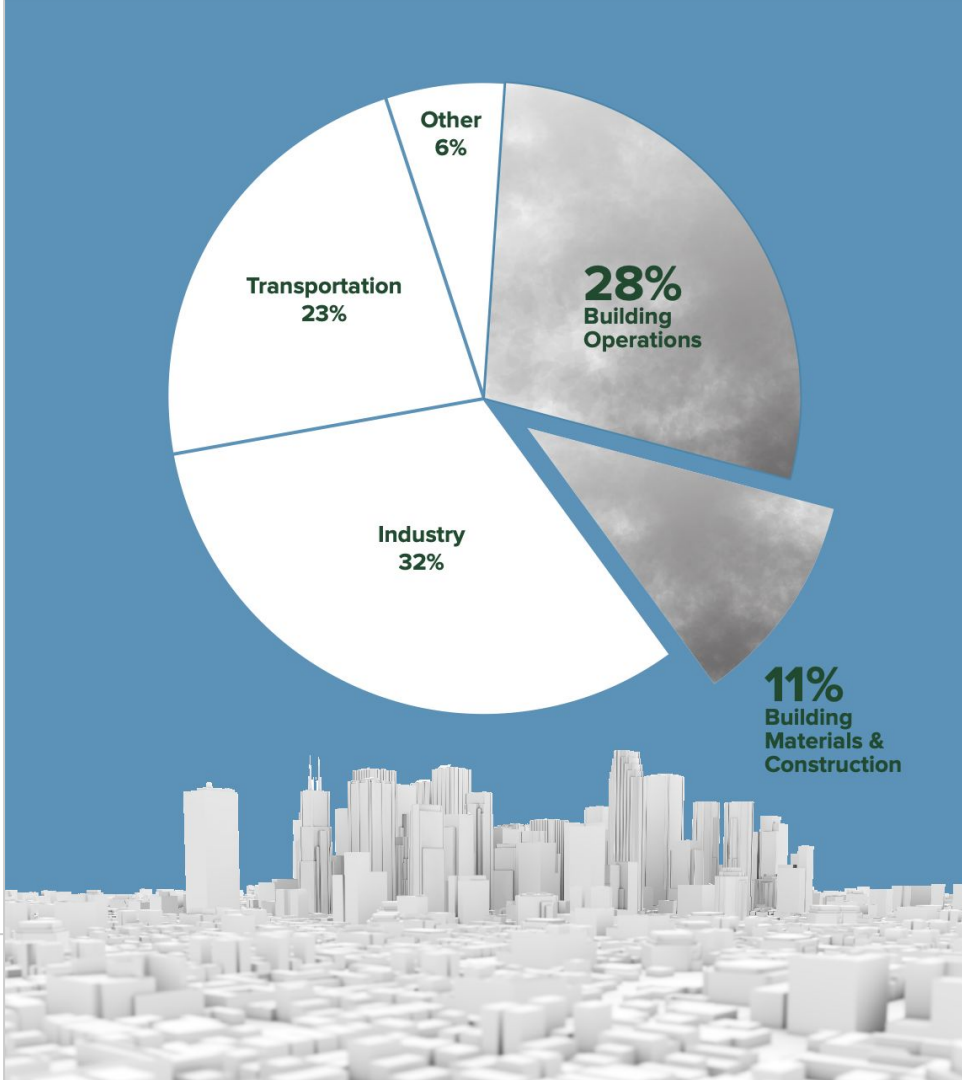
Think Wood

Wood's Role in Net Zero Carbon Buildings

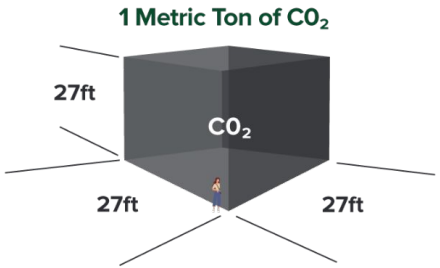
To stay within 1.5°C warming, greenhouse gas emissions need to **decline 45% below 2010 levels by 2030** and reach net zero emissions by 2050.

The built environment accounts for **40% of GHG emissions.** Our sector has a critical role to play.



