

GreenDelta

sustainability consulting + software

Towards more interoperable databases: openLCA, SimaPro, summary of tools

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1. Interoperability of LCA software

Interoperability and LCA Software

- Interoperability: Large term; related to LCA software:
 - Supported exchange forms (data formats, templates)
 - Supported reference lists and nomenclature
 - (mapping procedures -> ways for assigning one reference list to another reference list;
 - internal database structure -> not covered today)

2. SimaPro

SimaPro and interoperability

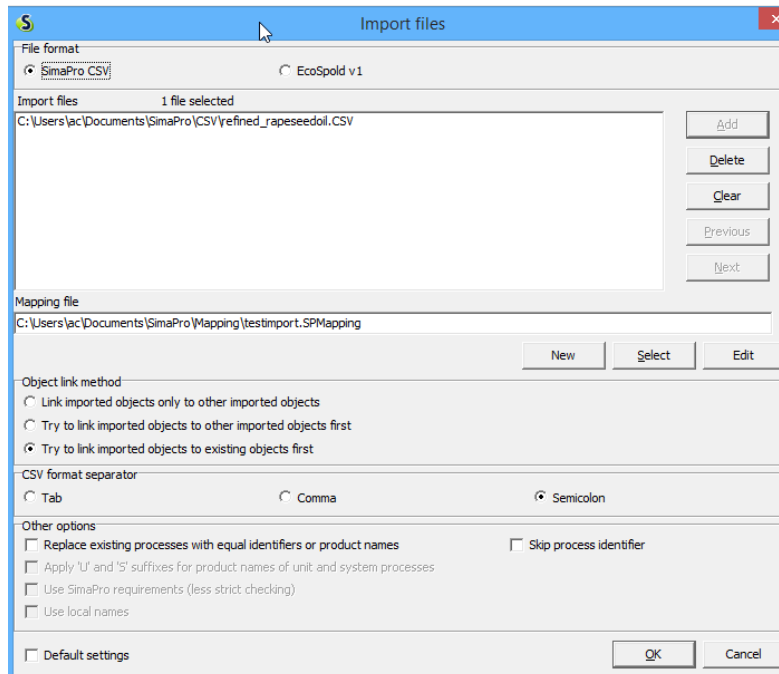
- SimaPro: one (of two) leading LCA Softwares in the world, for decades, developed by PRé consultants.



(screenshot from simapro.com)

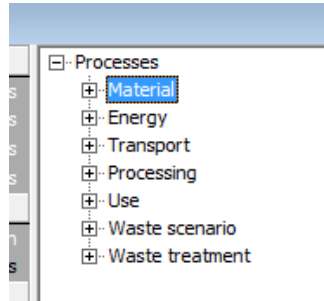
SimaPro data exchange formats

- SimaPro supports two exchange formats:
 - A proprietary CSV format
 - A slightly modified version of EcoSpold 1 (different mandatory fields than the official format)



SimaPro data reference lists

- SimaPro has an own reference list, often based on ecoinvent, but with additions and modifications
- Especially, SimaPro has a fix top category list



A screenshot of the SimaPro software interface showing a list of substances. The 'Acids' category is highlighted in yellow. The list includes: Raw materials, Airborne emissions, Waterborne emission, Final waste flows, Emissions to soil, Non material emissio, Social issues, Economic issues, Acids, Actinium, Additives, Air, Alloys, Aluminium, Anhydrite, Animal matter, Antimony, Arable land use, soy bean, Arc m2z, Arable land use, soy bean, Bra m2z, and Argon.

Substances	Substance	Def
Raw materials	Acids	kg
Airborne emissions	Actinium	kg
Waterborne emission	Additives	kg
Final waste flows	Air	kg
Emissions to soil	Alloys	kg
Non material emissio	Aluminium	kg
Social issues	Anhydrite	kg
Economic issues	Animal matter	kg
	Antimony	kg
	Arable land use, soy bean, Arc m2z	
	Arable land use, soy bean, Bra m2z	
	Argon	kg

