The world's most consistent and transparent Life Cycle Inventory database

# Future development of the ecoinvent database

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# ecoinvent after version 3.1

- Version 3 brought many technological and methodological changes and improvements
- Version 3.1 brought a new system model, but also a lot of new and updated data
- The new framework offers much room for development without much technological development
  - Focus on data and update of the core data
  - Development of selected new system models
  - Targeted additions of functionality
  - Increase global coverage of the database

# Update of the core data

- Version 3.2 updates electricity and concrete
  - Significant update, replaces older data
- Further sectors would benefit from updates
  - Individual updates and specific improvements of existing data over various versions
- Focus on updates in addition to new data
- Reviews of core sectors
  - Check for reliability and consistency
  - Expand geographical coverage when relevant
  - Identify datasets where newer data are available
  - Carry out individual updates or whole sector updates

# Update of the core data

- Metals
- Mining
- Energy and energy resources
- Freight transport
- Waste treatment and Recycling
- Electronics
- …

- Long-term project, rolling updates and revisions planned

# Updates and new data planned

- Preliminary plans for v3.3
  - Agriculture and food products (WFLDB, first part)
  - Freight transport
  - Heat pumps for building heating
  - Agricultural data from Tunisia and Brazil
  - …?
- Longer-term plans for new sectors and areas of impact
  - Consumer goods (incl. textiles)
  - Household and office activities
  - Buildings and infrastructure
  - Noise

# Developments of new system models

- 3 system models offer choice to the users
- Too many system models lead to potential confusion
- Further models for end-of-life scenarios
  - Consistent scenarios for faster sensitivity analysis
  - Implementation of PEF end-of-life modelling (changed once already, currently undergoing review)
- Other models possible for specialty or non-LCA applications

# Development of new functionalities

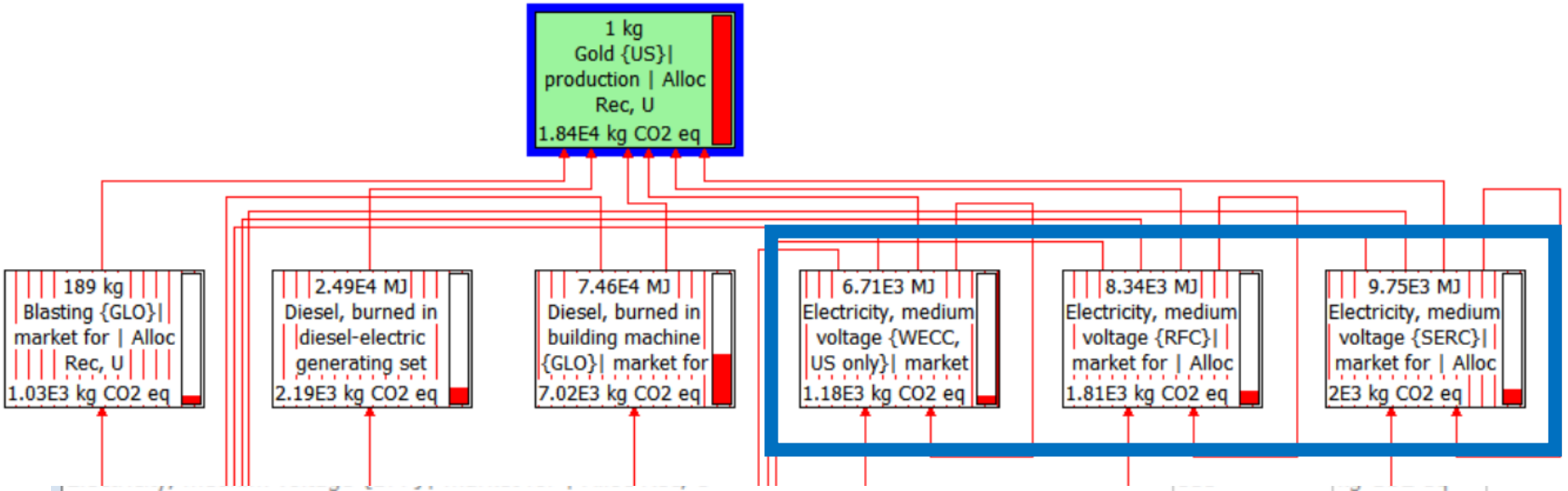
- Careful evolution of the version 3 system
- Assessment of new methodologies and functionalities
  - Review of benefits, problems and acceptance
- Development of additional functionalities
  - Maintain compatibility
  - Optional and non-intrusive

