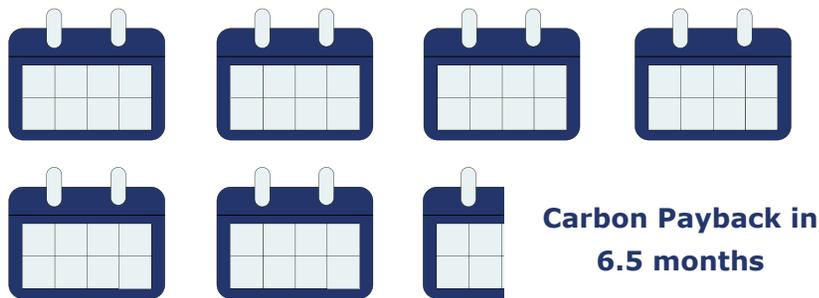


Most of our assumptions around the contribution of buildings to GHG emissions are based on data from 2006-2008 (see timeline below). This data is outdated and likely does not accurately represent our current GHG emissions allocations.

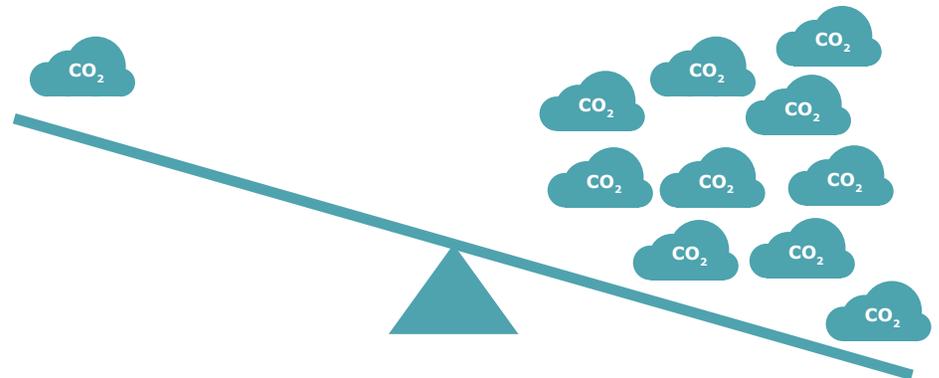


In most cases, an embodied carbon insulation investment will pay itself back quickly, often in less than one year of operations.

For example, commercial Wall Insulation impact has full Carbon Payback in 6.5 months in cold climates (Climate Zone 5) in Medium Renewable Energy (RE) Cost markets.¹



The carbon avoidance ratio shows that under certain conditions, for every unit of embodied carbon invested in the building, you could save up to 251 times the carbon during the 75-year life of the building.²



¹ Determination of Total Carbon Impact of Plastic Insulation Materials, ICF, August 29, 2023. <https://www.americanchemistry.com/better-policy-regulation/plastics/resources/determination-of-total-carbon-impact-of-plastic-insulation-materials>

² Assuming the current mix of heating system technologies, CZ5 installation and Medium RE Cost, Wall Insulation saves 251x its embodied carbon impact. The functional unit is kilograms (kg) of CO₂eq/m² of insulation based on an RSI value of 1 based on a 75-year service life.

Goal

A full life cycle approach can support efficient design selection that optimizes operational emissions, while reducing embodied emissions of materials.

The goal is to reduce overall carbon emissions by understanding the intersection of embodied and operational emissions.

Opportunity

Technologies like insulation enable efficiencies in electrification that help us further on the path of decarbonization.

Challenge

There are only a small percentage of building materials that currently have embodied carbon data. In addition, embodied carbon and operational carbon are often not considered together, which results in a large gap in understanding the overall carbon impacts of procurement decisions.

Global and U.S. Allocation of Emissions from Energy

59 GtCO₂eq
Total Global GHG emissions

10.1% of global total
Total U.S. GHG emissions

0.61% of global total
U.S. Building and Construction Materials GHG emissions

Action Item

Update U.S. and global emissions data to better understand and prioritize climate policies and document the breakdown of embodied carbon for additional building materials to better understand and inform building design.



Building insulation = 0.10% of total US GHG emissions

Structural steel = 0.9% of total US GHG emissions

Concrete = 1.7% of total US GHG emissions