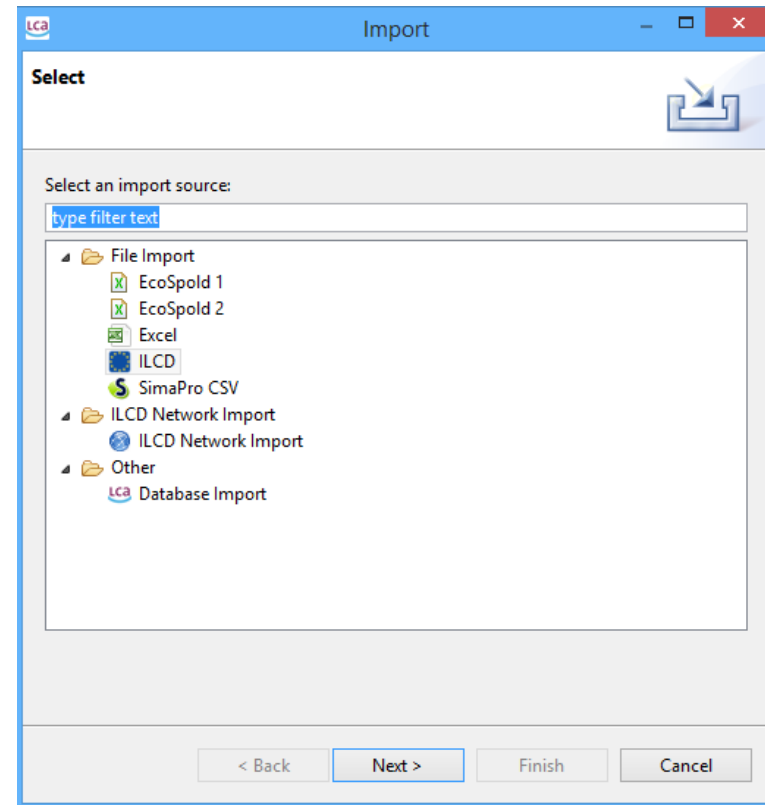
3. openLCA

openLCA and interoperability

- openLCA is the leading and broadly used open source LCA software, developed by GreenDelta since 2006
- **Open source:** source code and software is fully free, transparent
- **Business model:** support for software development, service contracts, database sales, use in innovative studies
- **Features:** same level as SimaPro or GaBi
- Developed as follow up of the openLCA format converter → special attention to interoperability

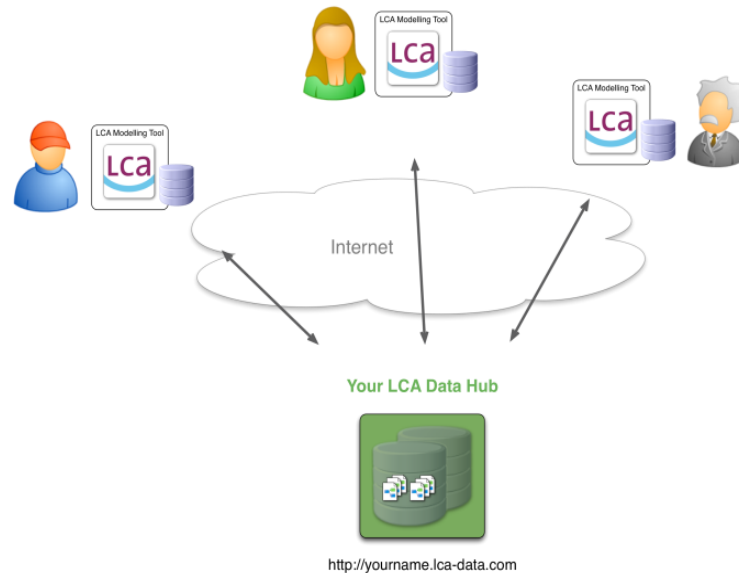
openLCA and data formats / data exchange

- openLCA supports the following formats for import and export:
 - EcoSpold 1
 - EcoSpold 2
 - ILCD
 - SimaPro csv (only import)
 - Excel (specific template)
 - Under development: an own, intuitive ontology commissioned by US EPA



openLCA and data formats / data exchange

- openLCA supports the direct connection to an ILCD server (soda4LCA, just as the ELCD or IBICT database).

