Database-wide updates in ecoinvent v3.1

Water use, prices, properties and production volumes

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Content

- Prices
- Properties
- Production volumes
- Water use
Introduction

- Database - wide updates are updates of data on one single issue related to all or significant amount of datasets
  - example; prices of the products

ecoinvent v3 database
Introduction

- Data are being supplied either by individual data providers or centrally
- Data are being managed centrally
- Data for the database - wide updates are being collected and calculated using one methodology assuring consistency, transparency and quality
- These data are being updated constantly, starting from ecoinvent v3.0
Update of prices

- Currently the ecoinvent v3.1 database contain prices for more than 1200 products
- Present in the datasets as a property of an exchange
- For now the prices are being collected for the year 2005
- The development of price modelling is ongoing

Use of the prices

- Economic allocation
Update of properties

- Currently the ecoinvent v3.1 database contain 6 mandatory properties for all the products and elementary exchanges which have a mass
- Dry mass, wet mass, water in wet mass, water content, carbon content, fossil and carbon content, non-fossil

Use of the properties

- Balances
- Information about the composition of the product or elementary exchange

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prices  properties  production volumes  water use

www.ecoinvent.org
ecoQuery - price and properties

- www.ecoinvent.org

barley production/DE

<table>
<thead>
<tr>
<th>Exchanges Properties</th>
<th>Name</th>
<th>Amount</th>
<th>Unit</th>
<th>Uncertainty</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Product</td>
<td>barley grain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ carbon content, fossil</td>
<td>0</td>
<td>dimensionless</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ carbon content, non-fossil</td>
<td>0.46538</td>
<td>dimensionless</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ dry mass</td>
<td>0.86</td>
<td>kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ energy content</td>
<td>15.583</td>
<td>MJ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ water content</td>
<td>0.16279</td>
<td>dimensionless</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ water in wet mass</td>
<td>0.14</td>
<td>kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ wet mass</td>
<td>1</td>
<td>kg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Use of the properties

- What is the amount of water in barley?

- Reference product:
  barley grain [kg]

  - Water in wet mass = 0.14 kg

- Answer: the amount of water in 1kg of barley is 0.14 kg.
Update of production volumes

- Currently the ecoinvent v3.1 database contain production volumes for more than 12000 products
- 4000 products produced as a reference product and 8000 produced as a by-product
- Present in the datasets in the description of the product

Use of the production volumes

- Market mix modelling
Production volumes - market mix

soybean production A
GLO

soybean production B
GLO

PV₁ = 18ton
PV₂ = 2ton

soybean → soybean → soybean

PV₁/(PV₁ + PV₂) = 18/(18 + 2) = 0.9
PV₂/(PV₁ + PV₂) = 2/(18 + 2) = 0.1

market GLO

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## ecoQuery - production volume

### Unit Process Exchanges

<table>
<thead>
<tr>
<th>Name</th>
<th>Amount</th>
<th>Unit</th>
<th>Uncertainty</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>soybean oil, refined</td>
<td>1</td>
<td>kg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Reference Products

- **Name**: soybean oil, refined
- **Amount**: 1
- **Unit**: kg

### Uncertainty

- Compartment: Subcompartment
- Classification: Formula
- CAS-Number: Synonym
- Activity Link: Variable Name
- Mathematical Relation: Comment

### Production Volumes

- **Name**: soybean oil refined PV
- **Production Volume**: 28695693573,8964
- **Variable**: Production Volume
- **Mathematical Relation**: (39761852*1000*fraction_of_crude_oil_PV_to_refinery)/soybean_oil_crude_input

### Production Volume Comment

- Data from FAO: (http://faostat.fao.org/site/636/DesktopDefault.aspx?PageID=636#ancor). The production volume PV in 2010 was 3.97E-10 kg/year. In 2005 the PV was 3.4E+10 kg/year.

### Tags

- Source
- Annual Production Volume

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prices | properties | production volumes | water use
Update of water use

ecoinvent version 2 ➔ ecoinvent version 3.0

- Surface water (lake, river, etc.)
- Ground water
- Tap water
- Irrigation, etc.
- Products' water content
- Products' water content
- Wastewater
- Water, to water (surface, ground, etc.)
- Water, to air

Technosphere

Biosphere

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Update of water use

ecoinvent version 2 → ecoinvent version 3.0

- New exchanges on the output side of the unit processes
- Most of the processes from ecoinvent v2.2 updated; exchanges on the output side have been added
- Properties to all products have been added which allow calculation of the amount of water embedded in the products
Update of water use

ecoinvent version 2 → ecoinvent version 3.0 → ecoinvent version 3.1

prices  properties  production volumes  water use

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Update of water use

ecoinvent version 2 ➔ ecoinvent version 3.0 ➔ ecoinvent version 3.1

- All the activities in the database have been look at and most of them updated, so that most of them are as close to the ideal water balance as possible.

- New datasets which were being accepted for ecoinvent v3.1 were reviewed to assure, that the water use is modelled correctly.
Update of water use

ecoinvent version 2 ➔ ecoinvent version 3.0 ➔ ecoinvent version 3.1

water balance of the LCI

water IN ➔ water OUT

prices
properties
production volumes
water use

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Conclusion

- On top of many new datasets a lot of additional data added in the older datasets

- Database-wide updates
  - increased overall quality
  - consistency and transparency

- The new and updated data can be used even outside of traditional LCA studies
Thank you for your interest in ecoinvent version 3!

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