# Market groups

- Activities with large regions may cover many markets for some inputs
  - Electricity markets very developed and regionalized
  - One product input is covered by many supplying datasets
- Sum is of course available and calculable, but software support sometimes lacking

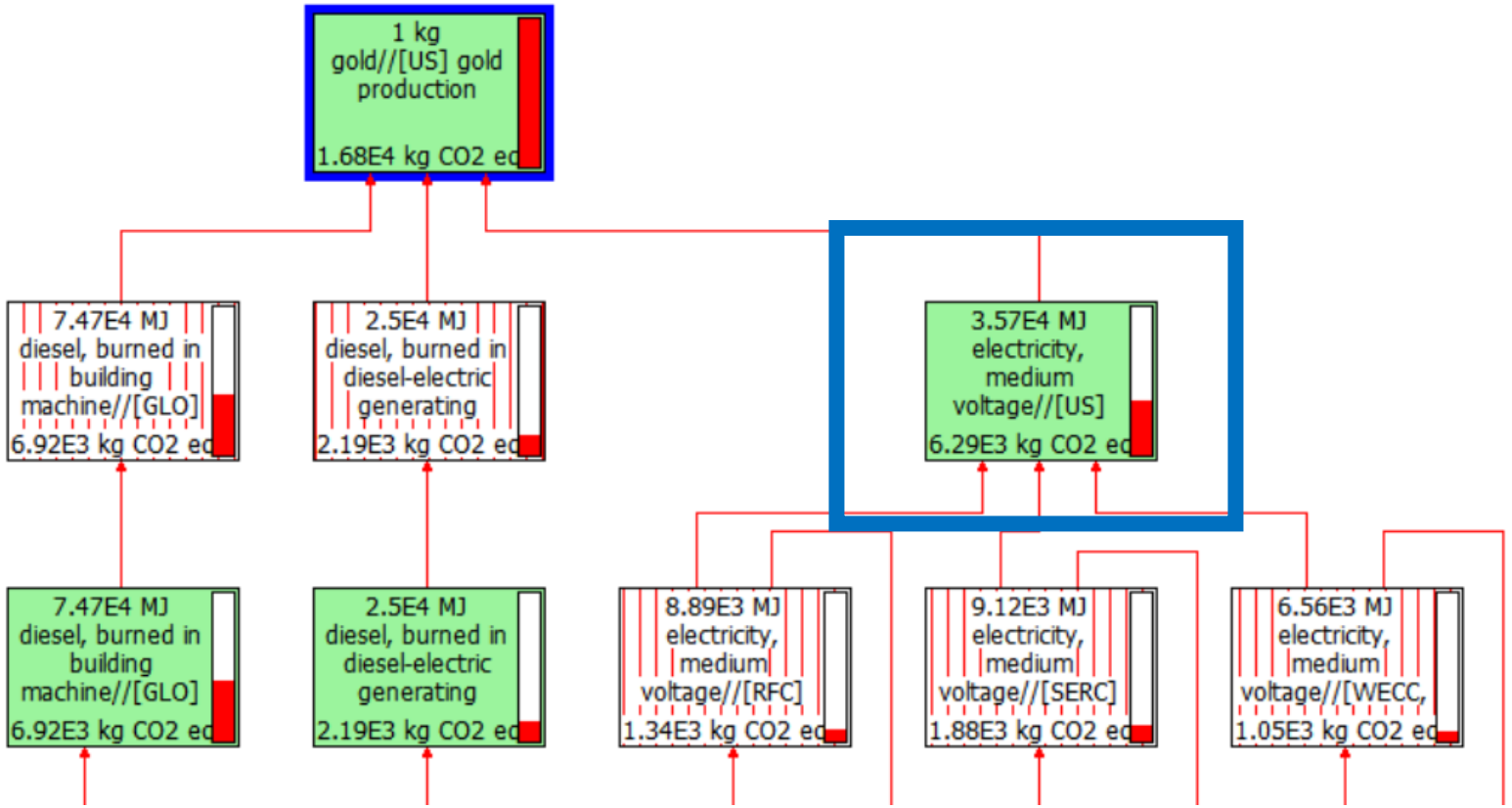
# Market groups

Flows




| | | |
|---|---|---|
| Electricity, medium voltage {FRCC}\| market for \| Alloc Rec, U | 441 | kg CO2 eq |
| Hydrochloric acid, without water, in 30% solution state {RoW}\| market for \| Alloc Rec, U | 342 | kg CO2 eq |
| Electricity, medium voltage {NPCC, US only}\| market for \| Alloc Rec, U | 267 | kg CO2 eq |
| Sodium cyanide {GLO}\| market for \| Alloc Rec, U | 227 | kg CO2 eq |
| Heat, district or industrial, other than natural gas {RoW}\| market for \| Alloc Rec, U | 83.1 | kg CO2 eq |
| Lime, packed {GLO}\| market for \| Alloc Rec, U | 60.4 | kg CO2 eq |

# Market groups



# Market groups

- Single input facilitates analysis and assessment
- Calculation speed increases in some software tools due to lower network connectivity
- Now available for all major regions for products where many local markets exist
  - Datasets with multiple market inputs still exist in the database, but at lower numbers
- Also support user-requested regions, e.g. UCTE

# Documentation

## Ecoinvent 3.1 dataset documentation

jute production, rainfed - IN

### Dataset identification

| | |
|---|---|
| Activity name | jute production, rainfed |
| Synonym | None |
| Geography | IN (India) |
| Classifications | **EcoSpold01Categories**<br>agricultural production/plant production<br>**ISIC rev.4 ecoinvent**<br>0116:Growing of fibre crops |
| Time period | 1995-01-01 to 2014-12-31<br>Valid for all period |
| Dataset type | Ordinary transforming activity |
