



Interacting with the ILCD data network from an LCA software - the example of openLCA

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Agenda

1. Background: ILCD & openLCA
2. Connecting the ILCD database network with LCA software
 - a. Why – benefits?
 - b. Principle
 - c. Extensions
3. Practical use case: The German BioEnergieDat project
4. Outlook & discussion

1. ILCD & openLCA

ILCD: International reference Life Cycle Data network



1

"European Reference Life Cycle Database (ELCD) – needs on ILCD"; lca@jrc.it

Meeting among LCA tool and developers on
"The International Reference Life Cycle Data System' (ILCD)
- IT implementation"
Ispra, Italy, November 19th 2008

European Reference Life Cycle Database (ELCD) and EU policy related needs on the ILCD

Marc-Andree Wolf, David Pennington, Rana Pant, Kirana Chomkham, Ugo Pretato
European Commission,

ILCD: International reference Life Cycle Data network

- ILCD (ex ELCD) data format
- Tools (editor, ...)
- Handbooks
- Databases
- (...)

ILCD: International reference Life Cycle Data network

- ILCD (ex ELCD) data format
- Tools (editor, ...)
- Handbooks
- **Databases**
 - ELCD database, JRC, Ispra
 - Other countries: Brazil, Malaysia, Thailand, ...
 - Database as such not bound to countries or governments

ELCD database as one example

Firefox ▾

EUROPA-Site on LCA Tools, Services and... +

http://lca.jrc.ec.europa.eu/lcainfohub/datasetList.vm?topCategory=Materials+production&subCategory=Wood

Most Visited LEO Deutsch-Englisch... openLCA Framework | ... Freie Universität Berlin:... PROSUTE - prosuite.org openLCA user forum | ... Home: Willkommen b... Bookmarks

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European Commission - Joint Research Centre
LCA Tools, Services and Data

ies

European Commission > JRC > IES > LCT > European Platform on LCA > LCA Info Hub

Main Menu

- ELCD database
- Browse and view
- Search
- Developer support
- Maintenance area
- LCA Resources Directory

List of data sets

This page lists the data sets for your search or chosen index category. Click on the name of the data set to see the description of the data set

Category: Materials production
Subcategory: Wood

Location	Name of Process or LCI result set	Category	Reference year	Parameterised?
DE	Pine log with bark; refostered managed forest; production mix entry to saw mill, at plant; 44% water content	Materials production/Wood	2005	no
DE	Pine wood; timber; production mix, at saw mill; 40% water content	Materials production/Wood	2005	no
DE	Spruce log with bark; refostered managed forest; production mix entry to saw mill, at plant; 44% water content	Materials production/Wood	2005	no
DE	Spruce wood; timber; production mix, at saw mill; 40% water content	Materials production/Wood	2005	no

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Joint Research Centre

Last update: May 27, 2010 | [Top](#)

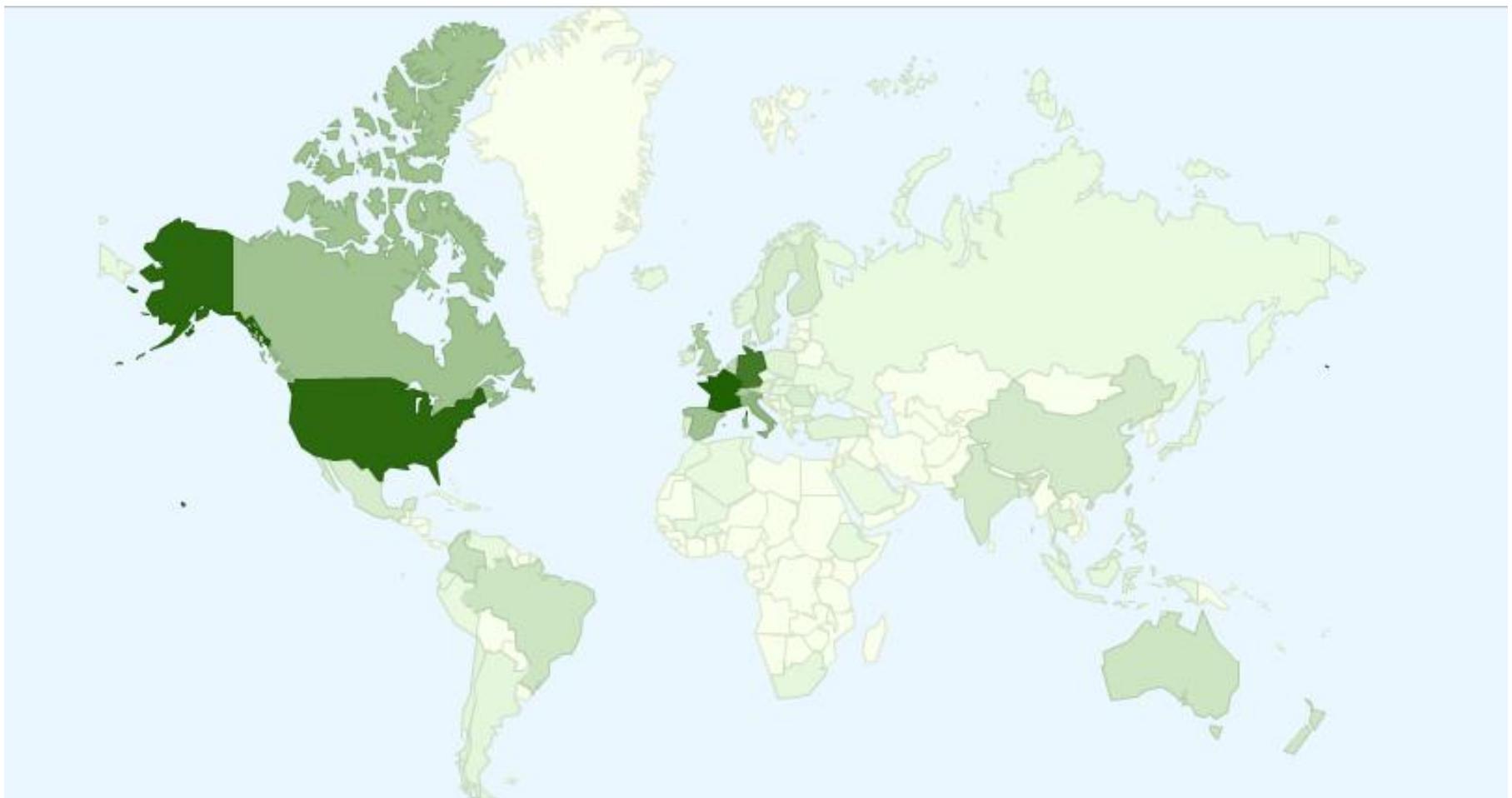
European Commission - DG Joint Research Centre - Institute for Environment and Sustainability

openLCA: free and open source, professional Life Cycle Assessment software



Websites:

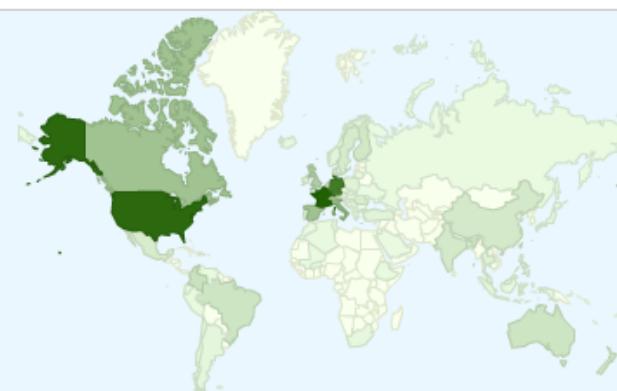
- www.openlca.org project website
- www.sourceforge.net/projects/openlca download site
- www.openlca.org/documentation wiki documentation



- > 2500 Downloads 2011!

[Summary](#) [Files](#) [Reviews](#) [Support](#) [Develop](#) [Hosted Apps](#) [Tracker](#) [Mailing Lists](#) [Forums](#) [Code](#)[Home](#) / openlca_framework ([Change File](#))

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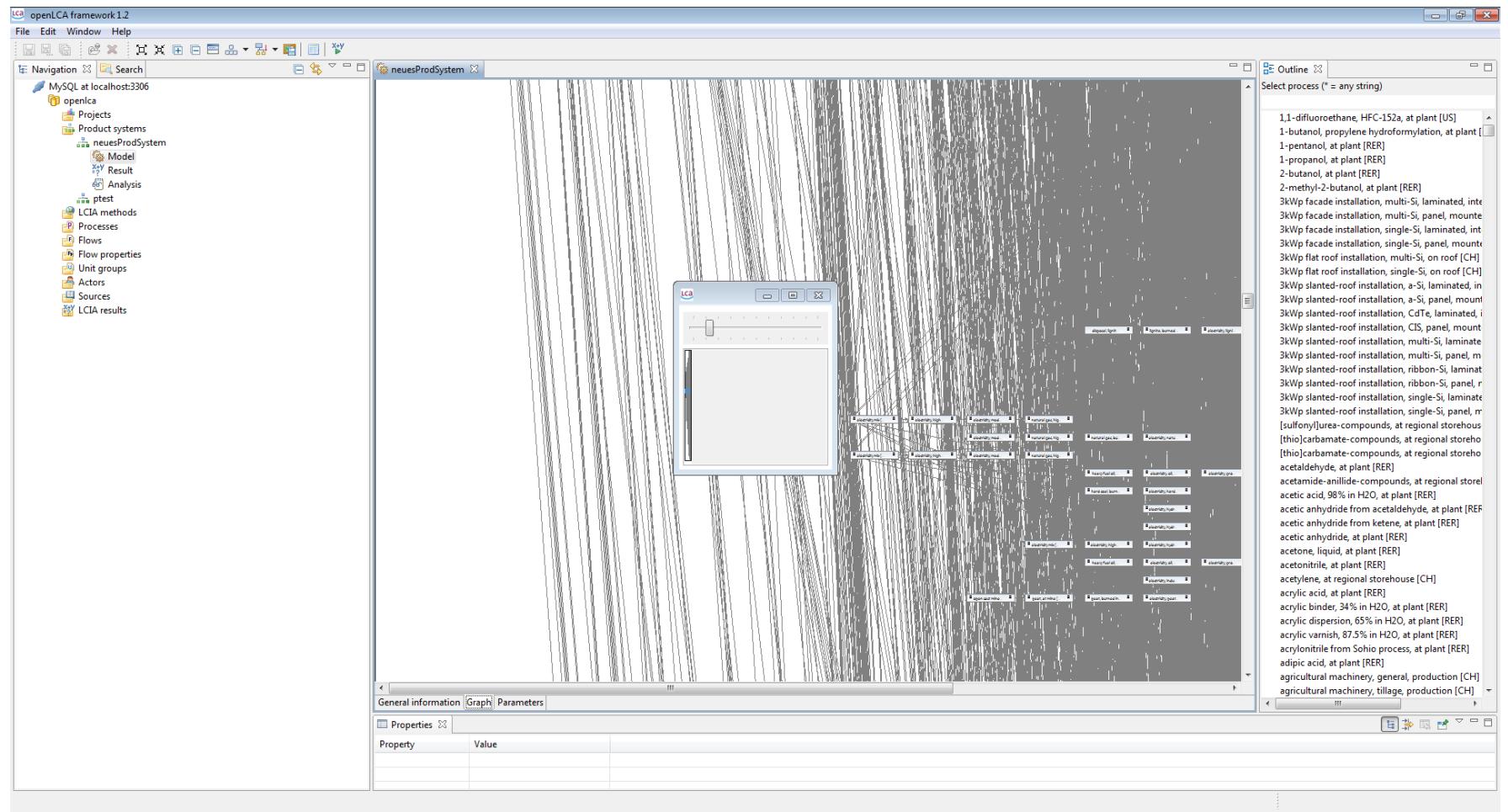
14% of downloaders

