

Life Cycle Assessment (LCA) as a tool for greenhouse gas quantification



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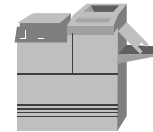
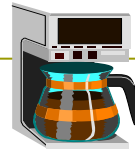


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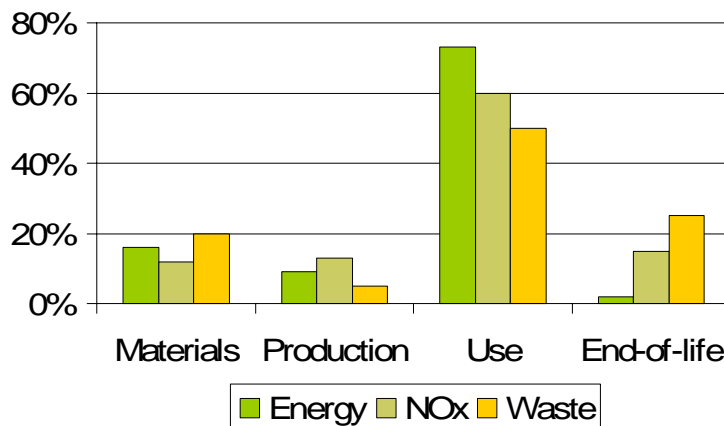
- ▣ Life Cycle Assessment (LCA) is ready and able to support GHG quantification of projects
 - GHG quantification of projects borrows the preexisting standards on LCA
 - Similarities - and differences - are notable.
 - LCA is not especially complex, time consuming or expensive
 - ▣ Myths concerning the complexity and costs of LCA will be addressed.
 - LCA has software tools, methodological approaches, and databases, developing for more than fifteen years

What is LCA?

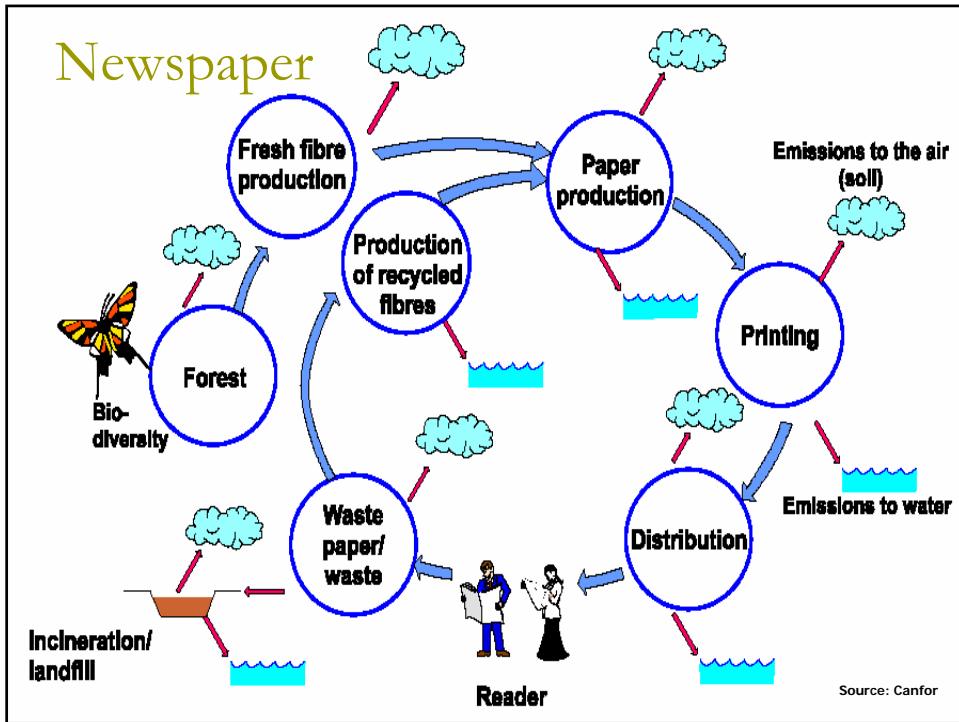
- ISO/DIS 14040 (2005):
“compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle”
- LCA is a tool to measure the environmental performance of product
 - about systems analysis and decision-making