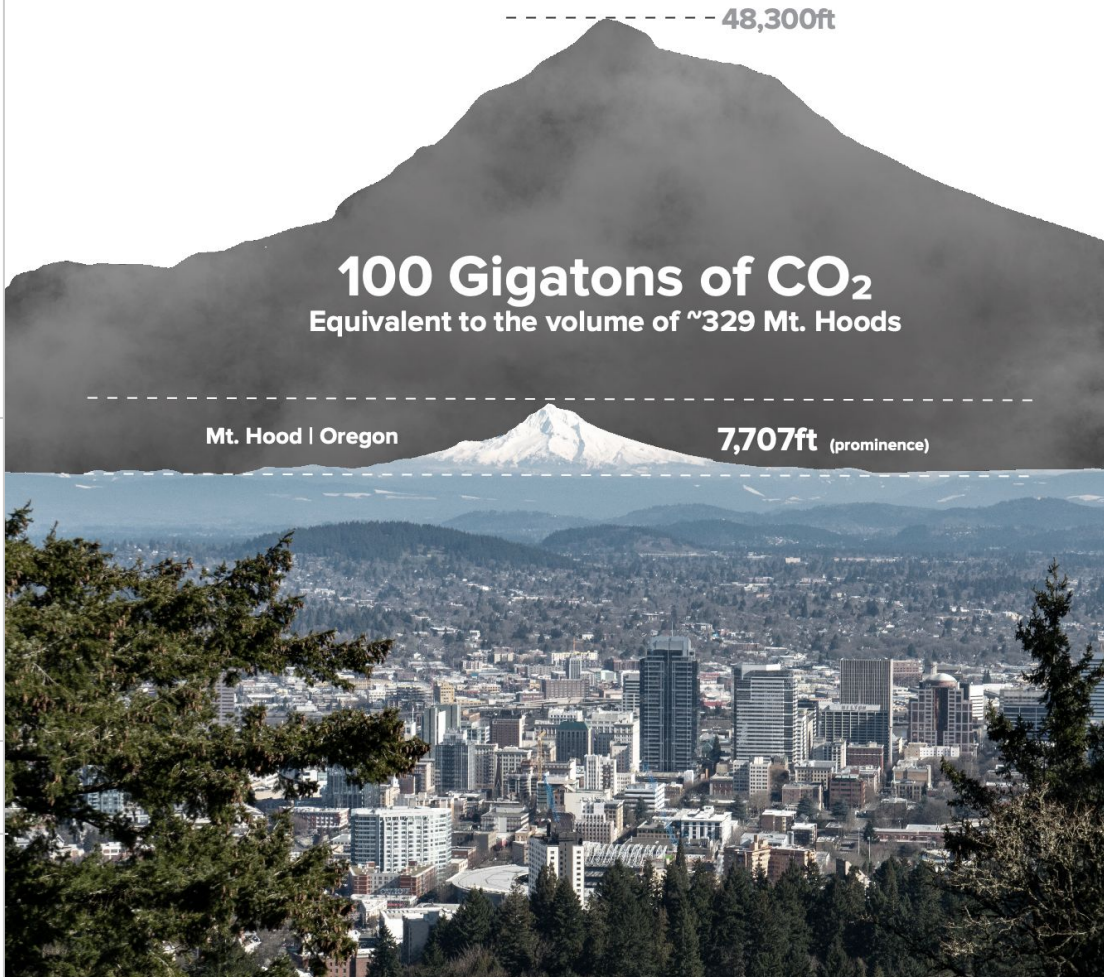
Sources: How to Calculate the Wood Carbon Footprint of a Building, p. 145; Architecture 2030; and Global Alliance for Buildings and Construction 2018 Global Status Report

Without decisive action, building materials used in new construction in cities across the globe will generate **100 gigatons** of embodied carbon by 2050.



