# ecoinvent 3.9.1 in openLCA

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|---|---|
| Software version: | openLCA 1.11 / 2.0 |
| Report version: | 1 |
| Date: | 4th December 2022 |


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GreenDeLTa

# Content

# 1 What is new in ecoinvent 3.9.1?

The latest version 3.9.1 of the ecoinvent database was released by the ecoinvent Association the 15th of December 2022 and includes major updates of 1099 new processes (datasets), 1876 updated datasets and 271 new products. Some of these updates and additions are listed below.

## 1.1 New and updated datasets

**Agriculture:**

*"The sector features updates introducing data on new crops produced in Canada and Brazil. Specifically, ecoinvent v3.9 includes data on the production of new crops from Canada, such as pinto bean, red kidney bean, fava bean, and navy bean. Further, it introduces data on the production of new products (peanut) and updates data on the production of major products from Brazil, including coffee, sugar cane, soybean, and maize. Data for these updates were provided by the University of British Columbia (Canada) and Embrapa (Brazil). ecoinvent 3.9 also features new and updated data on pesticides, which may affect the results of assessments for agricultural processes and products."* [1]

**Batteries:**

*"ecoinvent v3.9 continues the improvement of the representation of batteries in the ecoinvent database. This year's update includes new datasets on the 'Lithium, Iron, and Phosphate' battery technology, thus, expanding the coverage of battery chemistries now including 5 important technologies. These datasets were created by the Swiss Federal Laboratories for Materials Science and Technology (EMPA) and include battery components specifically for this type of battery as well as the production of lithium iron phosphate. Complementary, the datasets for battery separator and electrolyte were updated."* [1]

**Building & Construction:**

*"In ecoinvent v3.9, the sector is enhanced with new data for cement and concrete using recycled and waste mixed aggregates. Furthermore, new nomenclature rules have been introduced for the cement and concrete supply chains. The goal of these new rules is consistency across all geographies, alignment with the nomenclature used in industry standards and a clear structure that can facilitate the users understanding of the different cement and concrete types and the selection of the product with the right properties for their study. Along with the change in nomenclature, the global datasets for cement and concrete production have also been restructured and only the most representative datasets for the global geography have been maintained."* [1]

**Chemicals & Plastics:**

*"The Chemicals sector is updated to include 36 new chemical products developed for the EF initiative, mainly pesticides and plasticizers, including ethephon, triclopyr, and dioctyl adipate. The data is integrated following the ecoinvent approach. Moreover, ecoinvent v3.9 takes the first step to gradually improve the representation of hydrogen in the ecoinvent database. Specifically, ecoinvent v3.9 introduces data on the main production technology for hydrogen (steam reforming) in Europe and the World."* [1]

[1] Adpated from https://ecoinvent.org/the-ecoinvent-database/data-releases/ecoinvent-3-9 (accessed 04.01.2023)

### Electricity:

*"ecoinvent v3.9 updates the electricity market mixes to reflect the situation in 2019. In the case of the US, Canada, and Switzerland the electricity mixes are updated to reflect the situation in 2020. The update of the Swiss data is based on Swiss national data, while the rest of this update is based on data from the International Energy Agency (IEA). This year, the electricity mixes for China, India, and Brazil are also updated to reflect the situation in the countries in 2020, 2019, and 2020 respectively. These updates are performed, based on national statistics, while in the case of Brazil the data was provided by ACV Brasil. Moreover, all submarkets in these countries are updated, thus better representing the electricity situation in the various regions. The electricity mix for State Grid Corporation of China (SGCC) was split into its six subregions, now better reflecting the local conditions. At the same time, all electricity markets in the ecoinvent database are adjusted to include these updates. ecoinvent v3.9 also updates the data on electricity transmission networks. Specifically, this version updates the data on the infrastructure used for electricity transmission, which is also reflected in the electricity market datasets. For the countries where data is available, this update also introduces separate data for aerial, underground, and subsea cables. ecoinvent v3.9 further introduces residual mixes, based on data provided by the Association of Issuing Bodies (AIB)."* [2]

### Metals:

*"This update expands the data coverage of the Metals sector with new and updated data. Specifically, ecoinvent v3.9 introduces data on new metal products, including antimony, borates, germanium, zirconium and hafnium. New and updated datasets were provided by the Swiss Federal Laboratories for Materials Science and Technology, EMPA (sponsored by the Swiss Federal Office for the Environment, BAFU)."* [2]

### Pulp & Paper:

*"The Pulp and Paper sector has been updated with new and updated on products used to produce packaging materials and paper, including data from industry associations. This update expands the geographical coverage of the data."* [2]

