



Swiss Centre for Life Cycle Inventories

A joint initiative of the  
ETH domain and Swiss  
Federal Offices

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**EPFL**

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# ecoinvent a common platform for your LCI datasets

R. Hirschler

ecoinvent Centre, St. Gallen (Switzerland)

# ecoinvent data v3

**LCIA Results**

**System Expansion  
approach**

**Allocation  
approach**

**Cumulative  
LCI Data**

**Linked single-  
product datasets**

**Unlinked multi-  
output datasets**

Multiplication  
with LCIA factors

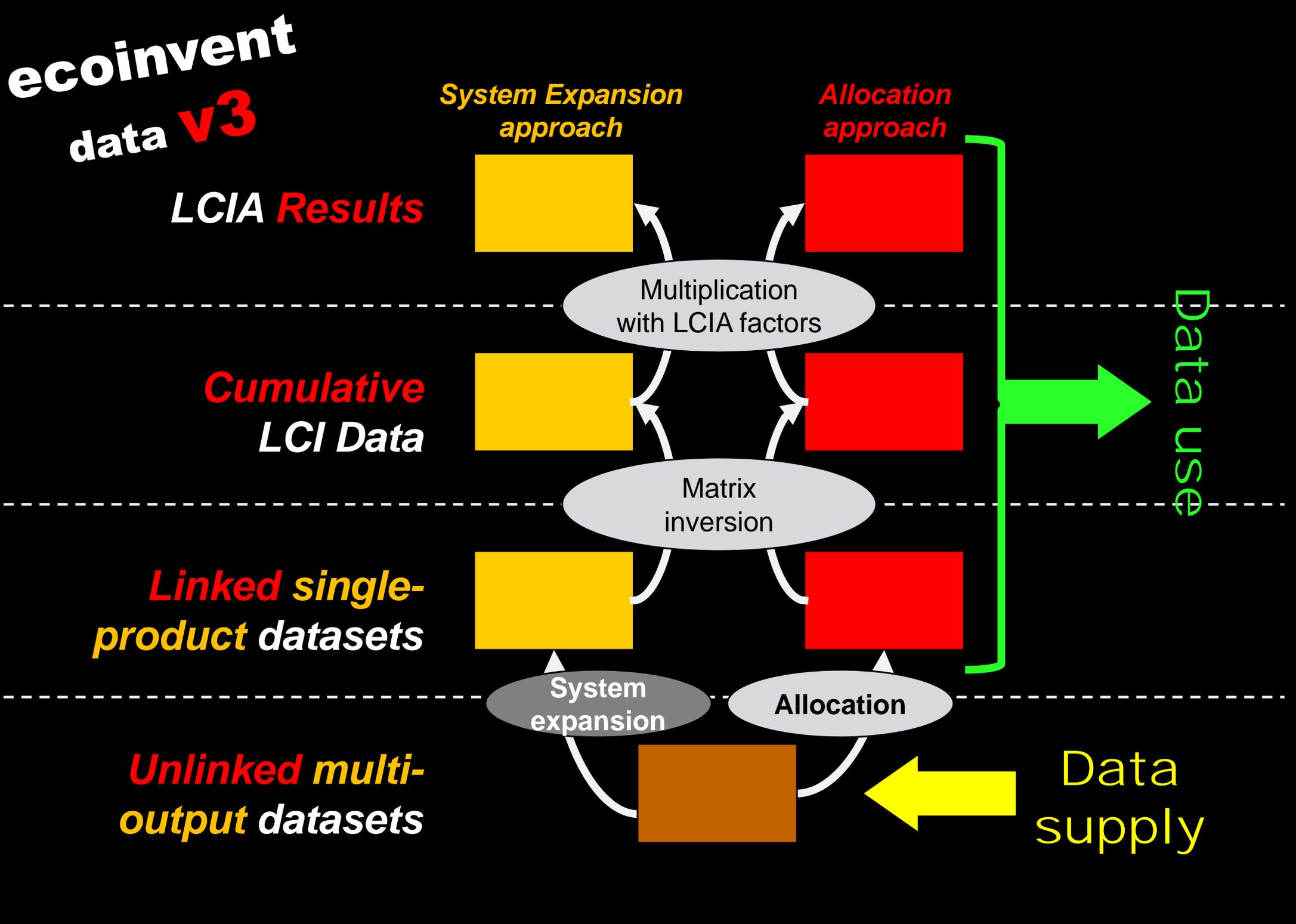
Matrix  
inversion

System  
expansion

Allocation

Data use

Data  
supply



# Table of Content

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- (Past) Data Collection Strategies
- (Future) Data Strategy & how this works
- Available Tools
  - Quality Guidelines & EcoSpold v2
  - Editorial Board
  - ecoEditor
- Conclusion

The logo for ETH (Eidgenössische Technische Hochschule), consisting of the letters "ETH" in a bold, italicized, sans-serif font.

The logo for EPFL (École Polytechnique Fédérale de Lausanne), featuring the letters "EPFL" in a white, stylized font inside a red rectangle.

