PUBLIC RESEARCH CENTRE HENRI TUDOR

Formation pour l'aquisition de connaissances en Analyse du Cycle de Vie et Eco-conception

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PUBLIC RESEARCH CENTRE HENRI TUDOR

Programme de la formation

Introduction - Programme de formation

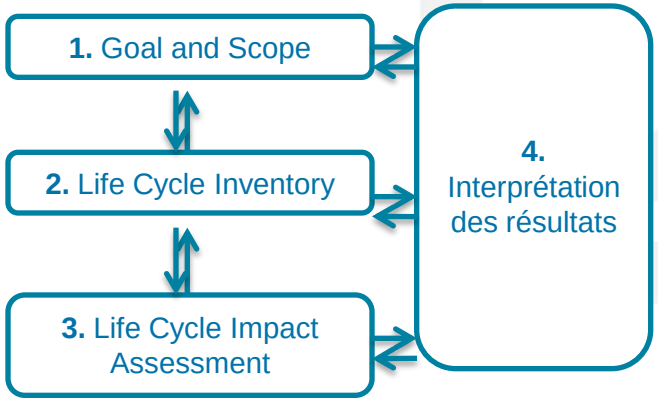
Lundi 22/10 matin : 9h30-12h30

1. L'Analyse du Cycle de Vie (ACV) – Introduction

- **Concept de base**: Cycle de vie et évaluation multi-critères
- **Contexte d'utilisation et finalités:** Eco-conception, Communication environnementale

2. Les principales étapes de l'ACV

- **Goal and scope:**
  - Contexte de l'étude et Unité Fonctionnelle
  - Frontières du système.
- **Life-Cycle Inventory (LCI):**
  - Données de premier plan et d'arrière plan
  - Système d'allocations
  - Bases de données de référence
- **Life-Cycle Impact Assessment (LCIA):**
  - Approche midpoint/endpoint
  - Méthodes de calcul les plus couramment utilisées
- **Interprétation des résultats**:
  - Analyse de contribution, de gravité
  - Analyse de sensibilité



Introduction - Programme de formation

Lundi 22/10 après-midi : 13h30-17h00

3. L'Econception

- **Approche, finalités et valeur ajoutée de l'éco-conception**
- **Mise en place par une entreprise : retour sur l'expérience du projet FEDER Eco-conception : « Passez à l'acte ! »**
  - Approche de travail: lessons learnt
  - Exemple de questionnaire pour la collecte des données en entreprise
  - Témoignage des entreprises

4. Formation à l'outil ECOPACT

- **Réalisation d'un pré-diagnostique éco-conception avec l'outil ECOPACT :**
  - Recherche des données à entrer dans l'outil: quantités et choix des procédés à considérer
  - Entrée des données pour l'ensemble du cycle de vie
  - Interprétation des deux niveaux de résultats obtenus: Indicateurs d'éco-conception et réultats ACV endpoint.

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2. Les principales étapes de l'ACV

3. L'Econception - Introduction

4. L'outil ECOPACT – Cas pratique

Objectifs

- **Comprendre le contexte de l'évaluation environnementale**
  - Contexte d'utilisation de l'ACV
  - Les grands principes de l'ACV
  - Les finalités et la valeur ajoutée

Evaluation environnementale

Quantifier

- Émissions et déchets générés
- Ressources Consommées
- Impacts environnementaux

etc.

Agir

- Réduire
- Améliorer
- Compenser

etc.

