

ADDRESSING CLIMATE CHANGE IN THE BUILDING SECTOR - CARBON EMISSION REDUCTIONS

Mountain Equipment Co-op Head Office, BC Photography: Ed White Photographics

BACKGROUND

Worldwide, the building sector contributes up to 30% of global annual greenhouse gas (GHG) emissions, which are a significant cause of climate change. The UN Environment Programme says these emissions could double in the next 20 years if nothing is done.¹ In Canada, the building sector accounts for about 12% of total GHG emissions – only the oil and gas and the transportation sectors have higher emissions.²

Concerns about climate change are encouraging decarbonization of the building sector, including the use of construction materials that emit fewer carbon dioxide (CO₂) emissions and improvements in building performance throughout the life cycle.

WHAT YOU NEED TO KNOW

Forests and Climate Change

The Intergovernmental Panel on Climate Change says a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks while producing timber, fibre, or energy, generates the largest sustained benefit to mitigate climate change.³

Trees absorb CO₂, store carbon and provide wood products that can replace other more GHG-intensive materials.⁴ In general, bio-based products like wood that are naturally grown with help from the sun have lower embodied emissions.

Carbon pools are reservoirs that can store or release carbon. The forest represents one pool, storing biogenic carbon in soils and trees. The carbon remains stored until the trees die and decay or burn. When a tree is cut, 40% to 60% of the biogenic carbon remains in the forest; the rest is removed as logs⁵ and much of it is transferred to the wood products carbon pool within

the built environment. Wood products continue to store this biogenic carbon, often for decades in the case of wood buildings, delaying the release of CO₂ emissions.

When the forest is regenerated, it begins to store carbon again, leading to a net overall gain in the total carbon pool. And once they reach the end of their life cycle, wood products are often recycled or recovered to generate renewable energy, displacing the use of fossil fuels.

A forest is a natural system that is considered carbon neutral as long as it is managed sustainably, which means it must be reforested after harvest and not converted to other land uses.⁶ Canada has some of the strictest forest management regulations in the world, requiring successful regeneration after public forests are harvested.⁷ Canada is also a world leader in voluntary third-party forest certification, adding further assurance of sustainable forest management.⁸

Embodied and Operational Emissions

There are two types of GHG emissions attributable to buildings – embodied and operational. While the GHG emissions linked to energy use from operating a building throughout its life are typically greater, it is also important to consider embodied emissions. These

CARBON CALCULATOR



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www.cwc.ca/carboncalculator

A tool to help evaluate the potential carbon benefits of a building using wood, including carbon storage and avoided GHG emissions.

embodied emissions arise through the production processes of building materials, starting with resource extraction or harvesting through manufacturing, transportation and construction. With continual improvements in operational building performance, the relative significance of embodied emissions will increase.

Bioenergy produced from bio-based residuals, such as tree bark and sawdust, is primarily used to generate energy for the manufacture of wood products in North America. Wood construction products have low embodied GHG emissions because they are grown using renewable solar energy, use little fossil fuel energy during manufacturing, and have many end-of-life options.

FOR MORE INFORMATION

- [reThink Wood](#)
- Binational Softwood Lumber Council/State University of New York - [Building with wood = Proactive climate protection](#)
- [Tackle Climate Change: Use Wood](#)

¹UNEP Sustainable Buildings & Climate Initiative, *Buildings and Climate Change*, 2009.

²Environment and Climate Change Canada, *Greenhouse Gas Emissions by Economic Sector*, 2014.

³Nabuurs, G.J., et al, 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

⁴Natural Resources Canada, *Canada's forests in a changing climate*, 2016.

⁵BC Forestry Climate Change Working Group, Canada Wood, Forest Products Association of Canada, *naturally:wood, Tackle Climate Change, Use Wood*, 2017.