The logo for PSI (Paul Scherrer Institut), consisting of the letters "PSI" in a white, stylized font inside a grey rectangle.

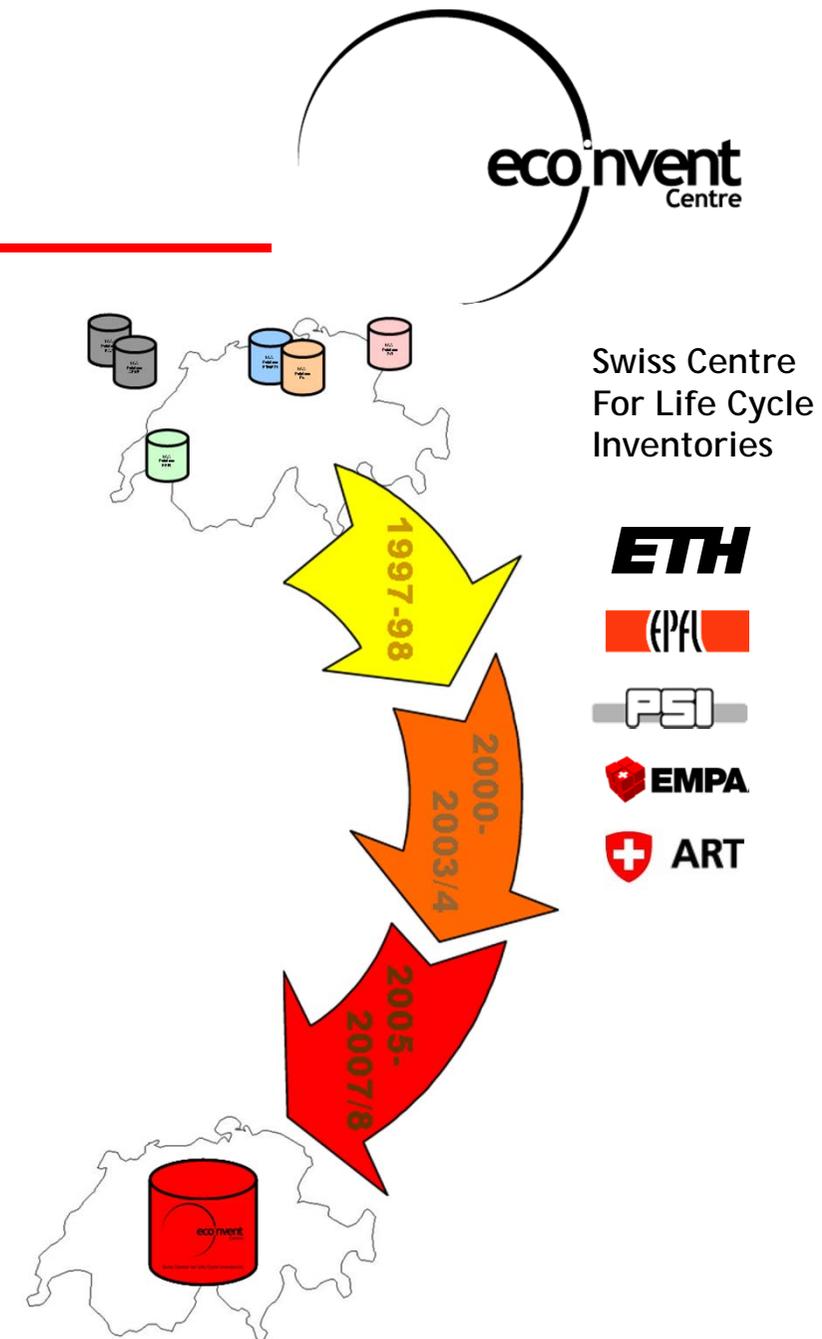
The logo for EMPA (Empa - Eidgenössische Anstalt für Materialprüfung), featuring a red shield with a white cross and the letters "EMPA" in a bold, sans-serif font.

The logo for ART (Anstalt für Ressourcennutzung, Recycling und Umwelttechnik), featuring a red shield with a white cross and the letters "ART" in a bold, sans-serif font.

# Introduction

ecoinvent v1 – «harmonisation» & «concentration»

- Before 1996: Different institutes (ETH, ...), each with their database
- 1997-1998 / **Pilot project**: system specification and first draft version of quality guidelines
- 2000-2004 / **Project „ecoinvent 2000“**:
  - finalisation of ecoinvent quality guidelines
  - establishing the database ecoinvent v1 (~ 2700 unit processes)
- 2005-2008 / **Project ecoinvent v2**:
  - update and extension of ecoinvent database from v1 to v2 (~4'000 unit processes)



→ All data work lead by the institutes of ecoinvent Centre.

