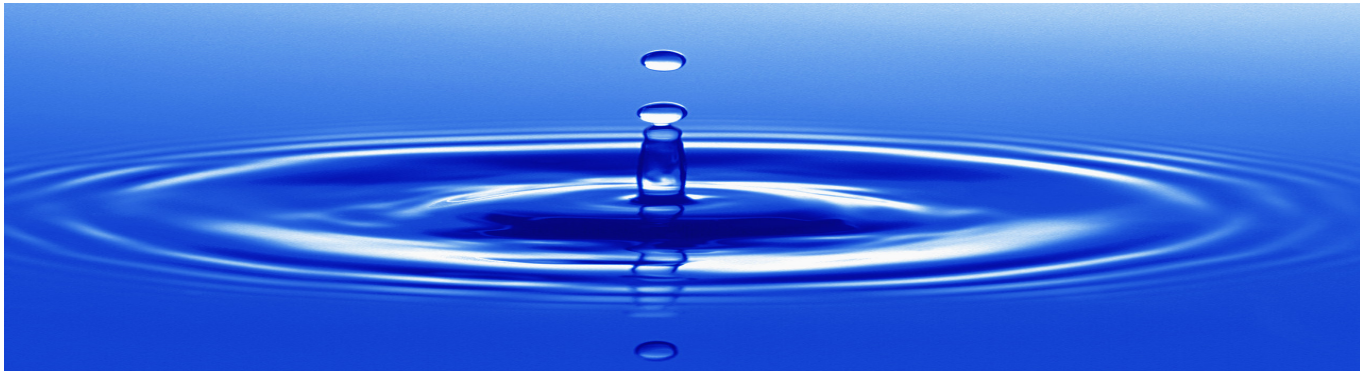


# When is “Green” Brown? Savvy Material Selection



Bonnie Bruce, FIIDA, LEED AP  
b2 + co

# In the United States

## Buildings Consume:

- Over 35% of the total energy
- Over 60% of the electricity
- Over 35% of bldg. materials
- Contribute over 35% of CO2 emissions
- Add over 35% to municipal solid waste
- Use over 25% of all fresh water



# The Importance of “Green” Materials

- Reduce greenhouse emissions & global warming (climate change)
- Limit environmental impacts from resource extraction
- Improve local air and water quality
- Provide healthy & safe indoor environments

# The Importance of “Green” Materials

## Creating healthy, safe, productive environments

To Provide good indoor environmental air quality (IAQ):

- Limit toxic VOC emittance from building materials
- Increase natural ventilation
- Avoid health effects from sick building syndrome
- Prevent mold and other expensive maintenance issues
- Increase people’s efficiency and productivity (studies by Judith Heerwagen)

# Designing for Sustainability

Simple concepts: Minimizing and Maximizing

- Minimize waste (recycle, salvage, re-use)
- Minimize material use (do you really need to use it?)
- Maximize material performance (durability, ease of maintenance)
- Maximize material lifecycle (Cradle to Cradle)

# Green Wash vs. “Green” Products

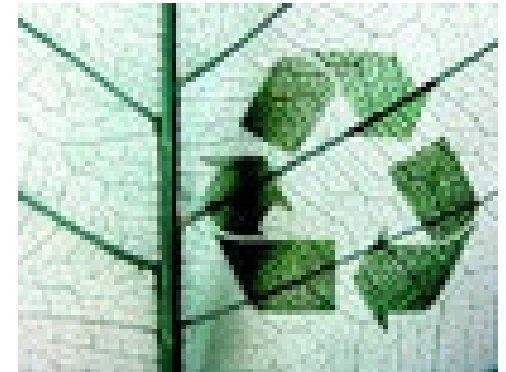
Criteria to consider:

- Recycled content (post consumer and pre-consumer)
- Local/Regional manufacture or extraction
- Recyclability
- Rapidly renewable material components
- Low emitting and Non toxic materials (low VOC, Red List items)
- Third Party Certification
- Low environmental impact during manufacture
- Manufacturers with existing environmental policies

# Materials with Recycled Content

## Why care?

- To increase demand for materials with recycled content and reduce the impacts resulting from extraction of new, virgin materials
- Post-consumer: consumer waste that becomes raw material for another product
- Pre-consumer: output from the manufacturing process that is “left over” and is used for material for another product.



