

# GreenDelta

sustainability consulting + software

## Webinar: What's new in openLCA 1.6

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# Content

- GreenDelta and openLCA
- New features in openLCA 1.6
  - Data Quality Systems
  - Collaboration server
  - Update manager
- Other improvements
- Upcoming trainings
- Questions

An aerial photograph of a river delta, showing a central lake and a network of branching channels. The water is a deep blue, contrasting with the light-colored, sandy or silty land. The channels radiate outwards from the central lake, creating a complex, web-like pattern. The overall scene is captured from a high angle, providing a clear view of the delta's structure.

# GreenDelta and openLCA

# GreenDelta and openLCA



➤ v.1.0	2006/2007
➤ v.1.1	2009
➤ v.1.2	2011
➤ v.1.3	2013
➤ v.1.4	2014
➤ v.1.5	2016
➤ <b>v1.6</b>	<b>2017</b>



# New features in 1.6

Data quality systems

# openLCA Data quality

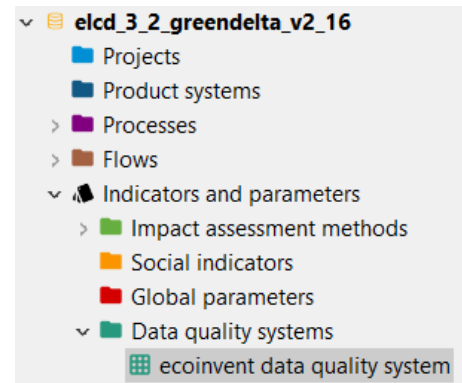


## Motivation

- Be able to document and calculate data quality

## Solution in openLCA

- New database element: Data Quality System



- The user can create his/her own system for evaluating data quality → flexible (e.g. choose number of indicators)

# openLCA Data quality systems



- Ecoinvent „Pedigree matrix“ as exemplary DQ system

ecoinvent data quality system

Data quality system: ecoinvent data quality system

General information

Indicators & Scores

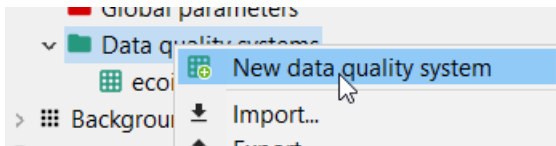
	1	2	3	4	5	Add score
Reliability	Verified data based on measurements	Verified data partly based on assumptions or non-verified data based on measurements	Non-verified data partly based on qualified estimates	Qualified estimate (e.g. by industrial expert)	Non-qualified estimates	Remove indicator
Completeness	Representative data from all sites relevant for the market considered, over an adequate period to even out normal fluctuations	Representative data from > 50% of the sites relevant for the market considered, over an adequate period to even out normal fluctuations	Representative data from only some sites (< 50%) relevant for the market considered or > 50% of sites but from shorter periods	Representative data from only one site relevant for the market considered or some sites but from shorter periods	Representativeness unknown or data from a small number of sites and from shorter periods	Remove indicator
Temporal correlation	Less than 3 years of difference to the time period of the data set	Less than 6 years of difference to the time period of the data set	Less than 10 years of difference to the time period of the data set	Less than 15 years of difference to the time period of the data set	Age of data unknown or more than 15 years of difference to the time period of the data set	Remove indicator
Geographical correlation	Data from area under study	Average data from larger area in which the area under study is included	Data from area with similar production conditions	Data from area with slightly similar production conditions	Data from unknown or distinctly different area (North America instead of Middle East, OECD-Europe instead of Russia)	Remove indicator
Further technological correlation	Data from enterprises, processes and materials under study	Data from processes and materials under study (i.e. identical technology) but from different enterprises	Data from processes and materials under study but from different technology	Data on related processes or materials	Data on related processes on laboratory scale or from different technology	Remove indicator
Add indicator	Remove score	Remove score	Remove score	Remove score	Remove score	

# openLCA Data quality systems

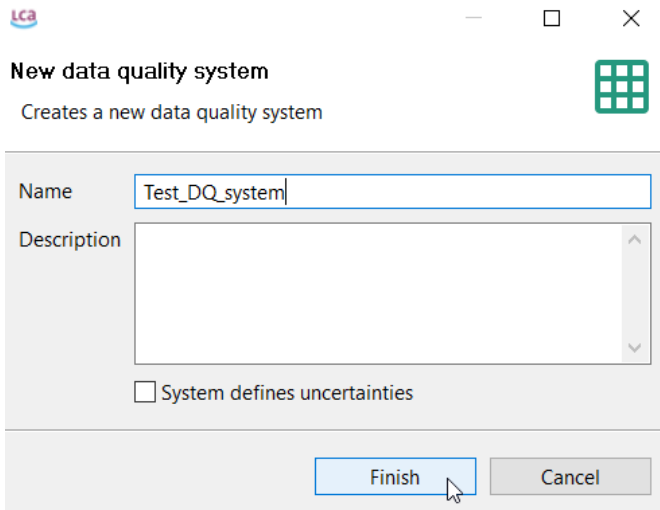


- Creating a new DQ system

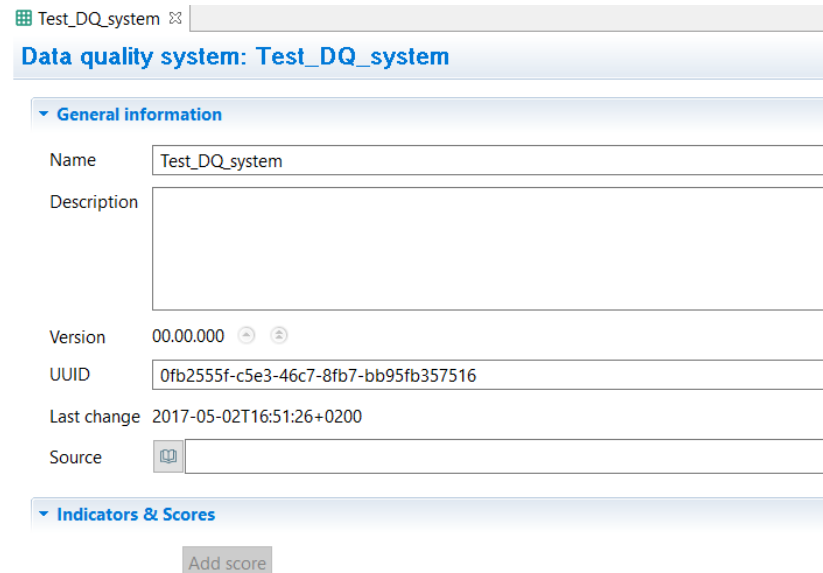
1.



2.



3.



4.

