



wood *WORKS!*
engineered for strength and style...*naturally!*

Wood Solutions To Sustainability Questions

Peter Moonen, BC Wood *WORKS!* Nov 5, 2008





HAMMURABI





Performance Based Code?

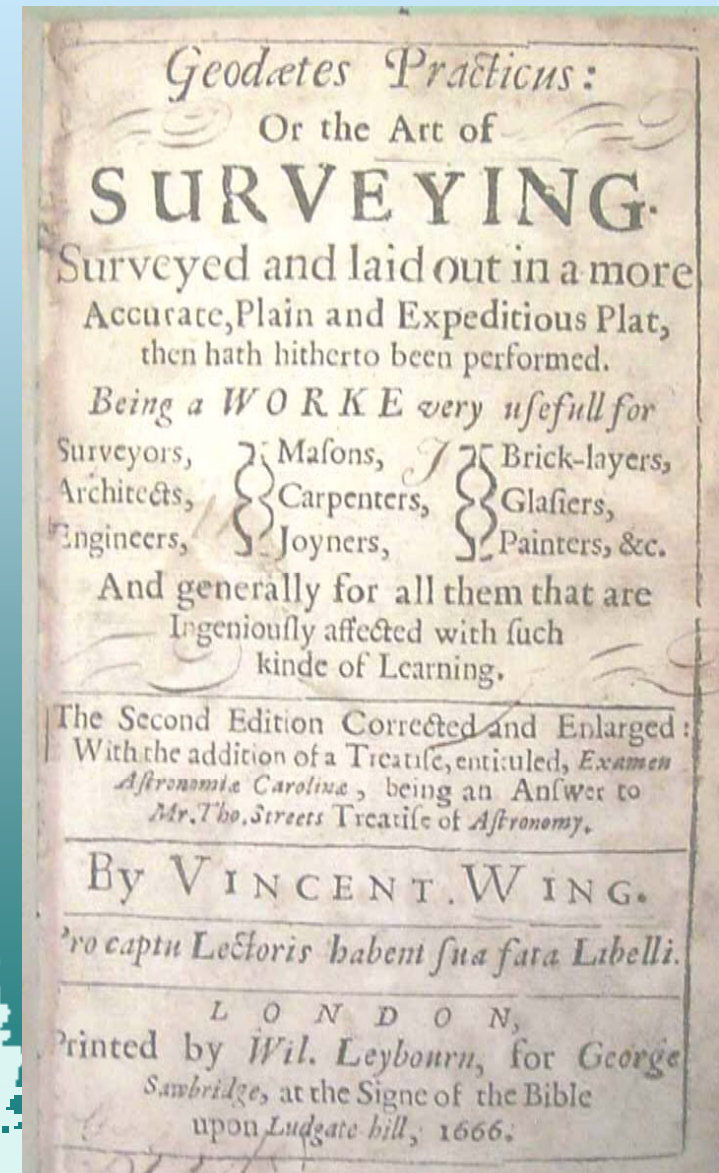
If a builder build a house for some one, and does not construct it properly, and the house which he built fall in and kill its owner, then that builder shall be put to death.

If it kill the son of the owner, the son of that builder shall be put to death.

- Kept builders honest
- Probably stifled innovation
- Not applicable to their own buildings

Building Code History

London
1666



Building Code History

Chicago
1871

Chicago: corner of
Dearborn and Monroe
after the devastating Great
Fire.



Building Code History

- London - 1666
- Chicago -- 1871
 - Codes started addressing risks of one building on another
 - Density driven
 - Light, ventilation, fire escapes, water supply, sanitary, drainage, stairs, railings...



Building Codes 2008 & Beyond



Green?

High Performance?

Prairie Sod House, circa 1909



Green Codes Or Greener Codes?

B.C. is greening up its building code

CONSTRUCTION | Reducing energy consumption a large part of the review focus

BY SCOTT SIMPSON
VANCOUVER SUN

efficient than the federal government's
Model National Energy Code for Build-

cent or better.