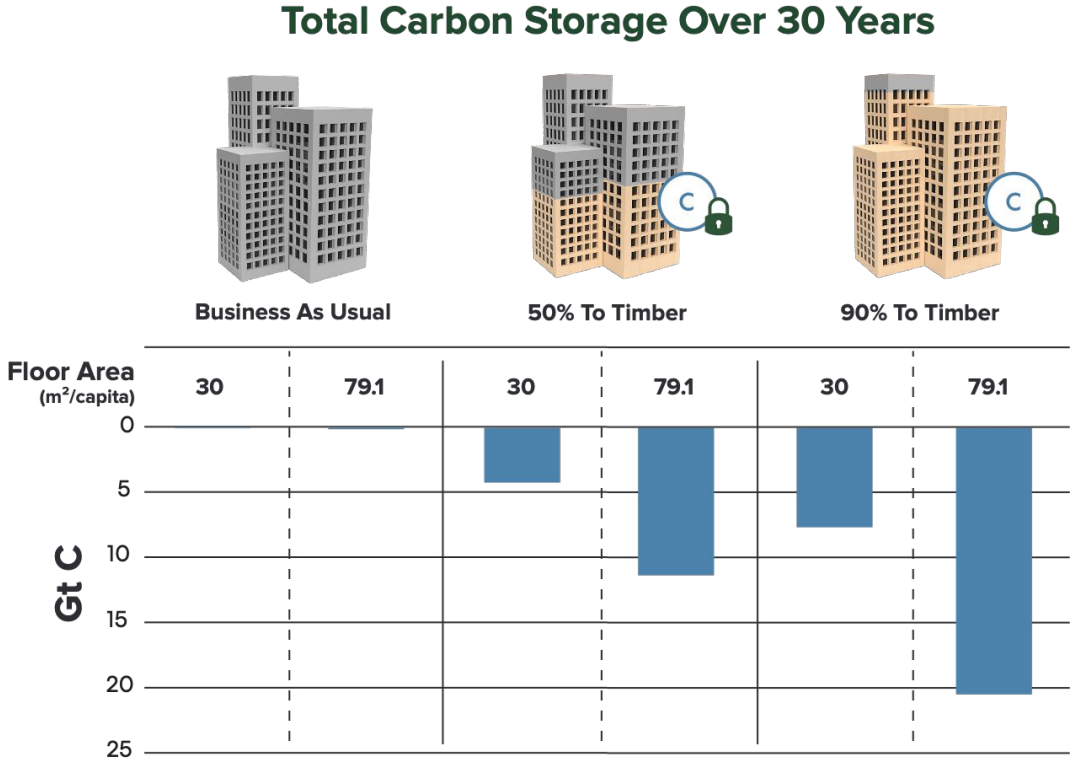
1 Billion Metric Tons = 1 Gigaton

Source: Carbon Neutral Cities Alliance, How much is a ton of carbon dioxide?



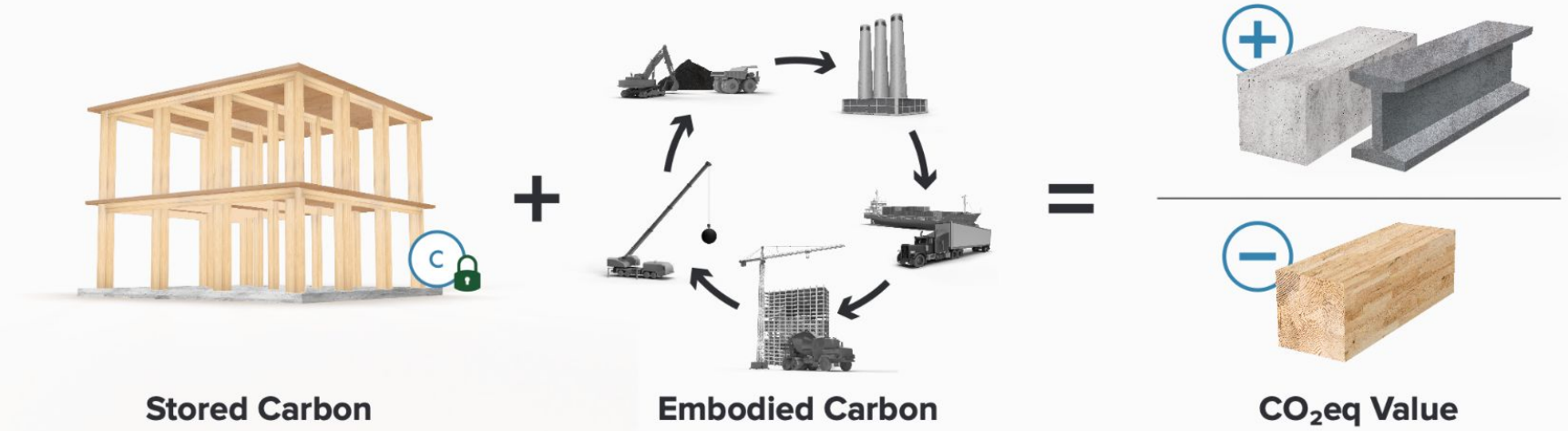
Cities built from bio-based materials such as timber can serve as constructed carbon sinks.

