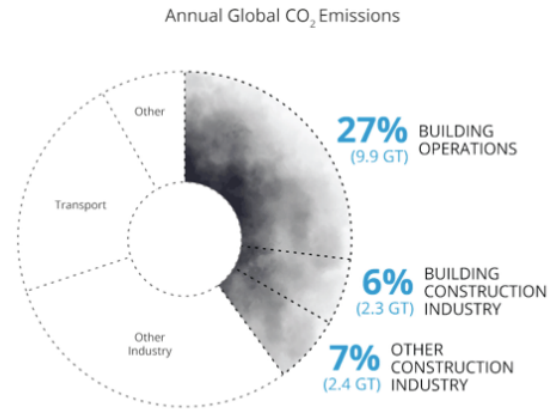


# LOCAL BUILDINGS & CLIMATE CHANGE

## Global and National Context

The built environment generates 40% of annual global CO<sub>2</sub> emissions. Of those total emissions, building operations are responsible for 27% annually, while building and infrastructure materials and construction (typically referred to as embodied carbon) are responsible for an additional 13% annually.

Building operations account for 12 percent of Canada’s national emissions, mostly for space and water heating. In 2020, 64% of the GHG emissions from building operations were from space heating.



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## How much space is enough?

Average residential floor space per capita in m<sup>2</sup>



Note: data for 2009 builds, \* China figures urban only, assumes average national household size  
Sources: CommSec, RBA, UN, US Census  
shrinkthatfootprint.com

Climate change weather events are resulting in substantial damage to the built environment impacting people, homes and communities.

## Canada: Insured Catastrophic Losses in 2022



We need to consider where and how we build and renovate our buildings in light of the risk of building damage due to extreme weather events. The dramatic increases in building damage from weather events has resulted in increased insurance premiums and challenges for some to even get insurance.

**Gabriola context:**

GHG emissions are created through *building operations* (space heating, water heating, etc.), *building construction*, and *building location*.

**Operations:** Space heating/cooling and water heating are the two biggest ongoing sources of GHG emissions from buildings. Type of heat source, size of building, number of occupants per square foot, and insulation values are the three biggest factors in space heating. For more info on residential energy use see the Climate 12 12 12 Fact Sheet for Energy on our web page: <https://sustainablegabriola.ca/climate121212/>

**Type of heat source:** The best option for BC, with our green electric grid, is a heat pump as can be seen by the table below. You'll notice it is also the lowest cost per kWh.

Type	\$/unit	Kg CO2e per/kWh	\$/kWh
Heat pump	\$0.14/kWh	0	\$0.05
Electric Baseboard	\$0.14/kWh	0	\$0.14
Wood	\$250/cord	depends on whether the tree was cut down or it was dead.	\$0.08
Propane	\$1.27/litre	0.22 Kg CO2e	\$0.25
Gas Generator	\$1.63/litre	0.25 Kg CO2e	\$1.34

Click [here](#) for information about BC Hydro Rebates for heat pumps and [here](#) for SG Heat pump program.

**Size:** The smaller the living space per person, the less GHG emissions, as there is less space to heat. Space can be reduced by living in a smaller abode (tiny homes are one example) or sharing a house with others. On Gabriola the average household size is 1.9 people. The average number of rooms per dwelling is 5.8 and the average number of bedrooms is 2.5. Of the 3062 dwellings on Gabriola 2,235 are single detached houses. There are approximately 45 apartments and 70 moveable dwellings.

**Insulation:** The effectiveness of your building's insulation determines how much energy you'll need to heat the space. The age of the building may be a factor in how effective your insulation is in keeping the cold out. On Gabriola there are 180 that require major repairs and most houses are 30-60 years old. (Stats Canada)

1 to 11 years old: 265

32 to 61 years old: 1020

12 to 31 years old: 985

62 years old or older: 105

Click [here](#) for information about BC Hydro rebates for insulation.

**Building Construction**

The manufacture of building materials, such as steel, cement and glass contribute significantly to the GHG emissions from construction. In a recent Canadian study analyzing how newly constructed houses fare when it comes to environmental impact, the researchers found that concrete basements accounted for an average of 56% of total material intensity. The manufacturing of concrete generates 7% of global GHG emissions.

Local builders emphasize the need to build smaller, build airtight, insulate well and reduce the number of windows (or use high efficiency windows) in order to reduce emissions, both from the build itself, as well as long term emissions from energy consumption.

**Location**

There is an interconnection between emissions from buildings and transportation, one that highlights the importance of location for our homes. When homes are located within walking or biking distance of services, groceries, bus routes and any destination that requires travel, our emissions from transportation drop substantially (as long as we walk or bike rather than drive to those destinations!).