### Oil & Gas:

*"ecoinvent v3.9 introduces an extensive overhaul of the data on natural gas and crude petroleum oil supply. Specifically, this version includes an update on the natural gas and crude petroleum oil supply chains (production, long-distance transport, and regional distribution) in the ecoinvent database to reflect the global supply situation in 2019. The geographical coverage in the database is expanded with data on the production of natural gas and crude petroleum oil in different countries and regions. When combined, the ecoinvent database now covers 90% of the global production of crude oil and nearly 80% of natural gas. In addition, the update introduces regional consumption mixes for crude petroleum oil to North America and Europe, alongside new or updated natural gas supply to 44 countries, based on the situation in 2019. The update integrates data on the flaring of natural gas from the Global Gas Flaring Reduction Partnership (GGFR) of the World Bank and on methane emissions from gas venting and fugitive emission source from the International Energy Agency's Methane Tracker 2022. Building on earlier studies commissioned by the Swiss Federal Office for the Environment (FOEN), the Swiss Federal Office for Energy (SFOE), the Swiss Gas Industry Association (Verband der Schweizerischen Gasindustrie, VSG), and Avenergy Suisse (previously Erdöl-Vereinigung), this update was commissioned by the ecoinvent Association and prepared by ESU-services Ltd."* [2]

### Waste:

*"ecoinvent v3.9 introduces the first part of the Waste sector overhaul. Specifically, this update disaggregates the wastewater treatment chains, allowing visibility of the by-products of waste-water treatment and its subsequent treatments."* [2]

[2] Adpated from https://ecoinvent.org/the-ecoinvent-database/data-releases/ecoinvent-3-9 (accessed 04.01.2023)

## 1.2 Updates for the emission factors (LCIA Methods)

*"ecoinvent v3.9 integrates IPCC 2021, updates the EF method by the European Platform on Life Cycle Assessment to v3.1, and implements the latest versions of Ecological Scarcity (2021), ReCiPe (2016), TRACI v2.1, EPS (2020). With ecoinvent v3.9, Crustal Scarcity Indicator (2020) is now offered to ecoinvent users for the first time. With these new and updated methods, ecoinvent v3.9 offers more up-to-date emission scores on climate change, mineral resources, land use, water depletion, ozone depletion, and freshwater ecotoxicity, as well as impact scores expressed in monetary values, among other* things." [3]

## 1.3 Updates on the product information

*"Since ecoinvent v3.8, all products and services included in the database include a description that supports users in identifying them. The information includes a definition of the product or service as seen in the database. At the same time, the documentation of the services incorporates supporting information on how to use them. With ecoinvent v3.9, the database-wide update and expansion of the information on products and services is now complete, including enhanced product characteristics. This feature is also implemented in various LCA software tools, offering enhanced transparency to LCA practitioners. Please contact your software provider for more information."* [3]

## 1.4 Updates on Nomenclature & Identifiers

*"Following ecoinvent's participation in the GLAD project, ecoinvent v3.9 updates the nomenclature and identifiers of the complete list of elementary exchanges (environmental flows). Specifically, ecoinvent v3.9 updates names, CAS numbers, formulas, and synonyms of the exchanges. The result of this update is an improved list of elementary exchanges that is now more aligned with the respective lists of other databases. This helps modelers using the ecoinvent database to easier identify and choose the data needed for their assessments. This update also improves the interoperability of the ecoinvent database with other databases around the world and enhances collaboration in assessing environmental impacts."* [3]

[3] Adpated from https://ecoinvent.org/the-ecoinvent-database/data-releases/ecoinvent-3-9 (accessed 30.11.2022)

## 1.5 Get ecoinvent 3.9.1 for openLCA from Nexus

ecoinvent 3.9.1 is available for download for openLCA exclusively on https://nexus.openlca.org. Please note that versions of ecoinvent 3.9.1 obtained elsewhere will not be compatible with openLCA. The ecoinvent licence purchased via nexus.openLCA.org is downward compatible.

In addition, users with an ecoinvent 3.9.1 license will also receive access to older versions of ecoinvent. All the different data packs can be used as independent databases in openLCA or combined together, if necessary[4]. However, special attention should be paid to integrating older versions of ecoinvent databases with the ecoinvent version 3.9.1 database.

The Life Cycle Impact Assessment (LCIA) methods by ecoinvent are available in a method package via openLCA Nexus, too. With this package it is possible to reproduce the LCIA results provided by the ecoinvent Association. However, the use of the openLCA LCIA method package (currently version 2.2.0 at the release date) is also possible and recommended by GreenDelta.

[4] It is recommended to always import the data pack of smaller size into the bigger one to reduce the time of the import (e.g. unit process data files into LCI data files)

# 2 Unique and interesting properties of the ecoinvent database

Several aspects are worth being noted about the ecoinvent database. Most of them have also been provided with previous versions of the database. These include:

- three different "system models" that reflect different allocation, cut-off and substitution rules, and rules for modelling end-of-life and recycling, besides the most recent system model "allocation, cut-off, EN15804", currently released for ecoinvent 3.8 by GreenDelta
- every process dataset is available as a unit process and as a system process (with very few exceptions) in each of the system models
- separate documentation is available for each data set, and the link to this information can be found in openLCA software, under:

  Process → General Information → Description (last sentence)

- a correspondence file is provided by ecoinvent with changes from the previous version to the current version of ecoinvent databases
- costs/revenues provided by ecoinvent are included in the database, with the exception of waste flows and products from recycling

For more information about the content and methodology of the ecoinvent 3.9.1 database, please check the ecoinvent website (https://ecoinvent.org/), and the report of changes[5] for ecoinvent 3.9 and 3.9.1 from the ecoinvent website.

