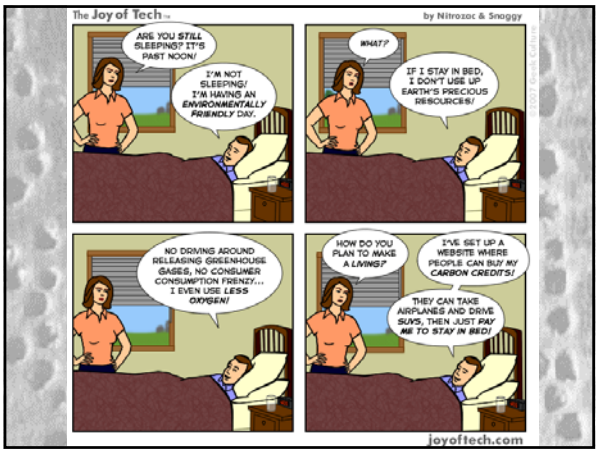


Don't Save the Trees

Moving Towards a Holistic View of Environmental Impact

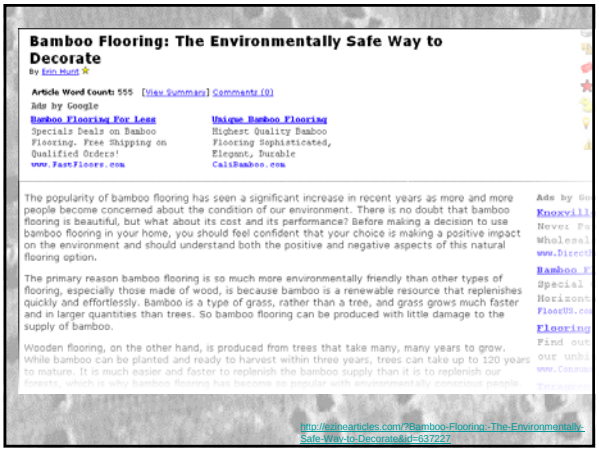
Adam Taylor - Assistant Professor
Forestry, Wildlife & Fisheries
12:20 p.m.
4 March 2009
125 Ellington Plant Sciences Building


CLEAN COAL.
AMERICASPOWER.ORG


USS
STEEL IS GREEN
The construction of each steel-structure automatically saves a quantifiable number of trees directly related to the size of the structure
http://www.ussi.ca/residential_steel.html


WORLD DRYER

http://blog.heritagemakers.com/wp-content/uploads/2008/04/environment-blog-image1.jpg



Bamboo Flooring: The Environmentally Safe Way to Decorate

By Kris Hunt

Article Word Count: 555 [View Summary] Comments (0)

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Bamboo Flooring For Less
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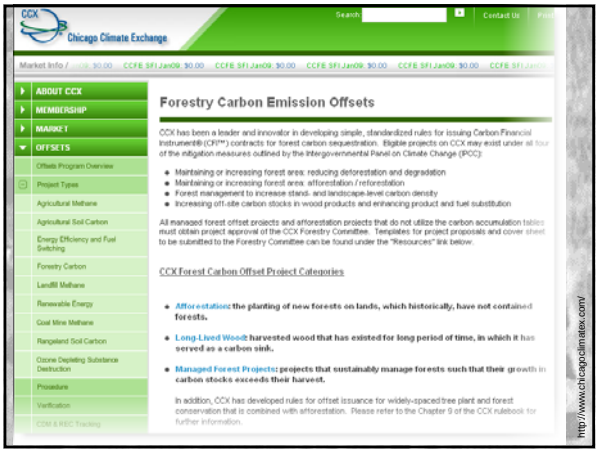
Unique Bamboo Flooring
Highest Quality Bamboo Flooring Sophisticated, Elegant, Durable
CalsBamboo.com

The popularity of bamboo flooring has seen a significant increase in recent years as more and more people become concerned about the condition of our environment. There is no doubt that bamboo flooring is beautiful, but what about its cost and its performance? Before making a decision to use bamboo flooring in your home, you should feel confident that your choice is making a positive impact on the environment and should understand both the positive and negative aspects of this natural flooring option.

