

Special LCA forum, December 5, 2003
ETH Lausanne / Plenary session

Project ecoinvent 2000 Objectives and Overview

Konrad Hungerbühler

Swiss Federal Institute of Technology (ETHZ)
Institute for Chemical and Bioengineering
hungerbuehler@tech.chem.ethz.ch

slide 1

Presentation: Konrad Hungerbühler



Swiss Centre
For Life Cycle
Inventories

A joint initiative of the
ETH domain and Swiss
Federal Offices



Problem setting

- Broad LCA expertise in Switzerland
- ETH domain: Since the beginning of the 90ties one of the leading LCI centres
- Various LCA-Databases in Switzerland different methodological approaches
 - ➔ different results / incompatible datasets!
- Resource intensive data maintenance and update
- Demand for consistent LCA data of basic commodities for, e.g., Integrated Product Policy (IPP)

slide 2

Presentation: Konrad Hungerbühler



Swiss Centre
For Life Cycle
Inventories

A joint initiative of the
ETH domain and Swiss
Federal Offices



Objectives

- Joint Swiss LCA database
- Consistent, harmonised and quality controlled LCA data
- LCA data access via the Internet

Leads to:

- Top position as LCA data provider
- Increased credibility and acceptance of LCA
- Establish LCA as a tool to support
 - Integrated Product Policy (IPP)
 - Process and product development and environmental management in industry
 - Methodology oriented research and development



Swiss Centre
For Life Cycle
Inventories

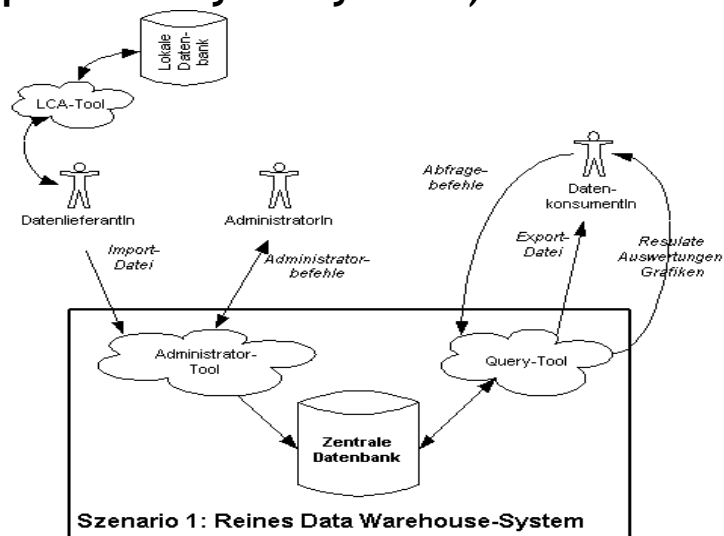
A joint initiative of the
ETH domain and Swiss
Federal Offices



slide 3

Presentation: Konrad Hungerbühler

Database architecture (preliminary study 1998)



Swiss Centre
For Life Cycle
Inventories

A joint initiative of the
ETH domain and Swiss
Federal Offices



slide 4

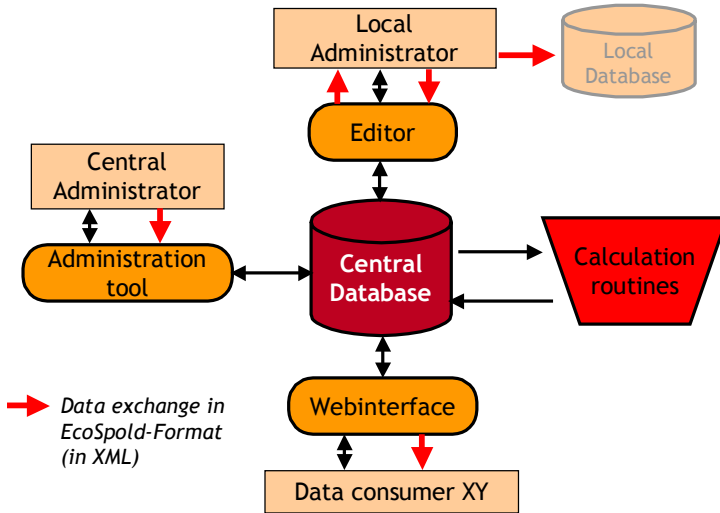
Presentation: Konrad Hungerbühler

ecoinvent database system (release version 2003)