They could increase the existing carbon pool of urban areas (1–12 Gt C) by 25% to 170%.

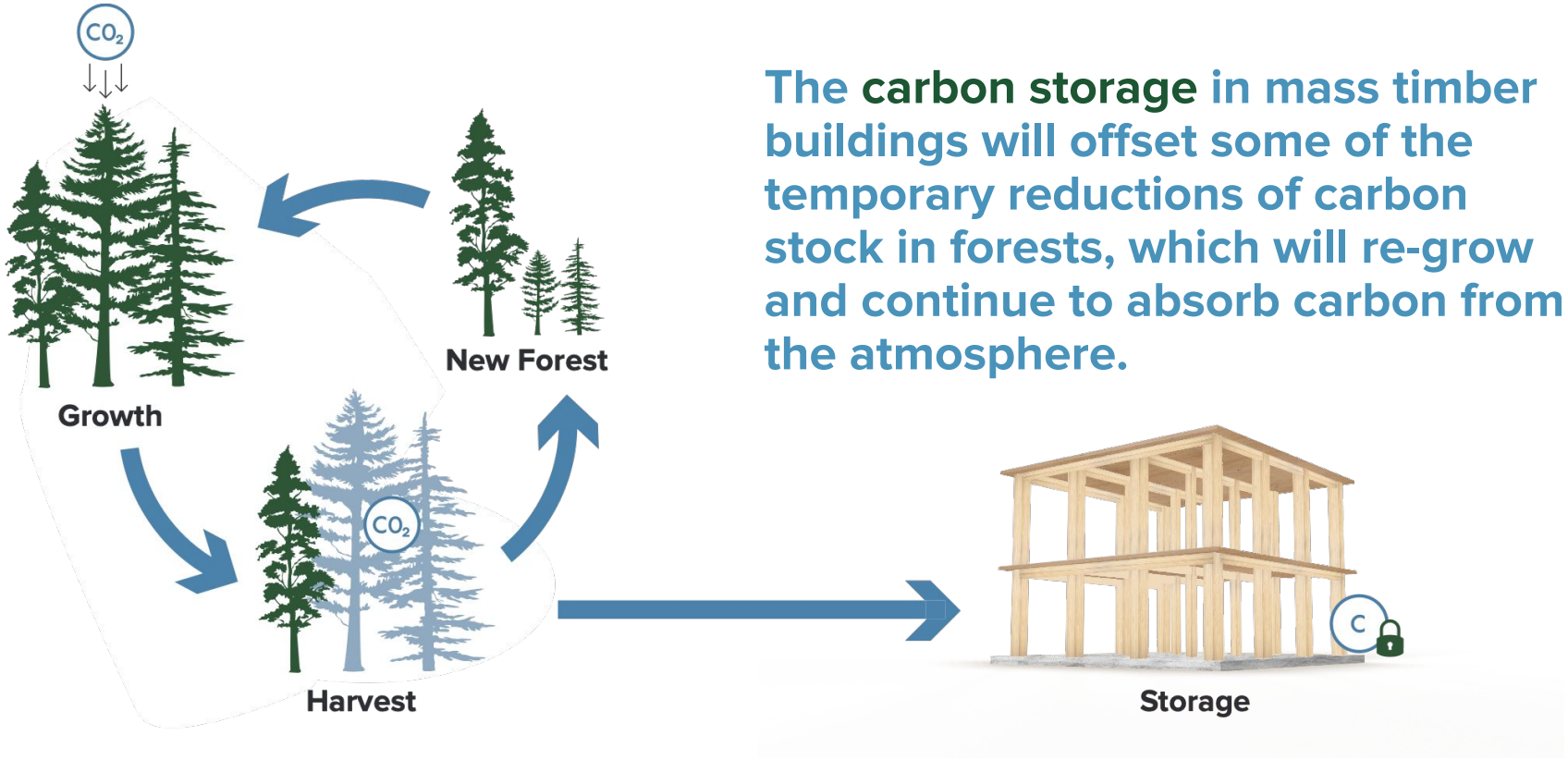


Sources: Churkina, Buildings as a global carbon sink, *Nature Sustainability*, January 2020, page 4. Supplemental chart #10.