Entreprise

Production

Produit 1

Produit 2

Produit…

Produit n

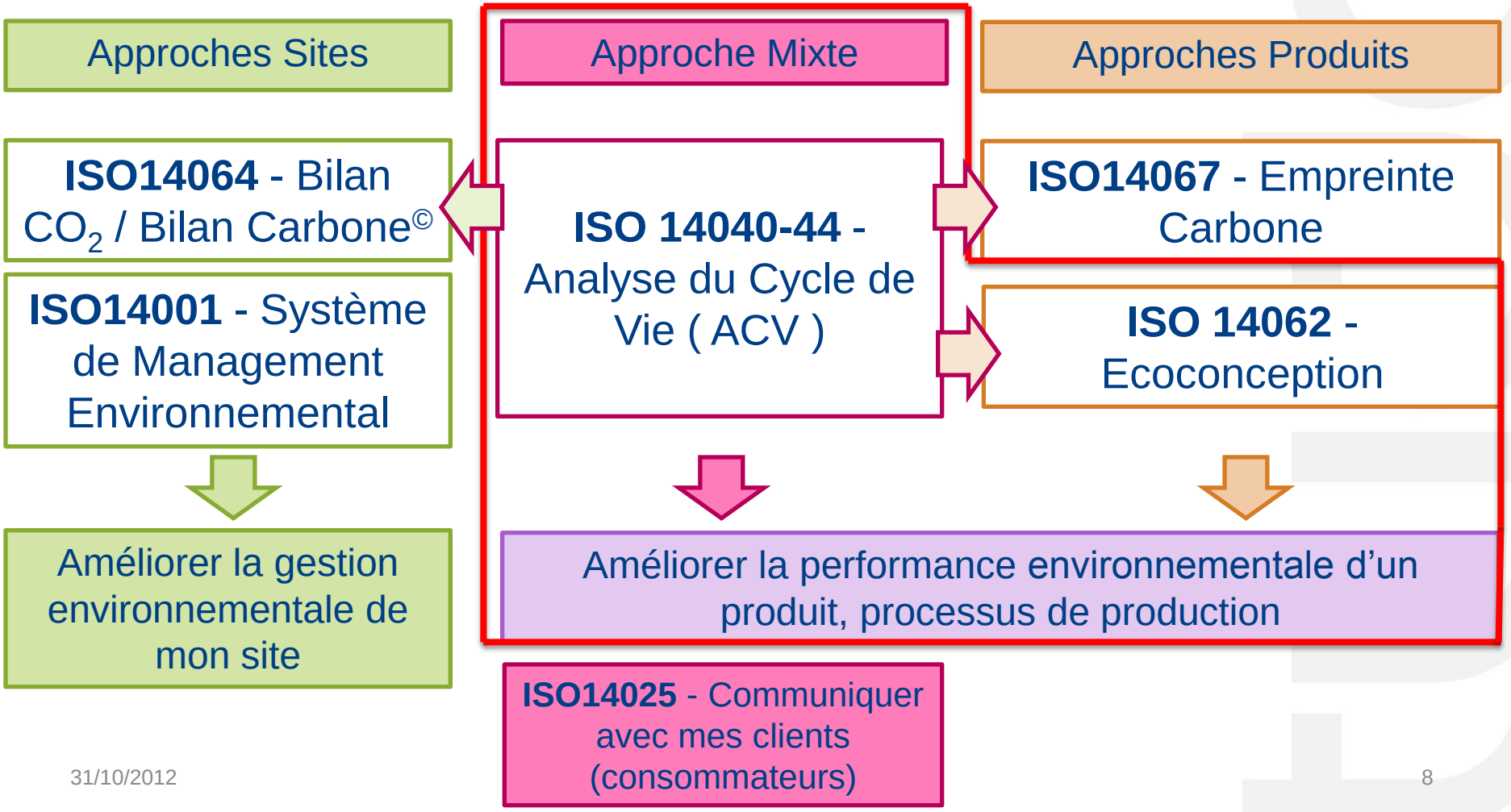
Activités

Administratives

Commerciales

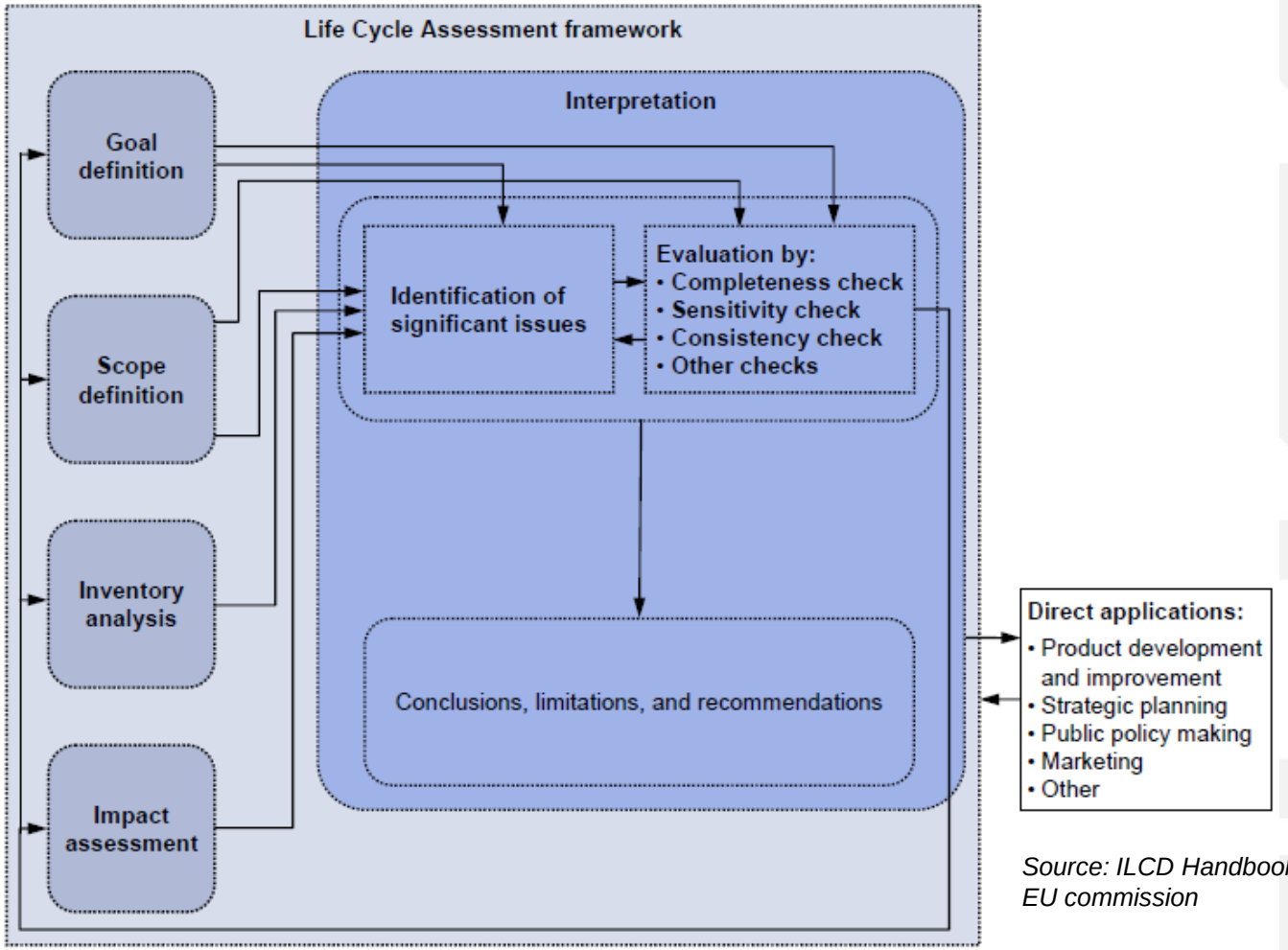
Approches pour l'évaluation environnementale

Les performances environnementales d'une entreprise (site) ou d'un produit peuvent être évaluées et/ou gérées par différents moyens :



ISO 14040-14044

Compilation and evaluation of the mass and energy inputs, outputs and the environmental impact of a system (product) *throughout its life cycle*