TOP OS**Windows**

81% of downloaders

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7. Switzerland	107
8. United Kingdom	98
9. Colombia	59
10. Netherlands	58
11. Brazil	50
12. Australia	50
13. New Zealand	46
14. Finland	44
15. Taiwan	44
16. India	40

openLCA large system view



2. Connecting the ILCD database network with LCA software

Connecting the ICLD database with LCA software – benefits

- Web-database is always available
 - Contains data sets in a form that fits to the local database of the user
 - Upload of datasets to the database is also possible
- Smarter than exchanging single data sets
→ Fewer / no import problems (!)
→ In the long run, data market place possible

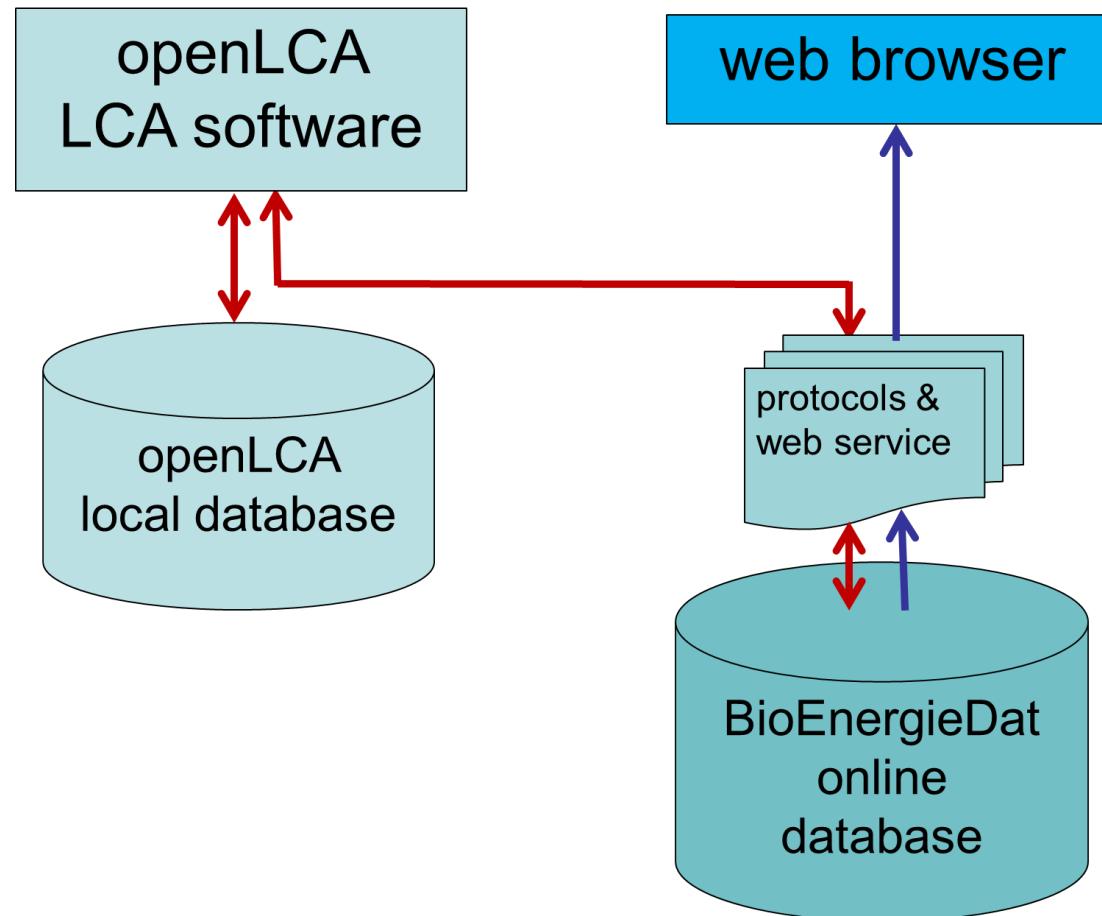
Connecting the ICLD database* with LCA software – benefits

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*also called „SODA4LCA“ (service oriented database application)

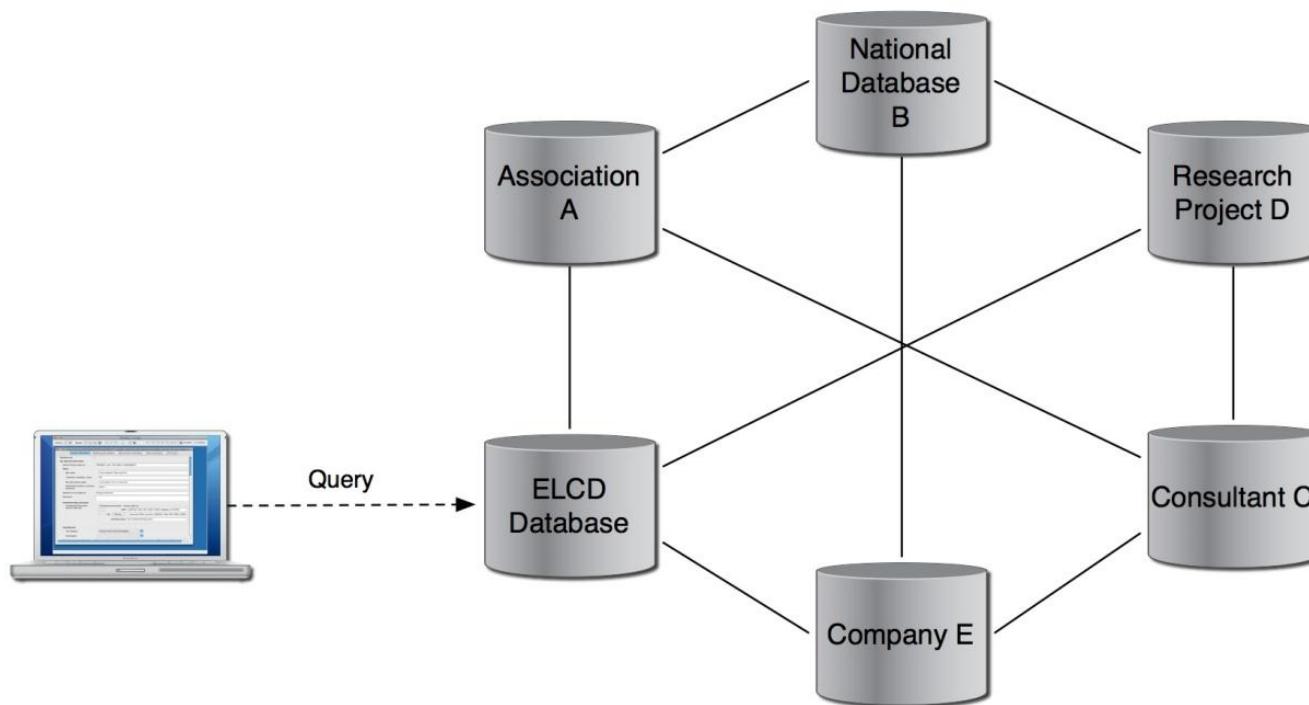
Connecting the ICLD database with LCA software – principle