The primary reason bamboo flooring is so much more environmentally friendly than other types of flooring, especially those made of wood, is because bamboo is a renewable resource that replenishes quickly and effortlessly. Bamboo is a type of grass, rather than a tree, and grass grows much faster and in larger quantities than trees. So bamboo flooring can be produced with little damage to the supply of bamboo.

Wooden flooring, on the other hand, is produced from trees that take many, many years to grow. While bamboo can be planted and ready to harvest within three years, trees can take up to 120 years to mature. It is much easier and faster to replenish the bamboo supply than it is to replenish our forests, which is why bamboo flooring has become so popular with environmentally conscious people.

http://ezinearticles.com/?Bamboo-Flooring:-The-Environmentally-Safe-Way-to-Decorate&id=637227



http://www.chicagoclimatex.com/

http://creativebits.org/files/images/save.jpg

Holistic

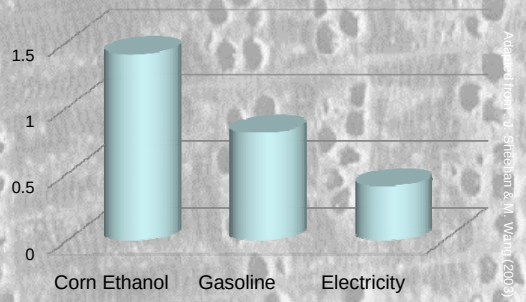
concerned with complete systems

http://buildingcommissioning.wordpress.com/2008/01/

http://www.image-archeology.com/redwood_tree_ca.htm

Capital
v
Income

Fossil Fuel Efficiency



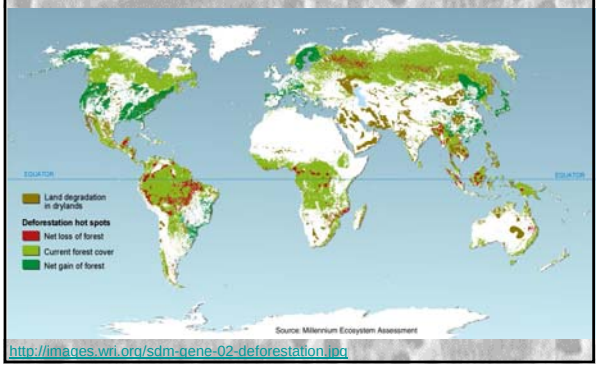
Modified from J. Sheehan & M. Wang (2003)

Adapted from J. Sheehan & M. Wang (2003)

NIMBY & "Leakage"

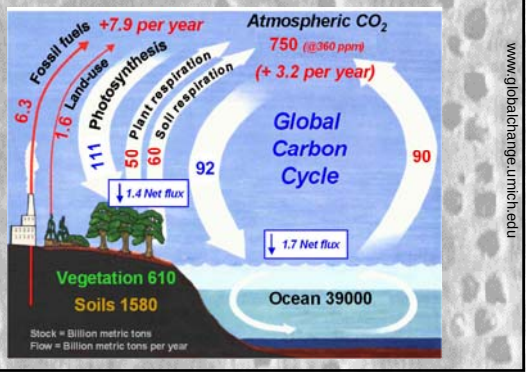
www.lr.org

Trees or Forests?

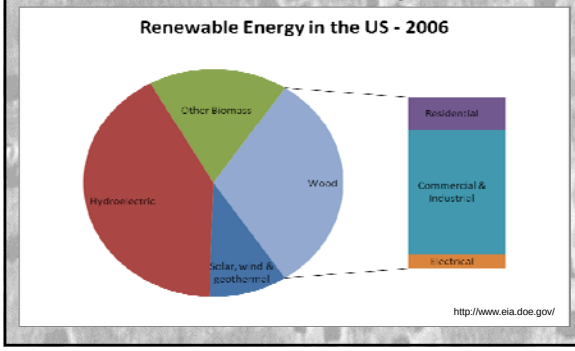


http://images.wri.org/sdm-gene-02-deforestation.jpg

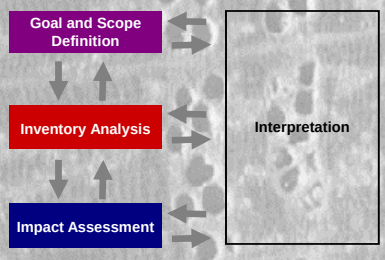
"Permanence"

