LCM Conference Zurich 2007 – Simplified Methods

'Slimline LCA' for use at the Swiss retailer Coop – LCA reduced to the max

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Starting Point – General

LCA should be applicable for all project sizes – small, medium & large!

Diagram:
- Simple
- Medium
- Complex
- Hyper-complex
- Low Cost / Time
- Medium
- High Cost / Time

Categories:
- Packaging
- Tissue
- 'Nano'
- mouse
- PC
- Trsp-systems

Complexity of a study
Starting Point – Focus on the simple LCAs

LCA should be applicable for all project sizes – small, medium & large!
The Goal

- **Coop**: a major retailer in Switzerland, uses – sometimes – LCA for its packaging and product selection.

- LCA for packaging is a 20 yr. old issue – LCA-wise often a straightforward analysis.

- But packaging keeps changing, and the environmental assessment should be easily available when necessary.

- Coop and E2 developed a slimline LCA process, using all standard elements available for inventory and impact assessment including interpretation.

- This allows LCA for standard comparisons of packaging and similar products at low cost, of less than € 2000 per analysis.

- Such slimline LCA processes reduce the cost barrier and allows LCA application in everyday business situations.
Procedure

1) Coop decides to order an LCA

2) Coop fills in form sheets
   - functional unit,
   - type and amount of material,
   - transport information,
   - waste treatment

3) E2 calculates the LCA,
   - using standardized inventory data (ecoinvent) and
     impact assessment methods (UBP'97 and EI'95 / EI'99)
   - and produces a short, standardized report

4) E2 submits the report, possibly followed by a short review by phone

5) Cost of 1500 € – 6000 €
Example: A typical result format


- Funct. Unit & Scope (1 – 2 p.)
- Result (1 p.)
- Interpretation (1 p.)
- Data annex (2 p.)
Example 1: Joghurt cover

Question: Which cover material?

<table>
<thead>
<tr>
<th>Alternatives (1000 pcs)</th>
<th>Materials (*)</th>
<th>Waste type</th>
</tr>
</thead>
<tbody>
<tr>
<td>PET type 1</td>
<td>0,38 kg</td>
<td>incineration (PE)</td>
</tr>
<tr>
<td>PET type 2</td>
<td>0,30 kg</td>
<td>incineration (PE)</td>
</tr>
<tr>
<td>Aluminium foil</td>
<td>0,43 kg</td>
<td>incineration (Alu)</td>
</tr>
</tbody>
</table>

(*) = data partially changed

Scope and Data used:
- PET foil supply chain \(\text{BUWAL 250}\)
- Aluminium foil supply chain \(\text{BUWAL 250}\)
- Waste treatment of PE / Alu \(\text{BUWAL 250}\)
Example 1: Joghurt cover

Result in UBP'97

Result in Eco-indicator pts

... from waste treatment

... from production of material

- PET alternatives are environmentally slightly superior
- Annual use = some mio pcs.; the difference would lead to an environmental impact equivalent to 43'000 car kms.
Example 2: Bath gel packaging

Question: Old or new packaging?

<table>
<thead>
<tr>
<th>material</th>
<th>Old</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>per 1000 items (*)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tube</td>
<td>29 kg PP</td>
<td>27 kg PP</td>
</tr>
<tr>
<td>Cover</td>
<td>5 kg PE</td>
<td>11 kg PP</td>
</tr>
<tr>
<td>Label</td>
<td>1,2 kg PE</td>
<td>0,7 kg PE</td>
</tr>
<tr>
<td>Transport</td>
<td>4 tkm</td>
<td>19 tkm</td>
</tr>
</tbody>
</table>

(*) = data partially changed

Scope and Data used:

- PE, PP
- Waste treatment material
- Transport

BUWAL 250 / ecoinvent
BUWAL 250 / Ökoinventare für Verkehr
(infrastructure, fuel precombustion, fuel use)
Example 2: Bath gel packaging

Result in UBP'97

Result in Eco-indicator pts

Ökobilanz Coop Naturaline-Verpackungen: ‘Bäder-Douche’-Verpackung (in UBP '97 pro 300 Liter Inhalt)

- Differences are minor
- Material change, weights and transport distances are almost offsetting each other.

Ökobilanz Coop Naturaline-Verpackungen: ‘Bäder-Douche’-Verpackung (in EI '95 pro 300 Liter Inhalt)

... from truck transports
... from waste treatment
... from production of tube / cover / label material
Example 3: PE Waste Bag Improvement

Question: Increase recycling content?

<table>
<thead>
<tr>
<th>Alternatives</th>
<th>Materials (*)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Virgin</td>
<td>Recycled</td>
</tr>
<tr>
<td>Existing bags</td>
<td>47.5 %</td>
<td>52.5 %</td>
</tr>
<tr>
<td>New bags</td>
<td>19 %</td>
<td>81 %</td>
</tr>
</tbody>
</table>

(*) = data partially changed

Scope overview (yellow = included)

1: Production virgin granulate PE
   - Gas field
   - New PE

2: Production Re-Granulate PE in-house
   - Trsp.
   - Shredd
   - Heating
   - Re-Granulate

3: Production Re-Granulate PE from recycler
   - Trsp.
   - Shredd
   - Heating
   - Re-Granulate

4: Herstellung Kehrichtsack (in-house)
   - Extruder
   - Rehricht-Sack
   - Mixing relation "New"/"Re"
   - Assumpt.: Processes 2 (in-house) and 3 (recycler) identical

Client → Waste treatm't
Example 3: Plastic Waste Bag – the result

LCA-Comparison per roll of 35-l-waste bags
(in Eco-points / UBP'97 )

- Sensitivity Analysis on recycled content
- New Bag is environmentally superior
- Today, new bag is available at Coop. LCA was one key argument to increase recycled content

from recycled granulate
from virgin granulate

here: 1 of 11 pp. (more complex than the other LCAs)
Experience

- Standardized Process: Form sheets, standard calculation, standard interface between commissioner and practitioner work well.

- 11 LCAs from 2002 – 2004. (After 2005, Carbotech produced LCAs based on their standardized 'BasicLCA' and 'AdvancedLCA' approaches.)

- Even a very simplified form needs explanation! One person at the company should be responsible for the LCA contact.

- To be applied, Slimline LCA must be integrated into internal processes

- Slimline LCA prepares environmental input for decision making.

- Absolute comparison of relevance helpful: The LCAs resulted in equivalences of 20'000 to a few mio car-km.

- If a study does not give clear results: look further (for improvements) or accept that environmental issues are not very relevant in this decision.
Conclusions

- Complexity of an LCA approach should fit the complexity of the question at stake.

- There is a market for 'slimline LCA', done with a budget of < 2'000 €.

- In addition to detailed LCA studies, 'Slimline LCA' offers an alternative approach to strengthen life cycle thinking in decision making.

- Therefore, 'Slimline LCA' has its place and can be used for wider application.