| Technology level | Current |
| System model | Allocation, cut-off by classification |

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### Output to technosphere overview

| Output type | Product name | Amount | Description |
|---|---|---|---|
| Reference product | jute fibre | 1.0 kg | Material for treatment: no<br>By-product classification: allocatable product |

### Dataset authorship

| Role | Date | Name | Contact |
|---|---|---|---|
| Data generator | 2010-07-28 | Cornelia Stettler, Carbotech AG<br>not active author | c.stettler@carbotech.ch |
| Data entry | 2010-07-28 | Cornelia Stettler, Carbotech AG | c.stettler@carbotech.ch |

### General comments

Production of Jute delivers the co-products 'jute fibres, rainfed system, at farm' and 'jute stalks, from fibre production, rainfed system, at farm'. An allocation was carried out based on economical and mass criteria

This dataset was already contained in the ecoinvent database version 2. It was not individually updated during the transfer to ecoinvent version 3. Life Cycle Impact Assessment results may still have changed, as they are affected by changes in the supply chain, i.e. in other datasets. This dataset was generated following the ecoinvent quality guidelines for version 2. It may have been subject to central changes described in the ecoinvent version 3 change report (http://www.ecoinvent.org/database/ecoinvent-version-3/reports-of-changes/), and the results of the central updates were reviewed extensively. The changes added e.g. consistent water flows and other information throughout the database. The documentation of this dataset can be found in the ecoinvent reports of version 2, which are still available via the ecoinvent website. The change report linked above covers all central changes that were made during the conversion process.