**EMPA SG**

- Plastics
- Paper & Board
- Basic chemicals
- Detergents
- Waste treatment \*)

**agroscope**

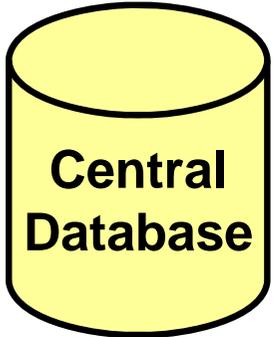
- Agriculture

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**EMPA Dü**

- Metals
- Construction Mat.
- Woods
- Basic chemicals \*)



**PSI**

- Energy supply \*)
- > Fuels
- > Electricity prod.
- > Heat production

**ETH**

**EPFL**

**PSI**

**EMPA**

**ART**

**ETH UNS**

- Transports

**ETH LTC**

- Basic chemicals

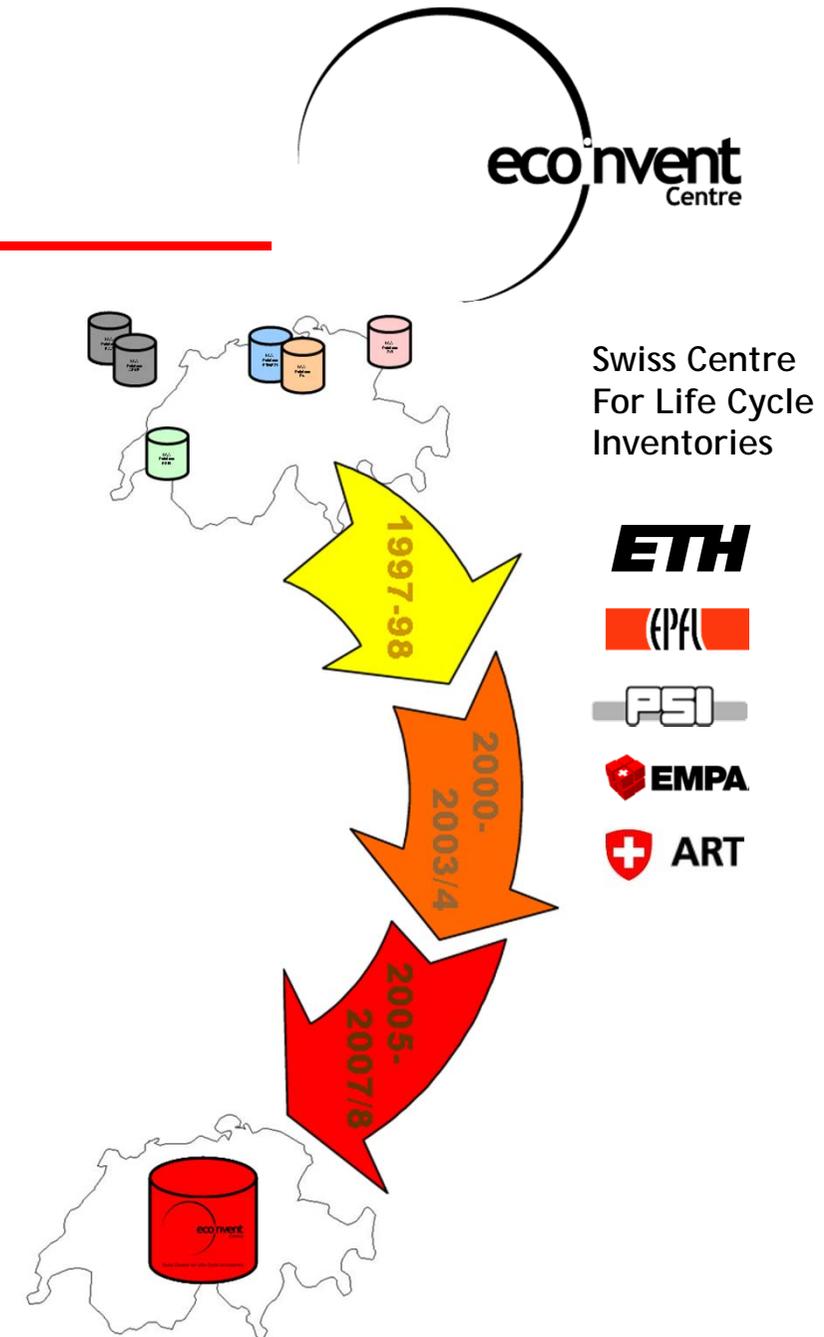
\*) supported by Consultant companies (ESU, Doka, Chudacoff-Ökoscience)

→ **Funding:** Swiss Federal Offices & in-kind contributions.