Connecting the ILCD database with LCA software – extensions

- ILCD database is available also „outside of“ JRC → you can create an own ILCD database (such as the BioEnergieDat case)
- There is the idea to connect the different ILCD-type databases → a connection to one database offers connections to others (but of course, sensitivity issues)

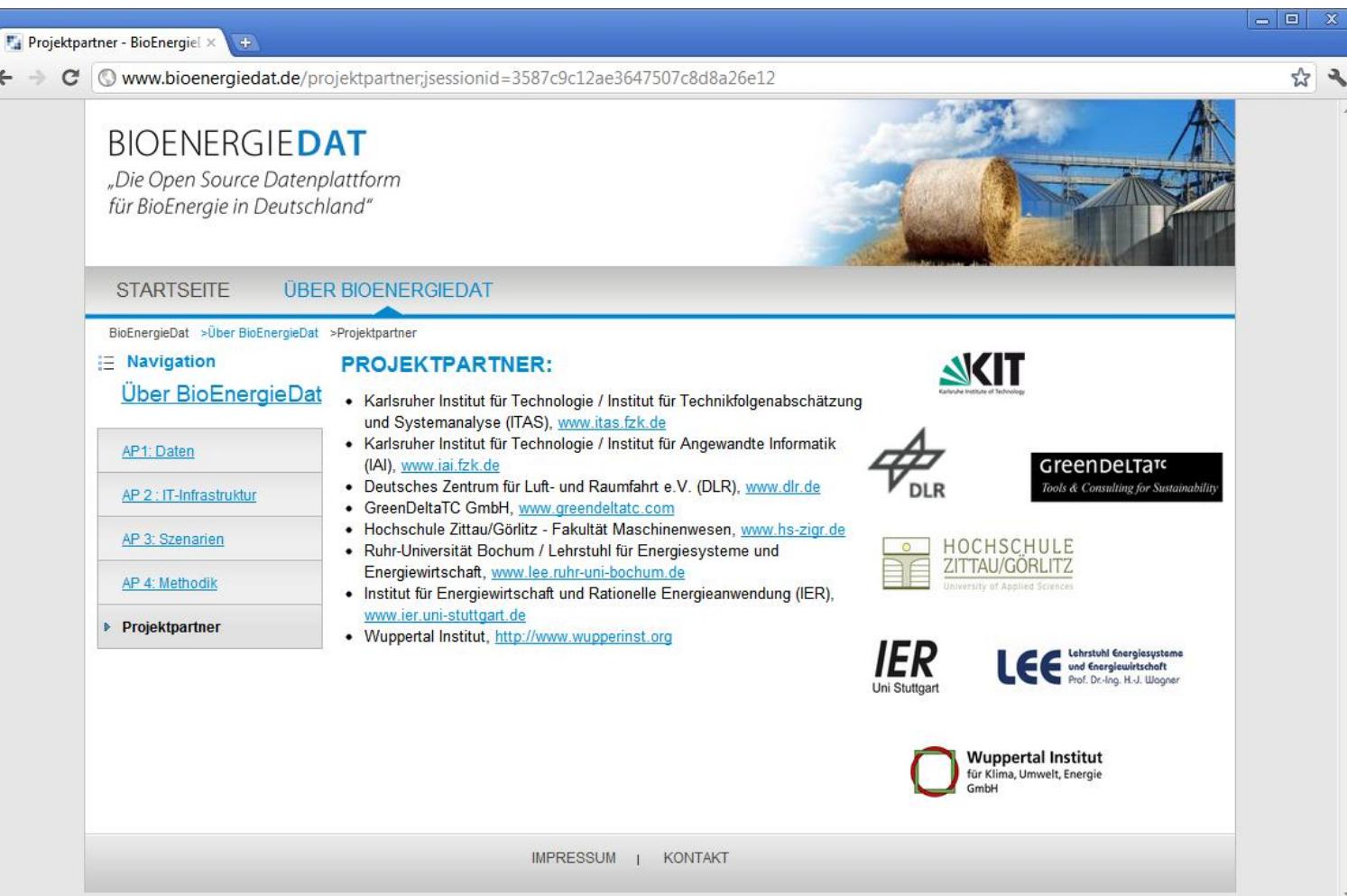
Connecting the ICLD database with LCA software – extensions



3. Practical case: The German BioEnergieDat project

The BioEnergieDat project

BIOENERGIEDAT
*„Die Open Source Datenplattform
 für BioEnergie in Deutschland“*



STARTSEITE ÜBER BIOENERGIEDAT

BioEnergieDat >Über BioEnergieDat >Projektpartner

Navigation

Über BioEnergieDat

- [AP 1: Daten](#)
- [AP 2 : IT-Infrastruktur](#)
- [AP 3: Szenarien](#)
- [AP 4: Methodik](#)
- [Projektpartner](#)

PROJEKTPARTNER:

- Karlsruher Institut für Technologie / Institut für Technikfolgenabschätzung und Systemanalyse (ITAS), www.itas.fzk.de
- Karlsruher Institut für Technologie / Institut für Angewandte Informatik (IAI), www.iai.fzk.de
- Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), www.dlr.de
- GreenDeltaTC GmbH, www.greendeltatc.com
- Hochschule Zittau/Görlitz - Fakultät Maschinenwesen, www.hs-zigr.de
- Ruhr-Universität Bochum / Lehrstuhl für Energiesysteme und Energiewirtschaft, www.lee.ruhr-uni-bochum.de
- Institut für Energiewirtschaft und Rationelle Energieanwendung (IER), www.ier.uni-stuttgart.de
- Wuppertal Institut, <http://www.wupperinst.org>

