The Flexibility of LCAs: When Assumptions Determine Outcomes...

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Technical Innovation and Industry Best Practice
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Life Cycle Assessment (Analysis?) since 1985

- For Research
- For eco-labelling
- For certification schemes
- To inform policy documents
- To guide packaging legislation in Europe.
- To guide alternative-fuel policies in the US.
- Now in the 'Integrated Product Policy' of the EU
- Now used for carbon footprint standards for transportation fuels.

Is it really that good?



- Widely varying conclusions can be drawn from LCA comparisons of products
- Results depend on the subjective choices by the LCA practitioner .
- To the uninitiated, the results seem more certain and scientifically objective than they actually are.
- These facts are not being fully taken into account in the drafting of Performance Based Regulations (PBR's).
- Controversy over its use in the European Renewable Energy Directive (RED) relating to biofuels.
- NOW: The EC will try to calculate the environmental footprint of consumer products using LCA

...And then there'sWalmart's Sustainability Index

Every product in Walmart stores will have a label detailing attributes like carbon inputs, recycled content and end-of-life options.

The ***Sustainability Consortium***, hosted by the University of Arkansas and Arizona State University, has taken on the responsibility of providing the product sustainability data for Walmart.

SUSTAINABILITY CONSORTIUM

Sustainability Consortium (TSC) Mission

• To design and implement "credible, transparent and scaleable" science-based measurement and reporting systems for manufacturers, retailers and consumers.

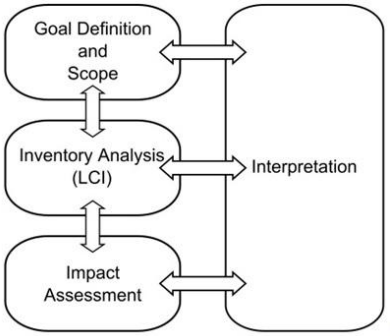
•It's Sustainability Measurement and Reporting System enables "rigorous product level *Life Cycle Assessments* to be done at a fraction of today's time and cost, and provides a platform for sustainability-related data sharing across the supply chain."

•To establish its systems as the worldwide standard for sustainability measurement.

Is LCA really that good?

Method standardised in ISO 14040 in 1997:
"*The compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle.*"
This was reviewed and extended to ISO 14044 (2006)

Life Cycle Assessment Framework



For environmental life cycle impact, an LCA calculates requirements, e.g energy, in:

- Raw material production.
- Manufacture.
- Distribution.
- The use and disposal of a product.
- All intervening transportation steps necessary or caused by its existence.

The limitations of LCAs are well known, even to ISO. The results of two LCAs on the same consumer product may differ according to the objectives (!) and…

1. The actual processes used
2. The quality of the data gathered
3. The impact categories chosen
4. The impact assessment methods used
5. The system boundaries chosen
6. The software used

Other Issues:

- LCAs are very complex and time consuming.
- Error margins range from +/- 10% for energy to “huge” for impacts such as eco- and human-toxicity.
- Supply chains and processes are dynamic and may alter in the time taken to complete an LCA.
- Comprehensive LCA’s are very costly. Independent Experts needed for credibility.

This makes the work carried out by organisations like EDANA and INDA particularly significant.

First EDANA LCA : June 1993, with 66 member companies participating.

Disposable diaper chosen (Many EDANA members through the value chain).

- A common approach to LCA methodology.
- The adoption of a software system for calculations.
- The establishment of a database relevant to each company.
- A baseline for each company to measure future product and process improvements.

The EDANA companies involved concluded:

- The ability to collect reliable data was crucial.
- This required a major contribution from the suppliers in respect of all of the raw materials involved.
- LCA allowed the development of advanced Supplier Standards for diapers.
- LCA allowed a tremendous degree of transparency within the supply chain.
- LCA allowed Consumer goods organisations to feel confident about their products.

Some other LCAs carried out by EDANA :

- Polyester nonwovens for roofing membranes.
- Diaper disposal routes.
- Superabsorbent polymer (SAP).
- Baby and industrial wipes.

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"In over 20 years of use by EDANA and its member companies, life cycle assessment methodology has become a tool used not only to effectively model the environmental impact of products and processes, but also to deliver significant improvements of environmental performance thanks to better product design and process efficiencies.