[5] From https://ecoinvent.org/wp-content/uploads/2022/10/Change-Report-v3.9.pdf (accessed 04.01.2023)

# 3 Implementation of ecoinvent 3.9.1 in openLCA

ecoinvent 3.9.1 Consequential, and Cutoff are implemented for openLCA 1.11 and are compatible with openLCA 2.0. As in the previous ecoinvent 3 versions, data packs generated by the ecoinvent centre from the undefined ecoinvent database are provided containing the different system models, all as unit and aggregated (system[6]) processes:

- Allocation at the Point of Substitution: "The system model 'allocation at the point of substitution' is also known as the APOS system model. It follows an attributional approach in which the responsibility over wastes (burdens) are shared between producers and subsequent users benefiting of the treatment processes by using valuable products generated in these."[7] (this system model will be released for version 3.9.1 as soon as it is published by the ecoinvent Association)
- Allocation cut-off by classification: "The system model 'allocation, cut-off by classification', or the cut-off system model, is based on the recycled content, or cut-off, approach. In this system model, wastes are the producer's responsibility ('polluter pays'), and there is an incentivisation to use recyclable products, that are available burden free (cut-off)."[8]
- Allocation, cut-off, EN15804: "The system model 'allocation, cut-off, EN15804' has been developed to support the needs of Environmental Product Declaration (EPD) practitioners. The system model is compliant with an attributional interpretation of EN15804, ISO21930 and ISO14025. It provides all Life Cycle Inventory (LCI) indicators required by the aforementioned standards and adheres to the end-of-waste criteria set by the European Commission."[9] (this system model is currently released for openLCA for the previous ecoinvent version 3.8)
- Substitution, consequential, long-term: "The system model 'substitution, consequential, long-term' is also known as the consequential system model. This model uses different basic assumptions to assess the consequences of a change in an existing system. It applies substitution to credit processes with the avoided burdens from supply chains that are replaced by the by-products generated within them."[10]

System models in ecoinvent version 3 are explained in detail on the ecoinvent website.

[6] Named "LCI" in the database files

[7] From https://ecoinvent.org/the-ecoinvent-database/system-models/#!/allocation (accessed 04.01.2023)

[8] From https://ecoinvent.org/the-ecoinvent-database/system-models/#!/allocation-cut-off (accessed 04.01.2023)

[9] From https://ecoinvent.org/the-ecoinvent-database/system-models/#!/EN15804 (accessed 04.01.2023)

[10] From https://ecoinvent.org/the-ecoinvent-database/system-models/#!/substitution (accessed 04.01.2023)

## 3.1 ecoinvent 3.9.1 regionalised unit process database

Besides the data packs provided by ecoinvent, GreenDelta also prepared a regionalised version of the database (only for the unit process database). In the non-regionalised versions of ecoinvent, elementary flows in the inventory of a process are generic and not assigned to a specific location (Figure 1). In the regionalised versions of ecoinvent, some elementary flows in the inventory of a process are region-specific as indicated by codes[11] for the names of countries, dependent territories, and particular areas of geographical interest. Region-specific elementary flows allow usage of region-specific characterisation/impact factors in Life Cycle Impact Assessment methods (e.g. Ammonia flow – emission to air / low population density in Figure 2).

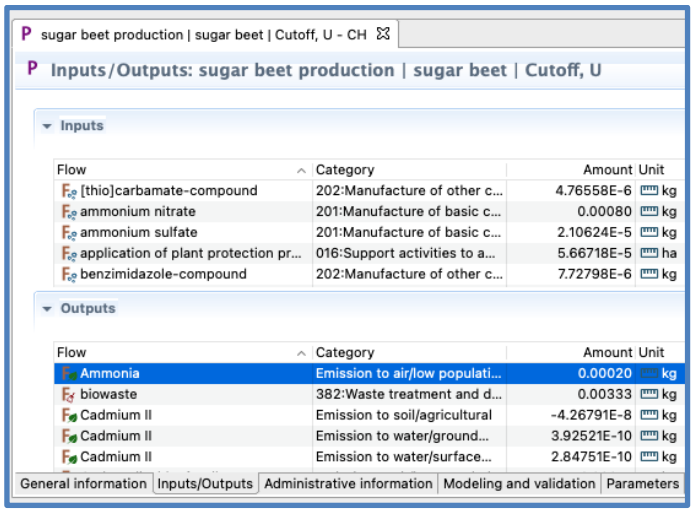


Figure 1: ecoinvent v3.9.1 unit process, cutoff (sugar beet production | sugar beet | Cutoff, U – CH)

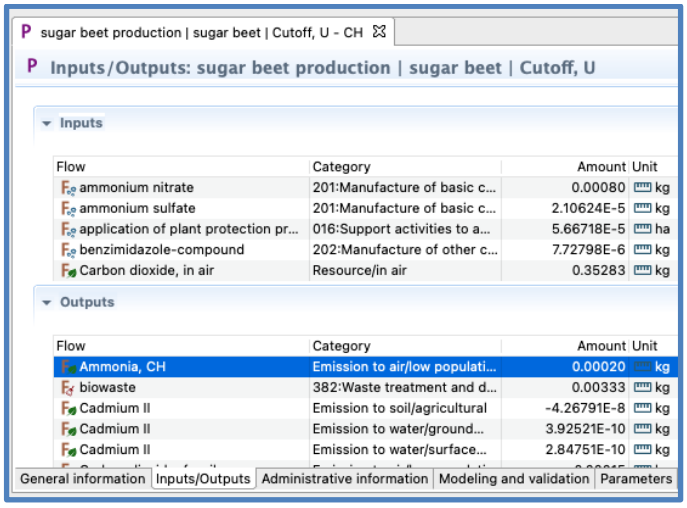


Figure 2: ecoinvent v3.8 regionalised unit process, cutoff (sugar beet production | sugar beet | Cutoff, U – CH)