# Local/Regional Materials

## Why care?

- To reduce environmental impacts of transportation (resource depletion and pollution)
- To support the local economy



# Rapidly Renewable Materials



## Why care?

- Materials that replenish themselves within a 10 yr. lifecycle result in less loss of biodiversity
- Examples:

Bamboo

Biofiber Board

Wool Carpet

Cotton Batt Insulation

Linoleum Flooring

Cork

# Materials for Healthy Indoor Air

## Why care?

- Many materials contain VOCs (volatile organic compounds)
- Unhealthy indoor air can aggravate allergies
- People can develop sensitivities to chemicals when exposed over time to building and cleaning products with high VOCs.



# Third Party Certified Products

## **Why care?**

- Independent Third Party certification can provide verification of manufacturer's claims

## **What Types of Products?**

- Wood Products
- Cleaning Products
- Paint and Sealants
- Carpets





# Other Criteria for Greener Choices

## **Lifecycle Analysis -- LCA**

- LCA is tracking the environmental impacts of a product from extraction to manufacture, transportation, installation, use, disposal, reclamation and re-use
- Many manufacturers have completed LCAs on their products
- A growing number of manufacturers will publicly share LCAs

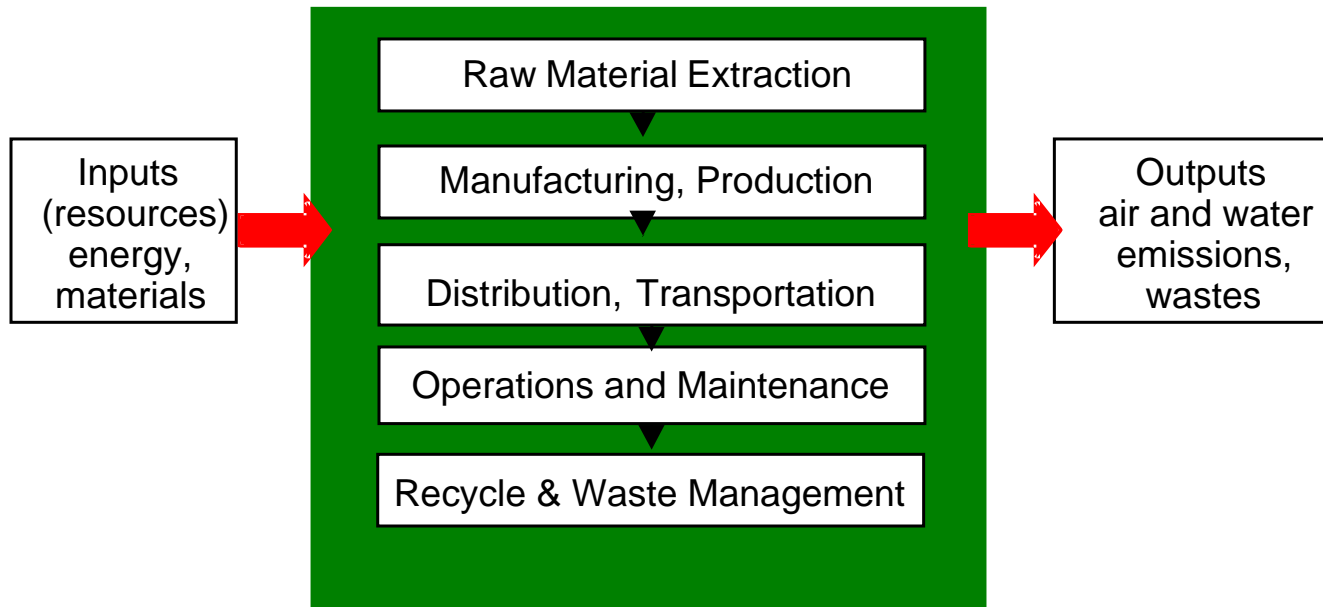
# Life Cycle Assessment Defined

Evaluates the environmental burdens associated with a product, process, or activity by identifying energy and materials used and wastes released to the environment. (SETAC, 1990)

‘Life Cycle’ refers to the major activities in the course of the product’s life.



