WHAT

Changes to the provincial building code came into effect on May 1st, 2023 allowing local governments to adopt the Zero Carbon Step Code (ZCSC) which limits the greenhouse gas emissions of new buildings. Under the ZCSC, local governments can now require or incentivize builders to meet one of four increasingly stringent levels (or steps) of emissions reduction.

The four carbon performance, or "emissions levels" (EL), of the Zero Carbon Step code are:

1. Measure-only (EL-1): requires measurement of a building's emissions without reductions and is intended to build knowledge and capacity;
2. Moderate Carbon Performance (EL-2): in most cases, will require decarbonization of either space heating or domestic hot water systems;
3. Strong Carbon Performance (EL-3): in most cases, will require decarbonization of both space heating and domestic hot water systems; and
4. Zero Carbon Performance (EL-4): in most cases, will require the full electrification of a building.

The ZCSC will move towards the elimination of fossil fuels from homes and buildings in British Columbia, and support meeting local governments' and the province's greenhouse gas emissions targets.

WHY

Approximately 25% to 50% of emissions that B.C. local governments are responsible for come from fossil fuels used in buildings for space and water heating and other appliances. The Zero Carbon Step Code focuses specifically on greenhouse gas emissions, aims to remove most fossil fuels from our buildings and is an integral policy for meeting our short term and long-term climate targets. In British Columbia, natural gas, which heats more than 50% of buildings, is 17 times more carbon-intensive than electricity.

Any building built today with gas space- and water-heating equipment is locking in this carbon polluting equipment until the they are replaced, approximately 15-30 years down the road. Building new zero carbon homes and buildings today avoids expensive retrofit costs in the future that will be needed to meet 2050 climate targets.

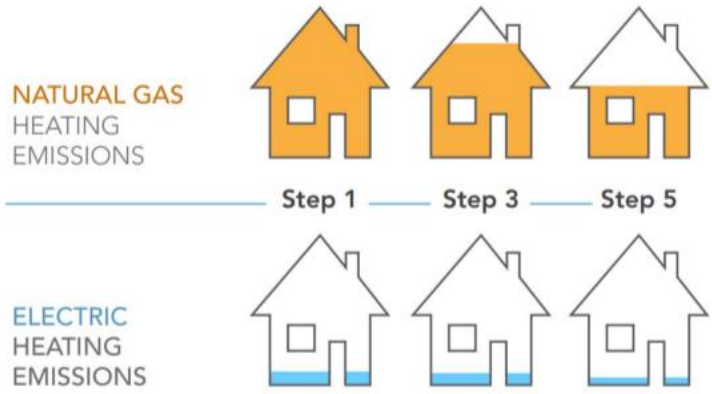
HOW

The ZCSC allows local governments to limit the carbon footprint for new buildings in a four-step approach. The Province of B.C. has stated that the provincial building code will require all buildings in the province to be built zero carbon by 2030. However, the Province has enabled municipalities to adopt the highest step of the ZCSC today. Many municipalities are choosing to leap over the intermediate steps and implement the highest step, requiring zero carbon buildings before 2030.

Under the highest step - a zero carbon requirement - every new home built will need to be designed in such a way that carbon pollution will essentially be eliminated. This can be easily achieved today through the use of electric space and water heating equipment (such as heat pumps) and appliances.

WHAT'S THE DIFFERENCE BETWEEN THE ZERO CARBON STEP CODE & ENERGY STEP CODE

The Energy Step Code, introduced in 2017, allows local governments to require new homes and buildings to meet higher energy efficiency than the base B.C. Building Code. The Energy Step Code regulates the amount of energy used in homes and buildings, rather than the carbon pollution associated with the energy used. Thus, homes and buildings designed under the highest level of the energy step code but use fossil fuels for space and water heating, can still have a significant carbon footprint. The Zero Carbon Step Code allows local governments to regulate carbon pollution specifically.