Other increasingly popular measures

Peter Simpson, chief executive officer
of the Greater Vancouver Home
Builders' Association, says an associa-
tion roll of restrictive new home

building standards compulsory w
serve to reduce per-unit costs to inst
them, making the energy-saving payba

Revised B.C. Building Code

- Building Policy Branch under Ministry of Forests
 - Office of Housing and Construction Standards is the lead agency
 - development and implementation
- February 13, 2007 -- Throne Speech announced development of unified BC Green Building Code
- February 27th, 2007 -- the BC Energy Plan announced implementation of cost-effective energy efficiency standards for buildings by 2010

Revised B.C. Building Code

- Implementation by Sept. 2008
 - significant step in an ongoing commitment to reduce greenhouse gas emissions related to buildings and construction
 - Water conservation
 - Greener', not 'Green' -- less complex!

Compliance & Enforcement

- Reference Standard is ASHRAE 90.1
- Part 3 Buildings
 - Registered Architect
 - Professional Engineer
- Part 9 Buildings
 - Inspection / Review by Municipality
- Natural Resources Canada EnerGuide Rating System 77
- Achievement of a Credible System?
 - BuiltGreen
 - Green Globes
 - LEED

Building and Design Systems

- Audobon Greenleaf
- BEES
- BOMA Go Green
- BOMA Go Green Plus
- BREEAM Greenleaf
- BuiltGreen
- CASBEE
- CHPS
- ECO QUANTUM
- Equilibrium
- Green Guide (Health Care)
- Green Globes
- GreenStar
- ISO 14000
- LABS21
- LEED
- NABERS
- NAHB
- NovoClimat
- R-2000
- SB Tool
- TGBRS
- TGBRS – Green Star
- →???????