Wood products are approximately 50% carbon by dry weight. When **sequestered carbon** is considered along with **embodied carbon**, many wood products have a **negative CO_2eq value** when sourced from forests with stable or increasing carbon stocks.



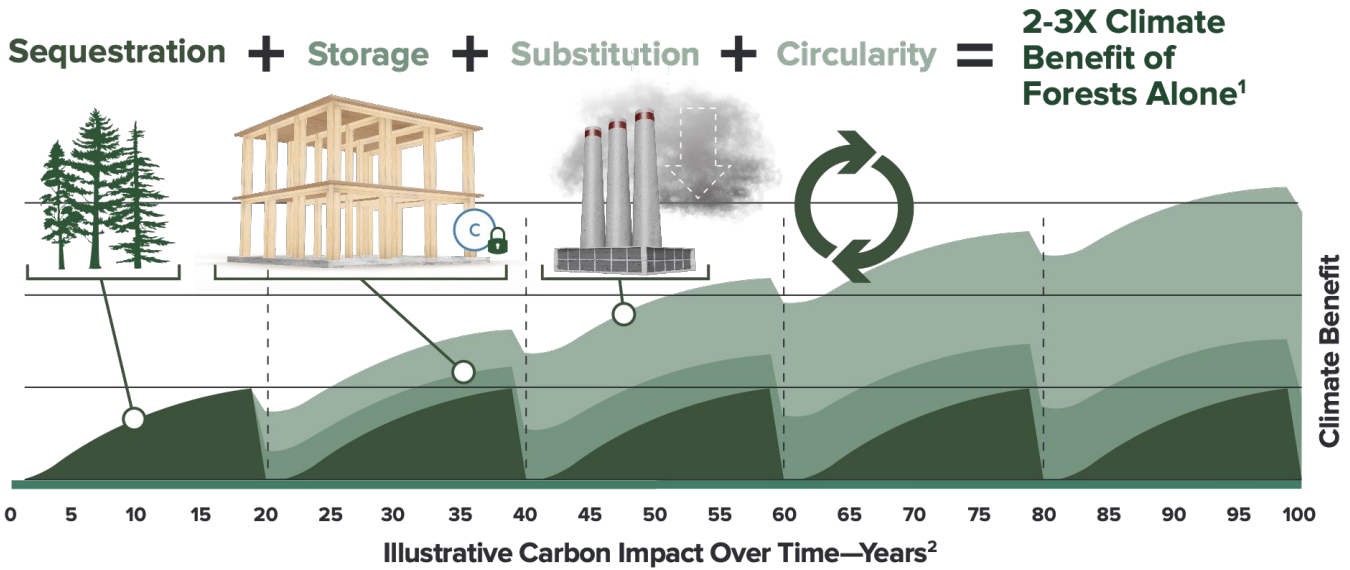
Sources: FPInnovations & Think Wood: The Impact of Wood Use on North American Forests, page 6; North American Softwood Lumber Environmental Product Declaration.



The carbon storage in mass timber buildings will offset some of the temporary reductions of carbon stock in forests, which will re-grow and continue to absorb carbon from the atmosphere.