[11] From https://en.wikipedia.org/wiki/ISO_3166-1 (accessed 19.11.2021)

## 3.2 Modifications in the database structure: Elementary flows and Methods

The compartments and subcompartments of the elementary flows of ecoinvent database and openLCA follow slightly different structures. Hence, aiming to achieve a better organisation of the database when it is applied together with openLCA methods, the categories/folders of the openLCA elementary flows is applied. This means that the names of the compartments and subcompartments of ecoinvent elementary flows were modified, according to Table 1. The same organisation was applied for the correspondence of the characterisation factors of the flows applied to both method packages.

**Table 1: Corresponding ecoinvent 3.9.1 and openLCA compartments/subcompartments**

| ecoinvent 3.9.1 compartment | openLCA compartment | ecoinvent 3.9.1 subcompartment | openLCA subcompartment |
|---|---|---|---|
| air | Emission to air | urban air close to ground | high population density |
| air | Emission to air | non-urban air or from high stacks | low population density |
| air | Emission to air | low population density, long-term | low population density, long-term |
| air | Emission to air | lower stratosphere + upper troposphere | lower stratosphere + upper troposphere |
| air | Emission to air | unspecified | unspecified |
| soil | Emission to soil | agricultural | agricultural |
| soil | Emission to soil | forestry | forestry |
| soil | Emission to soil | industrial | industrial |
| soil | Emission to soil | unspecified | unspecified |
| water | Emission to water | ground- | ground water |
| water | Emission to water | ground-, long-term | ground water, long-term |
| water | Emission to water | ocean | ocean |
| water | Emission to water | surface water | surface water |
| water | Emission to water | unspecified | unspecified |
| natural resource | Resource | biotic | biotic |
| natural resource | Resource | fossil well | fossil well |
| natural resource | Resource | in air | in air |
| natural resource | Resource | in ground | in ground |
| natural resource | Resource | in water | in water |
| natural resource | Resource | land | land |
| inventory indicator | Inventory indicator | waste | waste |

Regarding the methods provided directly by ecoinvent (provided separately by GreenDelta in JSON-LD "ecoinvent 3.9.1 LCIA Methods.zip"), all the impact categories and characterisation factors were maintained and included in the databases together with the openLCA LCIA Methods 2.2.0 (also separately available available in JSON-LD "openLCA LCIA Methods 2.2.0.zip").

## 3.3 Modifications in the database structure: Processes, Flows, and Geographies

ecoinvent processes and flows are organised according to the International Standard Industrial Classification of All Economic Activities (ISIC)[12]. However, the classification of a very few processes or product flows is unknown in the implementation file from ecoinvent. These processes or product flows are not placed automatically into a specifically named folder. Therefore, the same categories/folders which are applied in the previous version of the database (version 3.8) were used. For processes or product flows which are uncategorized and which were not available on the previous versions of ecoinvent, the categories/folders were selected similar to other and equivalent processes/flows in the database. This placement of some very few uncategorized flows/processes into the correct folders has no influence on calculations or results. It is for searching purposes and to keep order.

Regarding the geographies, the list of latitude/longitude of the locations was updated and the shapes (polygons) of the locations are included, using the latitudes/longitudes available in the geographies file from ecoinvent. The codes (short names) of the locations were replaced by their extended, full names to allow an easier visibility and comprehension for the user (Figure 3).

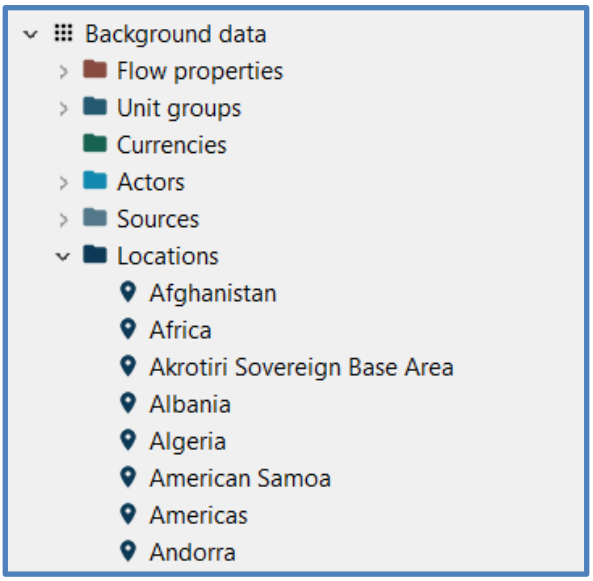


Figure 3: Locations (Geographies) in openLCA

[12] From https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf (accessed 22.11.2021).