Life Cycle Assessment

North American Systems



LEED



LEED Canada



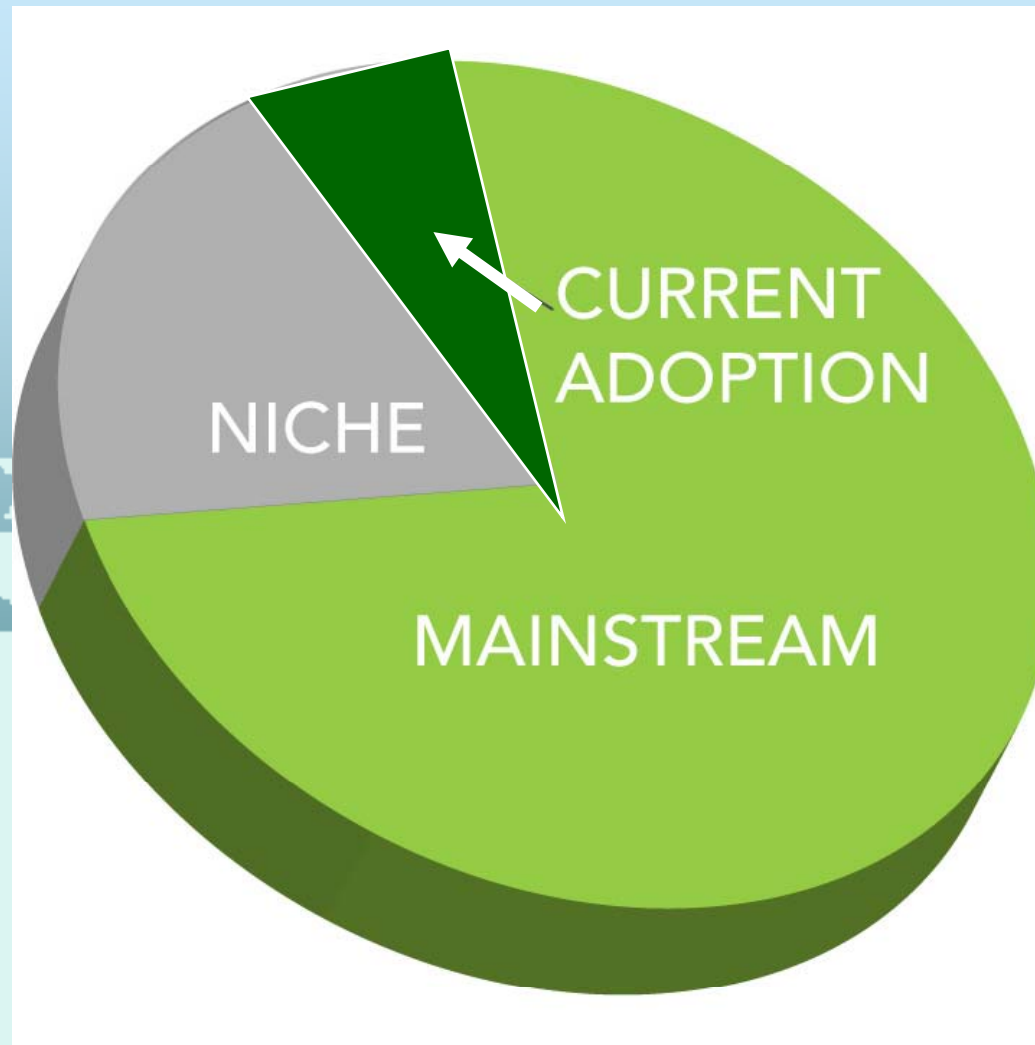
Green Globes/ BOMA Go Green Plus



- Operated by Green Building Council
- New and Existing Buildings
- 69 points (70 in Canada)
- Each measure is usually one point

- Operated by the Green Building Initiative and BOMA Canada
- New Buildings and Existing Buildings
- LCA approach / Online interactive
- 1,000 points
- Weightings for the various criteria. Partial scores possible. "Not applicable" option for some criteria.

Green Building Market Adoption



Concerns / Problems with LEED and USGBC

- LEED: Can be expensive, cumbersome
- Recognizes only FSC certification
- Rewards only “rapidly renewable” materials
- Only wood requires third-party certification
- Disincentive for designers to use wood
- Could bias against wood if codified
- Reinforces perception that using wood is bad for the environment
- LCA not yet incorporated



Areas of Assessment

5 %	1 Project Management
11	2 Site
38	3 Energy
8.5	4 Water
10	5 Resources
7	6 Emissions, Effluents & Other Impacts
20	7 Indoor Environment

1,000 points available



Ratings



Green Globes



LEED



35-54%

55-69%

70-84%

+85%

Certified 50-60%

Silver 61-70%

Gold 71-80%

Platinum 81+%

How rating systems treat wood in general

Areas of Relevance

- Certification
- Renewability
- Proximity
- Clearcutting
- Old Growth
- Waste/recycling
- Off-gassing/Toxicity

What Makes a Wood Product “Green?”

- Salvaged and re-used products
- Re-usable/re-configurable products Recycled content
- Regionally harvested and manufactured
- Rapidly renewable bio-based materials
- FSC-certified wood
- Minimal VOC emissions
- Innovation
- Other user health and comfort benefits

Rating systems & Treated wood

- LEED – No credits are applicable except, perhaps MRc7 Certified wood.
- Built Green -- 6 – 5
 - Use of recycled materials from local construction sites (1 point for each different product used)
- Green Globes
 - E-1 -- Integration of systems and materials with low environmental impact during their life cycle
 - E-2 -- Use of materials minimizing consumption and depletion of material resource
 - E-4 -- Building durability, adaptability and disassembly