In a materials-based industry, LCA is a major asset and a way to regularly challenge the nature and quantity of the materials used and the design of the products and production processes. ***LCA data has become the main scientific building block for the substantiation of environmental claims and sustainability-related communication."***

INDA is working with Sustainable Minds (SM)

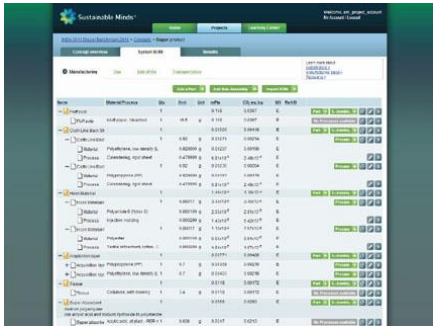
- SM LCA software is used in industry and education.
- 600 locations in 60 countries
- Particularly successful for building products.

IDEA13: SM demonstrated the software

- Simple
- Easy to interpret and share graphical results
- Allows non-experts to use LCA data in product development.

The SM nonwovens solution includes :

- a continually expanding dataset,
- example products,
- knowledge sharing and training
- showcasing products, their uses and applications.



However, we must remember:

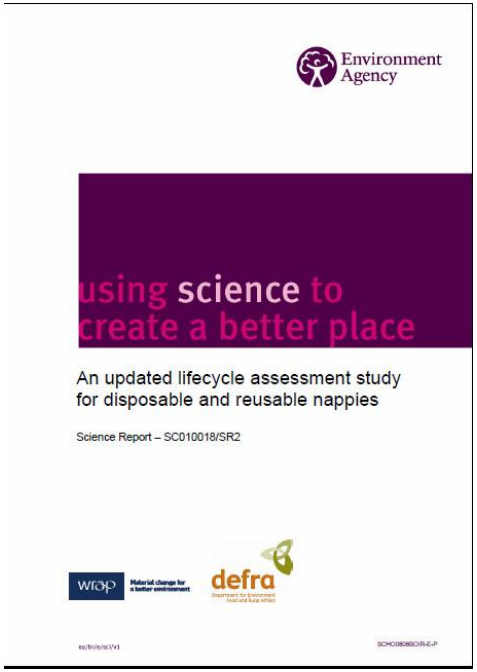
A 1990 diaper LCA for P&G found significant advantages for disposables over reusables in terms of energy consumption, water use, air pollution and water emissions.

A 1991 LCA by the National Association of Diaper Services (NADS) concluded that reusable diapers are superior from an environmental perspective, most notably because disposables produce higher volumes of solid waste and use more energy and raw materials.

Furthermore...

The 2005 LCA study by DEFRA found “no significant difference between any of the environmental impacts of the disposable, home-use reusable and commercial laundry systems that were assessed”.
The 2008 DEFRA study added that the results for reusable diapers strongly depend on assumptions about washing and drying.
The US Real Diaper Association (RDA) deemed DEFRA’s data and assumptions flawed:

- Too many variables for an accurate comparison
- UK attempts to control these variables fails
- “Compare two such different groups of products and the assumptions determine outcomes.”



And finally on diapers...

- Reusables washed cold and line-dried will have a very different impact to reusables boiled and tumble dried.
- P&G's promotion of the latest Ariel and Tide washing systems allows consumers to cold-wash their clothes (and presumably their reusable diapers) to reduce energy consumption and associated greenhouse gas emissions.
- Maybe a new LCA is now needed with the latest detergents!

- 48% of European consumers are confused by the stream of environmental information they receive.
- Demand for a pan-EU approach built on EU-wide science-based assessments and LCA.
- Multiple initiatives at Member State level confuse consumers and increase costs for industry.
- Companies have to choose between methods promoted by governments and private initiatives.
- Companies pay multiple costs for providing information
- Consumers are confused by too many labels and information that makes products difficult to compare.

So, the EU "Single Market for Green Products" Initiative has commenced. "Harmonisation"

EU Single Market for Green Products Initiative

- Proposes two methods for measuring environmental performance throughout the lifecycle:
  1. Product Environmental Footprint (PEF)
  2. Organisation Environmental Footprint (OEF).
- Has commenced a three-year testing period to develop product and sector-specific rules.
- *These PEF and OEF methods for testing products have drawn severe criticism from The EU Association for the Co-ordination of Consumer Representation in Standardisation (ANEC) specifically for their over-reliance on LCA.*

Points made by ANEC:

- *LCA's precision is limited by...*
  - *available resources,*
  - *data gaps and data quality constraints,*
  - *the use of generic data*
  - *the complex and changing logistics and supply chains.*
- *The error margin of an LCA will easily exceed 10% for energy and greenhouse gases.*
- *Therefore LCA is not well suited for comparisons of similar products and will typically not allow for product differentiation.*
- *Even if only primary data is used, the physical nature of these production processes makes it likely that the data is so similar that the identified differences are smaller than the error margin.*

Because of LCA's Limitations, ANEC argues:

- Labelling schemes will have to focus on material content or energy consumption in the use phase.
- LCA would not improve on current eco-labelling practices.
- LCA would require unnecessary efforts for data collection and compilation.
- LCA has clearly shown its limitations...
  - heated debates follow comparative studies
  - accusations of manipulation.