Add indicator



# openLCA Data quality systems



- Defining indicators and scores

Test\_DQ\_system

### Data quality system: Test\_DQ\_system

**General information**

Name: Test\_DQ\_system

Description:

Version: 00.00.001

UUID: 0fb2555f-c5e3-46c7-8fb7-bb95fb357516

Last change: 2017-05-02T16:59:08+0200

Source:

**Indicators & Scores**

	Good	Medium	Bad	
General data quality	General data quality - Good quality	General data quality - Medium quality	General data quality - Bad quality	Add score
	Remove score	Remove score	Remove score	Remove indicator

Add indicator

# openLCA Data quality systems



## Using a DQ system

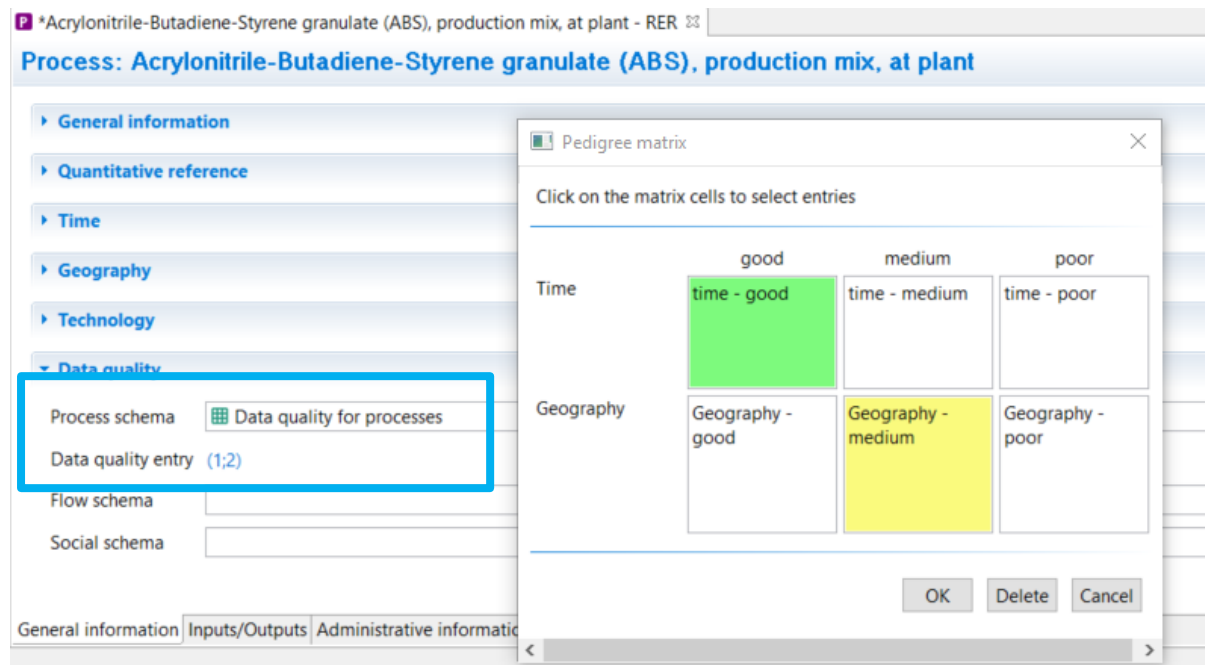
- Data quality systems can be used on three levels:
  1. For the general data quality of a process
  2. For the data quality of each exchange in a process
  3. For the data quality of social aspects

# openLCA Data quality systems



## Using a DQ system

- Data quality systems can be used on three levels:
  - For the general data quality of a process



Only for documenting data quality !

# openLCA Data quality systems



## Using a DQ system

- Data quality systems can be used on three levels:
  1. For the data quality of each input and output of a process
  2. For the data quality of each exchange in a process
  3. For the data quality of each input and output of a process

▼ Data quality

Process schema

Data quality entry (1:2)

Flow schema

Social schema

General information | Inputs/Outputs | Administrative information | Modeling and validation | Parameters | Allocation | Social aspects

# openLCA Data quality systems



## Using a DQ system

- Data quality systems can be used on three levels:
  - For the data quality of each exchange in a process

\*Acrylonitrile-Butadiene-Styrene granulate (ABS), production mix, at plan...

Process: Acrylonitrile-Butadiene-Styrene granulate (ABS), production mix, at plant

Inputs 1.23

Flow	Category	Amount	Unit	Costs	Uncertainty	Provider	Data quality entry	Des...
Chemicals (unspecified)	Production residue...	-0.00414	kg		none	P Dumm...		
Barite	Resource/in ground	7.73207E-7	kg		none			
Sodium nitrate, in ground	Resource/in ground	3.89724E-10	kg		none			
Dolomite, in ground	Resource/in ground	5.91516E-6	kg		none			
Chromium	Resource/in ground	3.65590E-8	kg		none			

Outputs 1.23

Flow	Category	Amount	Unit	Costs/Rev...	Uncertainty	Avoided ...	Data qual...	Des...
acrylonitrile-butadiene-s...	Materials producti...	1.00000	kg		none			
PAH, polycyclic aromatic...	Emission to air/uns...	2.16500E-6	kg		none			
NM VOC, non-methane v...	Emission to air/uns...	0.00446	kg		none			
Waste paper	Production residue...	8.25962E-7	kg		none	<input type="checkbox"/>		
Chlorate	Emission to water/...	1.51049E-6	kg		none			

General information | Inputs/Outputs | Administrative information | Modeling and validation | Parameters | Allocation | Social aspects

Before:  
„Pedigree  
matrix“

# openLCA Data quality systems



## Using a DQ system

- Data quality systems can be used on three levels:
  - For the data quality of each exchange in a process

Pedigree matrix

Click on the matrix cells to select entries

Reliability	Verified data based on measurements	Verified data partly based on assumptions or non-verified data based on measurements	Non-verified data from only some sites (< 50% of sites relevant for the market considered, over an adequate period to even out normal fluctuations)	Qualified estimate (e.g. by industrial expert)	Non-qualified estimates
Completeness	Representative data from all sites relevant for the market considered, over an adequate period to even out normal fluctuations	Representative data from > 50% of the sites relevant for the market considered, over an adequate period to even out normal fluctuations	Representative data from only some sites (< 50% of sites relevant for the market considered or > 50% of sites but from shorter periods)	Representative data from only one site relevant for the market considered or some sites but from shorter periods	Representativeness unknown or data from a small number of sites and from shorter periods
Temporal correlation	Less than 3 years of difference to the time period of the data set	Less than 6 years of difference to the time period of the data set	Less than 10 years of difference to the time period of the data set	Less than 15 years of difference to the time period of the data set	Age of data unknown or more than 15 years of difference to the time period of the data set
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Further technological correlation	Data from enterprises, processes and materials under study	Data from processes and materials under study (i.e. identical technology) but from different enterprises	Data from processes and materials under study but from different technology	Data on related processes or materials	Data on related processes on laboratory scale or from different technology

Base uncertainty: 1.0 og: 1.4202372169264263 Use as uncertainty value

OK Cancel

\*Acrylonitrile-Butadiene-Styrene granulate (ABS), production mix, at plan...

Process: Acrylonitrile-Butadiene-Styrene granulate (ABS), production mix, at plant

Inputs

Flow	Category	Amount	Unit	Costs	Uncertainty	Provider	Data quality entry
Chemicals (unspecified)	Production residue...	-0.00414	kg		none	P Dumm...	(1;2;3;4;5)

# openLCA Data quality systems



## Using a DQ system

- Data quality systems can be used on three levels:
  - For the data quality of environmental aspects
  - For the data quality of economic aspects
  - For the data quality of social aspects

A screenshot of the openLCA software interface. The "Data quality" section is expanded, showing a list of data quality systems. The "Social schema" entry, labeled "Data quality for social data", is highlighted with a blue border. Below this, a navigation bar shows various tabs: "General information", "Inputs/Outputs", "Administrative information", "Modeling and validation", "Parameters", "Allocation", and "Social aspects".