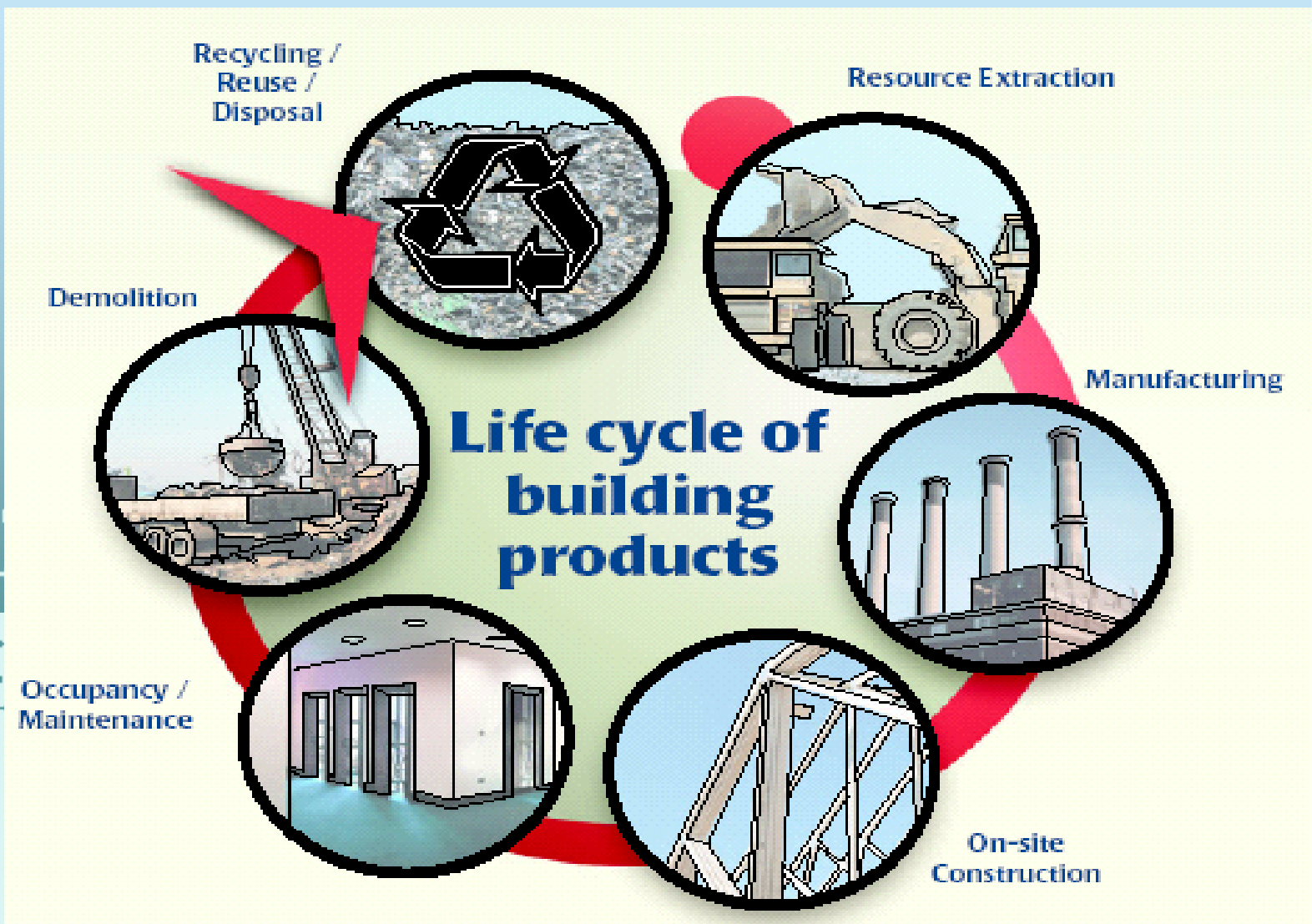
Why Wood?

- Carbon Sink
- Renewable
- Recyclable
- Reusable
- Organic
- Cleans Air
- Cleans Water
- Provides O₂
- Biodegradable



- Strong
- Lightweight
- Flexible
- Diverse
- Attractive
- Easy to Use
- Available
- Inexpensive
- Versatile

Life Cycle Assessment



Life Cycle of Wood

North American Sources

- ATHENA Institute

www.athenasmi.ca

Environmental Impact Estimator

- CORRIM

(Consortium for Research on Renewable Industrial Materials)