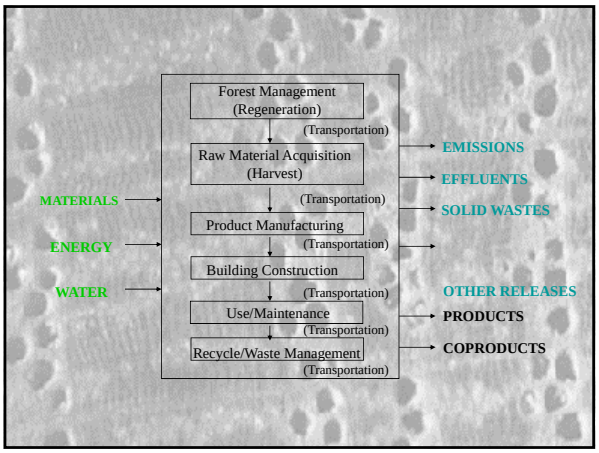


Ecosystem Services v. "Additionality"



Life Cycle Assessment





Whole-House Comparisons

Wood v Steel/Concrete

Design Differences: Minneapolis

Full Basement 2062 sq.ft. 2 story

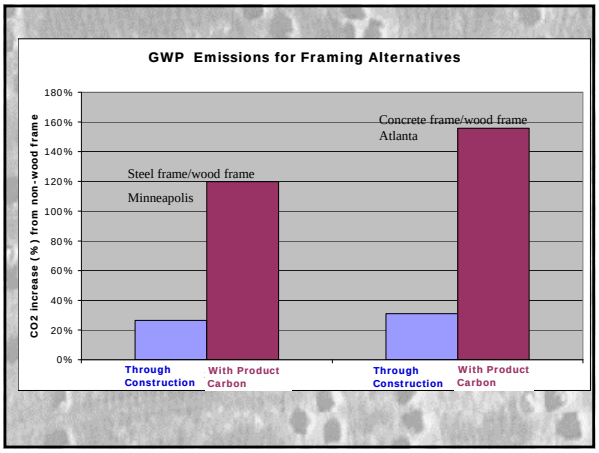
Characteristic	Wood Design	Steel Design
1st and 2nd Floors	Engineered wood "I" –joists @ 16" (400mm) o/c & 19/32" (15mm) plywood decking	Steel 18 ga. "C" joist @ 12" (300mm) o/c & 19/32" (15mm) plywood decking
Above grade exterior walls	2" x 6" wood studs @ 16" (400mm) o/c, #15 organic felt, OSB sheathing, R19 fiberglass batt insulation, 6mil polyethylene vapor barrier, 12mm gypsum board, vinyl siding	1.5" x 3.63" Steel 20 ga. "C" studs @ 16" (400mm) o/c, #15 organic felt, OSB sheathing, R13 fiberglass batt insulation, 1.5" EPS insulation, 6mil polyethylene vapor barrier, 12mm gypsum board, vinyl siding
Below grade exterior walls	2"x4" wood studs @ 24" (600mm) o/c, R13 fiberglass batt insulation, poly vapor barrier, 12mm gypsum board	1.5" x 3.63" Steel 25 ga. "C" studs @ 24" (600mm) o/c, R13 fiberglass batt insulation, poly vapor barrier, 12mm gypsum board
Partition walls	2"x4" wood studs @ 16" (400mm) o/c, 12mm gypsum board two sides	1.5" x 3.63" Steel 25 ga. "C" studs @ 16" (400mm) o/c, 12mm gypsum board two sides

