


Design for Environment

Principles and examples

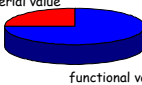


Dr. Andrius Plepys, IIIIEE
Acknowledgments: Dr. Märten Karlsson, IIIIEE/LU, Dr. Conrad Luttorpp, KTH


Eco-design -- A palette of buzzwords:


- Sustainable Product Development
- Eco-efficiency Design for Environment
- Ecological design
- Environmentally Responsible Design
- Green Design Environmental Design
- Socially Responsible Design Sustainable Product Design
- Environmentally Oriented Design
- Life-cycle Design Dematerialisation
- Ecologically Oriented Design Biodesign

Design and values




functional value





immaterial value



Some products are dominated by functionality other by decoration glamour etc.

© Dr. Conrad Luttorpp, KTH

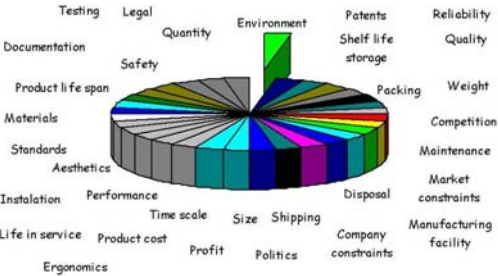


Environmental Products?



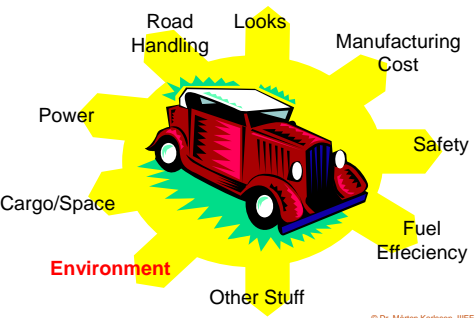
Environmentally improved products? (Eco-products)

Product design and the place of "eco"



© Dr. Conrad Luttorpp, KTH

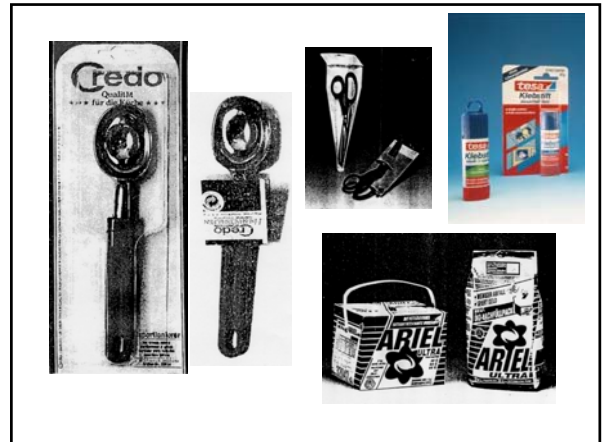
Example: eco-design trade-offs for a car



© Dr. Märten Karlsson, IIIIEE/LU

WHY ECO-DESIGN?

- Costs
- Market / sales
- Legislation, liability
- Company image
- ...
- ...



DFE Principles

- Cleaner Material
- Cleaner Processes
- Less Material
- Energy Saving (Use)
- Facilitate Recycling
- Long Life
- Functionality
- Efficient Distribution
- Facilitate Clean Consumption

© Dr. Mårten Karlsson, HEE/LU

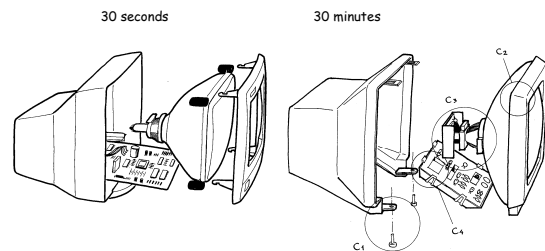
Eco-design examples

Did you know it is eco-design?



© Dr. Mårten Karlsson, HEE/LU

Design for disassembly



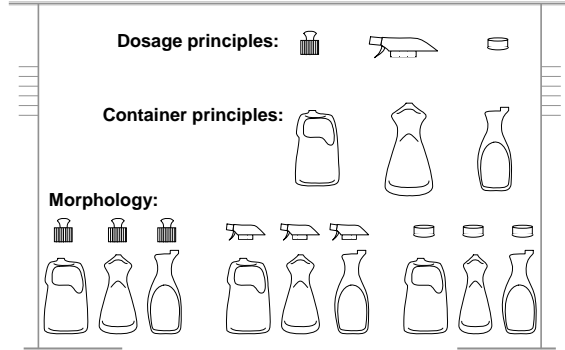
© Dr. Conrad Luttrupp, KTH

DfE:
mono-material design for recycling



© Dr. Mårten Karlsson, IIEE/LU

reduction of packaging variety



© Dr. Mårten Karlsson, IIEE/LU

DfE:
modular desing for reduced consumption



© Dr. Mårten Karlsson, IIEE/LU

DfE:
material recycling and innovation



© Dr. Andrius Plepys, IIEE/LU

DfE: solar energy
...but it depends
(LCA)



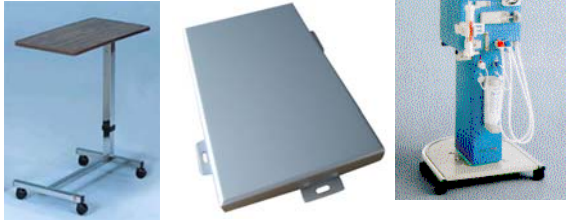
The non-ecological lunch on short-distance flights
Necessity, luxury or image branding?



© Dr. Conrad Luttrupp, KTH

"Cleaner" user phase

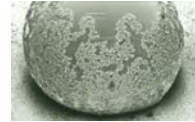
Surface coatings --
Shiny or not?



© Dr. Mårten Karlsson, IIEE/LLU

Coated surfaces for less maintenance

Nano-tech: means for eco-design



© Dr. Andrius Plepys, IIEE/LLU

Less
Material



© Dr. Mårten Karlsson, IIEE/LLU

Energy
Saving

Steam Iron with "Power Management"



© Dr. Mårten Karlsson, IIEE/LLU



Manually powered toys



Logical solutions



When we wash our hands the waste water is saved for the next flushing

© Dr. Conrad Luttrupp, KTH

DfE: system innovation



It can all be separated ☺
toilets from Ekologen (Sweden)



© Dr. Andrius Plepys, IIEE/LU

DfE examples
Dry toilets



DfE:
natural cotton



© Dr. Andrius Plepys, IIEE/LU

DfE:
recycling with product innovation



© Dr. Andrius Plepys, IIEE/LU

DfE:
dosage for rational consumption



© Dr. Måten Karlsson, IIEE/LU

DfE – recycled material



The use of renewable materials for consumer goods

e.g. telephone

© Dr. Mårten Karlsson, IIEE/LU

DfE - multifunctionality



Bi-functional packaging for motor oil

© Dr. Mårten Karlsson, IIEE/LU

Service solutions



Car pools when several families own one car together is more and more common

© Dr. Conrad Luttrupp, KTH