# All Life Cycle Stages



***Industrial System***

# Environmental Impact Categories

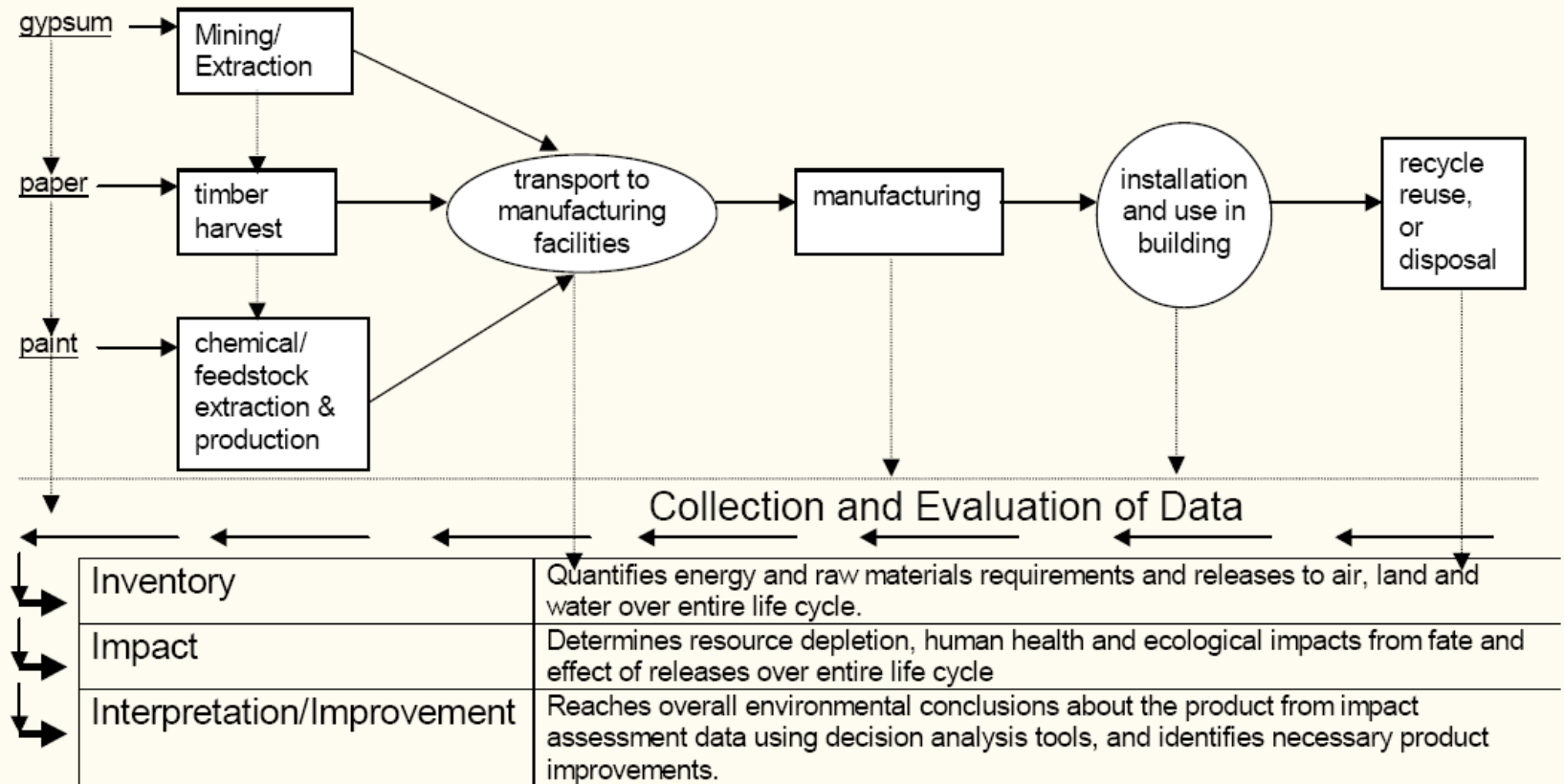
1. Climate Change
2. Stratospheric Ozone Depletion
3. Eutrophication
4. Photochemical Smog
5. Acidification
6. Human Toxicity
7. Eco-Toxicity
8. Water Resource Depletion
9. Mineral Resource Depletion
10. Fossil Fuel Depletion
11. Land Use/Biodiversity
12. Habitat Alteration
13. Indoor Air Pollution