Life-Cycle Inventory results
1.0 MSF 3/8-in. basis plywood production

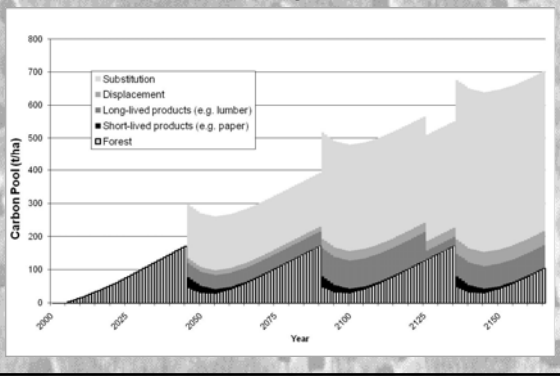
INPUTS			OUTPUTS		
Materials	**Units**	**Per MSF 3/8-in. basis**	**Materials**	**Units**	**Per MSF 3/8-in. basis**
Wood resin			Bark		
Roundwood (log)	ft.3	6.56E+01	Bark waste	lb.	1.31E+01
	lb.	1.89E+03	Bark ash	lb.	7.75E+00
			Total	lb.	2.09E+01
Phenol-formaldehyde	lb.	1.59E+01	**Products**		
Extender and fillers [a]	lb.	8.90E+00	Plywood	lb.	9.91E+02
Catalyst [a]	lb.	1.11E+00	**Co-products**	lb.	
Soda ash [a]	lb.	3.30E-01	Wood chips	lb.	4.25E+02
Bark [b]	lb.	1.98E+02	Peeler core	lb.	4.62E+01
Dry veneer	lb.	6.81E+00	Green clippings	lb.	3.10E+01
Green veneer	lb.	1.51E+01	Veneer downfall	lb.	3.44E+00
Electrical energy			Panel trim	lb.	1.07E+02
Electricity	kWh	1.39E+02	Sawdust	lb.	9.63E+00
Fuel for energy			Solid dry veneer	lb.	6.68E+01
Hog fuel (produced) [b]	lb.	3.83E+02	Total	lb.	6.89E+02
Hog fuel (purchased) [b]	lb.	3.40E+01	**Air emissions**		
Wood waste	lb.	5.00E-01	Acetaldehyde	lb.	1.12E-02
Liquid propane gas	gal.	3.59E-01	Acetone	lb.	4.80E-03
Natural gas	ft.3	1.63E+02	Acrolein	lb.	4.95E-07
Diesel	gal.	3.95E-01	Benzene	lb.	4.77E-04
			CO	lb.	1.91E+00
			CO 2 fossil	lb.	2.78E+02
			CO 2 non-fossil	lb.	2.78E+02
			Dust (PM10)	lb.	2.08E-01
			Formaldehyde	lb.	1.80E-02
			Methanol	lb.	1.28E-01
			NO x	lb.	2.34E-01
			Organic substances	lb.	2.20E-02
			Particulates	lb.	3.47E-01
			Phenol	lb.	8.27E-03
			SO 2	lb.	7.74E-04
			SO x	lb.	
			VOC	lb.	6.26E-01

a These materials were excluded based on the 2% rule.
b Bark and hogged fuel are wet weights whereas all other wood materials are ovendry weights; bark weight is included in the "hog fuel (produced)" weight.

Atlanta House	Wood	Concrete	Concrete v Wood (% Change)
Embodied Energy (GJ)	398	461	**16%**
Global Warming Potential (CO_2 kg)	21,367	28,004	**31%**
Air Emission Index (index scale)	4,893	6,007	**23%**
Water Emission Index (index scale)	7	7	**0%**
Solid Waste (total kg)	7,442	11,269	**51%**



Carbon Dynamics



Energy in Building Life Cycle

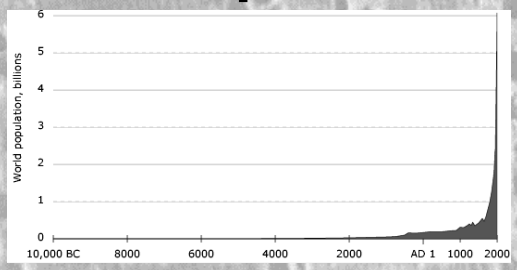
	Minneapolis House		Atlanta House	
	Wood	Steel	Wood	Concrete
Structure (GJ)	646	759	395	456
Maintenance (GJ)	73	73	110	110
Demolition (GJ)	7	7	7	9
Embodied energy total (GJ)	**727**	**840**	**512**	**573**
75 years of heat & cooling energy (GJ)	**7800**		**4575**	