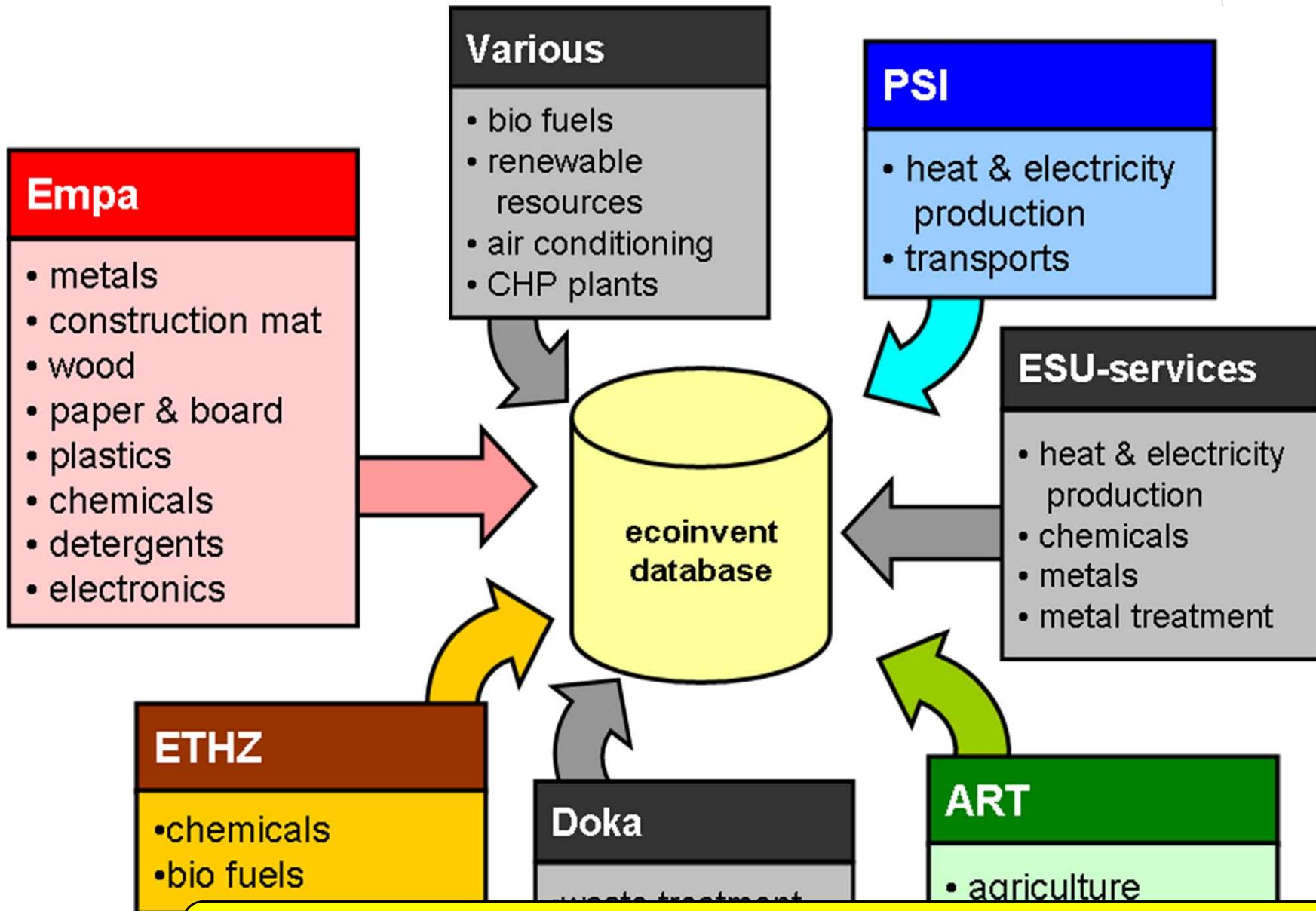
# Introduction

ecoinvent v2 – «maintaining» & «extension»

- Before 1996: Different institutes (ETH, ...), each with their database
- 1997-1998 / **Pilot project**: system specification and first draft version of quality guidelines
- 2000-2004 / **Project „ecoinvent 2000“**:
  - finalisation of ecoinvent quality guidelines
  - establishing the database ecoinvent v1 (~ 2700 unit processes)
- 2005-2008 / **Project ecoinvent v2**:
  - update and extension of ecoinvent database from v1 to v2 (~4'000 unit processes)



→ **Data work lead by institutes & by selected consultant companies (coordinated by theecoinvent management).**



→ **Funding:** Swiss Federal Offices (of selected projects!) & in-kind contributions.

# Introduction

ecoinvent v3 – «flexibility» & «simplicity»

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- [...]
- 2005-2008 / **Project ecoinvent v2:**
  - update and extension of ecoinvent database from v1 to v2 (~4'000 unit processes)
- 2008-2012 / **Project ecoinvent v3:**
  - Broad revision of the technical system ( and with this, of the structure) of our database  
[→ see subsequent presentations this morning ...]
  - selective update / extension of content, as well as an adaptation of the existing content to the new database structure

The logo for ETH (Eidgenössische Technische Hochschule), consisting of the letters "ETH" in a bold, italicized font.