# Life Cycle Analysis of Wallboard

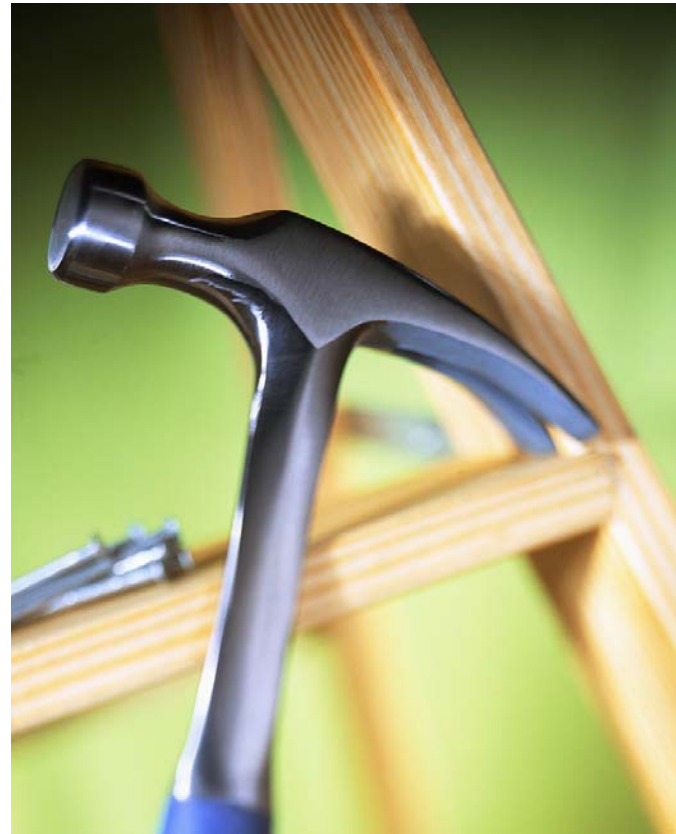
## Inventory & Impact Assessment of Releases & Energy Use

### Components



# LCA Tools & Resources

- BEES (NIST) - LCA
- GaBI- LCA
- PHAROS - LCA
- Building Green Digest
- EPA's Environmental Purchasers Products database
- Environmental Building News Green Spec