KIT
 Karlsruhe Institute of Technology

DLR

greenDELTAC
 Tools & Consulting for Sustainability

HOCHSCHULE ZITTAU/GÖRLITZ
 University of Applied Sciences

IER
 Uni Stuttgart

LEE
 Lehrstuhl Energiesysteme und Energiewirtschaft
 Prof. Dr.-Ing. H.-J. Wagner

Wuppertal Institut
 für Klima, Umwelt, Energie
 GmbH

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Bundesministerium
 für Umwelt, Naturschutz
 und Reaktorsicherheit

Im Rahmen der Klimaschutzinitiative



DIE BMU
 KLIMASCHUTZ-
 INITIATIVE

im Förderprogramm

Energetische
 Biomassenutzung

The BioEnergieDat project

launched September 2010 with the aim to

1. provide datasets for a consistent Life Cycle Assessment of bioenergy options, and to
2. develop a modelling software and database for efficient life cycle assessment modelling and data exchange (www.bioenergiedat.de).

The modelling software will be open source and freely available and be created based on openLCA; the database will be created based, technically, on the ELCD database of the European Commission (<http://lca.jrc.ec.europa.eu/lcainfohub/datasetArea.vm>).



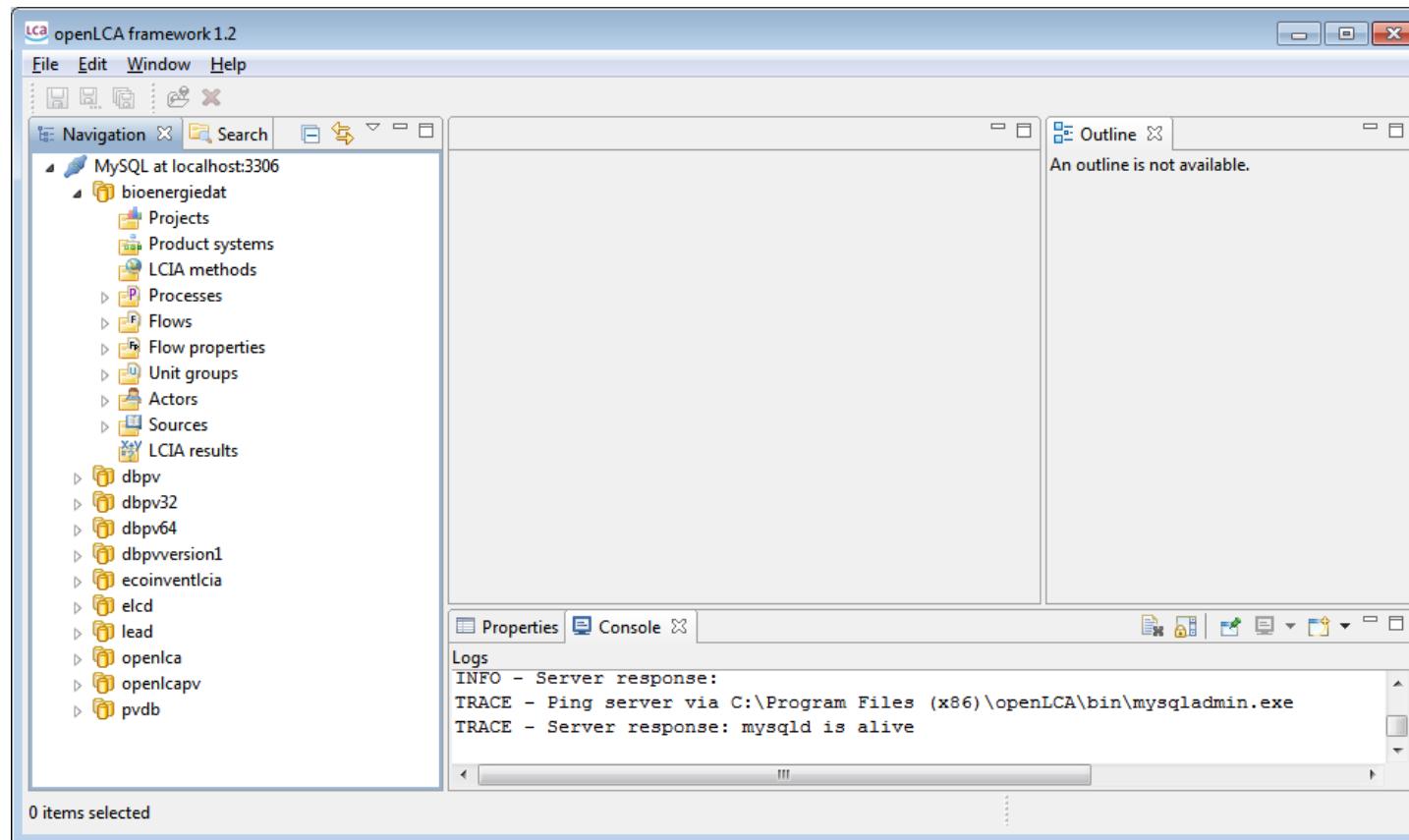
Im Rahmen der Klimaschutzinitiative



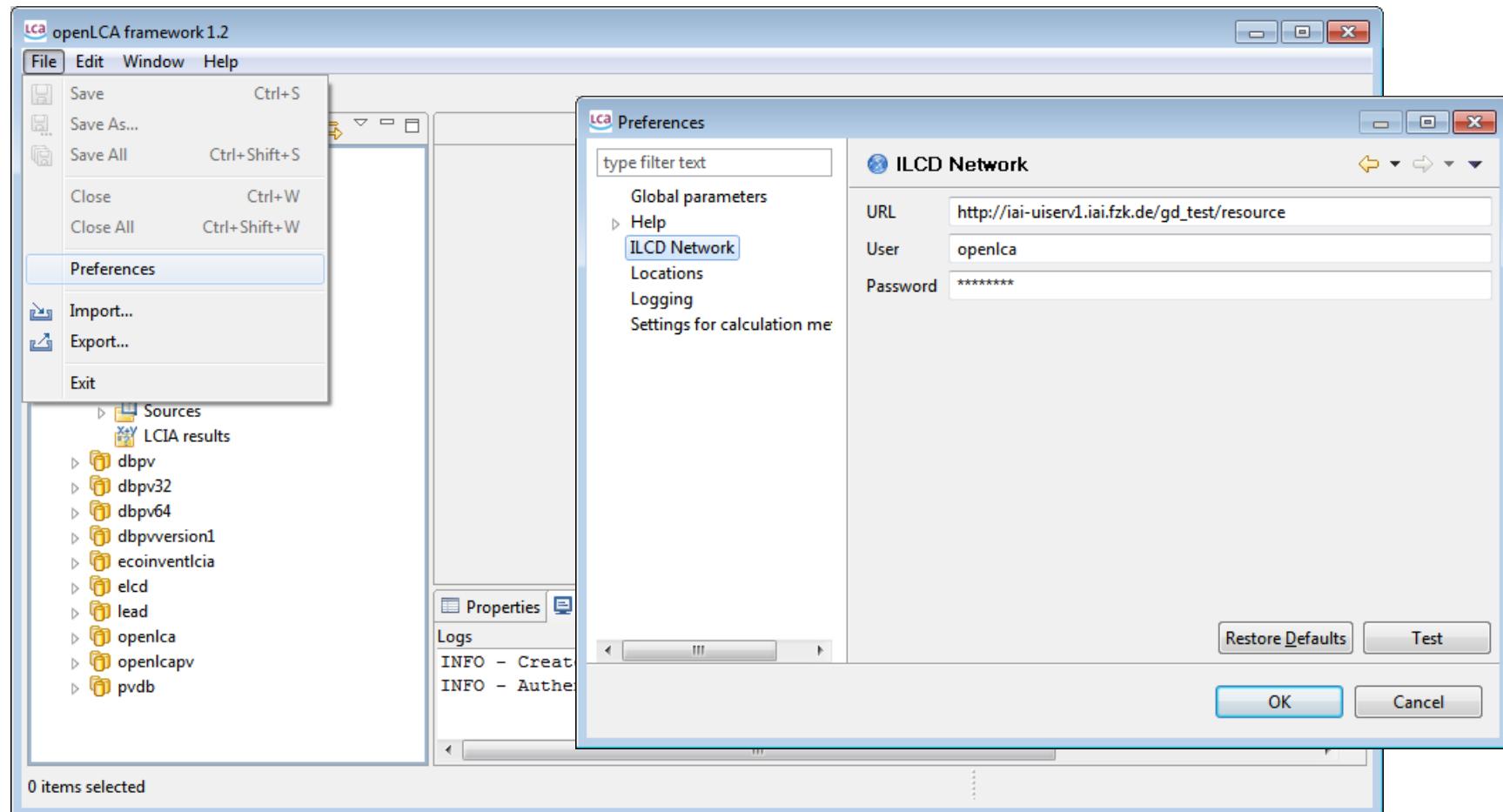
im Förderprogramm



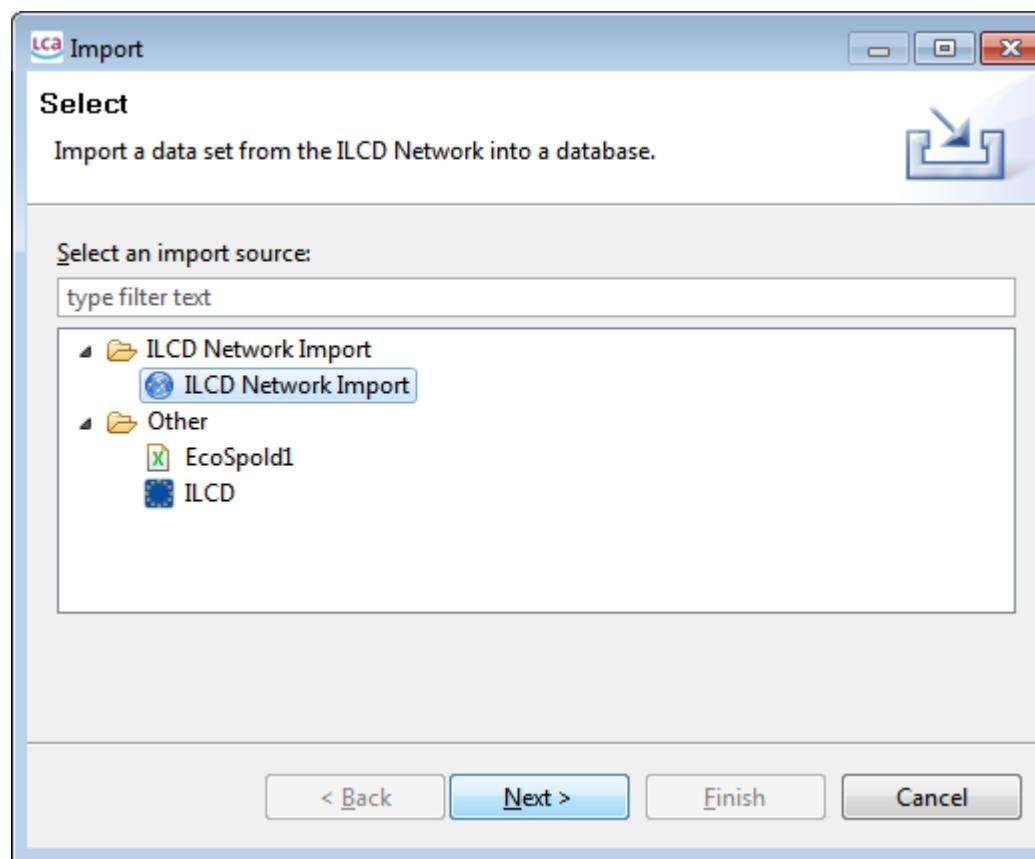
Connecting to the database – a practical demonstration