- The LCA-inspired EU Renewable Energy Directive (RED) requiring 20% of all energy used in the EU to come from 'renewable sources' including biomass, bioliquids and biogas by 2020 is effectively a subsidy scheme for biofuels.

The policy, ANEC asserts, is "built on sand".

- EU's RED is leading to the systematic allocation of biomass to energy to the disadvantage of material use.
- RED has triggered National support systems for biofuels which drive up biomass prices and agricultural leases.
- RED hurts the burgeoning bioplastics industry and its renewable polymers for fibres, nonwovens and plastics.

University of Michigan analyst John M. DeCicco
"While it may be discomfiting to some readers, the conclusion is that LCA is inappropriate for specifying regulations. Although LCA may be a useful research tool and can helpfully inform policy discussions, its literal application for policy specification is a mistake. Disputes over LCA regulatory outcomes are unproductive and ultimately unresolvable."
Institute for European Environmental Policy (IEEP).
"Biofuels are actually leading to an increase of anywhere between 80 and 160% more greenhouse gas emissions than are generated by meeting the same needs through fossil fuel use."

ANEC is not alone in arguing LCA is useless for consumer guidance:

- ORGALIME, the European Engineering Industries Association which represents 39 trade federations representing some 130,000 companies, agrees.
- So does ACEA, the European Automobile Manufacturers Association representing BMW, DAF, Daimler, Fiat, Ford, General Motors, Hyundai, Iveco, Jaguar Land Rover, Peugeot Citroen, Renault, Toyota, Volkswagen and Volvo.

ANEC

ORGALIME

ACEA

European Automobile Manufacturers Association

So, ANEC, ORGALIME and ACEA wrote to the President of the EC:

They state a shared view that environmental footprint methodology based on an LCA approach:

- Creates unnecessary risk of disruption to the internal market and room for unfair competition, while providing questionable benefits.
- Undermines the EC's wider Industrial Policy agenda, which requires policy makers to act in a coherent fashion.
- Undermines the EC's sustainability agenda, which requires reliable information on environmental burdens associated with products and organisations.
- Causes difficulties for enforcement and market surveillance authorities.

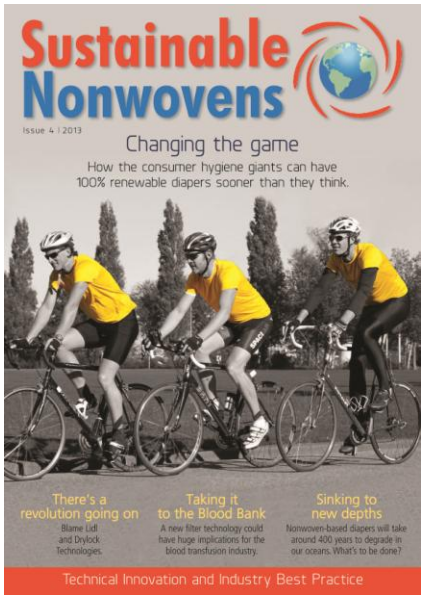
ANEC, ORGALIME and ACEA continue to consult with the EC and among the many recommendations are:

- Sound environmental assessments require a mix of tools, taking into account their strengths and weaknesses.
- Suitable production, consumption or disposal indicators can often be more robust and in many ways more meaningful or relevant than LCA data. In addition, they are cheaper, measurable and easier to verify.
- There is no point in collecting endless data to suit a ‘one-size-fits-all’ approach.

Summing Up:

- LCAs are limited by data constraints and can provide only a partial picture.
- LCAs are dependent on subjective choices made at the level of inputs into the model.
- LCAs are complex and costly, making them difficult for SMEs to undertake and to afford.
- LCAs do not allow consumers to make informed product comparisons and lead to more confusion.

LCA may be a good tool for developing improved products but may be too "flexible" as a basis for consumer comparisons and policy formulation!



Thank You!

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Any Questions???