Data quality	
Process schema	Data quality for processes
Data quality entry	(1;2)
Flow schema	ecoinvent data quality system
Social schema	Data quality for social data

General information | Inputs/Outputs | Administrative information | Modeling and validation | Parameters | Allocation | Social aspects

# openLCA Data quality systems



## Calculation with DQ system

- For the calculation of the data quality of a product system an aggregation needs to be done.

A screenshot of the "Calculation properties" dialog box in openLCA. The dialog box has a title bar with the openLCA logo and the text "Calculation properties". Below the title bar, the text "Calculation properties" and "Please select the properties for the calculation" is displayed. The dialog box contains several settings: "Allocation method" is set to "None"; "Impact assessment method" is set to "ReCiPe 2008, midpoint (H) [v1.11, December 2014]"; "Normalization and weighting set" is empty; "Calculation type" has four radio buttons: "Quick results" (selected), "Analysis", "Regionalized LCIA", and "Monte Carlo Simulation". Below these settings, there are two checkboxes: "Include cost calculation" (unchecked) and "Assess data quality" (checked). A blue rectangular box highlights the "Assess data quality" checkbox. At the bottom of the dialog box, there are four buttons: "< Back", "Next >", "Finish" (highlighted with a blue border), and "Cancel".



# openLCA Data quality systems



## Calculation with DQ system

- You are free to select an aggregation method, a rounding method and what to do with exchanges that do not have a data quality value.

A screenshot of the 'LCA Calculation properties' dialog box. The title bar shows 'LCA Calculation properties' with standard window controls. The main section is titled 'Data quality properties' and contains the instruction 'Please select the properties for the data quality assessment'. Below this are five dropdown menus: 'Process schema' (Data quality for processes), 'Flow schema' (ecoinvent data quality system), 'Aggregation type' (Weighted average), 'Rounding mode' (Half up), and 'n.a. value handling' (Exclude zero values). A blue rectangular box highlights the 'Aggregation type', 'Rounding mode', and 'n.a. value handling' options. At the bottom, there are four buttons: '< Back', 'Next >', 'Finish', and 'Cancel'. The 'Finish' button is highlighted with a blue border.

# openLCA Data quality systems



## Calculation with DQ system

### Analysis result of Wood window

#### General information

#### Top 5 contributions to flow results - overview

#### Top 5 contributions to impact category results - overview

#### Data quality

Process data quality schema  Data quality for processes

Flow data quality schema  ecoinvent data quality system

Aggregation

Rounding mode

n.a. value handling

#### Process data quality statistics

Indicator	Coverage
<input checked="" type="checkbox"/> Time	6.67% (1/15)
<input checked="" type="checkbox"/> Geography	6.67% (1/15)

Number of processes that have process DQ defined

#### Flow data quality statistics

Indicator	Coverage
> <input checked="" type="checkbox"/> Temporal correlation	0.0% (0/1215)
> <input checked="" type="checkbox"/> Geographical correlation	0.0% (0/1215)
> <input checked="" type="checkbox"/> Completeness	0.0% (0/1215)
> <input checked="" type="checkbox"/> Reliability	0.0% (0/1215)
> <input checked="" type="checkbox"/> Further technological correlation	0.0% (0/1215)

Number of elementary flows that have DQ defined

# openLCA Data quality systems



## Calculation with DQ system

- The calculated data quality is shown in the **inventory results tab** and the LCIA results/impact analysis

**Inventory results**

Inputs

Cut-off 1,0 %

Name	Category	Sub-category	Amount	Unit	R	C	T	G	F
> Fe Aggregate, natural	Resource	in ground	0.00463	kg					
> Fe Air	Resource	in air	3.23567	kg					
> Fe Barite	Resource	in ground	0.00104	kg					
> Fe Basalt, in ground	Resource	in ground	0.00037	kg					
> Fe Bauxite	Resource	in ground	0.10667	kg					
> Fe biomass; 14.7 MJ/kg	Resource	biotic	3.21387E-10	MJ					

Outputs

Cut-off 1,0 %

Name	Category	Sub-category	Amount	Unit	R	C	T	G	F
> Fe Cadmium	Emission to water	ocean	8.70677E-9	kg					
> Fe Calcium	Emission to soil	unspecified	0.00033	kg					
> Fe Calcium	Emission to water	fresh water	0.01991	kg					
> Fe Calcium	Emission to water	ocean	2.71465E-8	kg					
> Fe Carbon dioxide	Emission to air	unspecified	1.14892	kg	2	2	2	2	2
> Fe Carbon disulfide	Emission to air	unspecified	2.03093E-11	kg					

Total requirements

Process	Product	Amount	Unit	T	G
P Pine wood, production mix, at saw mill, ti...	Fe pine wood	5.00000	kg		
P Wood window - DE	Fe wood window	1.00000	Item(s)	2	2
P Container glass (delivered to the end user...	Fe Glass (formed & finished)	1.00000	kg	1	1
P Aluminium sheet, production mix, at plan...	Fe aluminium sheet	0.10000	kg		
P Dummy_Plutonium as residual product	Fe Plutonium as residual pr...	-4.06818E-9	kg		
P Dummy_CaF2 (low radioactive)	Fe CaF2 (low radioactive)	-6.85185E-7	kg		

General information | Inventory results | Impact analysis | Process results | Contribution tree | Grouping | Locations | Sun burst | Sankey diagram

# openLCA Data quality systems



## Calculation with DQ system

- The calculated data quality is shown in the inventory results tab and the **LCIA results/impact analysis**

**Impact analysis**

Subgroup by processes  Cut-off 1,0 %

Name	Category	Inventory re...	Impact factor	Impact result	Unit	R	C	T	G	F
> Climate Change				1.23012	kg C...	2	2	2	2	2
> Terrestrial acidification				0.00528	kg S...	5	5	5	5	5
> Agricultural land occupation				0.00000	m2*a					
> Fossil depletion				0.34777	kg oi...	5	5	5	5	5
> Water depletion				0.00515	m3	5	5	5	5	5
> Urban land occupation				0.00000	m2*a					
> Marine eutrophication				0.00022	kg N...	5	5	5	5	5
> Human toxicity				0.08986	kg 1,...	5	5	5	5	5
> Ionising radiation				0.11778	kg U...	5	5	5	5	5
> Natural land transformation				0.00000	m2					
> Marine ecotoxicity				0.00030	kg 1,...	5	5	5	5	5
> Freshwater eutrophication				1.88506E-5	kg P ...	5	5	5	5	5
> Freshwater ecotoxicity				0.00019	kg 1,...	5	5	5	5	5
> Terrestrial ecotoxicity				4.39360E-5	kg 1,...	5	5	5	5	5
> Ozone depletion				9.73051E-8	kg C...	5	5	5	5	5
> Metal depletion				0.05383	kg F...	5	5	5	5	5
> Photochemical oxidant formatio				0.00310	kg N...	5	5	5	5	5
> Particulate matter formation				0.00159	kg P...	5	5	5	5	5