## 3.4 Addition and extension of price data

As in the previous ecoinvent 3.8 version, the price information for all the intermediate exchanges provided by ecoinvent 3.9.1 database were extended during the implementation in openLCA so that all exchanges of products with price data had the correspondent cost/revenue specified. As in previous versions of ecoinvent, the prices are provided per product, and do not differ across different processes or also across different countries. This implies that the prices are the same for unit and system processes, and thus, for system processes, do not reflect life cycle costs but “merely” prices.

openLCA includes an advanced Life Cycle Costing feature, which, in addition to the price data of products included in ecoinvent 3.9.1, allows you to calculate the net added value and the life cycle costs of ecoinvent product systems. For further details on how to perform such calculations, please check the manual "Life Cycle Costing in openLCA" available on the openLCA website.

## 3.5 Compatibility and quality assurance

ecoinvent 3.9.1 for openLCA has been thoroughly tested and found to be 100% compatible without any constraints. The inventory and impact assessment results calculated for product systems using unit process datasets with the ecoinvent Methods in openLCA were compared to the LCI and LCIA results published by the ecoinvent Association. The LCIA results obtained in openLCA match the results from the ecoinvent Association to a very high degree. Table 2 lists the LCIA results for the total sum of four exemplary, full product system, data sets and the EF v3.1 method from ecoinvent. Furthermore, processes were included which went through corrections from ecoinvent 3.9.0 to ecoinvent 3.9.1 to test the correct implementation of new data sets. As can be seen from Table 2 the average deviation between the calculations in openLCA and published results from the ecoinvent Association is negligible small and in the range of parts per million (ppm).

If the openLCA LCIA Methods are applied, the results are slightly different due to some variations in the characterisation factors. The users can also compare it results directly, using the ecoinvent link which is added to the original ecoinvent dataset documentation in the description of the processes (Figure 4).

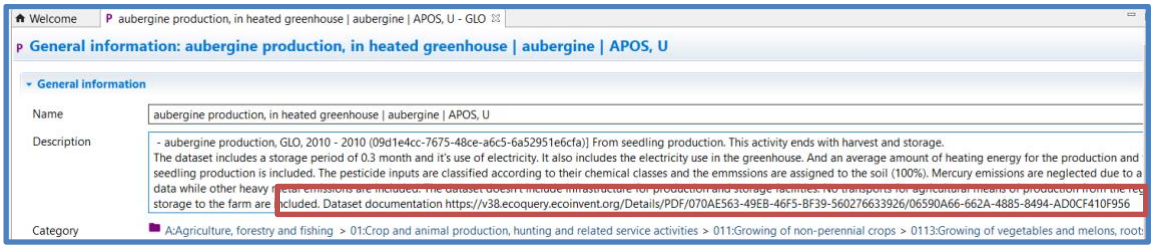


Figure 4: Link containing dataset documentation

**Table 2: Comparison of the results published by the ecoinvent Association with those calculated in openLCA using the LCIA methods as provided by ecoinvent**

| Impact Category | Unit | Ecoinvent published results | openLCA calculated results | relative Difference |
|---|---|---|---|---|
| acidification | mol H+-Eq | 1,13994E+00 | 1,13994E+00 | 0,00000 |
| climate change | kg CO2-Eq | 1,71640E+02 | 1,71640E+02 | 0,00000 |
| climate change: biogenic | kg CO2-Eq | 3,68753E-01 | 3,68750E-01 | -0,00001 |
| climate change: fossil | kg CO2-Eq | 1,70956E+02 | 1,70956E+02 | 0,00000 |
| climate change: land use and land use change | kg CO2-Eq | 3,15169E-01 | 3,15170E-01 | 0,00000 |
| ecotoxicity: freshwater | CTUe | 2,84842E+03 | 2,84842E+03 | 0,00000 |
| ecotoxicity: freshwater, inorganics | CTUe | 2,74107E+03 | 2,74107E+03 | 0,00000 |
| ecotoxicity: freshwater, organics | CTUe | 1,07345E+02 | 1,07345E+02 | 0,00000 |
| energy resources: non-renewable | MJ, net calorific value | 2,17842E+03 | 2,17842E+03 | 0,00000 |
| eutrophication: freshwater | kg P-Eq | 1,56818E-01 | 1,56820E-01 | 0,00001 |
| eutrophication: marine | kg N-Eq | 2,33553E-01 | 2,33550E-01 | -0,00001 |
| eutrophication: terrestrial | mol N-Eq | 2,23563E+00 | 2,23563E+00 | 0,00000 |
| human toxicity: carcinogenic | CTUh | 1,62086E-07 | 1,62086E-07 | 0,00000 |
| human toxicity: carcinogenic, inorganics | CTUh | 1,11023E-07 | 1,11023E-07 | 0,00000 |
| human toxicity: carcinogenic, organics | CTUh | 5,10633E-08 | 5,10633E-08 | 0,00000 |
| human toxicity: non-carcinogenic | CTUh | 9,80832E-06 | 9,80832E-06 | 0,00000 |
| human toxicity: non-carcinogenic, inorganics | CTUh | 6,46289E-06 | 6,46289E-06 | 0,00000 |
| human toxicity: non-carcinogenic, organics | CTUh | 3,34543E-06 | 3,34543E-06 | 0,00000 |
| ionising radiation: human health | kBq U235-Eq | 1,94079E+01 | 1,94079E+01 | 0,00000 |
| land use | dimensionless | 6,68428E+02 | 6,68428E+02 | 0,00000 |
| material resources: metals/minerals | kg Sb-Eq | 3,20817E-02 | 3,20800E-02 | -0,00005 |
| ozone depletion | kg CFC-11-Eq | 8,44332E-06 | 8,44332E-06 | 0,00000 |
| particulate matter formation | disease incidence | 1,12731E-05 | 1,12731E-05 | 0,00000 |
| photochemical ozone formation: human health | kg NMVOC-Eq | 6,41482E-01 | 6,41480E-01 | 0,00000 |
| water use | m3 world eq. deprived | 6,91774E+01 | 6,91774E+01 | 0,00000 |
| **Average** | | | | 0,00000 |