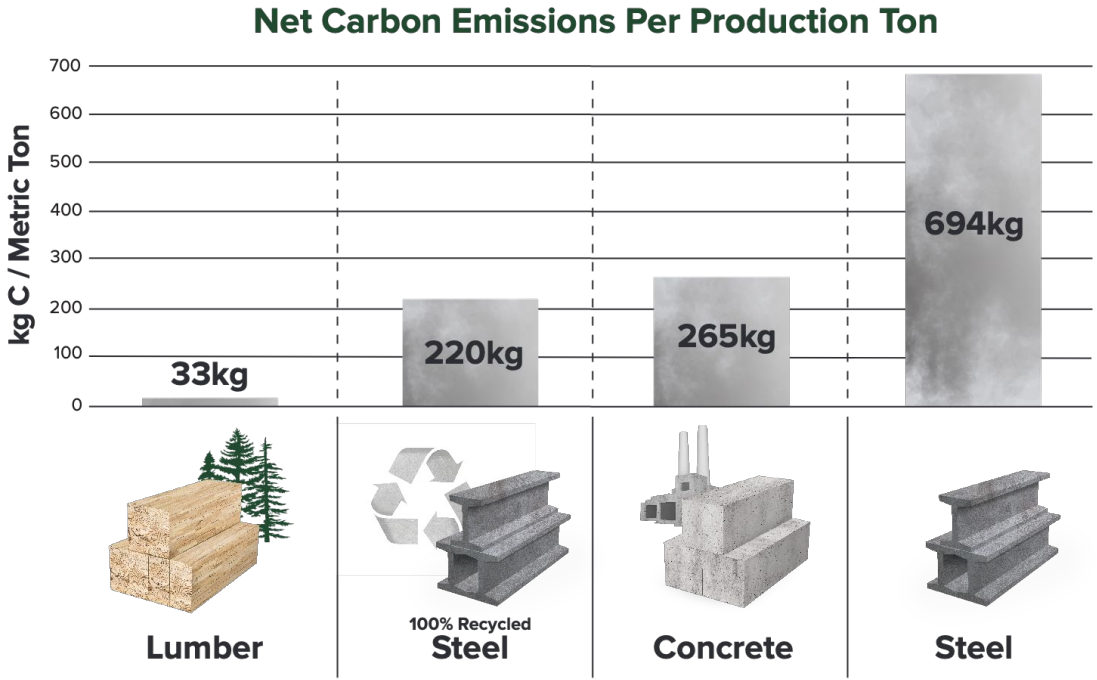
Source: Churkina, Buildings as a global carbon sink, *Nature Sustainability*, January 2020, page 4.

Sustainable forest products can deliver more climate benefit than forests alone due to forest carbon sequestration, carbon storage in buildings, substituted emissions of carbon-intensive building materials, and reuse/recycling of wood products at the end of their service lives.



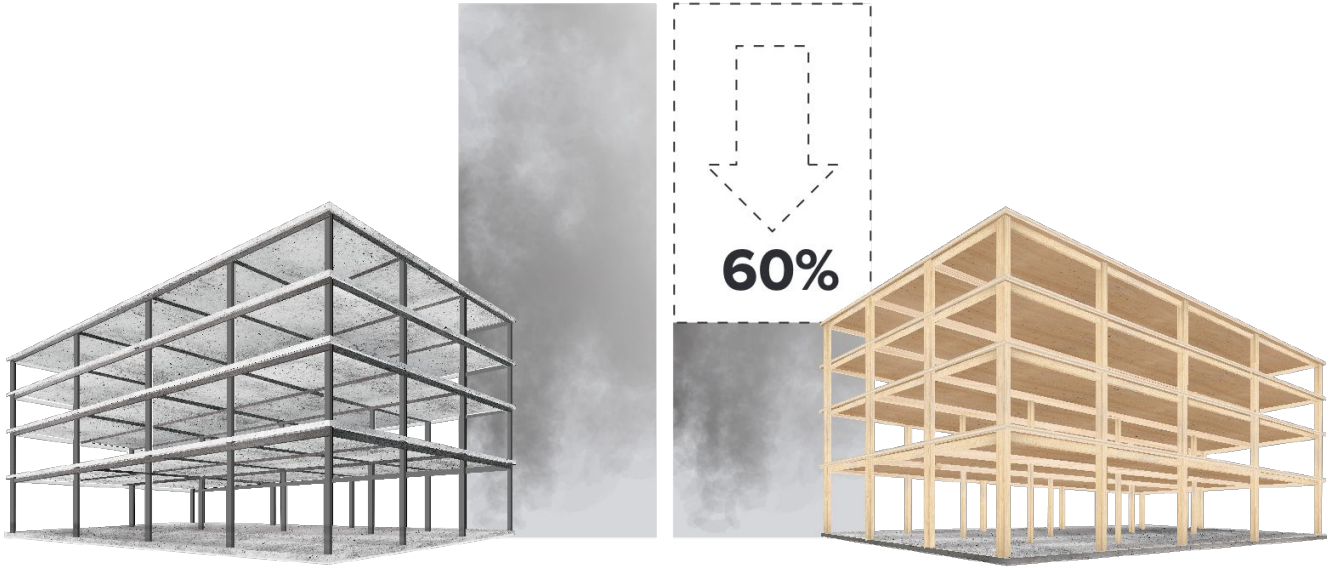
Sources: "Future forests, timber supply & the bioeconomy", Yale Forest Forum, TIG presentation, September 2021. (1) "Substitution Effects of Wood-based Products in Climate Change Mitigation", Leskinen et. al, 2018, TIG Analysis; (2) TIG Analysis based on 18 year Eucalyptus sawlog rotation in Brazil.

