



Aalto University
School of Chemical
Technology

Tool for Product Designers – The Life Cycle Approach

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FIMECC - Breakthrough Materials - Light and efficient solutions program (LIGHT) - Environmental Footprint research theme with FIMECC, Rautaruukki Corporation, Metso Corporation and Aalto University.

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Life Cycle Connections Between Companies

- Collaboration between companies



- Information exchange
- In industry thinking about using LCA based tools in designers' work
- Other criterions than environmental impacts

Finding design alternatives

Analysing of design alternatives

LCA

Product Designer

Making internal decisions

Providing information to managerial decision making

Designer LCA Tool Concept Key Challenge

- Early part of design process
 - Big decisions -> most environmental impacts lock in
 - Low detail design information
- Final part of design process
 - Relatively low influence possibilities on environmental impacts
 - High detail design information
- Flow of information

Objective

- Aim of the study
 - Review of LCA based software tools in design engineer's perspective
 - Excluding simple key indicators drawn from LCA
- Materials and methods
 - Software's web-pages, whitepapers, demo software familiarization, manuals

Subjectively selected software

- SolidWorks Sustainability
- Sustainable Minds
- GaBi (and GaBi i-report)
- SimaPro (and SimaPro LCA Wizard, ECO-it)
- CES Selector with Eco Audit (and Autodesk Inventor Eco Materials Adviser)
- **Not** analysed e.g. Autodesk Ecotect Analysis, Autodesk Green Building Studio, CCaLC, e-DEA, EcoMundo, EIME, GaBi DfX, GaBi Build-it, openLCA, QUANTIS SUITE 2.0, TEAM and Umberto

Tool type	Software	Environmental impact categories
Screening in CAD-environment	SolidWorks Sustainability	Non-renewable lifecycle energy demand, water eutrophication, carbon footprint and air acidification
	Autodesk Inventor Eco Materials Adviser	Energy usage, carbon footprint
Screening outside CAD-environment	Sustainable Minds	Acidification, ecotoxicity, global warming, ozone depletion, water eutrophication and fossil fuel depletion
	CES Selector with Eco Audit	Energy usage, carbon footprint
	ECO-it	Single end-point indicator
Extensive to screening LCA software	GaBi SimaPro	Multiple choices
Extensive to screening LCA with parameterization to non-lca-expert by lca-expert	GaBi i-report creator & publisher and GaBi reader SimaPro LCA Wizard	Multiple choices

Conclusions and recommendations

- In screening estimated significant difference is generally 20 %
- Maybe need LCA expert for professional utilization
- Impression good, but the benefits?
- Input data availability and gathering is maybe the most affecting factor on time consumption

Thank You

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