





The power of LCA

Life Cycle Assessment

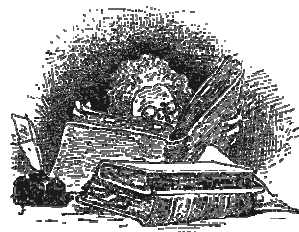
Joep Meijer

President of theRightenvironment



Seminar Goals

- To learn about life cycle assessment
- To see LCA-software
- To know how to find your way around
- To define what role LCA can play for you
- To get quizzed to the point of a headache





About LCA

ISO 14044

Lets have a look

- Functional unit
- Normalization / weighing
- 6.1 last paragraph



About LCA

Further reading

ISO 14040 series on Life Cycle Assessment

ISO 14020 series on Environmental labeling

<http://therightenvironment.net/LCA.htm>

UNEP: why take a life cycle approach?

<http://therightenvironment.net/UNEPLCAapproach.pdf>



10 out of 10

- **What best describes the environmental footprint of each daily activity?**
- Source: *Stuff the Secret Lives of Everyday Things*, by Ryan and Durning, copyright 199, Northwest Environment Watch, Seattle;
- Used with permission by Fivewinds / Interface / Armstrong / Rio Tinto Minerals at the USGBC GreenBuild Conference 2006.



10 out of 10

1. Coffee - 2 cups per day

- a) Drinking 2 cups of coffee per day requires 12 trees and 11 pounds of fertilizer annually
- b) Coffee farming destroys fragile tropical ecosystems
- c) Requirement for me to stay awake at work
- d) Answers: a & b

2. Newspaper

- a) 85% of newspaper is recycled after use
- b) Approx. 4 billion pounds is sent to US landfills each year
- c) Approx. 4 billion pounds is sent to worldwide landfills
- d) Newspaper is black & white and read all over



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Austin Energy

Emission patterns

Lets have a look

- Total 2006
 - Impact assessment
 - Normalization
 - 880.000 people: factor 7 just electricity
- Savings 1997-2006
- Compare PV-panels



About LCA tools

World leaders

SimaPro

<http://www.pre.nl/download/manuals/SimaPro7IntroductionToLCA.pdf>

Gabi



GaBi Software
PRODUCT SUSTAINABILITY



10 out of 10

3. Polyester in your T-shirt

- a) 10 times its weight in CO₂ is released during its production
- b) The polyester in your T-shirt was made from 1 pint of petroleum
- c) The polyester in your T-shirt released no CO₂ during production
- d) 100% polyester clothes should still be in fashion!

4. Shoes

- a) Leather tanning causes the largest impact during the life cycle
- b) 1 month of laborer's salary < sales price of the final shoe product
- c) Are never purchased by women
- d) None of the above



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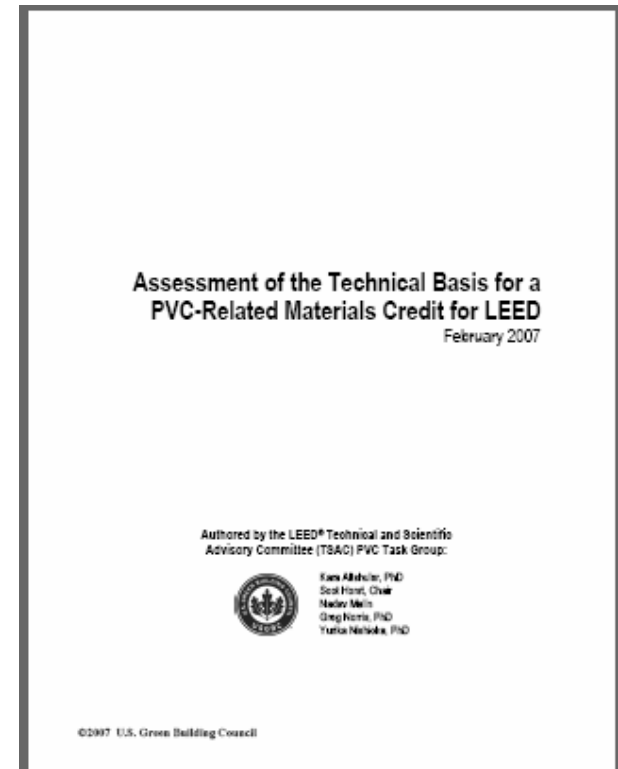
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USGBC PVC study

Conclusions:

- Risk next to life cycle
- Results depend on the comparison
- Table 1-2
- Comments