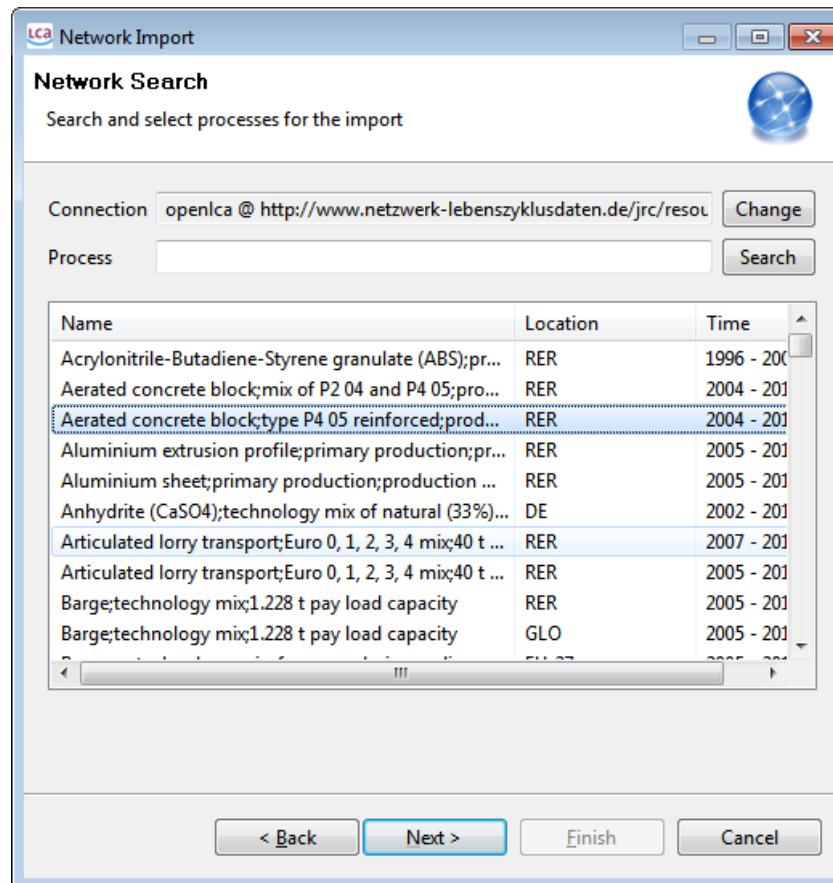
Connecting to the database – a practical demonstration



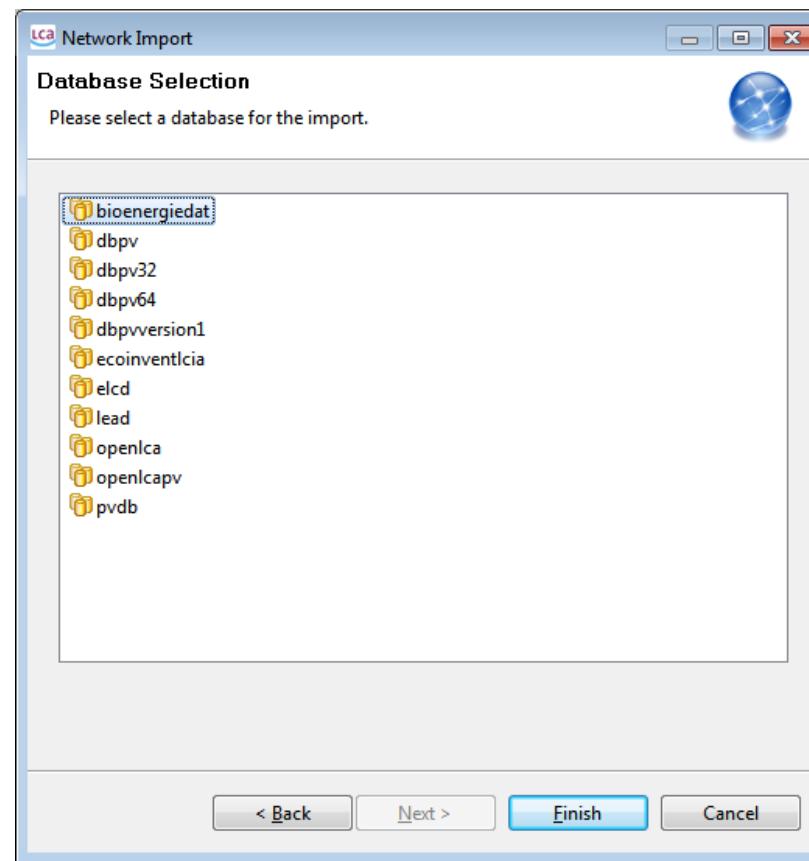
Connecting to the database – a practical demonstration



Connecting to the database – a practical demonstration



Connecting to the database – a practical demonstration



Connecting to the database – a practical demonstration

The screenshot shows the openLCA framework 1.2 software interface. The main window displays a process named "Aerated concrete block, production mix, at plant, type P4 05 reinforced, average density 485 kg/m³ (bioenergiedat)". The interface is divided into several sections:

- General information:** Name: Aerated concrete block, production mix, at plant, type P4 05 reinforced, average density 485 kg/m³. Description: The data set covers all relevant process steps / technologies over the supply chain of the represented cradle to gate inventory with a good overall data quality. The inventory is mainly based on industry data and is completed, where necessary, by secondary data.
- Category:** Construction (selected), Infrastructure process (unchecked).
- Quantitative reference:** Quantitative reference: aerated concrete block.
- Time:** Start date: 1/1/04, End date: 1/1/12, Comment: Annual average.
- Geography:** Location: RER. Geography comment: The data set represents the country / region specific situation, focusing on the main technologies, and the region specific characteristics.
- Technology:** Description: Components from aerated concrete are produced in fixed industrial processes. The main ingredients used in the aerated concrete block production are quartz sand with 60 to 70%, cement (type CEMI) with 20 to 30%, quick lime with 10 to 20% and gypsum with 2 to 5%. The rate of mineral production residues is considered with 3,5%. These residues are handled as inert waste, which are reusable in the building industry. The most important process steps are: 1. Preparation, drying and mixing of primary materials. 2. Production and installation of the corrosion protective reinforcement (for reinforced components) 3. Casting of blocks. 4. Hardening using steam 5. When necessary, further processing (rubbing and cutting) of the hardened aerated concrete parts. The assessment includes the life cycle from energy generation and raw material supply to the finished product on the factory gate. The infrastructure and the production of the manufacturing facility is not considered. Transports 'gate to building site' are not part of the system and have to be considered afterwards. The background system is addressed as follows: Electricity, Thermal energy: The electricity (and thermal energy as by-product) used is modelled according to the individual country-specific situation.
- Bottom navigation:** General information, Inputs/Outputs, Administrative information, Modeling and validation, Parameters, Properties, Console.