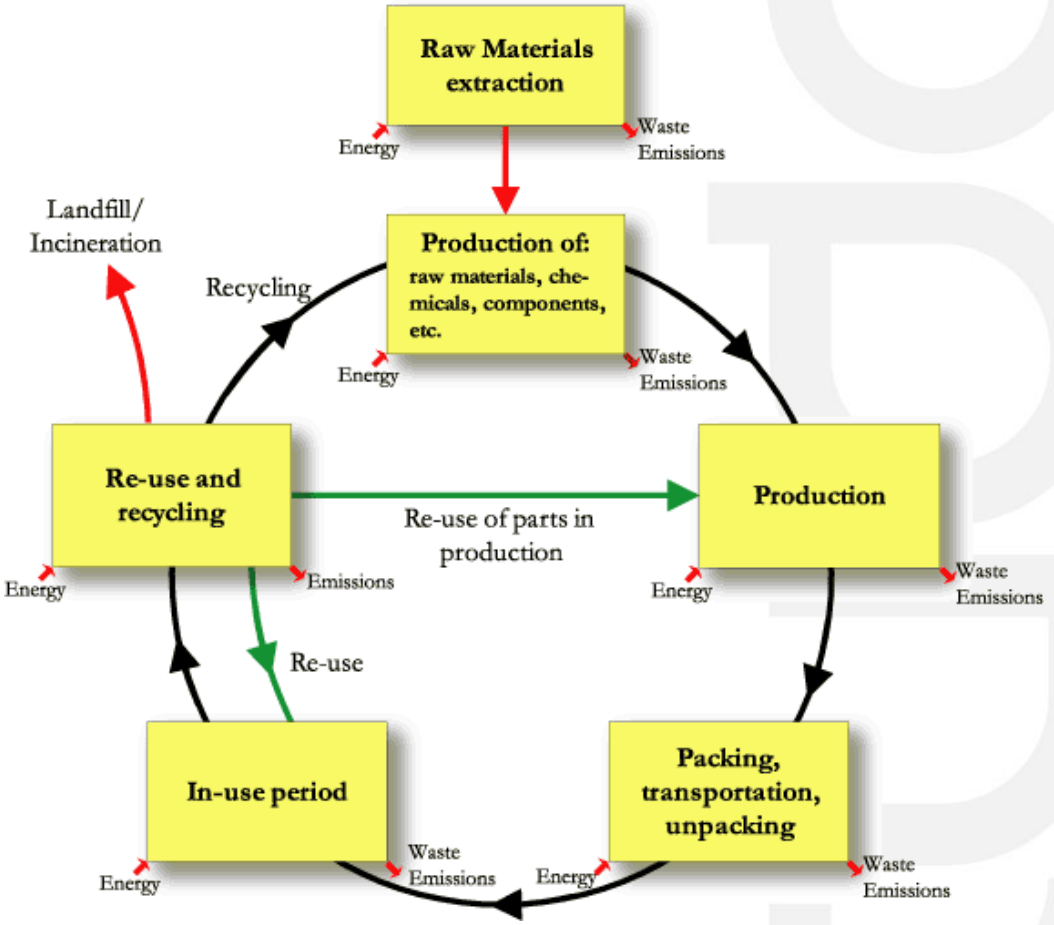


Source: ILCD Handbook, EU commission

Life Cycle Assessment (LCA)

- Compare systems and technologies fulfilling the same functions according to their environmental performances

- Decision-making support for ecodesign and eco-marketing



A little history of LCA...

End of 60ies: First applications

- Ian Boustead: energy accounting and balances applied to industrial processes
- Coca Cola study: glass bottle vs. aluminium can

1990-1992 : first code of practice (methodology) of LCA

- Institute for Environmental Science Leiden – CML: LCA Guide (methods)
- Society for Environmental Toxicology and Chemistry (SETAC, www.setac.org) conference in Vermont

1996: Increasing interest

- Scientific: International Journal of LCA
- Industrial: application in automotive, energy and chemical industry

1997-2002: full methodological foundation of LCIA

- Development of impact assessment methods
- ISO standards (14020-14040 series)

From 2002:

- Progressive deployment of LCA in all market and industrial sectors
- Development of databases (Ecoinvent)