Corrim: WWW.CORRIM.ORG

USLCI database: www.nrel.gov/lci

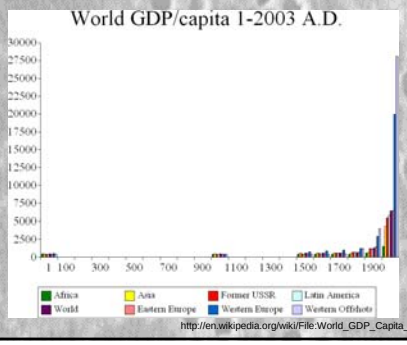
$$I = P \times A \times T$$

P



http://en.wikipedia.org/wiki/File:Population_curve.svg

A



http://en.wikipedia.org/wiki/File:World_GDP_Capita_1-2003_A.D.png

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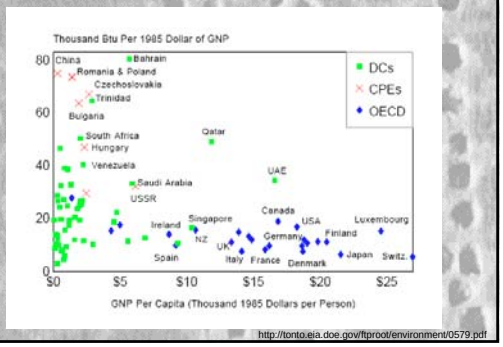
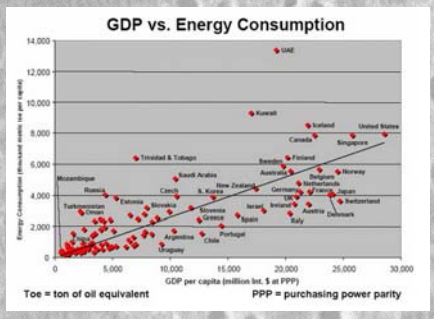


http://tonto.eia.doe.gov/ftproot/environment/0579.pdf

T

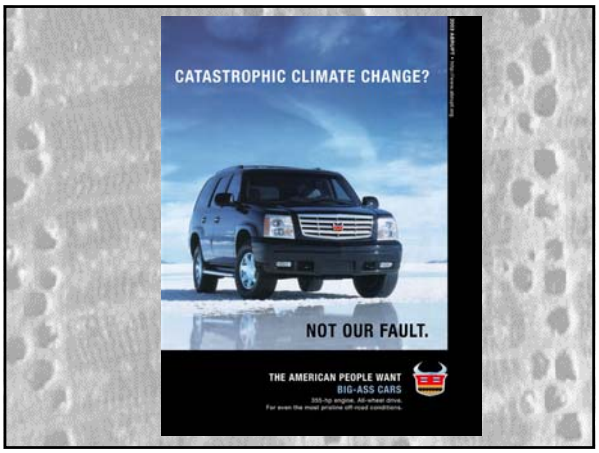


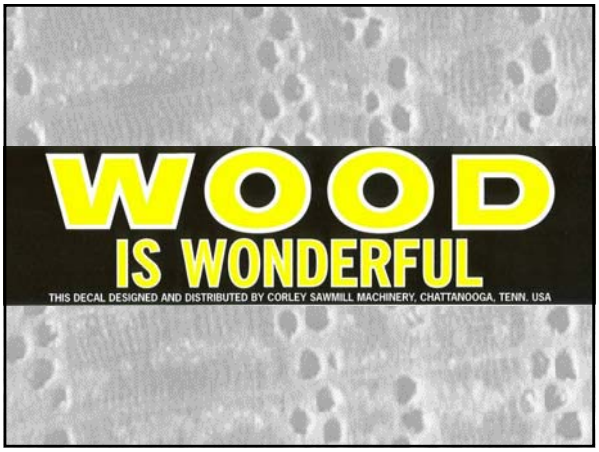
www.greenparty.ca/en/node/3362

The Voluntary Human Extinction Movement

"May we live long and die out"

http://www.vhemt.org/


CATASTROPHIC CLIMATE CHANGE?
NOT OUR FAULT.
THE AMERICAN PEOPLE WANT
BIG-ASS CARS


WOOD
IS WONDERFUL
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