

Life Cycle Sustainability Analysis (LCSA)

Framing questions to approaches

Jeroen Guinée & Reinout Heijungs & Gjalt Huppes
Institute of Environmental Science (CML)
Department of Industrial Ecology (IE)
Leiden University

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Universiteit Leiden
The Netherlands

LCA has developed fast

- 1960-1980:
 - merely energy (and waste) analysis
 - divergence of methods, no discussion platforms
- 1980-2000:
 - full-fledged life cycle inventory and impact assessment methods
 - life cycle costing
 - Convergence through ISO-14040 series of Standards

2000-2010: divergence of approaches again

- With respect to:
 - allocation, system boundaries, consequential LCA, use of economic models
 - impact assessment methods
 - spatial differentiation
 - economic and social indicators
 - temporal differentiation: dynamics etc.
 - input-output based modelling
 - etc.

Starting situation for CALCAS



- There is a growing divergence of LCA approaches
- There is a need (e.g., discussion on biofuel LCAs) for:
 - broadening (more impact types; broader questions)
 - deepening (more mechanisms; better mechanisms)
- There is thus no standard LCA
 - depends on the **QUESTION**
- BUT there is need for linking approaches to questions

EU FP6 CALCAS project: <http://www.calcasproject.net/>

Life-cycle Sustainability Analysis (LCSA)

- First adopted by Klöpffer & Renner (2008):
 - $LCSA = LCA + LCC + SLCA$
- Also adopted by CALCAS, though slightly adapted:
 - broadening and deepening
- LCSA \neq super-framework !!
- Framework for linking questions to approaches, identifying gaps and defining research needs

Life-Cycle Sustainability Analysis (LCSA)

Goal and scope definition

Modelling

→ broadening the scope of indicators →



EE-IOA / ...

multi-region IOA / general equilibrium models / ...

...



EE-IOA / ...

IOA / partial equilibrium models / ...

...



process-LCA / EIO-LCA / hybrid LCA

LCC

SLCA

Interpretation

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↑
broadening the object of analysis
↓

Key characteristics of LCSA framework

- Merging of inventory analysis and impact assessment
- Broadening of object of analysis
- Broadening of scope of indicators
- Deepening can be done in any of the modeling boxes

Key messages

- The future of LCA is LCSA
- LCSA is a framework: each practical study selects from this framework what is relevant for that study
 - significant deviation from mainstream current practice applying LCA as a method using one of the existing guides & handbooks
- Guidance in selecting proper approaches to questions
- All depends on the question
- Framing of questions very important !!