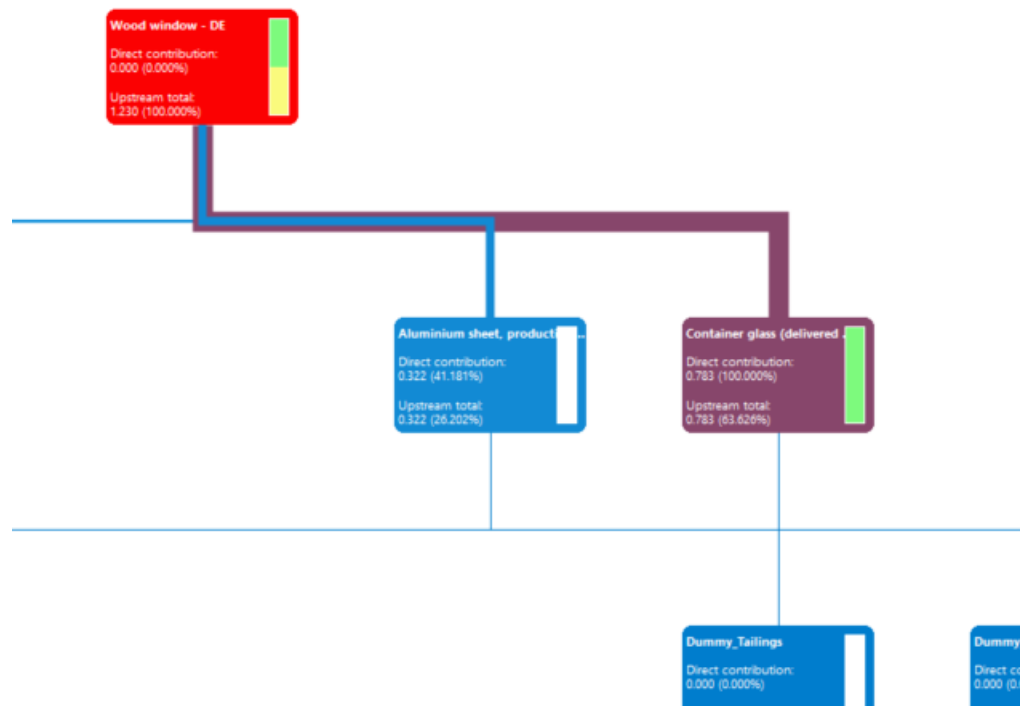
General information | Inventory results | **Impact analysis** | Process results | Contribution tree | Grouping | Locations | Sun burst | Sankey diagram

# openLCA Data quality systems



## Calculation with DQ system

- The process data quality is shown in the sankey diagram



# openLCA Data quality systems



## Uncertainty data derived from DQ system

- Ecoinvent data quality system („Pedigree matrix“)

ecoinvent data quality system

### Data quality system: ecoinvent data quality system

#### General information

#### Indicators & Scores

#### Uncertainties

	1	2	3	4	5
Reliability	1.0	1.05	1.1	1.2	1.5
Completeness	1.0	1.02	1.05	1.1	1.2
Temporal correlation	1.0	1.03	1.1	1.2	1.5
Geographical correlation	1.0	1.01	1.02	1.05	1.1
Further technological correlation	1.0	1.05	1.2	1.5	2.0

# openLCA Data quality systems



## Uncertainty data derived from DQ system

- From the information in the DQ matrix (and the underlying uncertainty factors for each cell), an uncertainty ( $\sigma$ ) can be calculated.

- This uncertainty can be applied to the uncertainty column for exchanges

Pedigree matrix ×

Click on the matrix cells to select entries

	Score 1	Score 2	Score 3
Indicator 1	Indicator 1 - score 1	Indicator 1 - score 2	Indicator 1 - score 3
Indicator 2	Indicator 2 - score 1	Indicator 2 - score 2	Indicator 2 - score 3
Indicator 3	Indicator 3 - score 1	Indicator 3 - score 2	Indicator 3 - score 3

Base uncertainty:   $\sigma$ :

# openLCA Data quality systems



## Uncertainty data derived from DQ system

- It then appears in the „Uncertainty“ column

### Process: Wood window

#### Inputs

Flow	Category	Amount	Unit	Costs	Uncertainty	Provider	Data quality e.
F <sub>2</sub> pine wood	Materials production/Wood	5.00000	kg		lognormal: gnEdit		(1;2;3)
F <sub>2</sub> aluminium sheet	Materials production/Meta...	0.10000	kg		none		(1;1;1)
F <sub>2</sub> Glass (formed & finished)	Materials p				none		(3;3;3)

Uncertainty

Uncertainty distribution: Logarithmic normal distribution

Geometric mean: 1.0

Geometric standard deviation: 1.2603708809003011

OK Test Cancel

#### Outputs

Flow	Category	Costs	Uncertainty	Avoided produ...	Data quality e.
F <sub>2</sub> wood window			none		(1;2;3)

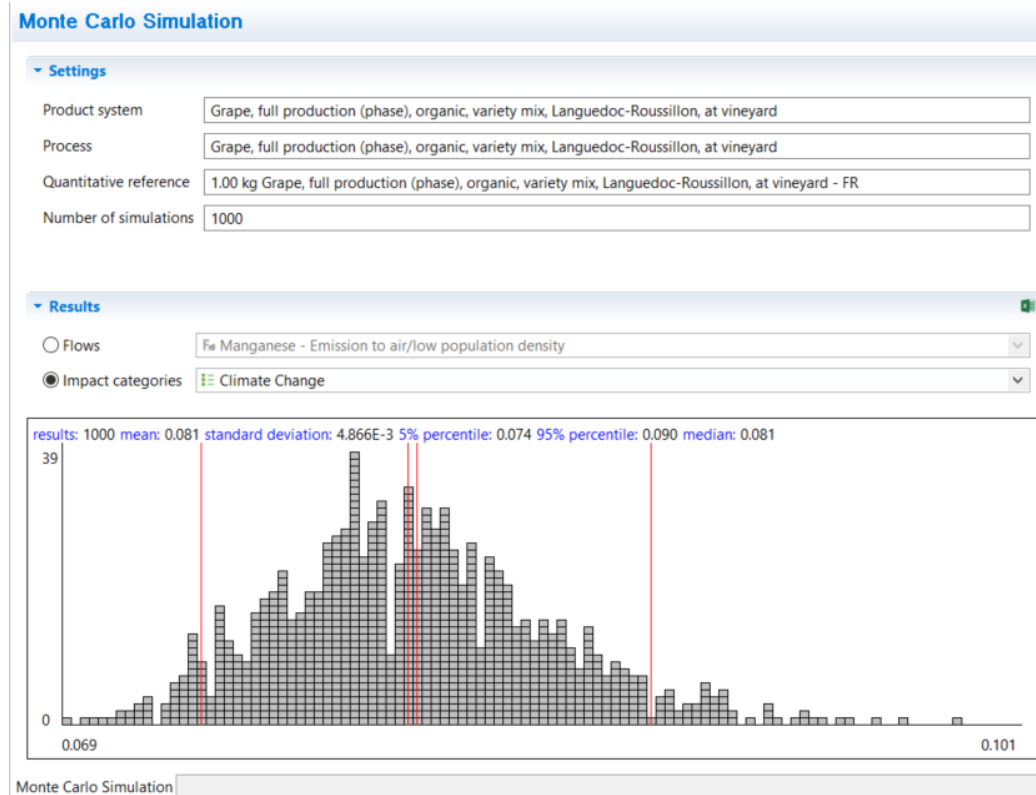


# openLCA Data quality systems



## Uncertainty data derived from DQ system

- This uncertainty data can be used for the Monte Carlo simulation





# New features in 1.6

Collaboration server

# openLCA Collaboration server



## Motivation

- Facilitate group work and establish a real multi-user environment
  - Different potentially distributed users should be able to work within the same database
  - Quality assurance (e.g. tracking of changes) is needed