## 3.6 Memory requirements

With an increased ecoinvent database size, the new product systems in openLCA typically have about 15,000 processes and about 165,000 connections in the cutoff system model with unit processes. These values can be seen when enabling the "statistics" sheet for product systems (Figure 5). When working with ecoinvent 3.9.1 in openLCA, it is recommended to increase the maximum memory usage of openLCA. This enables smoother and faster calculation of product systems for ecoinvent databases. Visit https://ask.openLCA.org for instructions[13].

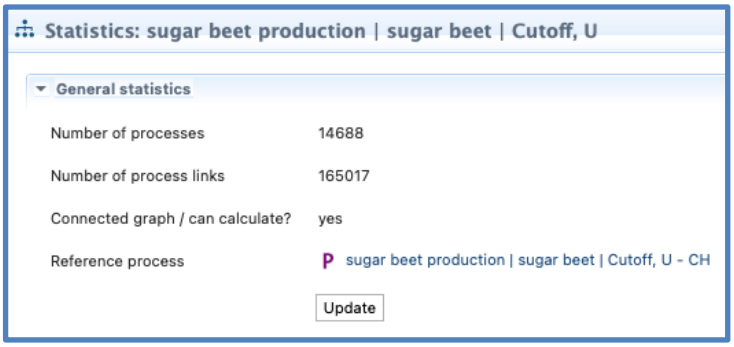


Figure 5: Statistics for the product system created for sugar beet production in ecoinvent 3.9.1 cutoff, upr

openLCA can handle these systems efficiently, which results in an acceptable calculation time and memory requirements. However, to calculate a full model, 12 GB of RAM should be available, which also means that the 64-bit version of openLCA should be used. It is recommended to increase the maximum memory usage of openLCA:

File → Settings → Configuration → Maximum memory usage in MB (Figure 6)

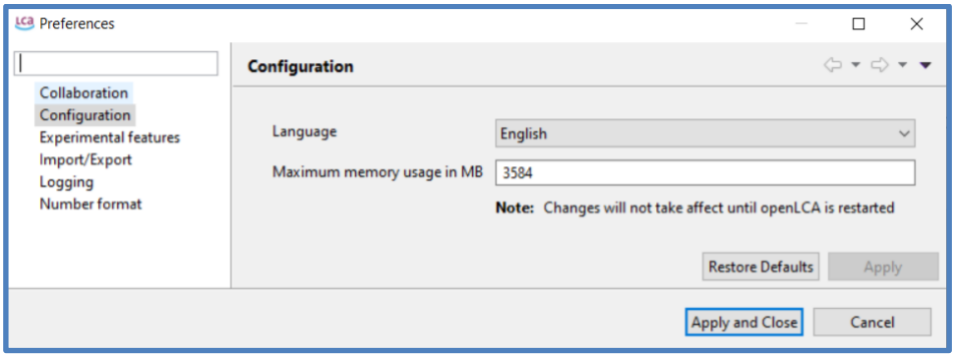


Figure 6: Allocating more memory (RAM) to openLCA

[13] https://ask.openlca.org/594/how-to-assign-more-memory-to-openlca?show=594

If it is not possible to allocate more memory (RAM), openLCA allows to specify a *cut-off* when creating the product system, which both reduces the number of processes and the number of connections. In this section, the wording cut-off should not be mixed with the ecoinvent system system model "cut-off". For reduced memory usage, cut-off means that process links with very small contributions (the threshold is selected by the user) are cut from the calculations (cut-off). For small cut-offs the impact on the result will be not significant. This user option is shown in Figure 7. The impact can be controlled by checking and comparing the system process result.

