International LCA Data Network

Demonstration Project for an Open International Online Database Structure

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ACR – Austrian Cooperative Research

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Environmental product declaration (EPD)

**EN 15804** Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

- **Product standards**, e.g. EN 16485 PCR for wood products
- **National requirements**, e.g. France
- **Specific EPD programmes**, e.g. International EPD system

EPD declare the environmental performance of a product throughout its life cycle in order to
- provide quantified information for building assessment;
- support product development in the construction sector

Standardised indicators: life cycle assessment
not standardised: qualitative performance aspects (health, ...)

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Organisers:
- Construction Industry Council
- HKGBC
- SBE Series
- iiSBE

International Co-owners:
- Global Alliance for Buildings and Construction
Motivation for an LCA data network

Environmental product declaration (EPD)

LCA databases

Various data input options

Online access

(xml-) transformation

LCA calculation tools
Actors and their main driving forces

EPD programme operators and producers
  want to spread their data (marketing)

data base providers
  want to collect data and deliver them (offer to buy or gift)

building assessment operators and others
  want to get high quality data of high consistancy
Working Group ‘International open Data Network for Sustainable Building’

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Working Group ‘International open Data Network for Sustainable Building’

EPD programme operators

- epddanmark
  - 1000 data sets

- Bau-EPD
  - Baustoffe mit Transparenz
  - 300 datasets

Database providers

- OPEN DAP
  - 500 data sets

- baubook
  - 800 data sets

- OKO BAUDAT
  - 1000 data sets

Building assessment operators and others

- Aalborg University

Only excerpt of members. For more information contact website (see last slide)
Fundamentals (‘decalogue’, excerpt)

Main objective

International LCA data network structure for construction products based on EPD information
The vision:
One request – multiple answers

Picture:
MATHIAS HØEG, epddanmark (2016):
EPD and use of external data for building calculation in Denmark. SBE 16 – Intern. Conf. on Sustainable Built Environment, Hamburg
### Fundamentals (‘decalogue‘, excerpt)

<table>
<thead>
<tr>
<th><strong>Main objective</strong></th>
<th>International LCA data network structure for construction products based on EPD information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EN 15804</strong></td>
<td>is the common ground to start; open for other standards in the future. It is not the aim to develop additional rules complementing the standards.</td>
</tr>
<tr>
<td><strong>Third party verification</strong></td>
<td>of EPD data according to EN 15804 is mandatory.</td>
</tr>
<tr>
<td><strong>ILCD data format</strong></td>
<td>will be used as a data exchange format</td>
</tr>
<tr>
<td><strong>English</strong></td>
<td>as mandatory common language; any other language optional</td>
</tr>
<tr>
<td><strong>Free of charge</strong></td>
<td>availability of all EPD data within the network structure.</td>
</tr>
</tbody>
</table>
Demonstration project

„ÖKOBAUDAT and Europa II“
Project funded by BBSR (Germany):
Zukunft Bau 10.08.17-16.42
Project partner: OK*WORX, IBO, GreenDelta

Technical infrastructure ready (currently working with soda4LCA (ÖKOBAUDAT software) + API interface)
Conceptual framework

• under progress
  on the agenda of 7th Meeting (Tromsö, 2016-06-15+16)

1. Unique identification of products
   GUID, version management, product categories

2. Transparency of content → data format and rules
## 2. ILCD Data Format

<table>
<thead>
<tr>
<th>ILCD Data Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Description</td>
</tr>
<tr>
<td>Modelling and Validation</td>
</tr>
<tr>
<td>Administrative Information</td>
</tr>
</tbody>
</table>

- **LCIA** Results
- **Modelling and Validation**
- **Administrative Information**
- **Process Description**
## Example: Data field definition

<table>
<thead>
<tr>
<th>Field name (EN)</th>
<th>Data type</th>
<th>Definition and explanation (EN)</th>
</tr>
</thead>
</table>
| Type of review    | enumerated list    | Type of review that has been performed regarding independency and type of review process. Possibilities for type of review:  
- no verification / critical review  
- internal verification / critical review (intra-company)  
- dependant external verification / critical review (external reviewer is not verifiably independent from LCA expert or owner of enterprise)  
- independent external verification / critical review (external reviewer who is verifiably independent from LCA expert or owner of enterprise) |