## Solution

- openLCA as LCA modeling application
- Web application and server (or several) for storing the repository

# openLCA Collaboration server



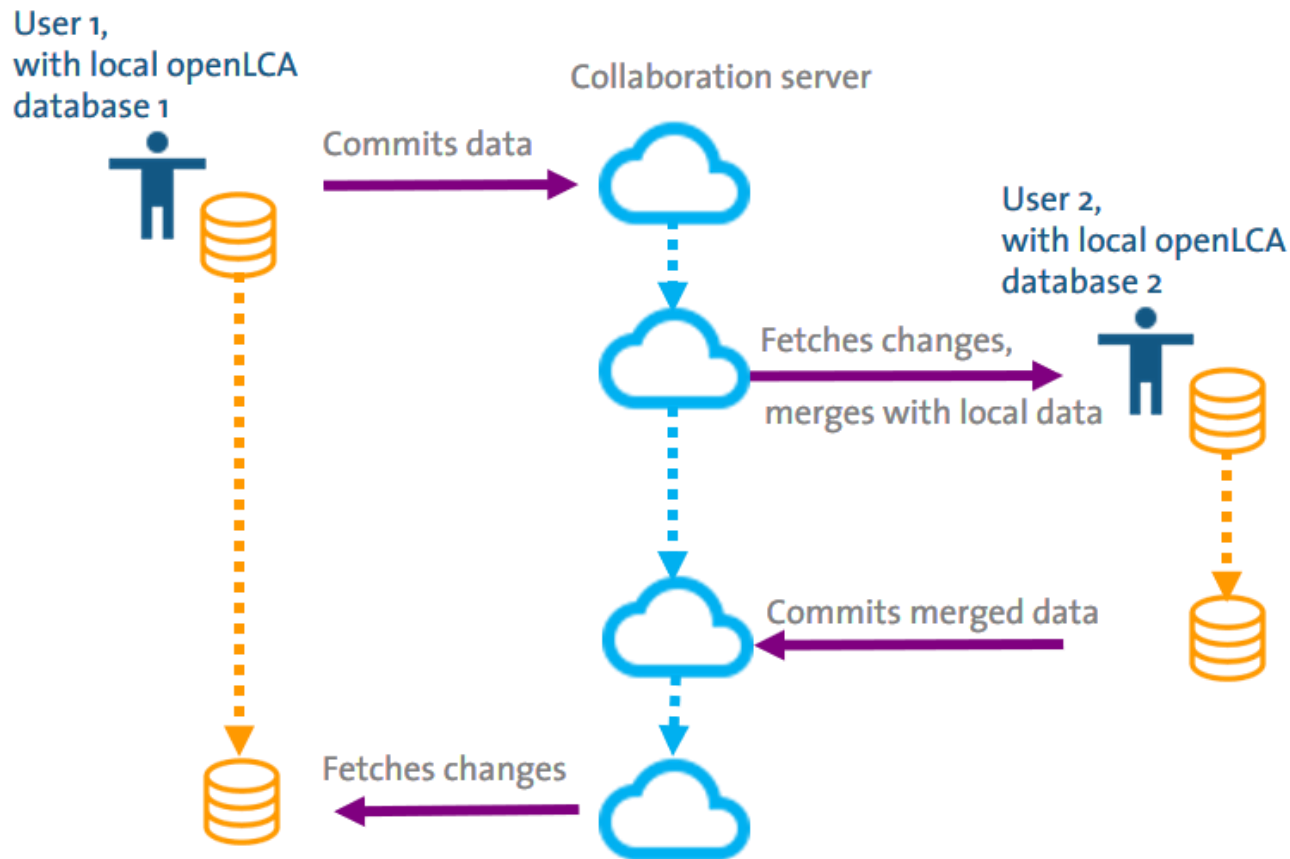
## Functions

- User rights management system
- All changes are documented
- Versioning allows roll-backs
- A diff tool shows where data differs before accepting changes

# openLCA Collaboration server



## Exemplary use case (distributed workgroup)

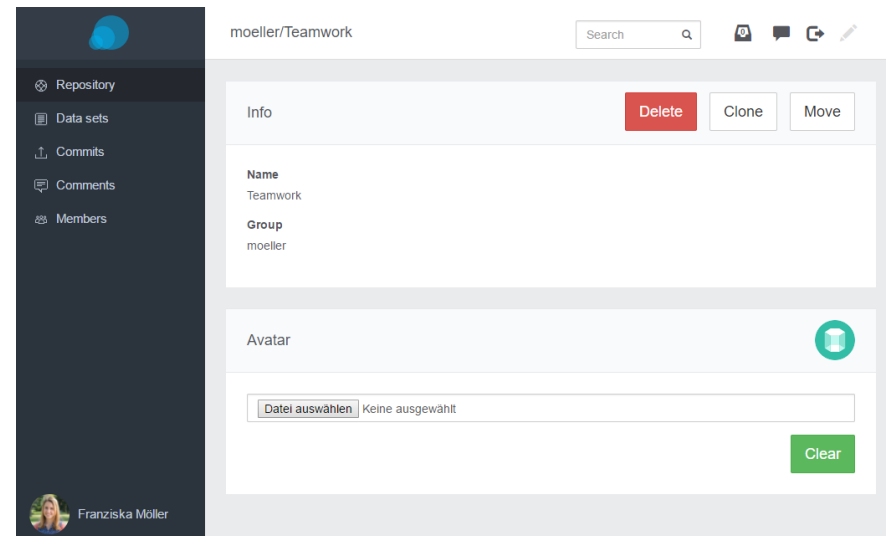
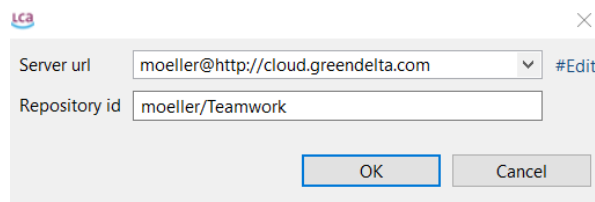
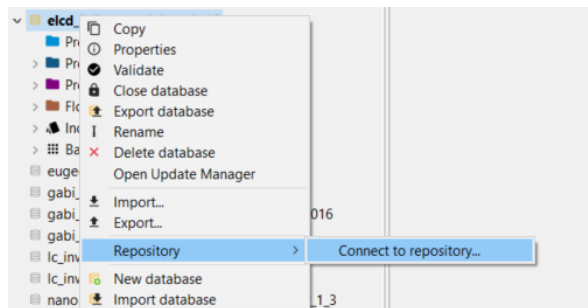


# openLCA Collaboration server



## Exemplary use case – work flow

- A repository is created and User 1 and User 2 are members
- User 1 connects local db to repository