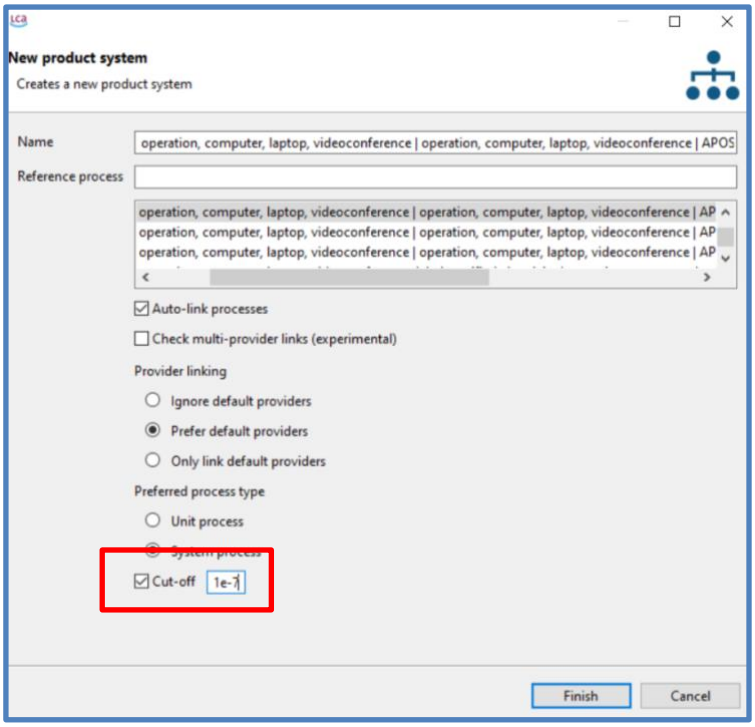


Figure 7: Setting cut-off while creating a product system

# 4 Migrating to ecoinvent 3.9.1

It is possible to import product systems from a previous version of ecoinvent (e.g. database version 3.8) into the newest version of ecoinvent 3.9.1. In cases, were the UUID of a process was changed by ecoinvent from one version to another, the providers have to be manually re-selected. Please note that migration will only be possible for ecoinvent databases underlying the same system model (consequential, cut-off, apos) and selection of unit processes (UPR) or system processes (LCI). openLCA 1.11 or openLCA 2.0 must be used.

## 4.1 Compatibility check between different versions of ecoinvent

To check if two ecoinvent databases in openLCA feature the UUID, either retrieve this information from the general information tabs of the processes or via the openLCA SQL Query Browser. For using SQL Query to check the UUID of a process (for e.g. barley grain, feed production, Swiss integrated production | barley grain, feed, Swiss integrated production | Cutoff, U), click on Tools → Developer tools → SQL, and run the following code:

```
SELECT REF_ID FROM TBL_PROCESSES
WHERE NAME LIKE
'%barley grain, feed production, Swiss integrated production | barley grain, feed, Swiss
integrated production%'
AND F_LOCATION = (SELECT ID FROM TBL_LOCATIONS WHERE CODE = 'CH')
```

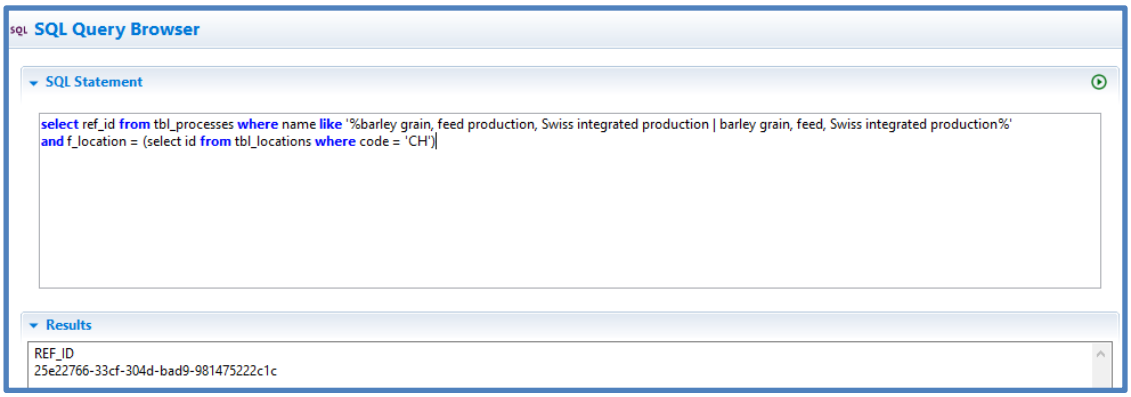


Figure 8: Run the query to check the reference id for a process

If the compatibility check turns out negative, please contact GreenDelta GmbH.

## 4.2 Export and import between different versions of ecoinvent

Before migrating data from a previous version of ecoinvent into ecoinvent 3.9.1, perform a compatibility check and create a backup of your databases to ensure that the original data is retrievable.

### 4.2.1 Export of data

Open the ecoinvent database from which you want to export data by double-clicking on it. Choose the *JSON-LD* export wizard in the folder openLCA and click *Next*. Select the data sets which you would like to export (Figure 9).

Make sure that you do not accidentally select all processes in your database as this will extremely prolong the export (and subsequently the import).

Select a file path for saving the JSON-LD file and click *Finish*.