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**Various**  
• bio fuels

**PSI**  
• heat & electricity

**Empa**  
• metals  
• construct  
• wood  
• paper &  
• plastics  
• chemical  
• deterge  
• electro

**ETHZ**  
• chemicals  
• bio fuels

**Doka**  
• waste treatment

• agriculture

**Services**  
• electricity  
• construction  
• chemicals  
• waste treatment

Swiss Discussion Forum on Life Cycle Assessment  
**ecoinvent v3 – an introduction to the new features & data**  
DF LCA No. 48, Dübendorf, June 13, 2012

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**Overview of new data**

R. Hischer, E. Moreno Ruiz, G. Wernet  
ecoinvent Centre, St. Gallen (Switzerland)



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# (Future) Data Strategy

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a **common platform** for your LCI datasets

R. Hischier

ecoinvent Centre, St. Gallen (Switzerland)

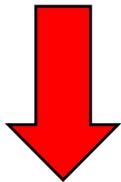
# (Future) Data Strategy

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*“share your research results  
in our database”*



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Ecoinvent is **independent**; one of the **most trusted sources** of LCA data due to **thorough review structure**, and the **full transparency** and **documentation** of all datasets.

# How does this work ?

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- ecoinvent makes it **easier for 3<sup>rd</sup> parties to contribute** ;
- we would like to **get a broader support for new datasets and/or corrections of existing datasets** ;
- ... and all data stay subject to **our very strict quality control**, review, and validation procedure.
  
- Hence (as in case of a contribution to a scientific journal) by submitting, you **share** your environmental data **with experts all around the world** ;
- your **name will be visible** in the dataset and as “active author” questions and/or **suggestions reach you!**

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# How does this work ?

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## Reasons for providing data:

- independence and thorough review procedure guarantee a **broad acceptance of data**;
- review process is for free, i.e. **low costs** for submitting datasets;
- since providing data to ecoinvent is free, the ecoinvent Centre has no financial interest in the **results** of such studies and is therefore a **very trustworthy source of LCA results**.

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# How does this work ?

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## Reasons for providing data:

- companies can provide data in a form that **respects** concerns about **confidentiality issues** (e.g. via industry associations);
- Providing data to an initiative like ecoinvent **demonstrates the environmental commitment of a company** & it greatly **simplifies future inquiries** about the sustainability standards of a company.

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- 
- When supplying a dataset to the ecoinvent database, the data provider confirms that the data are free from prior copyright, & transfers (a non-exclusive !) right of use to ecoinvent Centre.

In general, **all ecoinvent datasets** are **subject to copyright**. However, with assistance of sponsors it has become possible for some ecoinvent datasets to be provided as open access datasets, which can be freely shared. Use of these open access datasets is still subject to the normal rules for citation.

# Available tools



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# (i) the Quality Guidelines



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Aims to ensure a **coherent data acquisition & reporting** across the various activity areas & data providers involved.

- encompasses definitions of ...
  - different types of datasets,
  - level of detail required,
  - how completeness is ensured,
  - good practice for documentation,
  - naming conventions, and
  - rules for the reporting of uncertainty.
- covers the procedures for ...
  - validation, review, and embedding new datasets into the database;
  - calculation of attributional & consequential models, and
  - arriving at accumulated results of product systems.

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[http://www.ecoinvent.org/  
ecoinvent-v3/quality-guidelines/](http://www.ecoinvent.org/ecoinvent-v3/quality-guidelines/)

## (ii) ecoSpold v2 format



... in order to **take advantage of all the new developments**, this revision of the ecoSpold format has become necessary.

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- Structural changes
- Facilitating DB maintenance and extension, e.g. by:
  - parent-child relationships between activity datasets;
  - geographical information via GIS coordinates;
  - formulas and variables in numerical fields;
  - Use of UUIDs for internal references;
- Better support for alternative modelling options and data exchange with the ILCD format;
- Support for mass balances, energy balances and monetary balances;
- Support for language versions;
- Support for better documentation.