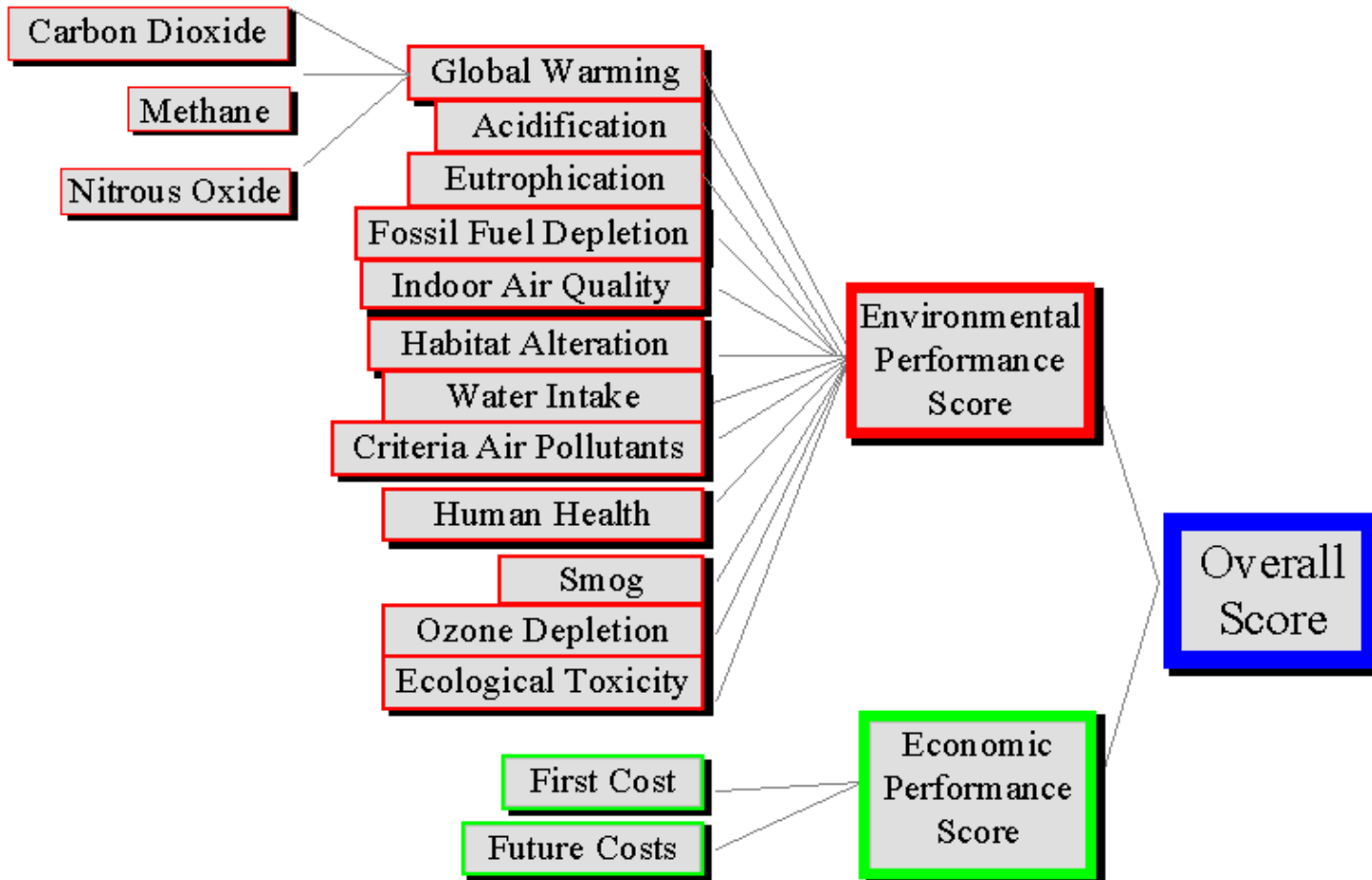




# BEES (Building for Environmental & Economic Sustainability)

- BEES measures the environmental performance of building products using life-cycle assessment (ISO 14000 standards)
- All stages of the life of a product are analyzed: raw material acquisition, manufacture, transportation, installation, use and recycling and waste management.
- Economic performance is measured using the ASTM standard life-cycle cost method, which covers costs of initial investment, replacement, operation, maintenance and repair and disposal.

Source: Green Building Services, Re-Think 2005, Green Materials for a Healthy and Productive Workspace



<http://www.bfrl.nist.gov/oea/software/bees/model.html>

# The Three Legged Stool

Beyond the environment



- Environmental Impacts (clean air, water, habitat)
- Economic Impacts (depletion of forests, teach a person to fish...)
- Social Impacts (fairly traded, no child labor practices)

# Pharos

Signaling the Future of Material Selection

[www.pharoslens.net](http://www.pharoslens.net)



“Enough carpet is land filled annually to pave a 2 lane freeway 6 times around the equator.”



**Finally.....**  
**Question EVERYTHING**

Ask suppliers the hard questions

Read labels carefully

Think critically

And pass it on.....

# Resources

- Northwest Product Stewardship Council  
[www.productstewardship.net](http://www.productstewardship.net)
- U.S. Environmental Protection Agency  
[www.epa.gov/opptintr/epp](http://www.epa.gov/opptintr/epp)
- Scientific Certification Systems (SCS)  
[www.scs1.com/index.html](http://www.scs1.com/index.html)
- Green Seal [www.greenseal.org](http://www.greenseal.org)
- Greenguard [www.greenguard.org/default.asp](http://www.greenguard.org/default.asp)
- Carpet & Rug Institute [www.carpet-rug.com](http://www.carpet-rug.com)
- Energy Star [www.energystar.gov](http://www.energystar.gov)
- Forest Stewardship Council [www.fscus.org](http://www.fscus.org)
- Healthy Building Network [www.healthybuilding.net](http://www.healthybuilding.net)
- Pharos [www.pharoslens.net](http://www.pharoslens.net)
- Responsible Purchasing Network  
[www.responsiblepurchasing.org](http://www.responsiblepurchasing.org)
- Building Green [www.buildinggreen.com](http://www.buildinggreen.com)