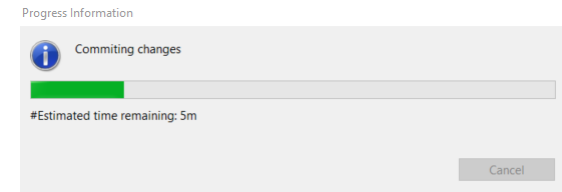
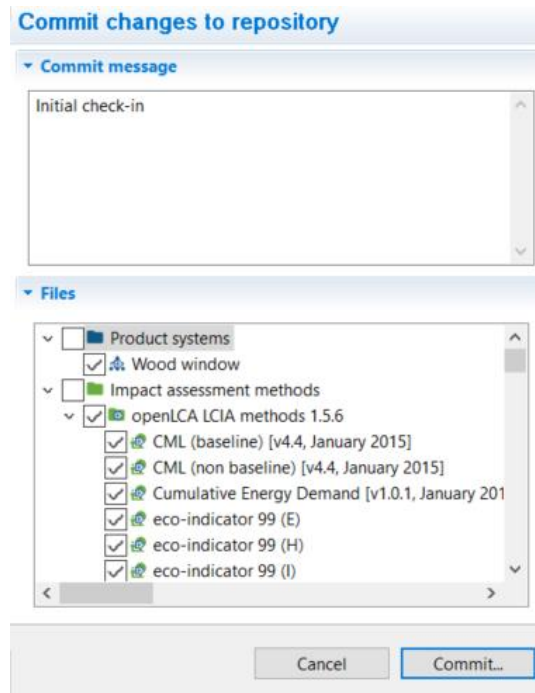
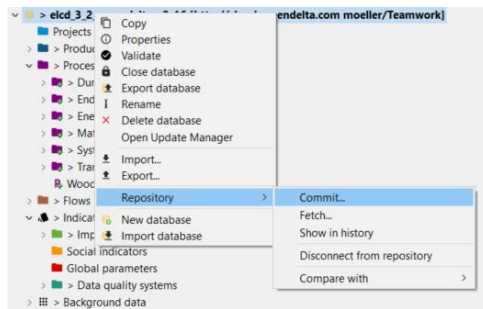


# openLCA Collaboration server



## Exemplary use case – work flow

- User 1 commits data



# openLCA Collaboration server



## Exemplary use case – work flow

- The data appears on the collaboration server

moeller/Teamwork - Data sets

Search

Filter by name

Name	Last change	Commit
Product systems		
Impact methods		
Processes		
Flows		
Flow properties		

moeller/Teamwork - Data sets

Search

Version: Latest [Download]

Fransiska Moller on 5/5/17 4:03 pm

### Wood window P

Inputs/Outputs | Documentation

Flow	Category	Amount	Costs	Uncertainty	Data quality	Provider
F <sub>2</sub> aluminium sheet	Metals and semimetals / Materials production	0.1 kg		Lognormal distribution Geom. mean: 1 Geom. SD: 1	(1;1;1)	
F <sub>2</sub> Glass (formed & finished)	Glass and ceramics / Materials production	1 kg		Lognormal distribution Geom.	(3;3;3)	

**Quantitative reference**  
F<sub>2</sub> wood window  
**Location**  
Germany

**Valid from**  
-

**Valid until**  
-

Fransiska Moller

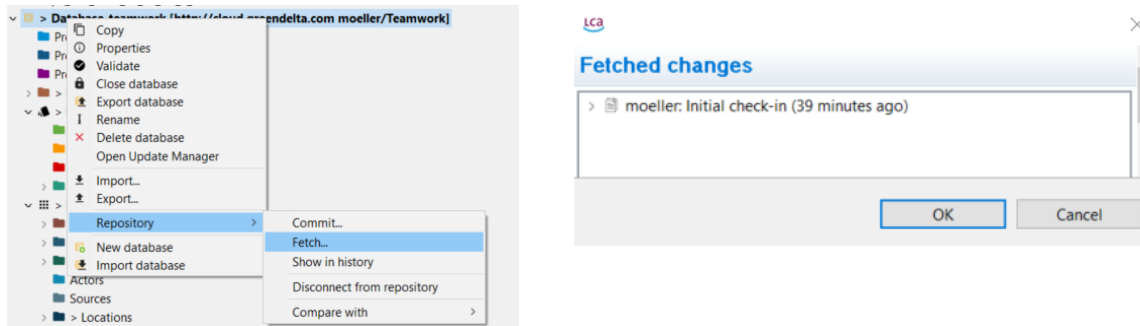


# openLCA Collaboration server

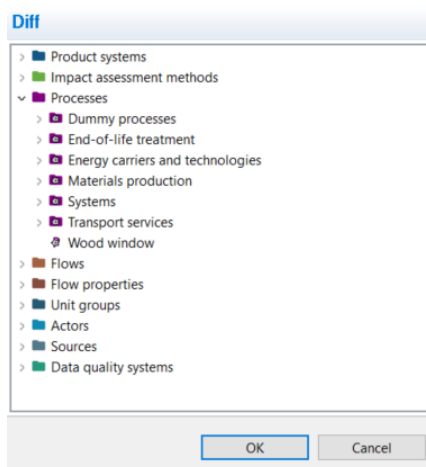


## Exemplary use case – work flow

- User 2 connects to the same repository and fetches data



- Summary of differences to local database appears

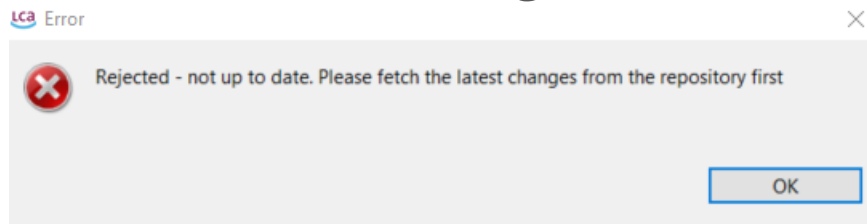


# openLCA Collaboration server

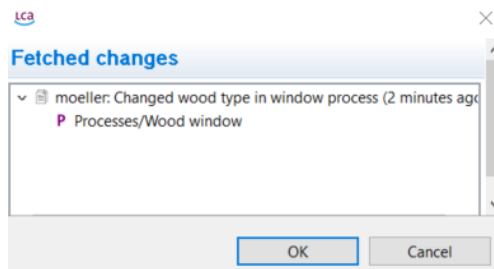


## Exemplary use case – work flow

- User 2 makes change in local data and commits again to repository
- User 1 makes change in local data and wants to commit



- User 1 fetches changes



# openLCA Collaboration server



## Exemplary use case – work flow

- Diff tool shows the differences in the data

Diff: Wood window

Local model	Remote model
Name: Wood window	Name: Wood window
Description: Window production (wooden frame)	Description: Window with wooden frame (spruce wood)
Process type: Unit process	Process type: Unit process
Location: Germany	Location: Germany
Process data quality schema: Data quality for processes Data quality entry: (1;2)	Process data quality schema: Data quality for processes Data quality entry: (1;2)
Exchange data quality schema: Text DQ system with uncertainties Infrastructure process: No	Exchange data quality schema: Text DQ system with uncertainties Infrastructure process: No
> Process documentation	> Process documentation
▼ F Inputs	▼ F Inputs
> Fe 1: pine wood	> 1:
> Fe 2: aluminium sheet	> Fe 2: aluminium sheet
> Fe 3: Glass (formed & finished)	> Fe 3: Glass (formed & finished)
> 4:	> Fe 4: spruce wood
> F Outputs	> F Outputs

Mark as merged

# openLCA Collaboration server



## Exemplary use case – work flow

- Commit history in the web app

The screenshot shows a web interface for 'moeller/Teamwork - Commits'. It features a search bar and a list of commits. The first commit is 'New process description' by Franziska Möller on 5/5/17, with commit ID d12c5930-6707-435e-b74a-59c42c64f280. The second is 'Changed wood type in window process' with ID f9ccb06-d17d-44cc-9049-7d5647dae8d5. The third is 'Initial check-in' with ID 88e384b7-c579-4455-8606-623a5fed66f4.