www.corrim.org



CORRIM report

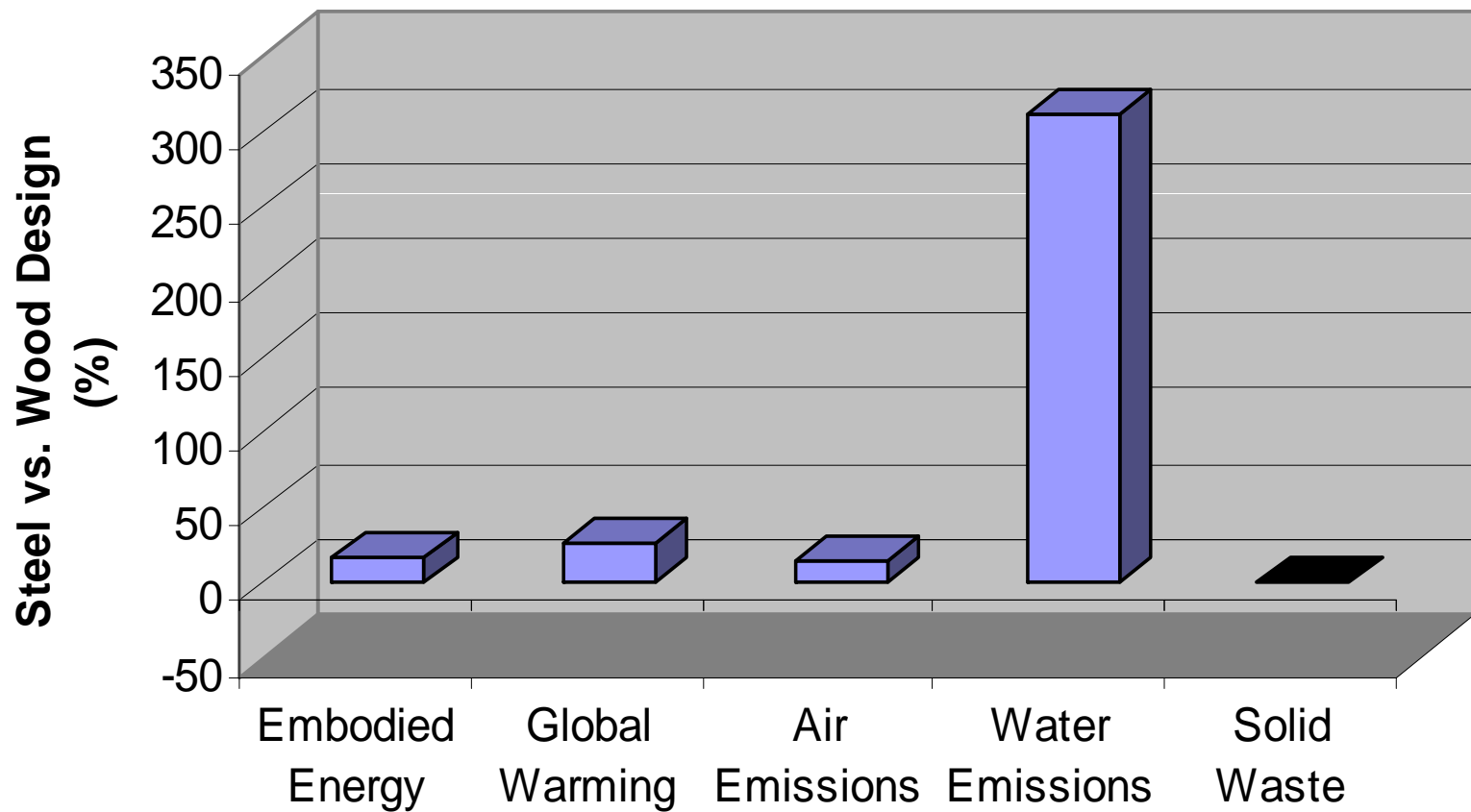
- Examined impacts of building over 75 year life.
- Calculated emissions of CO₂, methane, nitrous oxide.
- Estimated global warming potential.
- Examined water pollution and relative toxicity.
- Makes recommendations to reduce buildings' impacts.

Materials Comparison

	Steel to wood	Concrete to wood
Energy Use	12%	20%
Greenhouse	15%	29%
Air Pollution	10%	12%
Water Pollution	300%	225%
Resource Use	7%	50%
Solid Waste	6%	16%