The original documentation can be found in the following report: **Final report ecoinvent Data v2.0 - Life Cycle Inventories of Renewable Materials**

### Included activities start

*No information in this field.*

page 1

## Detailed exchanges with technosphere

***Contribution to impact scores legend:*** *IPCC 2007 GWP100 | ecoscarcity 2013 total | ReCiPe H total*

| Reference products | Annual prod.vol. | Amount |
|---|---|---|
| shaving, softwood, measured as dry mass | 4.01e+6 kg | 1.0 kg |

**Comment:** calculated as dry mass

**Production volume comment:** Calculated from production volume of reference product using the relative outputs.

| Inputs from technosphere | Amount and impact contributions |
|---|---|
| electricity, medium voltage | 6.85e-3 kWh<br>*2.2% \| 1.3% \| 0.13%* |

**Activity link:** market for electricity, medium voltage - CH
**Comment:** data from industry
**Uncertainty distribution:** lognormal; **Variance with pedigree:** 0.2008; **Pedigree matrix:** [2, 1, 2, 1, 1]

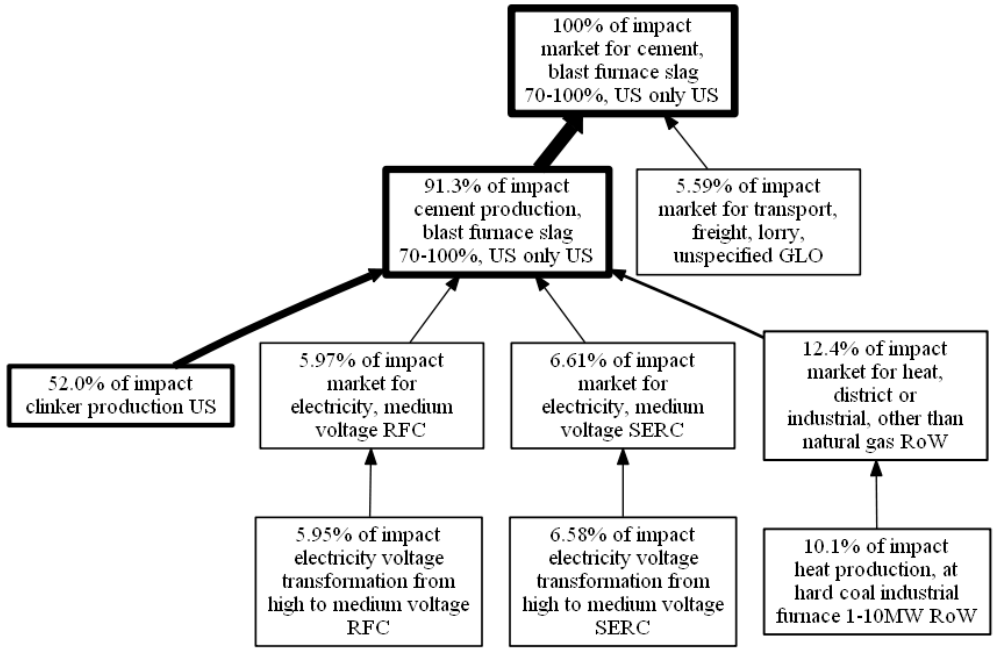
| | |
|---|---|
| planing mill | 4.66e-10 unit<br>*8.8% \| 5.3% \| 0.73%* |

