



Technical BULLETIN

► Report on: Life Cycle Assessment of Steel Framed Homes

Volume 3, Number 2

Steel and Wood Framing - The Real Facts

The previous technical bulletin introduced the Life Cycle approach to understanding the impact building materials have on the overall energy invested into a home, from the time it is built to when it is demolished. During this life cycle, the energy used to manufacture the framing materials is insignificant relative to the energy consumed during the everyday operation of a house.

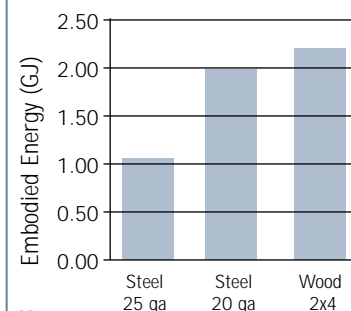
The following is intended to clarify information published by competing industries on the impact of steel framing on the environment. For comparison purposes a simple 2125 sq. ft. two-storey home was used as a model to estimate framing material quantities. The roof structure is not included.

EMBODIED ENERGY:

Material	Energy	Quantity in a 2125 sq. ft. two-storey home	Total energy
Steel (Electric Arc Steelmaking)	5.9 GJ/ton	10,811 lbs	31.9 GJ
Dimensional Wood	3.7 GJ/MBF	10,950 BF	40.5 GJ

For a typical home heating and cooling loads = 50 to 95 GJ /year
Thus over a number of years the environmental impact of the heating and cooling energy will dwarf the energy impacts of material manufacturing.

Energy Used in Manufacturing Framing Materials for a 30m x 3m Non-Load Bearing Wall



Notes:
1. Total length of steel framing, incl. track = 285 m
2. Total length of wood framing, incl. plates = 279 m

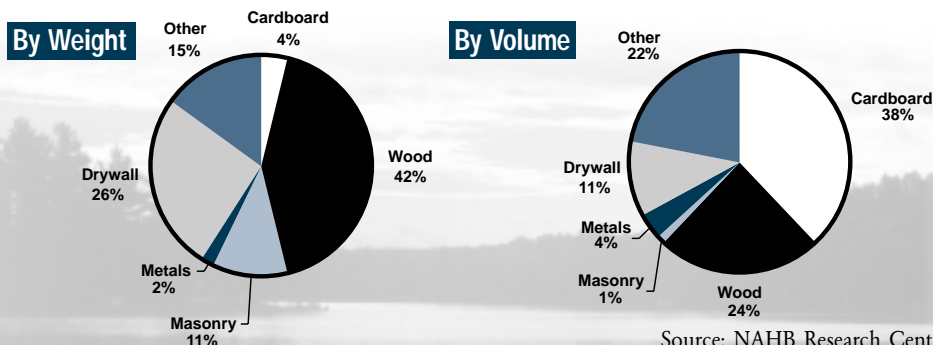
“...the ecological impacts associated with extraction are considerable for all materials, and are perhaps the greatest for wood.”

Dr. Paehkle report to Forintek, Building Materials in the Context of Sustainable Development, Phase II Summary Report, Forintek Canada Corp., October 1993

RECYCLING:

- Steel is 100% recyclable
- Steel for steel studs is made from at least 27% recycled steel and more often from 100% recycled steel
- Recycling rate of steel throughout North America and the world > 63%
- **Energy saved by using scrap steel in the steel making process last year would power approximately 18 million homes.**
- Recycling rate of automobiles > 90%
- 12 million scrap cars were recycled last year, enough to build 2 million steel framed homes
- Recycling rate of steel cans > 55%
- Recycling rate of appliances > 72%

CONSTRUCTION WASTE TO LANDFILL



Source: NAHB Research Centre

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“Wood is harvested from more than 200 million acres of forest and plantations in the United States, while iron ore is extracted from mining sites contained within a few thousand acres in Minnesota.”

Dr. S. Rhodes

“The significance of initial impacts from iron ore mining and coke production is greatly diminished when you recognize that the resulting steel can be reused indefinitely”

Dr. S. Rhodes, Scientific Certification Systems, as published in Environmental Building News, July/August 1994

“It is fair to conclude the ecological impacts associated with wood extraction are greater than are the impacts associated with the either of the mined materials (steel and concrete).”

Dr. Paehkle report to Forintek, Building Materials in the Context of Sustainable Development, Phase II Summary Report, Forintek Canada Corp., October 1993



“Despite claims of world-class forest practices, province-wide 92% of logging is by clearcutting. In fragile temperate rainforests 97% of logging is by clearcutting.”

David Boyd; Broken Promises, The Truth about what’s happening to British Columbia’s Forest, Sierra Club Legal Defense Fund, 1997

“83% of streams in 1996 cutblocks were clearcut right to their banks leaving no “riparian zone” of forest adjacent to the streams.”

David Boyd; Broken Promises, The Truth about what’s happening to British Columbia’s Forest, Sierra Club Legal Defense Fund, 1997



“Many studies have now proven that the cutting down of ancient forests and replacing them with tree farms is one of the greatest threats to biodiversity. Science clearly shows that ecosystems function better when they have a wide variety of species in them.”

David Boyd; Broken Promises, The Truth about what’s happening to British Columbia’s Forest, Sierra Club Legal Defense Fund, 1997



“You can renew trees, but you can not renew forests.”

Wayne Trusty,
Wayne B. Trusty & Associates
Ltd., Environmental Building
News, July/August 1994

