

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) studied the environmental performance of wood as a building material. CORRIM is a non-profit consortium of 15 research institutions.¹ The study used typical building designs to construct hypothetical homes, and then compared the environmental benefits of wood-framed versus steel-framed houses in a cold climate (Minneapolis, MN), and versus concrete-framed houses in a warm, humid climate (Atlanta, GA).

The study used “Life Cycle Analysis,” looking at environmental effects across the entire life cycle of the home. For example, the study measured energy consumption not just in the home, but also fuel to extract and haul materials, natural gas to generate steam in lumber mills, and electricity for steel mills.

The study also measured “global warming potential” caused by burning fossil fuels, which emit greenhouse gases. Using wood reduces greenhouse gas emissions because more than half the energy used by wood mills comes from a renewable resource: sawdust, chips, and other biomass.

Conclusions:

Energy Savings:

- Using wood instead of steel: 17%
- Using wood instead of concrete: 16%

Reduced Global Warming Potential:

- Using wood instead of steel: 26%
- Using wood instead of concrete: 31%

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%

For a 12 page summary of the CORRIM Report, visit <http://www.corrim.org/reports>

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, and The Engineered Wood Association.