Of the three primary structural materials used in construction, manufacturing lumber is the least energy intensive, followed by 100% recycled steel, concrete, and virgin steel. This accounts for wood's low embodied carbon.



Source: Jim Bower, Portland Cement as a Construction Material: How Does It Compare to Wood, Steel?, Dovetail, Inc., page 4.

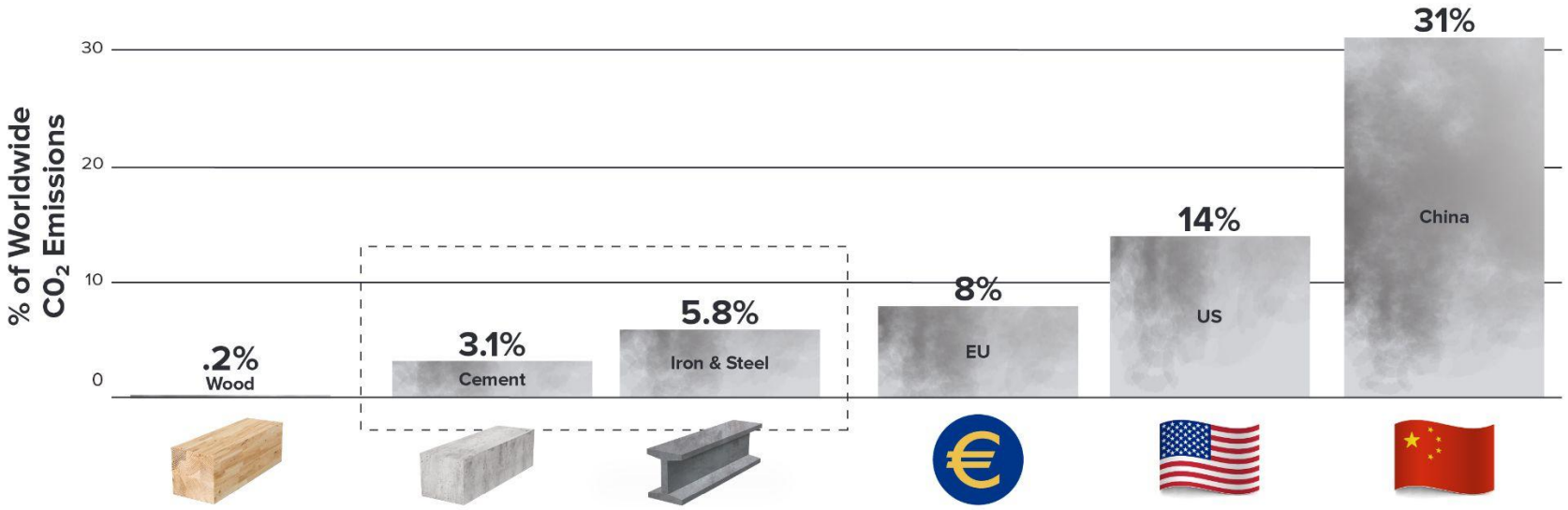
Using life cycle analysis, researchers found that substituting wood for concrete and steel in commercial buildings **cut GHG emissions by an average of 60%.**



Source: Use of structural wood in commercial buildings reduces greenhouse gas emissions, Oregon State University, 2017.

Today 70% of steel produced uses coal. Almost two tons of CO_2 are emitted for every ton of steel produced.

Cement is the most energy intensive of all industrial manufacturing processes. By 2050, 25% of global CO_2 emissions will be from cement production.



Sources: Steel - World Coal Association. World Steel Association. Cement - US Energy Information Administration. Public Radio International, July 2018. Country CO2 emissions - Global Carbon Project; Industry CO2 emissions - WRI World Greenhouse Gas Emissions in 2018