Evaluation of two simplified LCA methods

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VETENSKAP OCH KONST
KUNGL TEKNISKA HÖGSKOLAN

Evaluation of two simplified LCA methods

- The Environmentally Responsible Product Assessment matrix (ERPA method)

- MECO method

The environmentally responsible product assessment matrix (ERPA)

(Graedel, 1998)

Life cycle stage	Materials choice	Energy use	Solid residues	Liquid residues	Gaseous residues
Premanufacture					
Product Manufacture					
Product Delivery					
Product Use					
Refurbishment, Recycling, Disposal					

The MECO method

(Pommer et al., 2001)

	Material	Manufacture	Use	Disposal	Transport
1.Materials a) quantity					
b) resource					
2. Energy a) primary					
b) resource					
3. Chemicals					
4. Others					

Analysis

- Cars driven on petrol, ethanol, and electricity from coal and water-power

- Data from an earlier published quantitative LCA (Almemark et al 1999) and a database of fuel (Uppenberg et al 1999)

- Independent analyses, without knowledge of the results from the earlier published quantitative LCA

Criteria for the evaluation

- Results compared to the quantitative LCA.
- Qualitative information
- Toxicity
- Land use
- Production of consumables
- Weighting method
- Easiness
- Time
- Extent of arbitrariness
- The intention of the method
- Flexibility

Results compared to the quantitative LCA

- Decreased use of fossil energy and CO_2-emissions depends on production of electricity
  - MECO: YES ERPA: NO
- Increased use of other resources in the electric cars (for production on batteries)
  - MECO: YES ERPA: NO
- The electrical car generates more solid residues
  - MECO: NO ERPA: NO

Results from the evaluation

Criteria	MECO	ERPA	The quantitative LCA
Qualitative Information	Yes, under Other	No, not in the matrix.	No, not in this case
Toxicity	Yes	Yes	Yes, partly
Land use	Yes, qualitatively under Other	No	No, not in this case.
Production of Consumables	Yes	No	Yes
Weighting method	No	Possible to aggregate the product's environmental responsibility.	No, not in this case.

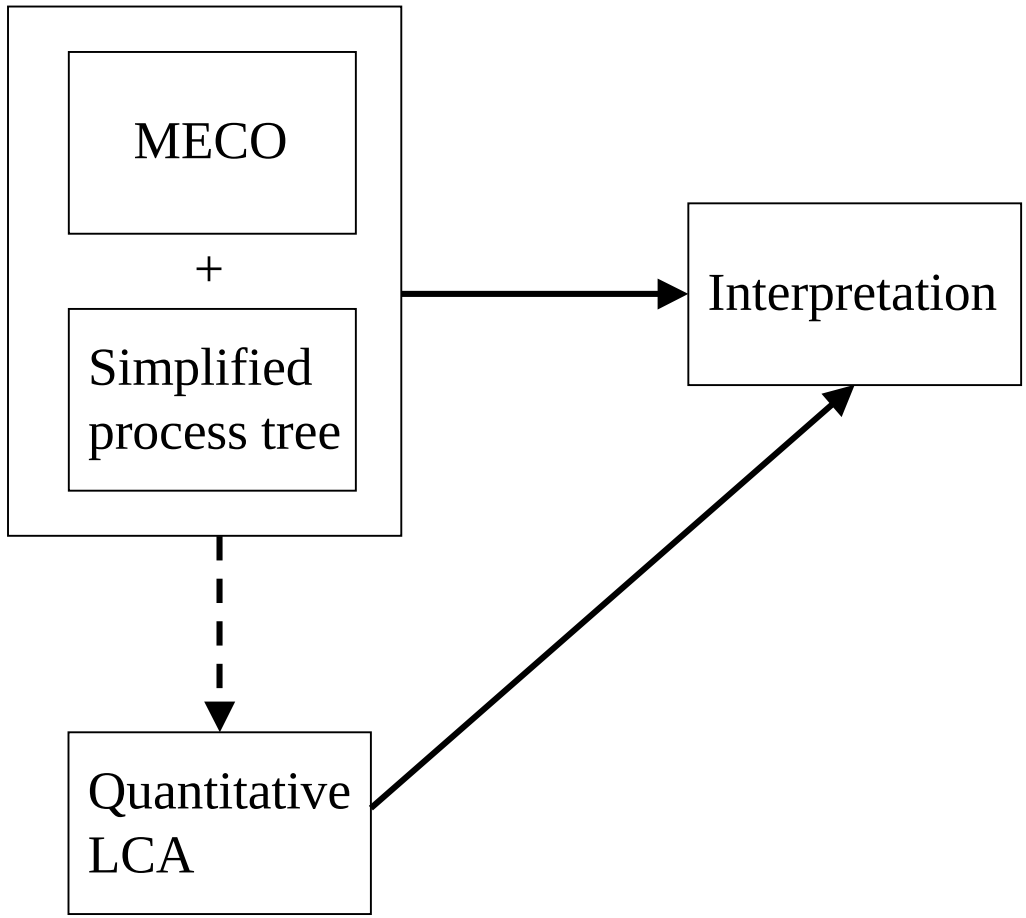
Results from the evaluation, cont.

Criteria	MECO	ERPA	The quantitative LCA
Easiness	Good. But, the lists limit the user.	It depends on the background information.	Requires LCA expertise
Time	In this case 1-2 weeks for all four cars.	In this case 1-2 weeks for all four cars.	Months
Extent of arbitrariness	Somewhat	Large	Somewhat
The intention of the method	Product development	Product development	Wide scope
Flexibility	Somewhat	Small	Somewhat

Usefulness of qualitative simplified LCA methods

- Identify critical aspects of products
- Complement a quantitative LCA study

Recommendation



Closure

- Hochschorner E. and Finnveden G. 2003. Evaluation of Two Simplified Life Cycle Assessment Methods. Int J LCA 8 (3) 119-128.

- www.fms.ecology.su.se