USGBC PVC study

Questions

- Data sources
- Comparisons according to [ISO 14044](#)
- Lets have a look
 - Calculations
 - Major contributions
 - Impact assessment
 - Example for siding wood (transport), vinyl (PVC source)



USGBC PVC study

Reassurance – EU study



About Europe

1980's Preference lists

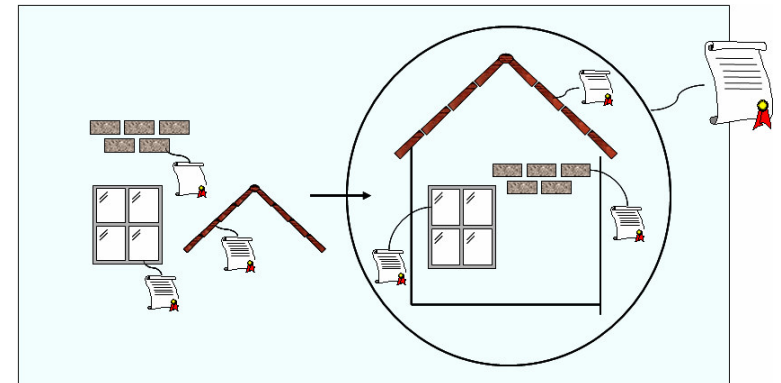
1990's Type III labeling over the last 10 years

2000 First LCA based Building model : EcoQuantum

2004 CEN Mandate 350 Sustainable Construction

2005 NL and French standards

2009 EU EPD standards for building products





10 out of 10

5. Car

- a) Each year Americans drive 10 times as many miles as the rest of the world's drivers combined
- b) Manufacturing accounts for 1/1000th of its life cycle energy demand
- c) Manufacturing accounts for one eighth of its life cycle energy demand
- d) Should be replaced by Hydrogen Fueled Hummers

6. Computer Chip

- a) Making a chip generates 4,500 times its weight in waste
- b) Computer chips are typically produced using renewable materials
- c) Computer chips are typically produced using at least 30% recycled materials
- d) A computer chip tastes much better than a potato chip



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Austin Climate Protection Plan

The plan

- Enhance incentives and requirements for Green Building program; develop “carbon neutral” certification.
- Develop online “carbon footprint calculator” for individuals and small businesses, and provide individually-tailored assessments for complex organizations and entities.





About CO₂ credits

- Free format – abundant, but what is it?
- Kyoto-proof
 - CDM
 - JI
- Trade - create a value
 - EU



10 out of 10

7. Computer

- a) 2/3 of US computers are left on every night and weekend
- b) Over 350 hazardous materials/chemicals went into the manufacturing
- c) Over 1000 hazardous materials/chemicals went into the manufacturing
- d) Self aware computers already control 75% of the U.S. government

8. Cheeseburger

- a) A cow metabolized 15 lb of corn into muscle for a 1/4 lb burger
- b) The growing of feed for beef cattle accounts for 10% of the world's pesticide use
- c) A cheeseburger can take 700 gallons of water to make
- d) I'm not sure that a cheeseburger even contains beef from a cow



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LCA for Architects

How to include life cycle considerations into your daily practice?

- What environmental topics
- What life cycle phases?
- At which stage of the design process?
- To arrive to...?
- Need for a tool...



USGBC PVC study

One comment

- <http://pvc.usgbc.org/comments.php> from the PPFA

PPFA believes it is in the best interest of the environment for USGBC to create Task Groups to review the lifecycle of all building materials, products and applications in a fair and balanced manner. Without like Task Groups for other materials, a fair and unbiased consensus process is undermined.



What do we need?

- Accepted database
- Materials and operations
- Building model with reference buildings
- For different design stages, focus on improvements
- Benchmark for performance based credits
- Relevance to existing programs, such as the Austin Green Building Program and the Climate Protection Plan



What do I need ?

- Accepted US/TX database
- Materials and operations
- Building model with US/Austin reference buildings
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- Relevance to existing programs, such as the Austin Green Building Program and the Climate Protection Plan

Architects that want to develop a building model and run a pilot with me



About existing models

Some LCA-based

None nationwide accepted and filled with primary data

Runners up are

- BREAM (UK)
- EcoQuantum (NL)

Necessity

- Local / Regional / State modifications



10 out of 10

9. Aluminum Can

- a) Recycling it takes only 5% of the original energy required to produce it from natural resources
- b) Bauxite mining disrupts more surface area than mining other ore
- c) Crushing an aluminum can against my forehead gets easier with each beer I drink
- d) All of the above

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- a) 12 pounds of stuff
- b) 120 pounds of stuff
- c) 240 pounds of stuff
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