Connecting to the database – a practical demonstration

openLCA framework 1.2

File Edit Window Help

Navigation Search MySQL at localhost:3306 bioenergiedat Projects Product systems LCIA methods Processes Primary Metal Manufacturing Alumina Refining Systems Construction Aerated concrete block, pro Transport services Flows Flow properties Unit groups Actors Sources LCIA results dbpv dbpv32 dbpv64 dbpvversion1 econiventica elcd lead openlca openlcapv pvdb

Aerated concrete block, production mix, at plant, type P4 05 reinforced, average density 485 kg/m³

Process: Aerated concrete block, production mix, at plant, type P4 05 reinforced, average density 485 kg/m³ (bioenergiedat)

Allocation Allocation method: None

Inputs (Formula view)

Flow	Category	Flow type	Flow property	Unit	Resulting amount	Uncertainty distribution type	Avoided product?
air	Resour...	Elemen...	Masse	kg	0.957617723825...	No distribution	
barium sulfate	Resour...	Elemen...	Masse	kg	5.029420188619...	No distribution	
baryte	Resour...	Elemen...	Masse	kg	2.388010176137...	No distribution	
basalt	Resour...	Elemen...	Masse	kg	7.035163100724...	No distribution	
bauxite	Resour...	Elemen...	Masse	kg	0.005572137275...	No distribution	
bentonite	Resour...	Elemen...	Masse	kg	5.637862721075...	No distribution	
biomass	Resour...	Elemen...	Unterer ...	MJ	8.703879574713...	No distribution	
brown coal	Resour...	Elemen...	Unterer ...	MJ	0.676960074386...	No distribution	
calcium carbonate	Resour...	Elemen...	Masse	kg	0.611975264874...	No distribution	
calcium chloride	Resour...	Elemen...	Masse	kg	5.149369715895...	No distribution	
carbon dioxide	Resour...	Elemen...	Masse	kg	0.002300759349...	No distribution	
chromium	Resour...	Elemen...	Masse	kg	0.001529345108...	No distribution	
clay	Resour...	Elemen...	Masse	kg	0.013075304297...	No distribution	
colemanite	Resour...	Elemen...	Masse	kg	5.619924594718...	No distribution	
copper	Resour...	Elemen...	Masse	kg	1.905738825332...	No distribution	
crude oil	Resour...	Elemen...	Unterer ...	MJ	0.540627347234...	No distribution	

Outputs (Formula view)

Flow	Category	Flow type	Flow property	Unit	Resulting amount	Uncertainty distribution type	Avoided product?
1,2-dibromoethane	Emissi...	Elemen...	Masse	kg	1.802082162084...	No distribution	
1,2-dichloropropane	Emissi...	Elemen...	Masse	kg	5.667733063766...	No distribution	
1,3,5-trimethylbenzene	Emissi...	Elemen...	Masse	kg	2.610143316781...	No distribution	
2,3,7,8-tetrachlorodib...	Emissi...	Elemen...	Masse	kg	2.125800134014...	No distribution	
2,3,7,8-tetrachlorodib...	Emissi...	Elemen...	Masse	kg	4.772309117270...	No distribution	
acenaphthene	Emissi...	Elemen...	Masse	kg	2.322159801449...	No distribution	
acenaphthene	Emissi...	Elemen...	Masse	kg	7.74346961261...	No distribution	
acenaphthylene	Emissi...	Elemen...	Masse	kg	9.032692925700...	No distribution	
acenaphthylene	Emissi...	Elemen...	Masse	kg	2.946515343737...	No distribution	
acetaldehyde	Emissi...	Elemen...	Masse	kg	2.801474757742...	No distribution	
acetic acid	Emissi...	Elemen...	Masse	kg	1.792068322669...	No distribution	
acetic acid	Emissi...	Elemen...	Masse	kg	8.158052992266...	No distribution	
acetic acid	Emissi...	Elemen...	Masse	kg	2.098335747898...	No distribution	
acetone	Emissi...	Elemen...	Masse	kg	2.695135556413...	No distribution	
acid (as H ⁺)	Emissi...	Elemen...	Masse	kg	3.117356049253...	No distribution	
acid (as H ⁺)	Emissi...	Elemen...	Masse	kg	1.296872630194...	No distribution	

General information Inputs/Outputs Administrative information Modeling and validation Parameters

Properties Console Logs

```
INFO - Get resource: http://www.netzwerk-lebenszyklusdaten.de/jrc/resource/flows/08a91e70-3ddc-11dd-98d8-0050c2490048?format=xml
INFO - Get resource: http://www.netzwerk-lebenszyklusdaten.de/jrc/resource/flows/fe0acd60-3ddc-11dd-a496-0050c2490048?format=xml
TRACE - Load instance (type=class org.openlca.core.model.Process, id=a8b2c610-429d-11dd-ae16-0800200c9a66) from database
```

4. Outlook, discussion

Summary, outlook, and discussion

- We have implemented a direct connection between the LCA software openLCA and a database of the ILCD network
- This connection allows uploading and downloading datasets, directly
- This makes data exchange much smarter than before
- It is currently used, and was implemented within, a German research project on bioenergy data sets

Summary, outlook, and discussion, 2

- In principle, this connection to one ICLD database opens a connection to all other different ILCD databases
- ILCD databases can be located on the web, as the ELCD database, but also local, or in an intranet
- BioEnergieDat project partners seek to establish a long term system based on the current implementation (lead: GreenDeltaTC)
- If you have interest → please contact us!

Vielen Dank.

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ciroth@greendeltatc.com

www.greendeltatc.com