# (ii) ecoSpold v2 format



## ■ Example “Geography”

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```
file:///C:/Docume.../Geographies.xml
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<geography ISOTwoLetterCode="AG" UNCode="28" longitude="-61.783" ISOThreeLetterCode="ATG" UNSubregionCode="34"
latitude="17.078" UNRegionCode="142" id="09581fbc-7d7e-11de-9ae2-0019e336be3a">
  <name xml:lang="en">Antigua and Barbuda</name>
  <shortname xml:lang="en">AG</shortname>
  <kml>
    <MultiGeometry>
      <Polygon>
        <outerBoundaryIs>
          <LinearRing>
            <coordinates>
              -61.686668,17.024441,0 -61.73806,16.989719,0 -61.82917,16.996944,0 -61.876114,17.016941,0 -61.880562,17.019722,0
              -61.883614,17.023609,0 -61.885834,17.028053,0 -61.887222,17.033054,0 -61.891113,17.094166,0 -61.887222,17.105274,0
              -61.884171,17.109722,0 -61.832779,17.163887,0 -61.826393,17.167221,0 -61.794449,17.16333,0 -61.784172,17.158333,0
              -61.744171,17.137218,0 -61.674171,17.093609,0 -61.67028,17.090275,0 -61.668892,17.084999,0 -61.666389,17.04583,0
              -61.667503,17.040554,0 -61.682503,17.027496,0 -61.686668,17.024441,0
            </coordinates>
          </LinearRing>
        </outerBoundaryIs>
      </Polygon>
      <Polygon>
        <outerBoundaryIs>
          <LinearRing>
            <coordinates>
              -61.729172,17.608608,0 -61.731117,17.547222,0 -61.73278,17.541111,0 -61.738892,17.540554,0 -61.751945,17.549442,0
              -61.815559,17.583885,0 -61.834724,17.588608,0 -61.839447,17.586666,0 -61.842781,17.582775,0 -61.847504,17.58083,0
              -61.853058,17.583054,0 -61.856674,17.592499,0 -61.873894,17.688889,0 -61.875282,17.698608,0 -61.873062,17.703888,0
              -61.850281,17.722775,0 -61.845558,17.724998,0 -61.839172,17.72472,0 -61.787224,17.700554,0 -61.783615,17.69722,0
              -61.74334,17.653053,0 -61.74028,17.649166,0 -61.73806,17.644722,0 -61.731674,17.624996,0 -61.729172,17.608608,0
            </coordinates>
          </LinearRing>
        </outerBoundaryIs>
      </Polygon>
    </MultiGeometry>
  </kml>
</geography>
Fertig
```

## (iii) editorial board

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... performs the review, validation and editing of the ecoinvent datasets before inclusion in the ecoinvent database.

- Under the **supervision of LCI Expert Group** (which is maintaining ecoinvent data quality guidelines and software systems);
- each editor is responsible for a **specific expertise area** (as **activity, geographical, language, inventory-indicator, meta-data** or **LCIA** editor);