From 2008

- Development of US LCI database
- Development of US LCIA method (TRACI)

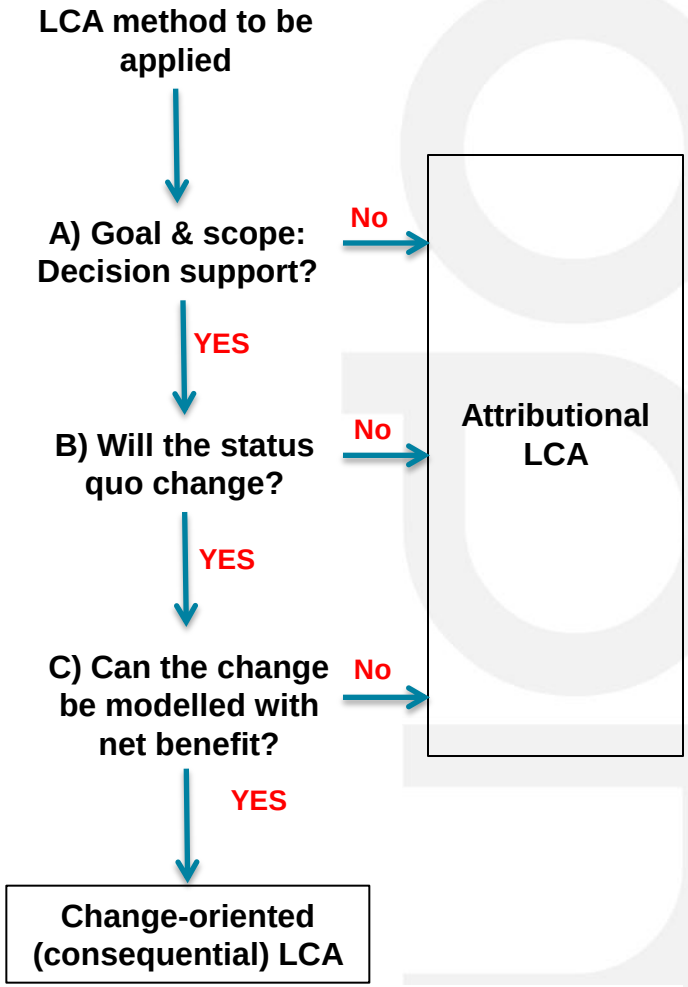
LCA in Europe

- **European Platform on Life Cycle Assessment**
  - http://lca.jrc.ec.europa.eu/EPLCA/
  - facilitate communication and exchanges on lifecycle data and launch a coordination initiative involving both ongoing data collection efforts and existing harmonisation initiatives.
- **UNEP Life Cycle Initiative**
  - http://lcinitiative.unep.fr
  - develop and disseminate practical tools for evaluating the opportunities, risks, and trade-offs associated with products and services over their entire life cycle to achieve sustainable development
- **FP7 (www.cordis.lu)**
  - Principal environmental assessment tool evocated for research projects on environmental technology & waste treatment
- **Policy initiatives based on a lifecycle approach**
  - IPP, Environment and Health Action Plan, ETAP, SCP action plan, Thematic Strategy on the Prevention and Recycling of wastes, Eco-design of EuP, Ecolabel.

LCA Types : beyond ISO standards
Classification of the decision context

Decision support?		Kind of process-changes in background system / other systems	
		None or small-scale	Large-scale
	Yes	Situation A "Micro-level decision support"	Situation B "Meso/macro-level decision support"
	No	Situation C "Accounting" (with C1: including interactions with other systems, C2: excluding interactions with other systems)	

Source: ILCD handbook - International Reference Life Cycle Data System, General guide for Life Cycle Assessment - Detailed guidance. http://lca.jrc.ec.europa.eu/EPLCA/overview.htm