Swiss Centre
For Life Cycle
Inventories

A joint initiative of the
ETH domain and Swiss
Federal Offices



slide 5

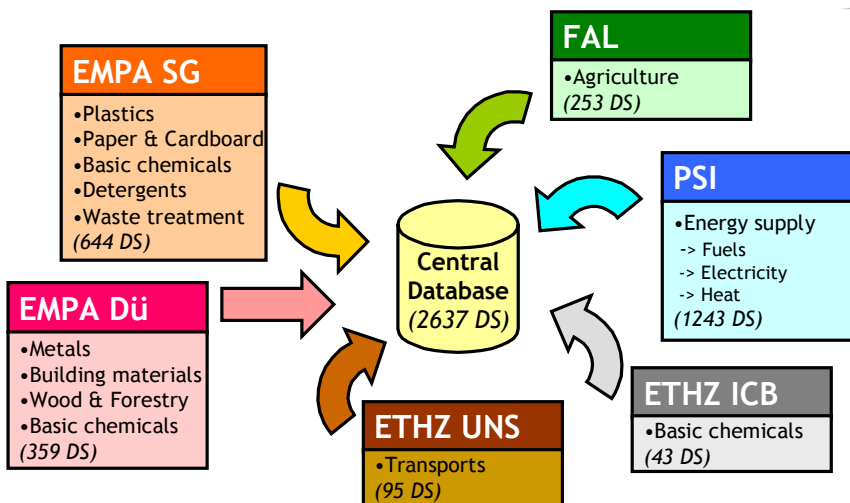
Presentation: Konrad Hungerbühler

content: economic sectors covered (DS = datasets)