Life-Cycle Results for Durable Product



*Typical
life cycle
stages*



December 8, 2005

GreenhouseGasMeasurement.com

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LCA versus GHG quantification of projects – SCOPE

ISO 14064-2 GHG Quant. Projects

- Project focus
 - Explicit comparison to baseline
 - Equivalent type and level of activity

- Public

ISO 14040 Life cycle assessment

- Product system
 - Implicit or explicit comparison
 - Functional unit – reference for comparability

- Public or private
 - Internal or external study



LCA versus GHG quantification of projects – INVENTORY

ISO 14064-2 GHG Quant. Projects

- Mass, energy
- Greenhouse gases
 - CO₂
 - CH₄
 - N₂O
 - HFC
 - HFE
 - PFC

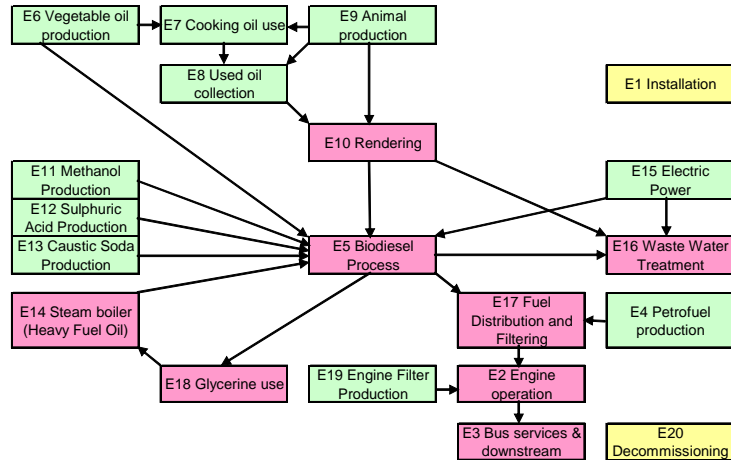
ISO 14040 Life cycle assessment

- “all” environmental inputs and outputs

ISO 14064-2

5.3 Identify project SSR's

(GHG sources, sinks, reservoirs)



LCA versus GHG quantification of projects – INDICATORS

ISO 14064-2

GHG Quant. Projects

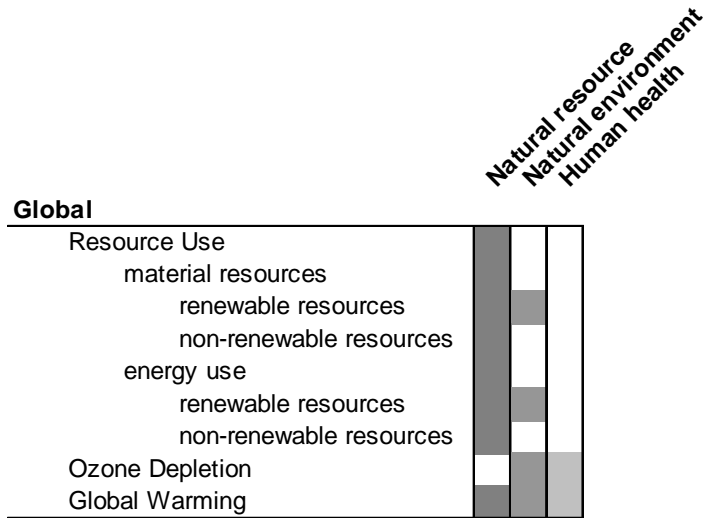
- Greenhouse gases
- >>> Global warming potential (CO₂e)
 - 1 – CO₂
 - 21 – CH₄
 - 310 – N₂O
 - 140-11700 – HFCs
 - 100-510 – HFEs
 - 6500-23900 – PFCs