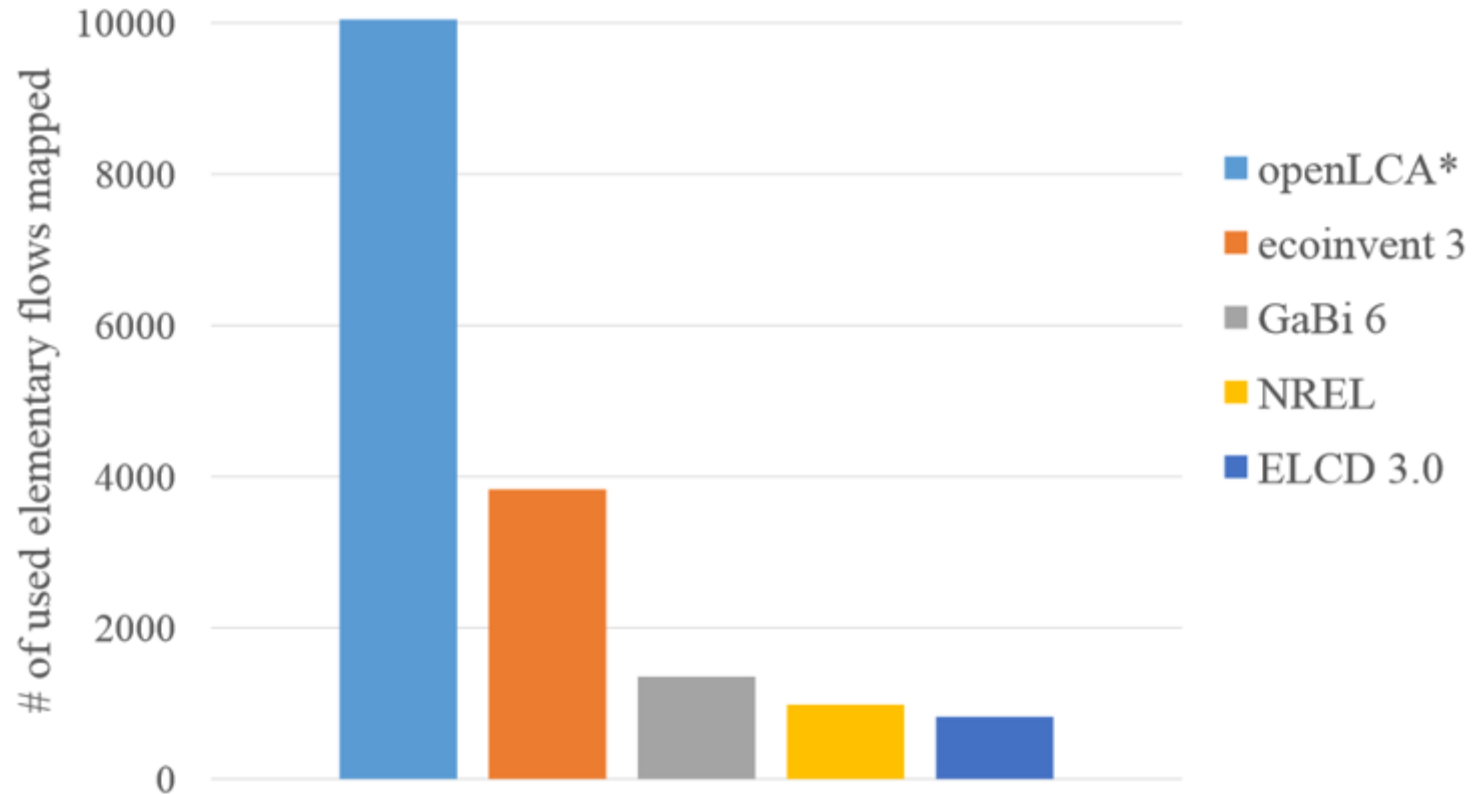


- In addition to the ELCD system, also product systems can be shared (i.e. full case studies)

openLCA and reference lists

- openLCA has a very extensive reference element list for elementary flows and other elements, basicallyecoinvent & ILCD & some other sources (USDA).
- This list is created when creating a database in openLCA with reference data
- Databases can also be created without reference elements → more flexibility