- in each case, a lead editor and one/more co-editors share the work.

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## (iii) editorial board

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### Activity Editor:

- responsible for reviewing of data for a specific industry, technology or other human activity.
- is the **main reviewer for a dataset**; she/he is the first to receive a submitted dataset, and the last to accept it for final upload to the current beta-version of the database.
- typically **leading (LCA) experts within their activity** area.
- divide the work between them according to the ISIC (Rev. 4, ecoinvent-amended) codes of the datasets.
- in principle **responsible for all datasets within an activity area**, disregarding any geographical differences (to ensure global consistency of activity datasets).

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Available tools

# (iii) editorial board



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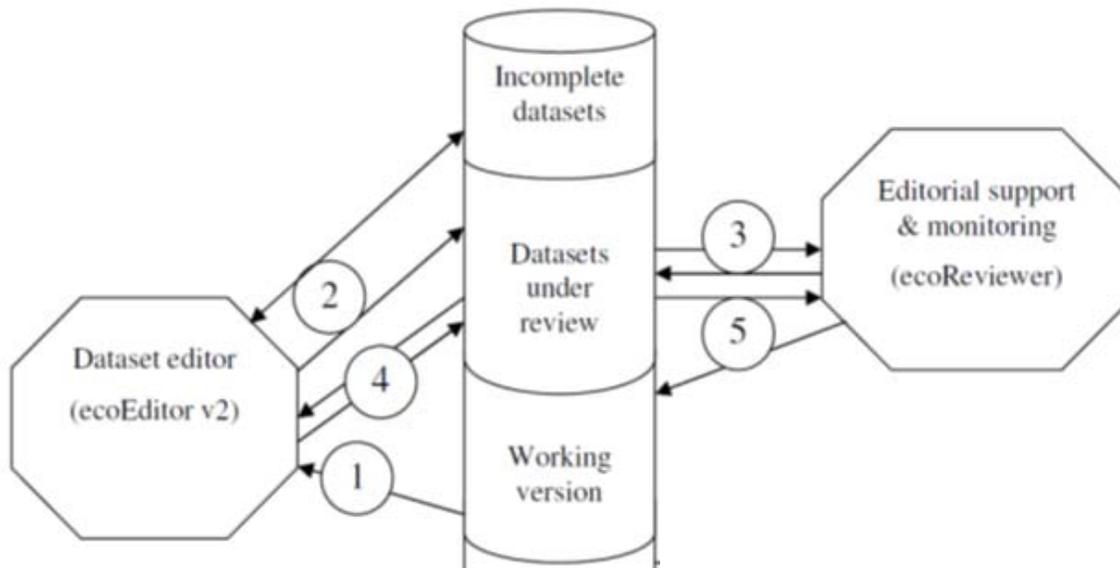


**Up-to-date & complete list of Editorial Board:**  
<http://www.ecoinvent.org/organisation/editorial-board/>

	Editor	Co-Editor
01.1 to 01.3, 01.61, 01.63 and 01.64 Crop production etc.	Thomas Nemecek Forschungsanstalt Agroscope Reckenholz-Tänikon ART, Switzerland	
01.41 to 01.44 Ruminants	Thomas Nemecek (see above)	
01.45 to 01.49, 01.62 and 01.7 Other animal production etc.	Thomas Nemecek (see above)	
02 Forestry	Jörg Schweinle Johann Heinrich von Thünen Institut, Institut für Ökonomie der Forst- und Holzwirtschaft, Germany	

# (iv) ecoEditor tool

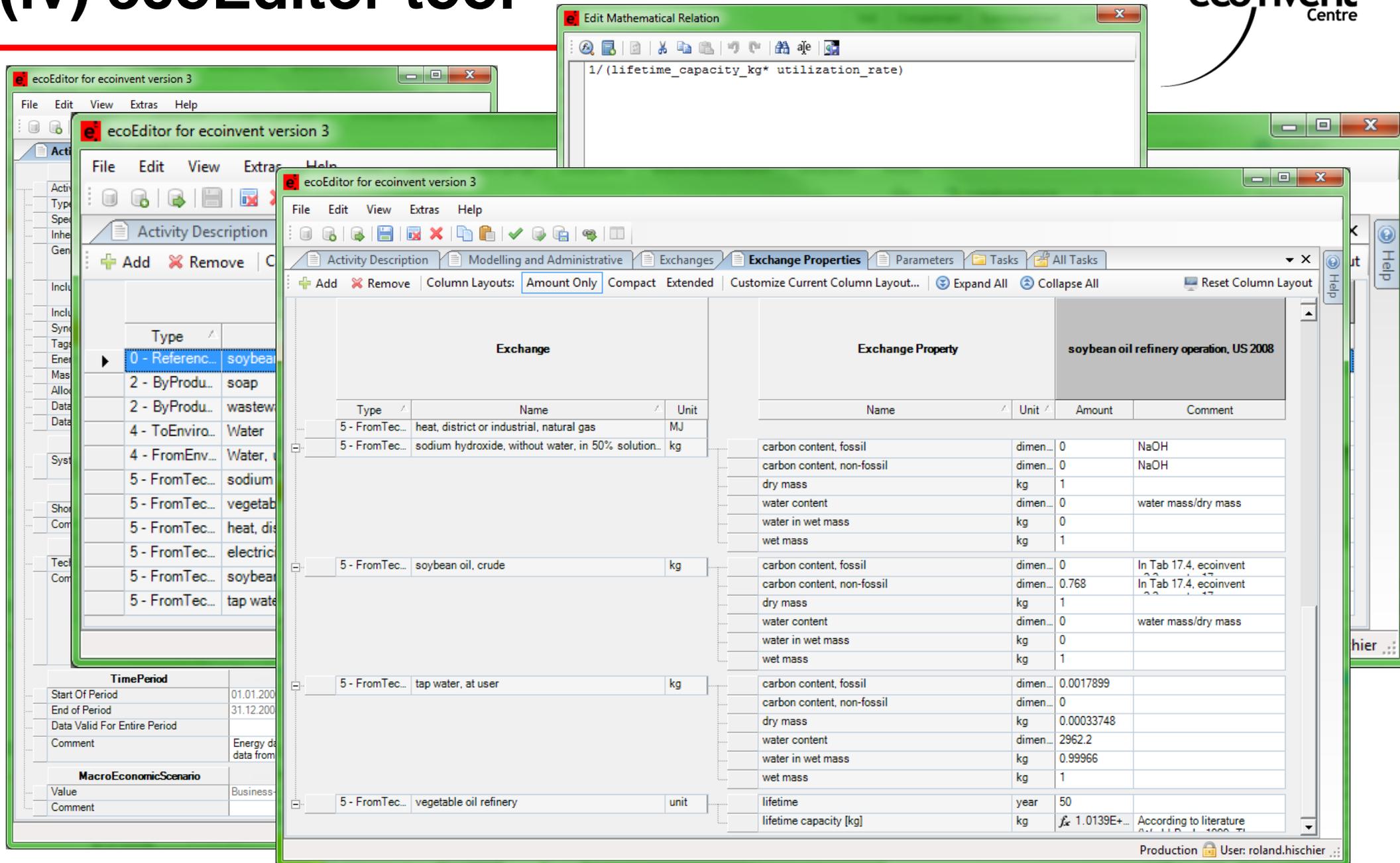
... for data suppliers and editors to **create, edit, review & to upload datasets** for ecoinvent database version 3



- Supports data supplier by ...
  - offering **access to the new features** of ecoinvent;
  - a **structured collection** of the necessary **data**;
  - built-in **help texts in order to guide** the collection process;
  - **validation** of entries.

Available tools

# (iv) ecoEditor tool



The screenshot shows the ecoEditor for ecoinvent version 3 interface. The main window is titled "Exchange Properties" and displays a table of exchange data for the "soybean oil refinery operation, US 2008". The table is organized into columns for Exchange, Exchange Property, Name, Unit, Amount, and Comment.

Exchange	Exchange Property	Name	Unit	Amount	Comment
0 - Referenc...		soybean			
2 - ByProdu...		soap			
2 - ByProdu...		wastew			
4 - ToEnviro...		Water			
4 - FromEnv...		Water, v			
5 - FromTec...		sodium			
5 - FromTec...		vegetab			
5 - FromTec...		heat, dis			
5 - FromTec...		electric			
5 - FromTec...		soybean			