Emissions from Homes Built Under the Different Steps of the Energy Step Code using Natural Gas vs Electric Heating (source Metro Vancouver Climate 2050 Building Emissions Discussion Paper)

WHEN
Over the next six months, many councils across B.C. will be considering whether to adopt the new Zero Carbon Step Code requirements.

HOW MUCH DOES IT COST
Everyone is concerned about affordability. Studies have shown that all-electric buildings can be designed and built at **no additional cost** across most building types. In some cases, all-electric residential buildings have even been built for **less than the cost** to build to minimum building code requirements. Costs will vary depending on design and experience of the team.

High quality all electric buildings come with many benefits:

Lower energy bills - Energy efficient buildings have lower overall demand for energy, which lowers utility costs for building occupants (both tenants and owners). All electric buildings have also been shown to result in utility savings when high performance electric equipment such as a heat pump is installed.

Quieter and more comfortable homes- Higher efficiency homes and buildings are designed with better envelopes and careful window placement, which help keep indoor temperatures comfortable year-round. With the electrification of space heating that comes with the Zero Carbon Step Code, many buildings will use heat pumps, which provide both heating and cooling.

WHERE IS THIS HAPPENING
Victoria, Saanich, Whistler, North Vancouver, District of North Vancouver, West Vancouver, and Nelson are amongst those who have adopted the highest levels of ZCSC (EL-3 or EL-4) by 2025, well in advance of the anticipated provincial requirement. The City of Vancouver has had a zero carbon requirement in place for new residential homes since 2022.

Common Myths about All Electric Buildings
#1 - Electric buildings need natural gas backup. More than 40% of homes in B.C. are already heated using electricity. There is a common misconception that relying solely on electricity puts residents at greater risk in the case of a power outage (compared to having both natural gas and electricity). In general, gas heating systems will not operate during a power outage as they use components (e.g. circuit boards, motors and fans) that require electricity to operate. An exception is when homeowners can light a natural gas fireplace or stove with a match; the same is true for some older domestic hot water systems.

#2 – B.C. won't have enough electricity to meet future demand for homes and vehicles. B.C. Hydro is planning for the rapid scale up of building, vehicle and industry electrification, and has developed near- and long-term actions to meet the scale of electrification required for achieving the provincial government's climate targets. The utility continuously updates these plans and projections in response to changing conditions (i.e. government policy and regulation, and market conditions). For example, in June 2023, BC Hydro announced its intention to add 3,000 GWh of renewable electricity by 2029 to meet anticipated new demand growth.

WHY NOT USE RENEWABLE NATURAL GAS OR HYDROGEN?

Renewable natural gas (RNG)

There is some discussion about the use of RNG (biomethane produced from organic waste from landfills, agricultural waste, and wastewater) for space and water heating in homes and buildings. There are significant constraints on the amount of renewable gas (RNG) available from B.C., and there are documented health risks associated with using gas indoors.

An of analysis of RNG potential specifically in B.C. found that biomethane from within B.C. could meet around 4% of B.C.'s total gas demand in 2032 (less than 10 petajoules or RNG; current demand in B.C. is nearly 230 PJ in 2021). As a result of very limited supply, B.C.'s gas utilities will buy credits for biomethane that is produced and used elsewhere (e.g. Ontario or the US), and pass along the "benefit" of biomethane to their B.C. customers.

With electric space and water heating being viable cost-effective options, especially in new construction, the limited RNG available should be directed to hard-to-electrify sectors (e.g. aviation and heavy industry).

Hydrogen

Hydrogen is also often discussed as a "renewable" alternative to natural gas. Due to the size of the hydrogen molecule and the chemical nature of the gas, hydrogen cannot be directly substituted safely in existing gas infrastructure and appliances. Up to 20% hydrogen could be blended with natural gas, but this only results in 6-7% reduction in the overall carbon footprint of gas. It's also worth noting that the majority of hydrogen is produced from natural gas or captured as a waste product in industrial processes.