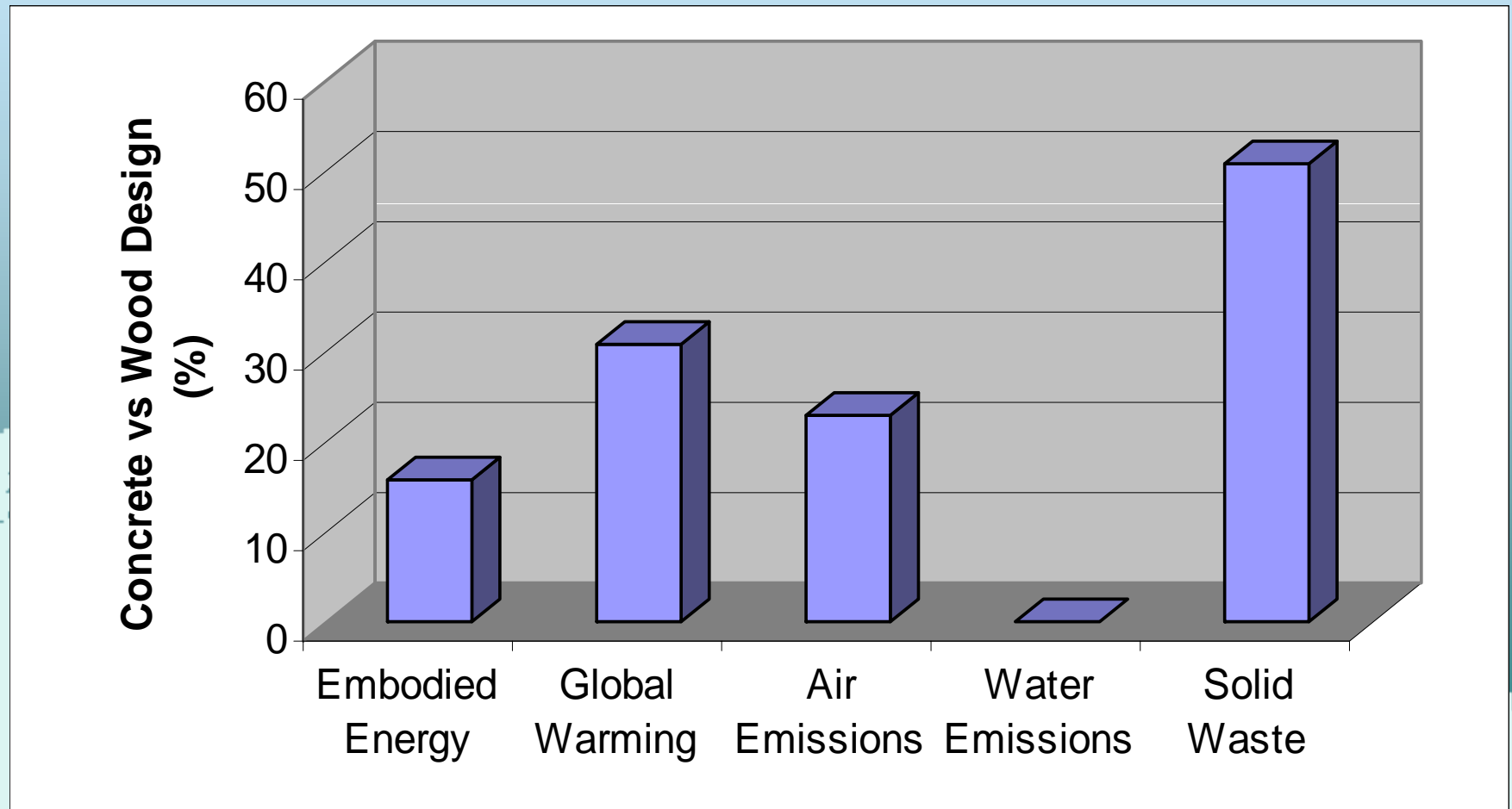
CORRIM -- Wood<=>Steel

Embodied Impacts



CORRIM -- Wood \rightleftharpoons Concrete

Embodied Impacts



Sample Impact by using wood

- A Typical 2400 sq. ft. wood-framed house:
 - Carbon Sequestration 29 tonnes
- Equivalent to CO₂ emissions from
 - 1 passenger car driven for 7 years
 - More than 12,500 litres of gasoline burned
 - Energy costs to operate the house for almost 4 years
- Impacts best determined by LCA
- Eco-Calculator developed for assessment

Where does this Leave us

- Know your wood species and how they can be used
- Understand limitations of wood
- Respect the concerns of market for woods valid weaknesses
- Understand perceived weaknesses of wood and defend with information
- How are you offsetting wood's weaknesses

Where To?

