

Is Wood Good?

The CORRIM Report: Environmental Performance of Wood vs. Concrete and Steel in Home Construction

The Consortium for Research on Renewable Industrial Materials (CORRIM) recently announced the results of its study of the environmental performance of wood as a building material. CORRIM is a non-profit consortium of 15 research institutions¹ formed to research the use of wood as a renewable material.

In the study, CORRIM used typical building designs to construct hypothetical homes, then compare the environmental benefits of wood-framed versus steel-framed houses in a cold climate (Minneapolis, MN) and wood versus concrete in a warm, humid climate (Atlanta, GA). The study looked at environmental effects across the entire life cycle of the home, known as “Life Cycle Analysis.”

Conclusions:

Energy Use:

- Construction of the steel-frame home used 17% more energy than the matching wood-frame home.
- Construction of the concrete-frame home used 16% more energy than the matching wood-frame home.
- The energy consumption measured included not just electricity, but also diesel and fuel oil to extract and haul materials, natural gas to generate steam in lumber mills, and electricity for steel mills.

Global Warming:

- The global warming potential of the steel-frame home was 26% higher than the wood-frame home.
- The global warming potential for the concrete-frame home was 31% higher than for the wood-frame home.
- Using wood products instead of steel or concrete can further reduce greenhouse gas emissions from fossil fuels because more than half the energy used by wood mills comes from biomass – bark, sawdust and other residuals – a renewable source of energy.

Environmental Performance Indices for Residential Construction

Minneapolis House	Wood Frame	Steel Frame	Difference	Steel vs Wood (% change)
Embodied Energy (GJ)	651	764	113	17%
Global Warming Potential (CO2 kg)	37,047	46,826	9,779	26%
Air Emissions Index (index scale)	8,566	9,729	1,163	14%
Water Emissions Index (index scale)	17	70	53	312%
Solid Waste (total kg)	13,766	13,641	-125	-0.9%
Atlanta House	Wood Frame	Concrete Frame	Difference	Concrete vs Wood (% change)
Embodied Energy (GJ)	398	461	63	16%
Global Warming Potential (CO2 kg)	21,367	28,004	6,637	31%
Air Emissions Index (index scale)	4,893	6,007	1,114	23%
Water Emissions Index (index scale)	7	7	0	0%
Solid Waste (total kg)	7,442	11,269	3,827	51%

¹ University of Washington, Oregon State University, Washington State University, Forintek (Canada), Purdue University, Composite Panel Association Research Foundation, University of Minnesota, University of Idaho, North Carolina State University, Western Wood Products Association, Louisiana State University, U.S. Forest Service Forest products Laboratory, Mississippi State University, Virginia Polytechnic Institute, The Engineered Wood Association,