Swiss Centre
For Life Cycle
Inventories

A joint initiative of the
ETH domain and Swiss
Federal Offices

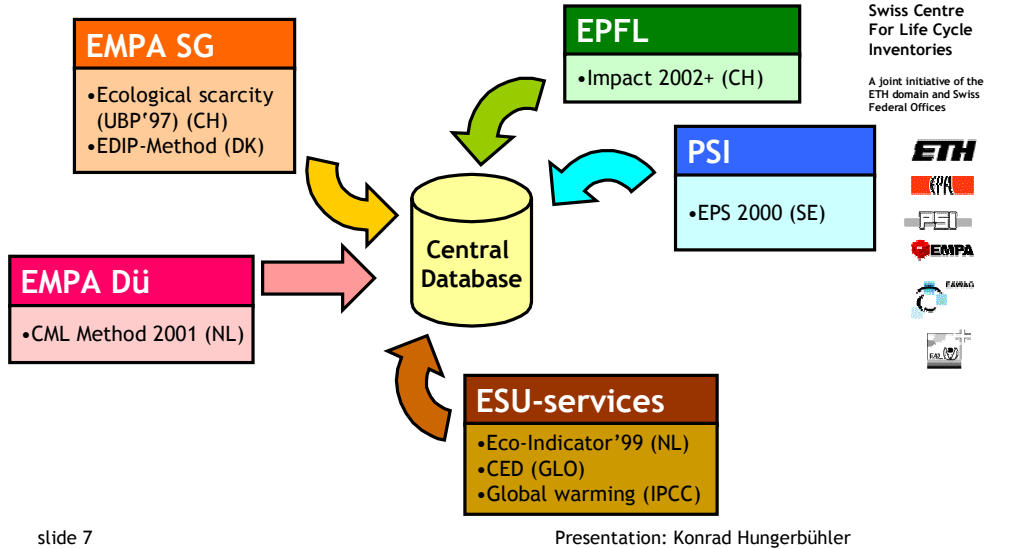


slide 6

Presentation: Konrad Hungerbühler

Content: impact assessment methods

Attribution of LCI data to method specific factors



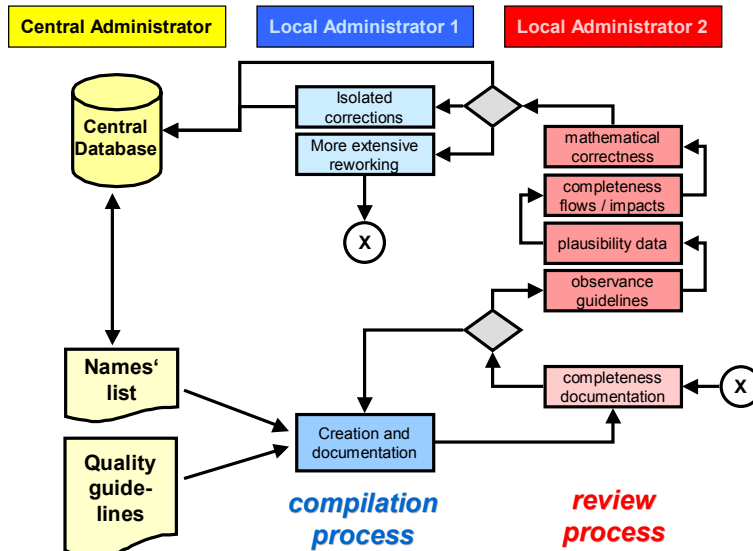
Complementarity of ecoinvent and LCA tools

| | ecoinvent database | SimaPro 5.X | Umberto 4.2 |
|--|--------------------|-------------|-------------|
| Release, maintenance, and update of large background databases | +++ | + | + |
| Online access to database | +++ | - | - |
| Uncertainty assessment | +++ | +++ | - |
| Daily LCA case studies work | - | +++ | ++ |
| Company's material and energy accounting | - | + | +++ |
| Parametrised modelling | - | - | +++ |
| Process trees, contribution analysis | - | +++ | +++ |

slide 8

Presentation: Konrad Hungerbühler

Data compilation and quality assurance



slide 9

Presentation: Konrad Hungerbühler



Swiss Centre
For Life Cycle
Inventories

A joint initiative of the
ETH domain and Swiss
Federal Offices



Main characteristics of ecoinvent

- Large number of datasets
- High Data quality, independence of data collectors
- High Transparency and by that flexibility for applications (e.g. raw data and cumulative results, multioutput processes)
- Extensive documentation
- Detailed recording of inventory data (e.g. distinction of ground- and surface water, long term and short term emissions)

➔ Possibilities for future research work

slide 10

Presentation: Konrad Hungerbühler



Swiss Centre
For Life Cycle
Inventories

A joint initiative of the
ETH domain and Swiss
Federal Offices



Future research projects - ecoinvent...

- Basis for consistent and broad application of LCA in technology, process and product assessment
- Allows inventory analyses on a higher degree of detail and analyses of compartments not considered so far, e.g. ground water
- Challenges LCIA research on new issues (e.g. new compartments, human exposition and assessment of long term emissions)
- Includes basic data for uncertainty assessments
- Is a reliable basis for science based policy making (e.g. IPP, policy instruments such as CO₂-tax etc.)



Swiss Centre
For Life Cycle
Inventories

A joint initiative of the
ETH domain and Swiss
Federal Offices



slide 11

Presentation: Konrad Hungerbühler

Database access

- www.ecoinvent.ch
- Registration required
 - Guest
 - Member
- Access rights **Guest**:
 - Meta information of all processes and impact assessment methods
- Access rights **Member**:
 - access rights Guest +
 - Inventory raw data and -results of all processes
 - Download of all data sets
 - extensive final reports (on CD-ROM, 1st quarter 2004)



Swiss Centre
For Life Cycle
Inventories

A joint initiative of the
ETH domain and Swiss
Federal Offices



slide 12

Presentation: Konrad Hungerbühler

ecoinvent 2000: Costs and Perspectives



Swiss Centre
For Life Cycle
Inventories

A joint initiative of the
ETH domain and Swiss
Federal Offices



- Project costs (Cash): 1.15 Mio EUR
(shared by: 1/3 ETH Domain, 2/3 Federal Offices)
plus 1.2 Mio EUR own contributions
- Product costs: costs for access to ecoinvent Data v1.0:
 - Guests free of charge
 - Members EUR 1'200.- (excl. VAT)
- Periodical update planned (every 2-3 years)
- Extension with additional sectors planned, e.g.:
Mechanical engineering, electronics, building services, wastes / sludges at metal extraction