- Understand the LCA implications of Treated wood
 - Positive (Durability)
 - Negative (perceived toxicity)
- New Opportunities
 - Laminated structural
 - Treatment options
- Focus on Benefits of Wood
- Advocate for change based on Technical merit

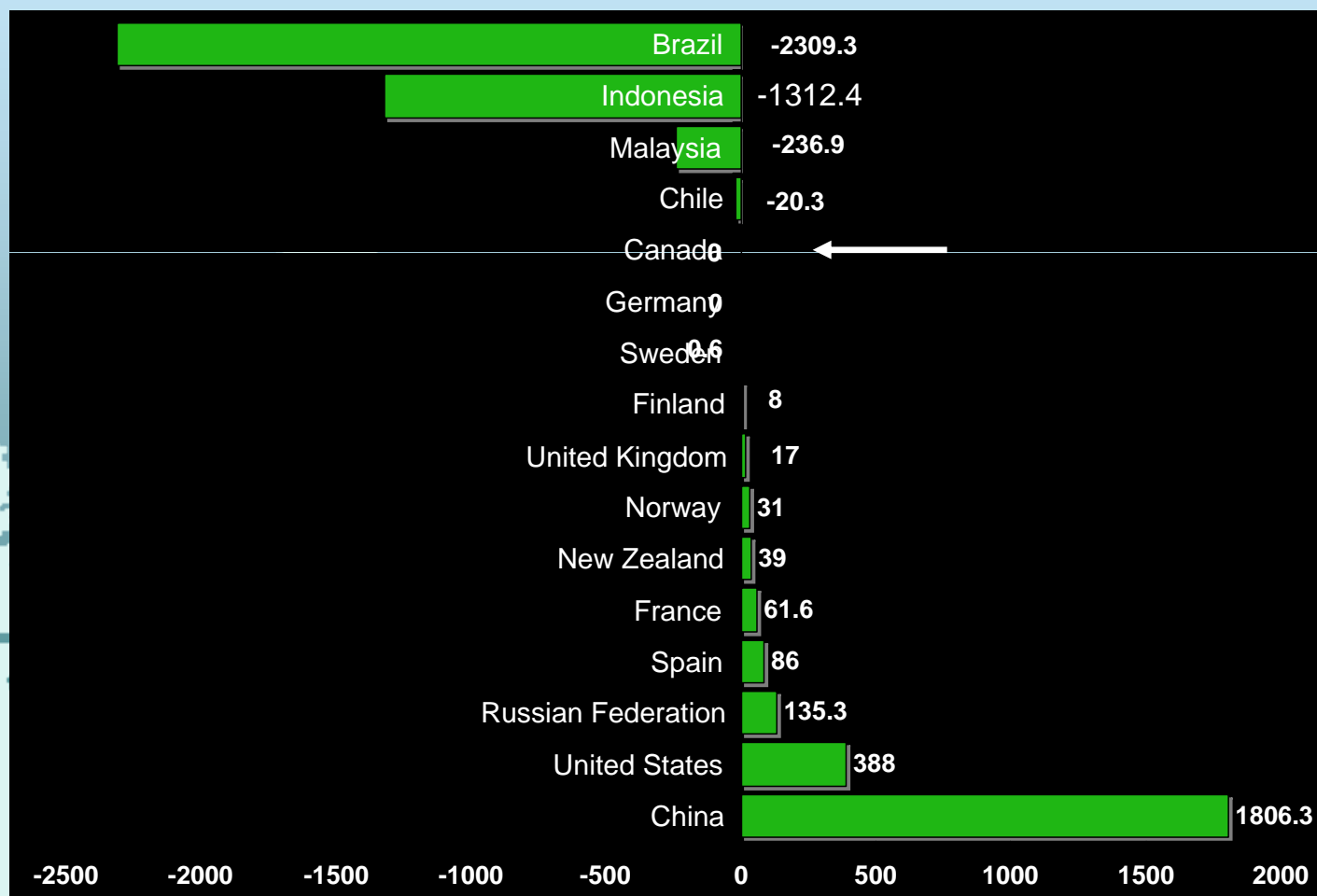
Sourcing Sustainable Wood

Certification Standards in use in Canada

- All Address Key Env., Economic, Social Values
 - Conservation of biological diversity
 - Protected areas and maintenance of special sites/values
 - Unacceptability of wood from illegal or unauthorized sources
 - Respect for traditional knowledge
 - A 3rd party audit of planning and practices
 - Public disclosure of audit report
 - NGO involvement/support for the certification standard
 - A label for use on-product and/or on-packaging to demonstrate product links to SFM certification