- Commit history in openLCA

The screenshot shows the 'openLCA 1.6.2' application menu. The 'Window' menu is open, showing options like 'Show views', 'Developer tools', 'Bulk-replace', and 'Formula interpreter'. The 'Other...' option is selected, leading to a sub-menu.

The screenshot shows the 'Show View' dialog box. It has a search field 'type filter text' and a tree view of views. The 'Commit history' view is selected under the 'Other' category. There are 'OK' and 'Cancel' buttons at the bottom.

The screenshot shows the openLCA software interface. The top window is 'Process: Wood window' with input and output tables. The bottom window is 'Commit history' showing a table of commits with a context menu open over the second commit.

Flow	Category	Amount	Unit	Costs	Uncertainty	Provider	Data quali...	Des...
F <sub>2</sub> pine wood	Materials productio...	5.00000	kg		lognormal...		(1;2;3)	
F <sub>2</sub> aluminium sheet	Materials productio...	0.10000	kg		lognormal...		(1;1;1)	
F <sub>2</sub> Glass (formed & finished)	Materials productio...	1.00000	kg		lognormal...		(3;3;3)	

Flow	Category	Amount	Unit	Costs/Rev...	Uncertainty	Avoided p...	Data quali...	Des...
F <sub>2</sub> wood window		1.00000	Item(s)		none		(1;2;3)	

Id	Message	Committer	Commit date
d12c5930-6...	New process description	moeller	2 minutes a...
f9ccb06-d1...	Changed wood type in window process	moeller	13 minutes a...
88e384b7-c5...	Initial check-in	moeller	1 hour ago



# New features in 1.6

Update manager

# openLCA Update manager



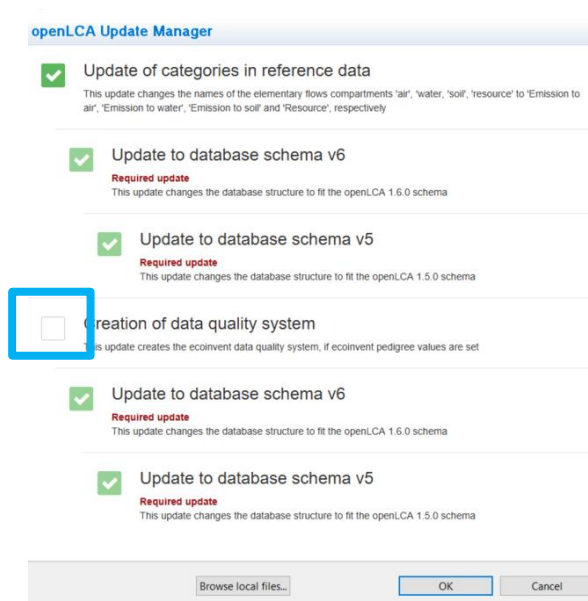
- When opening a database that is not up-to-date all possible updates are shown

A screenshot of the "openLCA Update Manager" dialog box. The title bar reads "openLCA Update Manager". The dialog lists seven updates, each with a green checkmark icon. The updates are: 1. "Update of categories in reference data" with a description: "This update changes the names of the elementary flows compartments 'air', 'water', 'soil', 'resource' to 'Emission to air', 'Emission to water', 'Emission to soil' and 'Resource', respectively". 2. "Update to database schema v6" marked as a "Required update" with description: "This update changes the database structure to fit the openLCA 1.6.0 schema". 3. "Update to database schema v5" marked as a "Required update" with description: "This update changes the database structure to fit the openLCA 1.5.0 schema". 4. "Creation of data quality system" with description: "This update creates the ecoinvent data quality system, if ecoinvent pedigree values are set". 5. "Update to database schema v6" marked as a "Required update" with description: "This update changes the database structure to fit the openLCA 1.6.0 schema". 6. "Update to database schema v5" marked as a "Required update" with description: "This update changes the database structure to fit the openLCA 1.5.0 schema". At the bottom of the dialog, there are three buttons: "Browse local files...", "OK", and "Cancel".

# openLCA Update manager



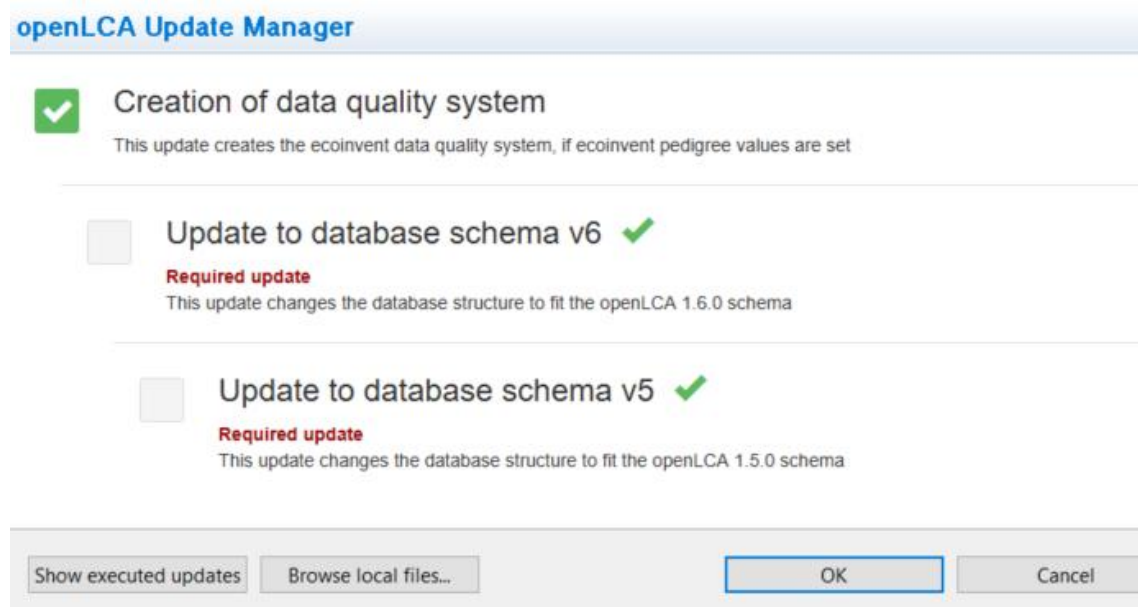
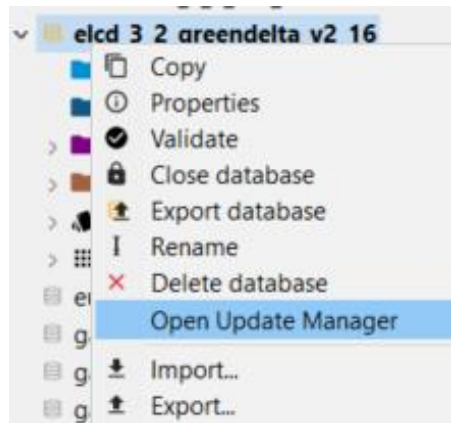
- All updates are checked by default (recommended)
- Required updates have to be installed
- Optional updates can be un-checked and installed later



# openLCA Update manager



- Open Update manager from database



- Choose the updates which you want to run



# openLCA Update manager



- If no optional updates are available

## openLCA Update Manager

No unexecuted updates available.