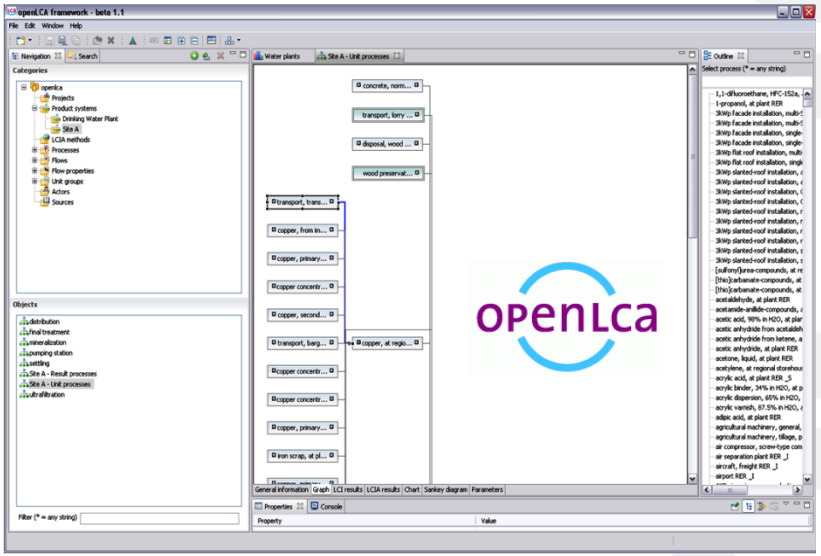
Source: S. Lundie, A. Ciroth, G. Huppes, 2007. UNEP-SETAC Life Cycle Initiative. Inventory methods in LCA: towards consistency and improvement. Final report.

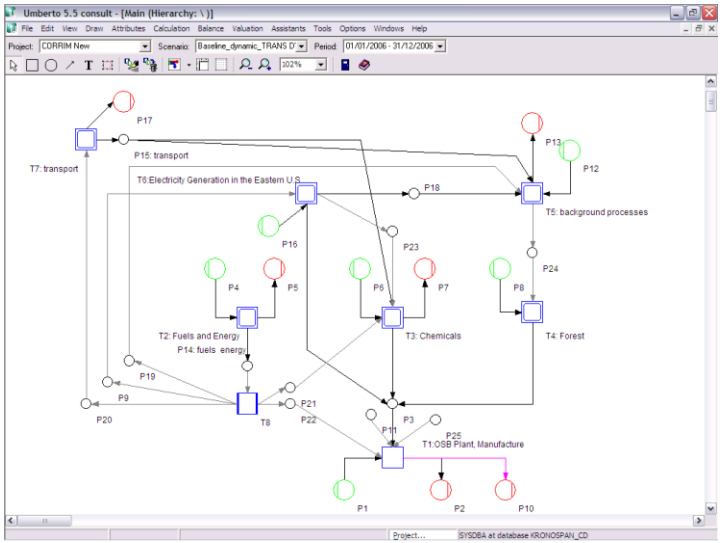
Outcomes from LCA

- **Comparison of processes and products delivering the same function(s) based on overall (lifecycle based) impact assessment**
  - Comparison of two floor coverings delivering the same function
- **Evaluation of the impact of innovative technologies on the overall environmental performances**
  - Improvement of production process
- **Identification of ecodesign opportunities/most significant environmental problems related over the lifecycle**
  - Which are the processes that contribute the most to greenhouse effect over the lifecycle?
- **Identification key issues to be further investigated**
  - Needs for further measurements and validation of data (quality, uncertainty)