slide 13

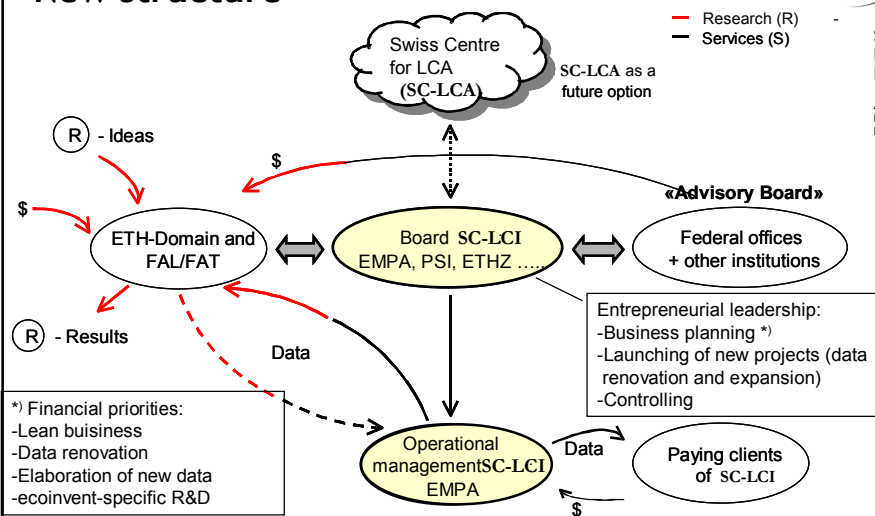
Presentation: Konrad Hungerbühler

Swiss Centre for Life Cycle Inventories (SC-LCI): New structure



Swiss Centre
For Life Cycle
Inventories

A joint initiative of the
ETH domain and Swiss
Federal Offices



slide 14

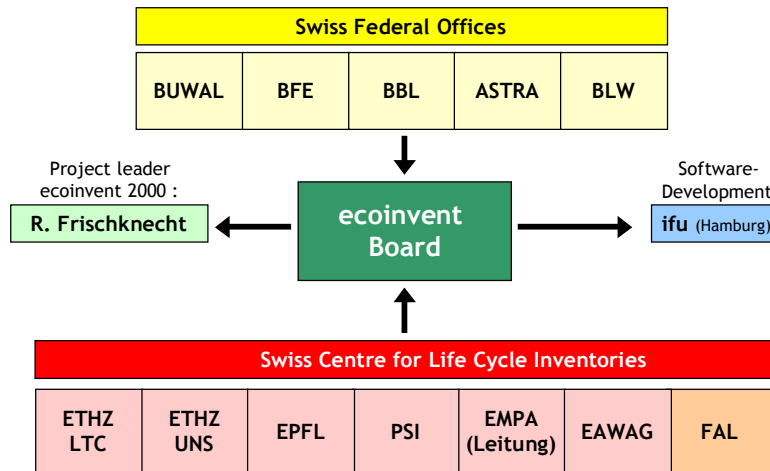
Presentation: Konrad Hungerbühler

Project partners



Swiss Centre For Life Cycle Inventories

A joint initiative of the ETH domain and Swiss Federal Offices



slide 15

Presentation: Konrad Hungerbühler

Acknowledgement



Swiss Centre For Life Cycle Inventories

A joint initiative of the ETH domain and Swiss Federal Offices



- ecoinvent Board - in particular X. Edlmann and P. Gilgen (EMPA), S. Hirschberg (PSI), C. Rentsch (BUWAL), M. Zimmermann (BfE)
- R. Frischknecht, ESU-services
- J. Hedemann, ifu Hamburg GmbH
- R. Kilcher, scope information systems (preliminary study)
- Staff at the institutes:

Sébastien Kilcher
 Mirjam Zimmermann
 Nicolas Zimmermann
 Alexander Zimmermann
 Oliver Rentsch
 Stefan Hager

slide 16

Presentation: Konrad Hungerbühler