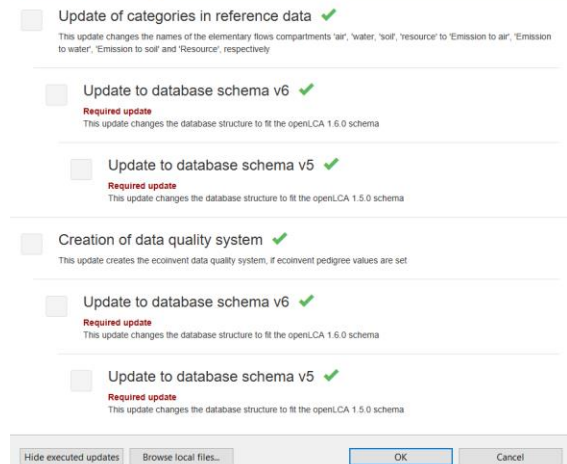
- Show/hide executed updates

## openLCA Update Manager

No unexecuted updates available.



## openLCA Update Manager



An aerial photograph of a desert landscape, showing a network of dry, cracked mud patterns across the terrain. A small, dark, circular pool of water is visible in the lower center of the image. The overall scene is arid and desolate.

Other improvements

# openLCA Other improvements



- Graphical improvements: No more pie charts (in General information and grouping tab)

→ to be able to display negative results

## Results of barley grain, feed production, organic | barley grain, feed, organic | cut-off, U

### General information

Product system barley grain, feed production, organic | barley grain, feed, organic | cut-off, U

Allocation method

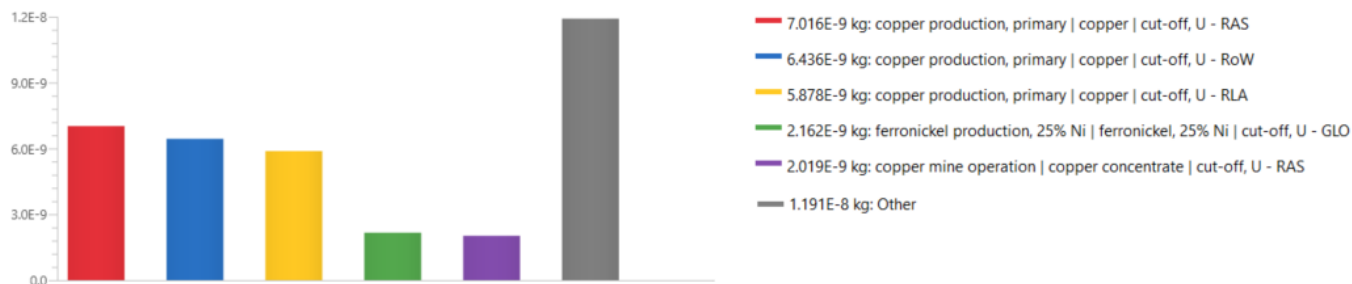
Target amount

Impact assessment method ReCiPe Midpoint (H) [v1.11, December 2014]

Export to Excel

### Top 5 contributions to flow results - overview

Flow Manganese - Emission to air/low population c



# openLCA Other improvements



- Clean-up of Analysis results (New tab „Impact analysis“)

## Impact analysis

### ▼ Impact analysis

Subgroup by processes  Cut-off  %

Name	Category	Inventory result	Impact factor	Impact result	Unit
> Agricultural land occupation				1.92249	m2*a
▼ Climate Change				0.39892	kg CO2 eq
▼ P barley production, organic   barley grain, organic   cut-off, U -	011:Growing of n...			0.19455	kg CO2 eq
F Dinitrogen monoxide	Emission to air / l...	0.00065 kg	298.00000 kg CO2 eq/kg	0.19455	kg CO2 eq
> P combine harvesting   combine harvesting   cut-off, U - RoW	016:Support activi...			0.02406	kg CO2 eq
> P hard coal mine operation   hard coal   cut-off, U - CN	051:Mining of har...			0.00663	kg CO2 eq
> P heat production, anthracite, at stove 5-15kW   heat, central or	353:Steam and air...			0.00487	kg CO2 eq
> P heat production, at hard coal industrial furnace 1-10MW   hea	353:Steam and air...			0.00743	kg CO2 eq
> P liquid manure spreading, by vacuum tanker   liquid manure sp	016:Support activi...			0.00618	kg CO2 eq
> P pig iron production   pig iron   cut-off, U - GLO	241:Manufacture ...			0.00625	kg CO2 eq
> P tillage, cultivating, chiselling   tillage, cultivating, chiselling   c	016:Support activi...			0.01127	kg CO2 eq
> P tillage, harrowing, by spring tine harrow   tillage, harrowing, t	016:Support activi...			0.00645	kg CO2 eq
> P tillage, ploughing   tillage, ploughing   cut-off, U - RoW	016:Support activi...			0.01896	kg CO2 eq
> P transport, freight, sea, transoceanic ship   transport, freight, se	501:Sea and coast...			0.00464	kg CO2 eq
> Fossil depletion				0.06405	kg oil eq
> Freshwater ecotoxicity				0.00253	kg 1,4-DB eq
> Freshwater eutrophication				0.00018	kg P eq
> Human toxicity				0.13717	kg 1,4-DB eq
> Ionising radiation				0.03096	kg U235 eq
> Marine ecotoxicity				0.00247	kg 1,4-DB eq
> Marine eutrophication				0.01806	kg N eq
> Metal depletion				0.02327	kg Fe eq
> Natural land transformation				6.21226E-5	m2
> Ozone depletion				2.92256E-8	kg CFC-11 eq
> Particulate matter formation				0.00257	kg PM10 eq
> Photochemical oxidant formation				0.00208	kg NMVOC
> Terrestrial acidification				0.01519	kg SO2 eq
> Terrestrial ecotoxicity				0.00037	kg 1,4-DB eq
> Urban land occupation				0.01229	m2*a
> Water depletion				0.77369	m3

# openLCA Other improvements



- Process results tab table entries can now be copied to clipboard
- New Hungarian translation

## Sneak peek

- It will be possible in the next version (1.6.3) to save calculated result
  - create an aggregated (system) process out of a product system



An aerial photograph of a desert landscape, likely a sand dune field. The terrain is light-colored and textured with wind-swept patterns. A prominent feature is a small, dark, circular structure or depression in the center of the frame. The image is overlaid on a solid green background.

Upcoming trainings

# openLCA Upcoming trainings



## Group trainings

### Upcoming group trainings

May 8 2017, 2pm CEST: FREE Webinar: What's new in openLCA 1.6?



May 22 & 23 2017: Life Cycle Assessment with openLCA (Berlin, Germany)



June 13 & 14 2017: Life Cycle Assessment with openLCA (Paris or Bordeaux, France)



June 2017: Introduction to openLCA and Life Cycle Assessment (Medellín, Colombia)



Sept/Oct 2017: Life Cycle Assessment with openLCA (Berlin, Germany)



An aerial photograph of a desert landscape, likely a salt flat or a similar arid environment. The terrain is characterized by a central circular feature, possibly a crater or a salt dome, surrounded by a network of branching, dendritic channels or ridges. The overall appearance is that of a complex, eroded surface. The image is overlaid on a solid green background.

Questions?



# GreenDelta

sustainability consulting + software

## Thank you!

Contact

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