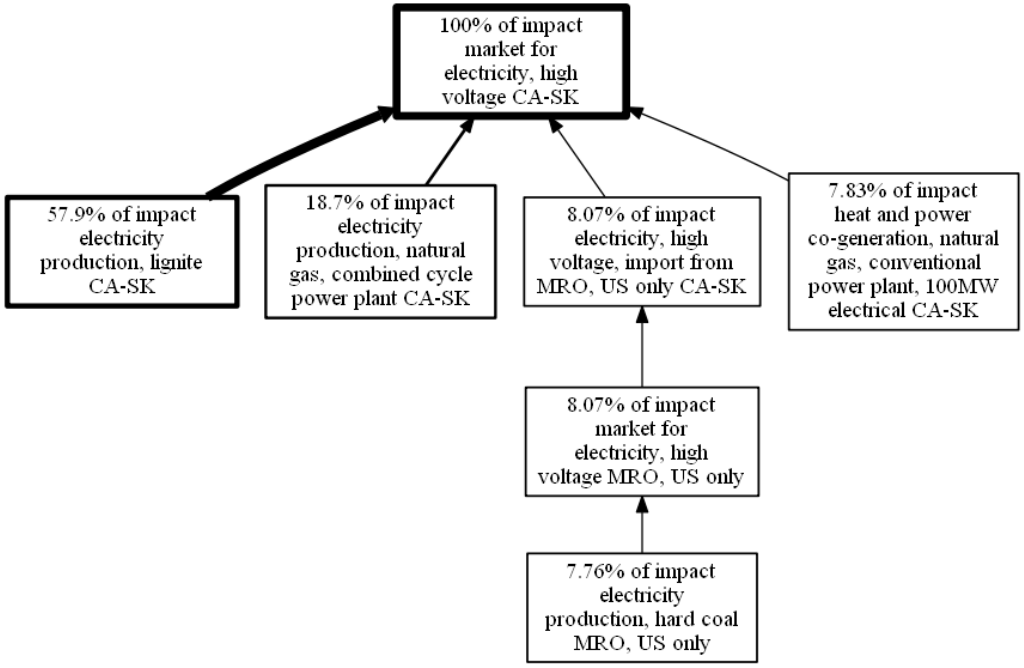
**Activity link:** market for planing mill - GLO
**Comment:** data from industry
**Uncertainty distribution:** lognormal; **Variance with pedigree:** 0.4308; **Pedigree matrix:** [2, 1, 2, 1, 1]

| | |
|---|---|
| sawnwood, beam, softwood, raw, kiln dried | 6.99e-4 m3<br>*89% \| 93% \| 99%* |

**Activity link:** beam, softwood, raw, kiln drying - CH
**Comment:** processed internally within the sawmill
**Uncertainty distribution:** lognormal; **Variance with pedigree:** 0.0008; **Pedigree matrix:** [2, 1, 2, 1, 1]

# Documentation



# Regionalized LCIA

- ecospold 2 data format supports GIS-based calculations
  - Mapping information for all activities available
- Regionalized LCIA methods are now available
  - Use and consumption of water
  - IMPACT World+ (coming soon)
  - …
- Implementation of regionalized LCIA in our internal calculation routine
  - Software tools implement LCIA methods independently

# Import and export

- Export to ecospold1 already implemented
- Export to ILCD format under development
  - Lead at the EU's JRC, contributions from ecoinvent

- Import functionalities for data providers to reduce workloads
  - OpenLCA
  - Excel
  - SimaPro CSV
  - … ?

# ecoinvent as a global database

- ecoinvent started as a **Swiss** database
  - **International supply chains** demanded international data collection
  - Now the most used global database of known quality
- Growth can be **challenging**:
  - Expertise at ecoinvent is Switzerland/Europe-centered
  - Data for different regions benefit from local expertise
  - International data collection ideally organized in a collaboration of regional data collection networks

# ecoinvent as a global database

- Collaboration with **CIRAIG** in **Canada** to build an LCI database for Québec
- Data are **integrated** into the existing global supply chains
- Local data collection efforts can rely on **global background data** and grow organically into local process systems
- **Other collaborations** are now starting to collect and submit data
  - Brazil, South Africa, India, Tunisia
- Further interest in collaboration from several other countries

# Cooperation of LCI initiatives

- Cooperation with several emerging economies to support LCI networks in developing countries, supported by the Swiss government (SECO)
  - Use the existing expertise of ecoinvent starting out as the Swiss LCI network
- The goal is to:
  - Build expertise on life cycle thinking and LCA
  - Create capacity for LCI data collection
  - Create background data for local (and global) studies
  - Grow into independent and self-sustaining regional LCI competence centres

# Conclusions

- Ensure that the **core sectors** of the database remain **valid**
- Continue to provide data for **new products and sectors**
- Provide **new system models** if beneficial to the user base
- **Assess** and **fine-tune** new features of the database
- Development of **useful improvements**
- Expand the **global coverage** of the database and form **network of collaborators**

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Data updates?

New system models?

Useful features?
Less useful?

Where should the database go?

# Thank you for your attention!

New sectors?


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