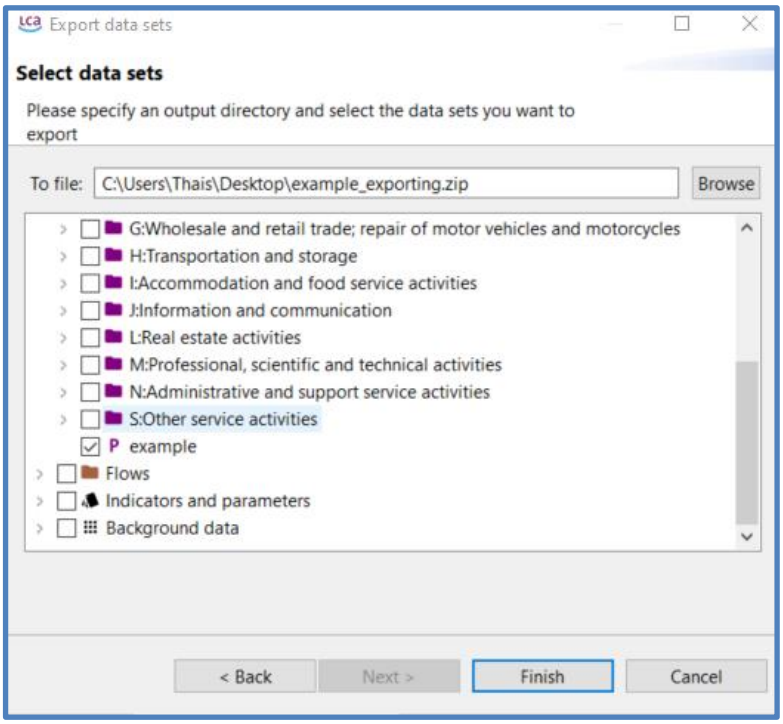


Figure 9: Export window in openLCA

### 4.2.2 Import of data

Similarly, open the ecoinvent database into which you want to import the exported JSON-LD data by double-clicking on it. Right-click onto the database and select *Import*. Select the *Linked Data (JSON-LD)* import wizard and click *Next* (Figure 10). Choose the directory where the JSON-LD file (.zip file) for your import is inside and then select the file in the right column. Click on *Next* to open the settings and select *Never update a data set that already exists* (see Figure 11).

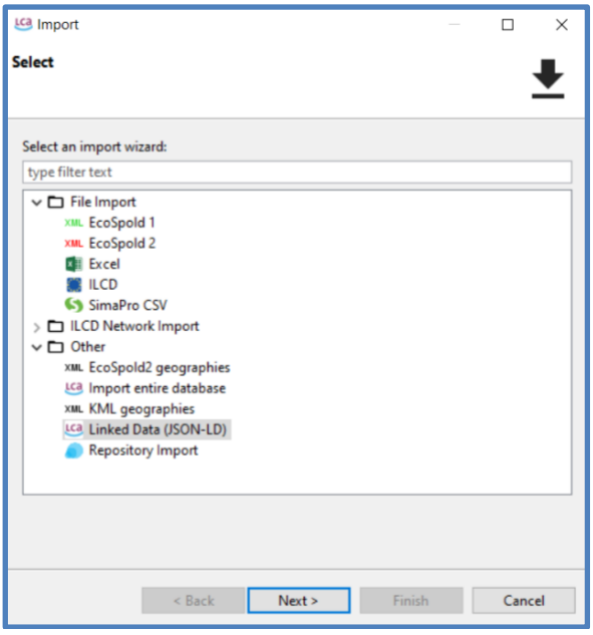


Figure 10: Right-click onto an open database in openLCA to open an import wizard

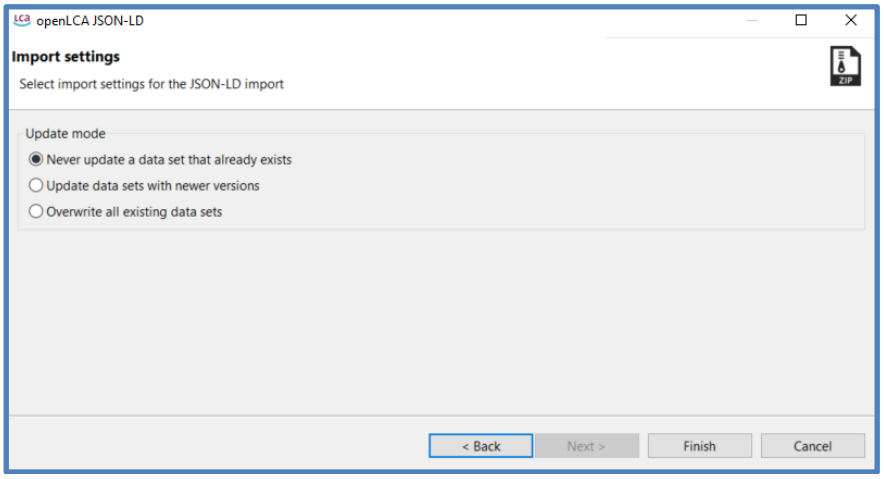


Figure 11: Select Never update a data set that already exists in the import settings

After importing, the providers of the flows will be automatically connected in case the equivalent process UUID is available in the database.

# 5 Support

GreenDelta GmbH, developer of openLCA, offers prioritised and guaranteed professional support for the users of openLCA via the GreenDelta helpdesk:
https://www.openlca.org/service-contracts

Public (*user to user*) support for openLCA is available via:
https://ask.openlca.org

In case you have questions, which are not addressed in this report or you have comments about the ecoinvent 3.9.1 database implementation in openLCA, please contact us or write us a mail.