

# NET ZERO IN QUEBEC – ENERGY EFFICIENCY AND CHOICE OF MATERIALS

## BACKGROUND

Buildings use 40% of the energy consumed in Quebec. In order to reduce GHG emissions, they have been targeted as a key sector, in particular through the tightening of energy performance requirements.

Over the long term, it is anticipated that energy regulations will become increasingly restrictive by 2030. They will be influenced by Net Zero, an objective that calls upon construction industry professionals to design better insulated buildings and equip them with energy-producing technologies, e.g. photovoltaic panels. A case study of the first net zero institutional building erected in Canada (2015) has revealed interesting findings and avenues for further research.

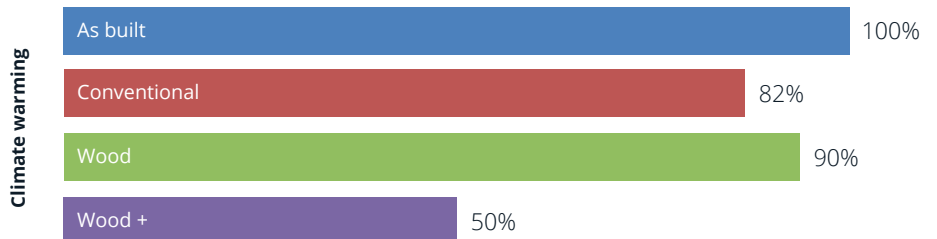
## KEY MESSAGES

- In the Quebec context, to reduce GHGs, it would be appropriate to focus on more than just building energy efficiency. Materials used as inputs in net-zero building construction represent the major portion (~55%) of the emissions over the building's life cycle, from extraction of raw materials to end-of-life.
- The carbon footprint of Quebec electricity is four times less than that of energy produced on-site through active technologies such as photovoltaic panels and geothermal energy. Consequently, the impacts of net zero are inflated with the use of active energy production systems and the additional resources required for increased insulation. This explains the higher carbon footprint (+8%) of wood buildings compared to conventional buildings.
- Employing a wood structure instead of a steel one allows for a carbon footprint reduction of approximately 10% in comparison to an as-built building.
- The use of non-structural wood products, e.g. wood facing and wood insulation, in addition to modernization through net-zero equipment, creates a reduction of the building's carbon footprint by more than 50%.



**For further information:** Batsy Dieudonné Romaric and Lavoie, Patrick. Évaluation des constructions à haute efficacité énergétique dans le contexte québécois. FPInnovations, 2019

## CARBON FOOTPRINT OF BUILDINGS



## RECOMMENDATIONS

- Implementation of policies and regulations requiring net zero may lead to a shift of GHG emissions from the construction sector to other sectors, e.g. manufacturing.
- The choice of low-carbon-footprint materials such as wood is a way to reduce GHGs that may replace reduction efforts through active technologies.
- Building life-cycle analysis done prior to construction may be a useful decision tool for ensuring sustainable development targets are met.