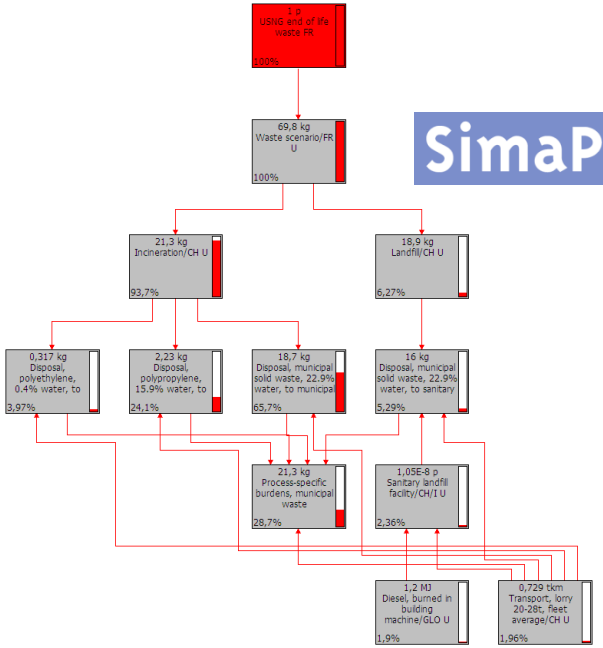
Tools for LCA

Tools: software (Umberto, Simapro, OpenLCA, ..) & databases (Ecoinvent, IVAM, Umberto, …)





umberto®
know the flow.



SimaPro 7

Tools for LCA

Calculation software: Umberto and Simapro

- Umberto: best fitted to SFA, no full uncertainty analysis for LCA, not user-friendly modelling, powerful scripting and exporting (external software) capabilities
- Simapro: only for LCA, full uncertainty and quality assessment, comply 100% with ISO requirements, difficult to export results
- OpenLCA (open source): CRTE will support the development of the tool (FNR project)

Database: Ecoinvent and ILCD

- Ecoinvent: fully transparent, ISO compliant, full uncertainty assessment, reliable, still focused on CH. Major development in 2011
- ILCD: Still under development

Valeur ajoutée de l'ACV

➢ Provide some new arguments

To industry:

- Information on environmental benefits, business opportunities, and improved interaction with business partners
- Scientific basis of assessment
- Ways to deal with threats and demonstrate competitive advantage

To other parties from industry's point of view:

- Opportunities for better decision making
- Better basis for decision-making, but can misunderstood (by competitors and other interests, including government) and inadequate
- Removes value judgement

Valeur ajoutée de l'ACV

➢ Ecodesign (or re-design) of the product

Considering environmental criteria in product design

Principles

1) Evaluate the environmental impacts
2) Point out the main contributing phases
3) State topics to improve process

Specificities:

- Functionality approach
- Multicriteria approach and priorities definition
- Life-Cycle approach

Added values:

- Anticipation of new regulations (European policies, e.g. IPP)
- Innovation : New ideas, new solutions; better internal and external communication
- Environmental communication: Environmental Product Declarations, Ecolabels, …
- Better environmental image: "Think different" →Better identification by the clients

Valeur ajoutée de l'ACV

➢ Environmental communication (ISO14063)

- Increase transparency
- Provide information
- Provide additional competitive advantages on the market

Different tools based on LCA results are available for environmental communication:

- Eco Labels (Type I ISO14024)
- Environmental Product Declarations (Type I ISO14025)
- Carbon Footprint
- Carbon Offsetting
- Ecological Footprint
- Environmental / Sustainability Report

The tool to be adopted depends on the targeted public:

- Business to business
- Business to consumer

Labels environnementaux et Déclarations environnementales

ISO 14020-25

- **Type I:** third party certified eco-labels; this implies third-party certification of the product on a voluntary basis. Awarded to products and services that have minimal environmental impact (covering one or two environmental criteria)

- **Type II:** Self declarations

- **Type III:** Environmental Product Declarations based on LCA. Comprehensive quantitative information on environmental impacts

Forces et faiblesses

		Certified eco-labels Type I	Self-declarations Type II	EPD Type III
Characteristics	The company needs to perform a LCI / LCA	NO	NO	Yes
	Certification by 3rd party	Required	Not required but enhances credibility	Not required but enhances credibility
	The eco-label communicates…	Better environmental performance with same quality	Improvement of one environmental aspect	Plain LCA data for comparison with other EPD
Useful for…	Communication with final consumer			
	Business-to-business			
	Green procurement			

Source: modified from Rubik & Frankl, 2005

 **good**

 **possibly useful**

 **poor**

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Merci pour votre attention!