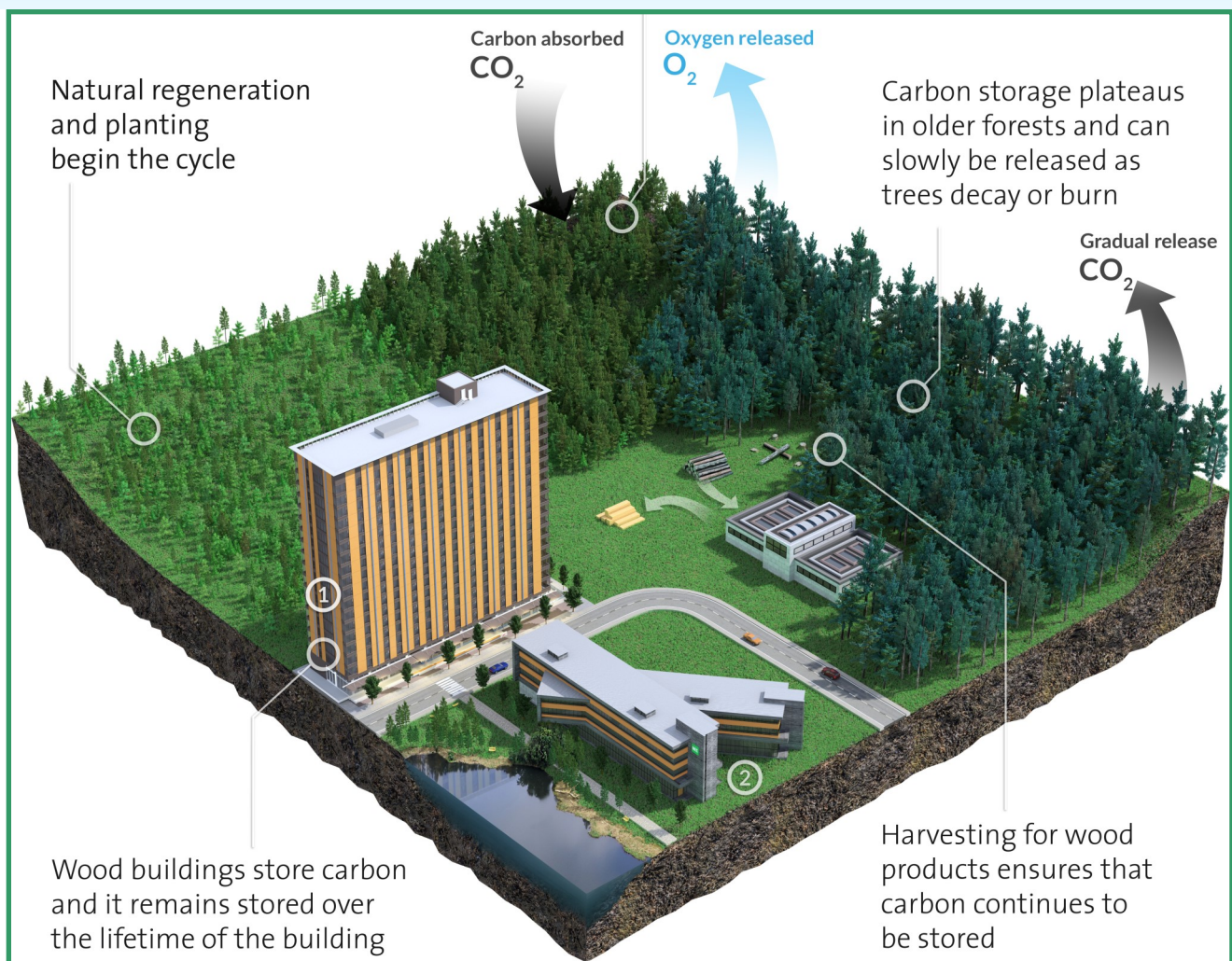
⁶FPIInnovations, *Product Category Rules for Preparing an Environmental Product Declaration for North American Structural and Architectural Wood Products*, v2, 2015.

⁷Natural Resources Canada, State of Canada's forests report, 2016.

⁸Certification Canada.

TACKLE CLIMATE CHANGE BY USING WOOD

Growing forests absorb carbon dioxide and release oxygen



naturally:wood®

1. **BROCK COMMONS PHASE 1, UBC, 18-storey wood building, estimated completion August 2017.**
2. **MOUNTAIN EQUIPMENT CO-OP, Headquarters, Vancouver, Completed in 2014.**