ISO 14040

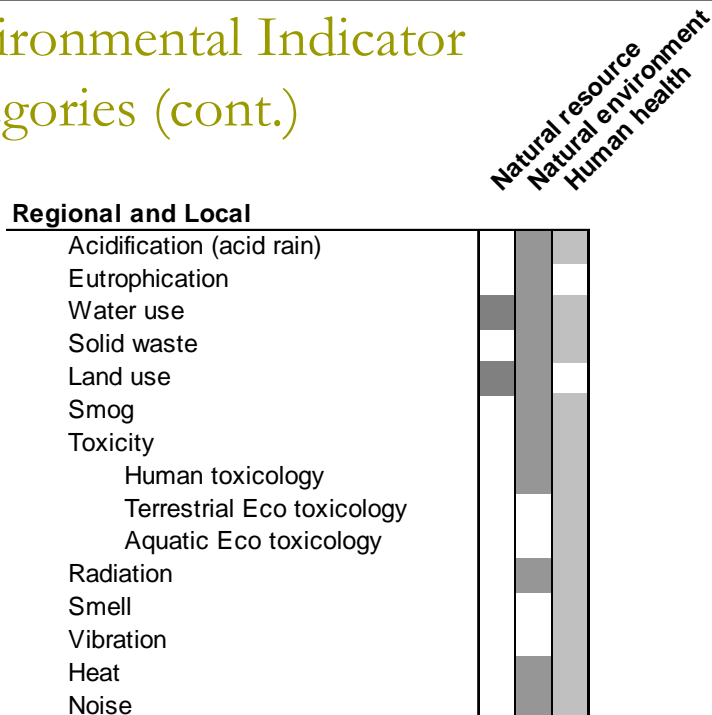
Life cycle assessment

- "all" environmental inputs and outputs
 - Academic
 - Diverse sets
 - Typically about 10

Environmental Indicator Categories



Environmental Indicator Categories (cont.)





LCA versus GHG quantification of projects – UNCERTAINTY

ISO 14064-2

GHG Quant. Projects

- Mass, energy
 - Greenhouse gases
 - CO₂
 - CH₄
 - N₂O
 - HFC
 - HFE
 - PFC
- Very manageable
 - Impacts indicators are accepted

ISO 14040

Life cycle assessment

- “all” environmental inputs and outputs
- Variable
- Data dependant
 - Science of impacts
- High uncertainty in some categories



LCA versus GHG quantification of projects – OTHER FEATURES

ISO 14064-2

GHG Quant. Projects

- Relative – GHG emission reductions and removal enhancements
 - Relevance criteria
 - Ownership (CRA)
- Data quality procedures
- Monitoring
- Validation/Verification

ISO 14040

Life cycle assessment

- Absolute results
- Data quality reporting
- Data collection, as available
- Critical review



Myths and perceptions

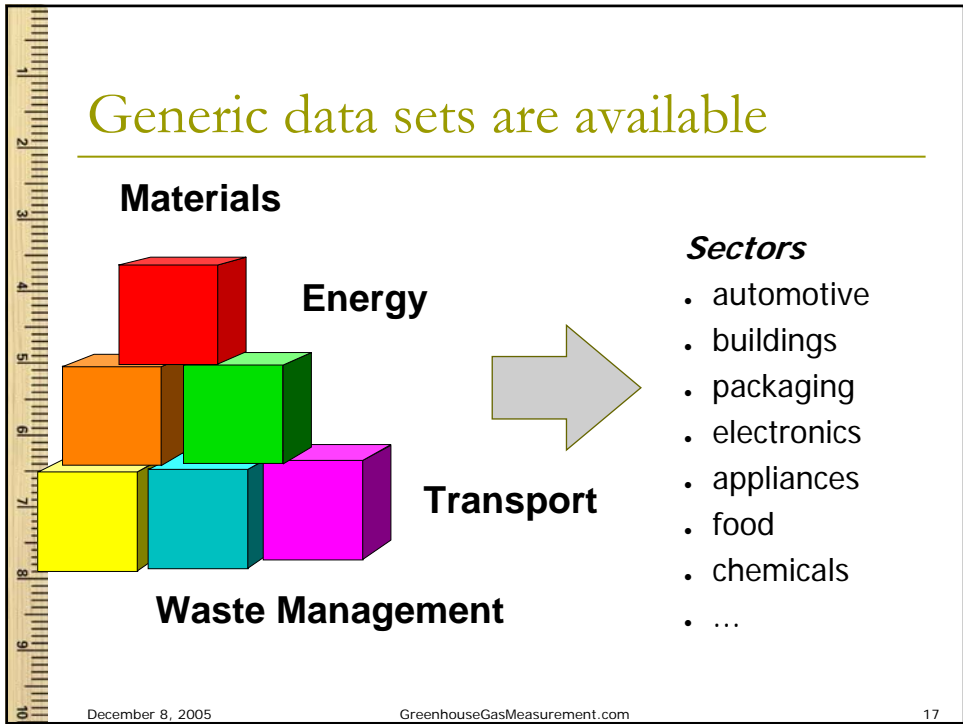
- LCA is not especially:
 - Complex – scope can be broad or detailed
 - Time consuming – data can be pre-existing
 - Expensive – studies can be done in a day
- Data collection is (often) complex, time consuming and therefore can be expensive
- A study needs to be focused on its aims:
 - Business decision-making
 - Product improvement
 - Process selection
 - Sales & marketing
 - Carbon credits (!)



