiency of the building.

What will happen to our homes if electricity goes out? What options are there for distributed power generation as back up?

In general, gas heating systems will not operate during a power outage as they use components that require electricity to operate, including circuit boards, relays and blower motors and fans.

Large buildings and critical infrastructure are also required to have a backup generator (regardless of the building's energy source) to keep occupants safe in the case of power outages.

The ZCSC does not preclude the use of distributed power generation, battery storage, and generators which could be used in the case of an electrical grid outage.



Zero-carbon electric equipment



98%

Electricity generated in BC
is from renewable resources

- electric induction cooktops are gaining popularity in the marketplace



- Electric heat pumps provide cooling in the summers and heat in the winters.
- Cold Climate heat pumps work efficiently down to **-25C**, with some maintaining efficiency over **200%** at -18 C



- efficient electric water heaters are readily available



Next Steps: ZCSC in Summerland



Next Steps

Bring back a staff report with findings, results from a public survey and final recommendations for opting into adopting the ZCSC