5 - FromTec...		tap water			
5 - FromTec...		heat, district or industrial, natural gas	MJ		
5 - FromTec...		sodium hydroxide, without water, in 50% solution...	kg		
5 - FromTec...		soybean oil, crude	kg		carbon content, fossil: 0; carbon content, non-fossil: 0.768; dry mass: 1; water content: 0; water in wet mass: 0; wet mass: 1. In Tab 17.4, ecoinvent
5 - FromTec...		tap water, at user	kg		carbon content, fossil: 0.0017899; carbon content, non-fossil: 0; dry mass: 0.00033748; water content: 2962.2; water in wet mass: 0.99966; wet mass: 1.
5 - FromTec...		vegetable oil refinery	unit		lifetime: 50; lifetime capacity [kg]: 1.0139E+...

The interface also includes a sidebar with a tree view of activities, a menu bar (File, Edit, View, Extras, Help), and a toolbar with various icons. The status bar at the bottom indicates "Production" and "User: roland.hischier".

Available tools

## (iv) ecoEditor tool



Want to learn more about this tool ?

→ on **our website** (→ ecoinvent v3 → ecoEditor for version 3)

→ in a **ecoEditor workshop** ...  
@ *important conferences*  
*across the whole year !*

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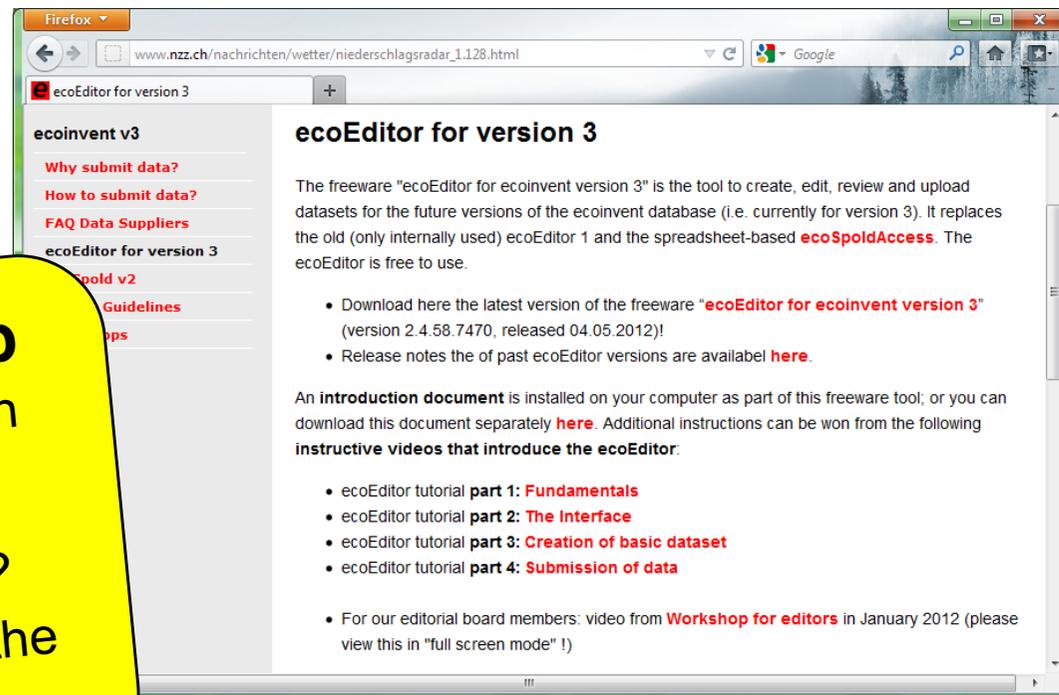
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**ecoEditor Workshop**  
June 14, 2012, 09:15-17:30h  
Empa Dübendorf, NO209  
*You wanna participate ?*  
-> please see me in one of the  
breaks during this day!

# Conclusion

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- ecoinvent offers you a **platform** together with a **complete toolbox** (incl. services) in order to establish and share life cycle inventory datasets of a high quality;
- ... and since providing data to ecoinvent is free, the ecoinvent Centre has no financial interest and gets a **very trustworthy source of LCA** results.

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# ... and a (very) last point !

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- In order that the **same data** (e.g. from Industry Association) can be used **in various** databases, **gate-to-gate datasets** need to be provided; as only such data allow **a consistent & reliable use** in different environments (databases) ...

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*... and ecoinvent offers you an ideal platform to do so ...!*

# Thank you

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More Information:

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c/o Empa  
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9014 St. Gallen, Switzerland

[support@ecoinvent.org](mailto:support@ecoinvent.org)  
[www.ecoinvent.org](http://www.ecoinvent.org)