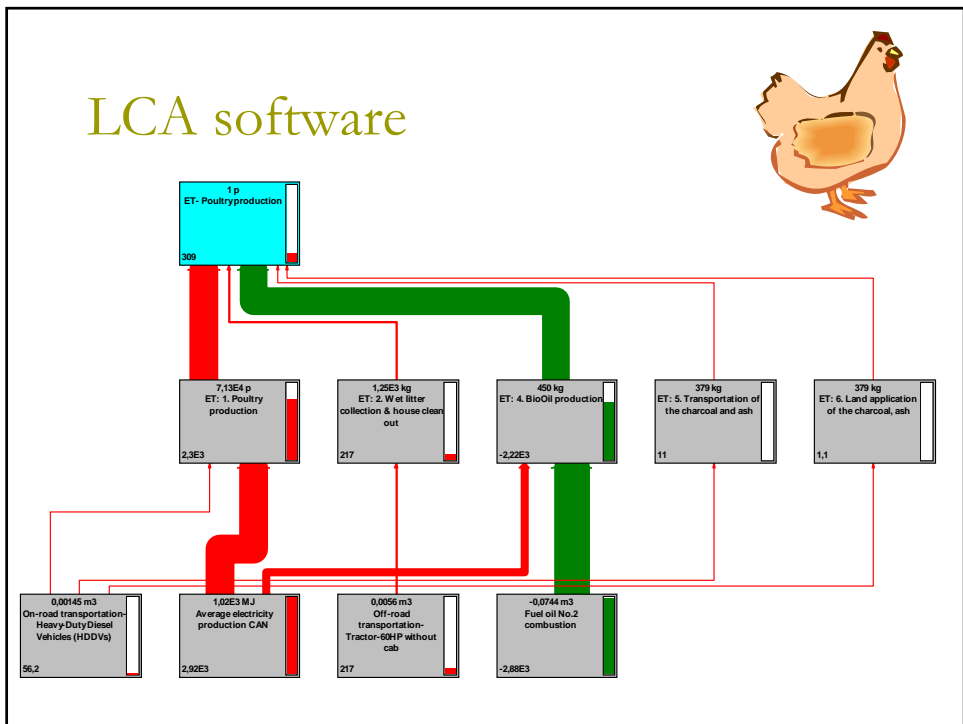
Tools and resources

- LCA has software tools
- Methodological approaches
 - Co-product allocation
 - Multiple products from same process
 - E.g. Grease from restaurants to biodiesel
 - “waste” stream – with economic value
 - Data gaps analysis
 - Databases, developing for more than fifteen years

Generic data sets are available



LCA software





Messages

- Life Cycle Assessment (LCA) is ready and able to support GHG quantification of projects
 - Comparison GHG and LCA
 - LCA is not especially complex, time consuming or expensive
 - Tools
 - Software
 - Methodological approaches
 - Databases