openLCA and reference lists



* Total # of elementary flows in reference list

4. Umberto

Umberto

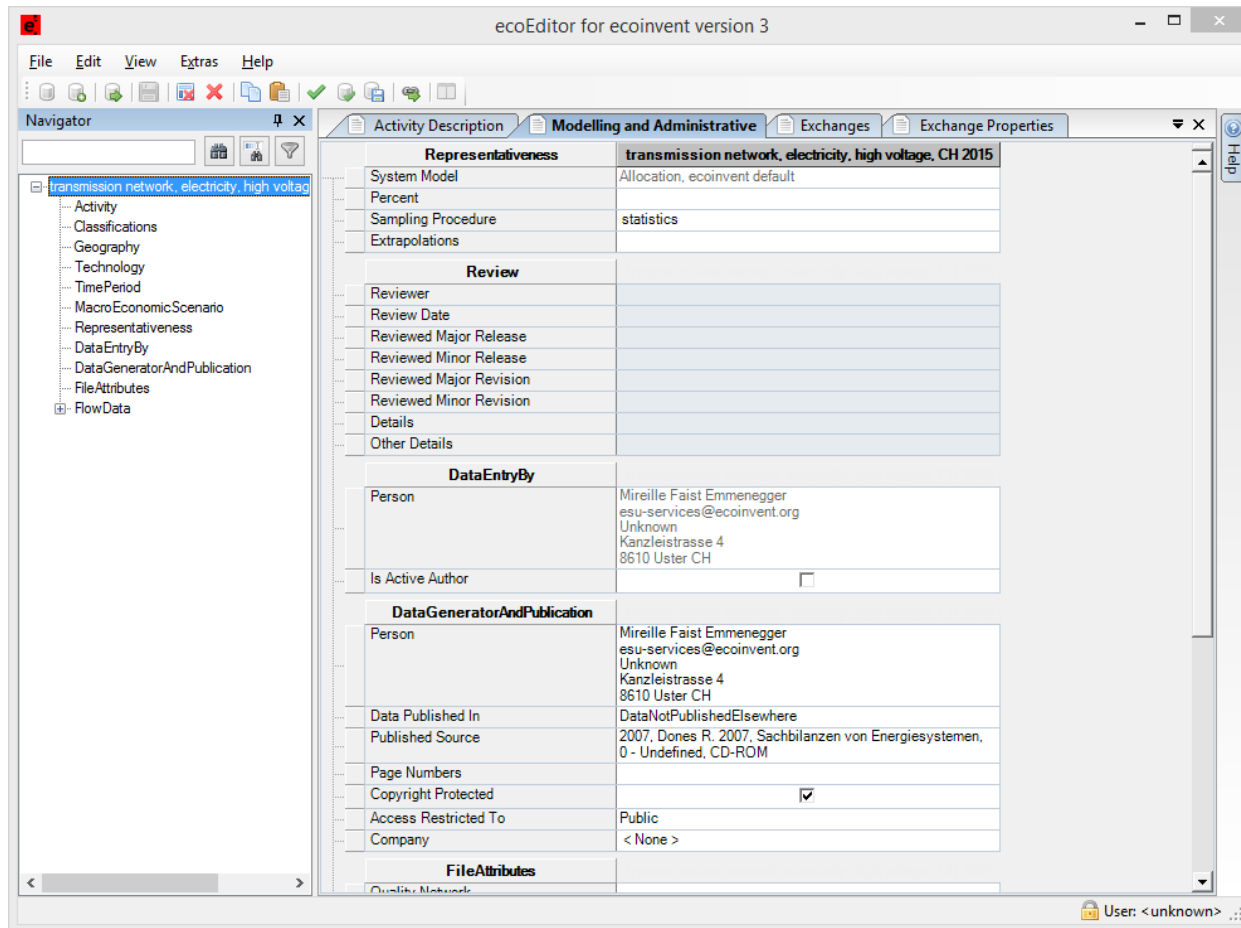
- LCA and material flow software developed by ifu, Germany
- Users in Germany and in some Latin American countries
- No own reference data
- Data import requires collaboration with ifu, export to EcoSpold 1, one process data set at a time

5. Overview of support tools

Overview of LCA data format supporting tools)

- **ecoEditor**: tool developed for the ecoinvent centre for submitting data sets to the ecoinvent database, including review. Freeware but not open source. Imports EcoSpold 2 (in dialect)
- **ILCD editor**: Open source application for creating ILCD data sets, not too comfortable to use.
- **openLCA format converter**: open source application for converting between major LCA data formats

EcoEditor



(here: opening a data set exported from openLCA in ES2)

openLCA format converter

from/to	EcoSpold 1	EcoSpold 1 (SimaPro)	EcoSpold 2	ILCD 1.1	CSV (SimaPro)
EcoSpold 1		x	x	x	-
EcoSpold 1 (SimaPro)	x		x	x	-
EcoSpold 2	x	x		x	x
ILCD 1.1	x	x	x		-
CSV (SimaPro)	-	-	x	-	

openLCA format converter

- Current project with JRC to especially improve the mapping files in conversion from ecoinvent / EcoSpold 2 to ILCD
- Converter will then be officially endorsed by JRC
- Recent project commissioned by PRé to allow selecting the mapping files, PRé has provided a list from SimaPro to ILCD (→ SimaPro can be used as a tool to create PEF case studies)

ILCD editor

- Java webstart application – for security reasons blocked by modern Windows systems
- Needs to be installed for every single use (!)
- [http://eplca.jrc.ec.europa.eu/?page_id=140:](http://eplca.jrc.ec.europa.eu/?page_id=140)

- ILCD Editor (beta 11)

(Note that it is for use exclusively by software developers; **this is not a software application that would run on your computer.**)

6. Summary for LCA tools

Summary for LCA tools

		GaBi	openLCA	SimaPro	Umberto
Reference data	own reference data	✓	✓	✓	-
	if yes extent of own ref data	++	+++	++	
	own ref data mandatory	?	no	top categories	
Import	EcoSpold 1	✓	✓	(✓)*	-
	EcoSpold 2	-	✓	-	-
	ILCD	✓	✓	-	-
	proprietary format	gbx	zolca	csv	?
	Excel	?	processes, all lists	parameters	?
	soda4LCA	-	✓	-	-
Export	EcoSpold 1	✓	✓	(✓)*	✓**
	EcoSpold 2	-	✓	-	-
	ILCD	✓	✓	-	-
	proprietary format	gbx	zolca	csv	?
	Excel	?	process data sets, analysis results, results of simulations	some lists	?

*own "dialect" with different mandatory and optional fields

** single data sets

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Thank you!

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