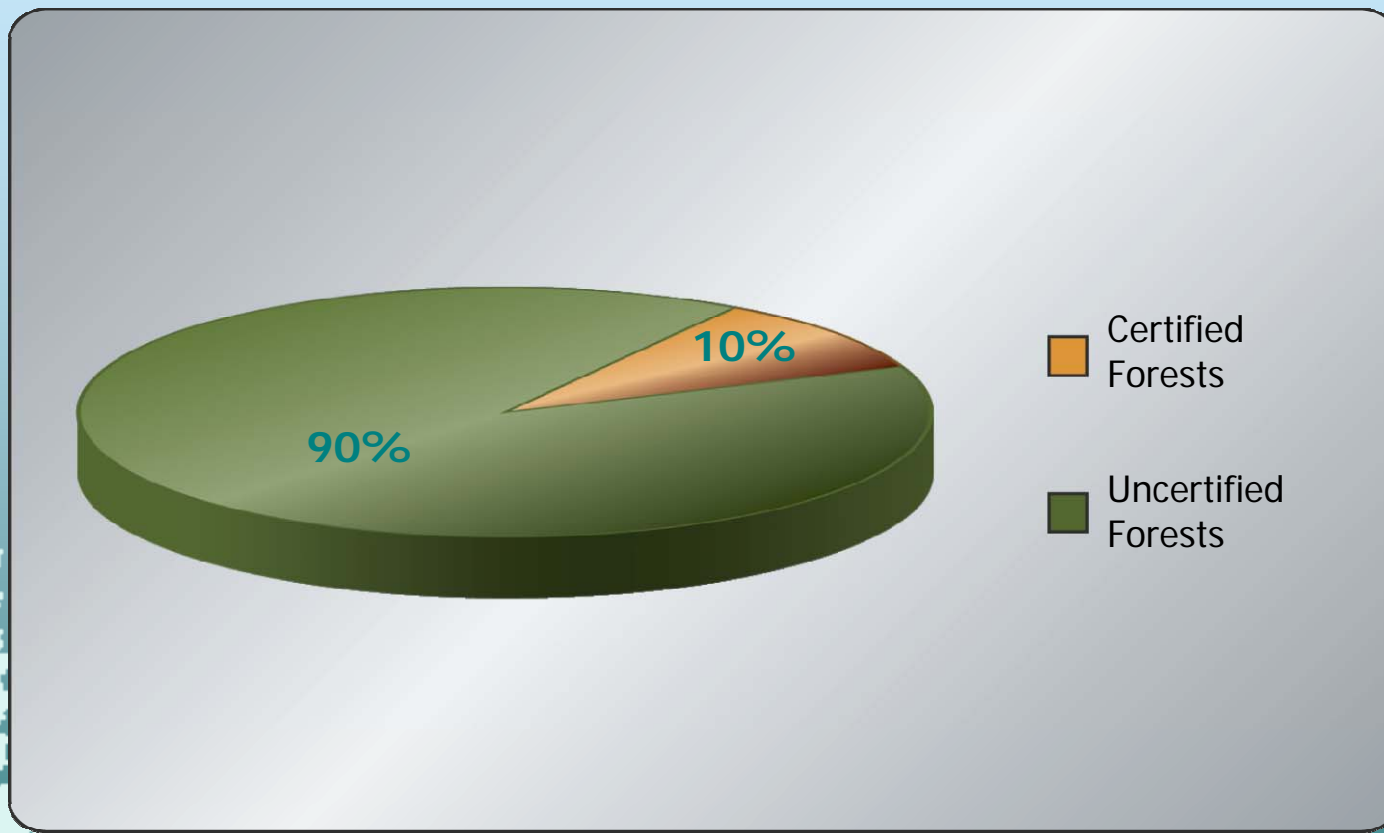


Change In Forest Area, 1990 – 2000 (Thousands of hectares)



Source: FRA 2000 Main Report, UNFAO

Only 10% of Global Forests are Certified to SFM Standards



Note: Potential area of forest likely to become certified is approximately 600 – 800 mill. hectares. This is the “core” productive forest that produces world annual harvest of 1,500 mill. m³ of industrial roundwood. (Jan 2006)