*red: specified in addition to ILCD*
## 2. ILCD+EPD Data Format

### ILCD Data Format

<table>
<thead>
<tr>
<th>Process Description</th>
<th>Inputs/Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modelling and Validation</td>
<td>LCIA Results</td>
</tr>
<tr>
<td>Administrative Information</td>
<td>Extension Points</td>
</tr>
</tbody>
</table>

*developed by BBSR / ÖKOBAUDAT (Germany)*

### Extension for EPDs

<table>
<thead>
<tr>
<th>Additional Metadata</th>
<th>Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Properties</td>
<td>Scenarios</td>
</tr>
</tbody>
</table>
Example for EPD Extension: Modul according to EN 15804

**BUILDING LIFE CYCLE INFORMATION**

<table>
<thead>
<tr>
<th>A 1-3</th>
<th>A 4-5</th>
<th>B 1-7</th>
<th>C 1 - 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCT stage</td>
<td>CONSTRUCTION stage</td>
<td>USE stage</td>
<td>END OF LIFE stage</td>
</tr>
<tr>
<td>A1 A2 A3</td>
<td>A4 A5</td>
<td>B1 B2 B3 B4 B5</td>
<td>C1 C2 C3 C4</td>
</tr>
<tr>
<td>Raw material supply</td>
<td>Transport</td>
<td>Installation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use</td>
<td>Maintenance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Repair</td>
<td>Replacement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Refurbishment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B6 Operational energy use</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B7 Operational water use</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Deconstruction</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Transport</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Waste processing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Disposal</td>
</tr>
</tbody>
</table>

BEYOND BUILD. LIFE CYCLE

<table>
<thead>
<tr>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits and load</td>
</tr>
<tr>
<td>Reuse-Recovery-Recycling-Potential</td>
</tr>
</tbody>
</table>

Scenarios needed
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Erneuerbare Primärenergie als Energieträger (PERE)</td>
<td>Input</td>
<td>MJ</td>
<td>31.3</td>
<td>0.0756</td>
<td>533</td>
<td>565</td>
<td>0.0109</td>
<td>4.7</td>
<td>7892</td>
<td></td>
</tr>
<tr>
<td>Erneuerbare Primärenergie zur stofflichen Nutzung (PERM)</td>
<td>Input</td>
<td>MJ</td>
<td>8.25E+3</td>
<td>0</td>
<td>43.4</td>
<td>8.29E+3</td>
<td>0</td>
<td>-6293</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total erneuerbare Primärenergie (PERT)</td>
<td>Input</td>
<td>MJ</td>
<td>8.28E+3</td>
<td>0.0756</td>
<td>577</td>
<td>8.86E+3</td>
<td>0.0109</td>
<td>-8299</td>
<td>7892</td>
<td></td>
</tr>
<tr>
<td>Nicht-erneuerbare Primärenergie als Energieträger (PENRE)</td>
<td>Input</td>
<td>MJ</td>
<td>2.29E+3</td>
<td>57.5</td>
<td>1.58E+3</td>
<td>3.93E+3</td>
<td>8.29</td>
<td>87.8</td>
<td>-9.72E+3</td>
<td></td>
</tr>
<tr>
<td>Nicht-erneuerbare Primärenergie zur stofflichen Nutzung (PENRM)</td>
<td>Input</td>
<td>MJ</td>
<td>5.8E+2</td>
<td>0</td>
<td>0</td>
<td>5.8E+2</td>
<td>0</td>
<td>-5.8E+2</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
2. ILCD+EPD Data Format Hierarchy

The core information is transferred between the databases and is mandatory for each data set.

National additional information shall be also possible. This information should ideally be commonly defined within the standard in order to prevent diverging developments.

The common data format has to be based on common compliance rules for content.
## Example: Rules for data field

<table>
<thead>
<tr>
<th>Field name (EN)</th>
<th>Data type</th>
<th>Definition and explanation (EN)</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of review</td>
<td>enumerated list</td>
<td>Type of review that has been performed regarding independency and type of review process. Possibilities for type of review: - no verification / critical review - internal verification / critical review (intra-company) - dependant external verification / critical review (external reviewer is not verifiably independent from LCA expert or owner of enterprise) - independent external verification / critical review (external reviewer who is verifiably independent from LCA expert or owner of enterprise)</td>
<td>mandatory</td>
</tr>
</tbody>
</table>

*Rule: For WG InData an independent external verification of the EPD is mandatory.*
Conceptual framework

1. Unique identification of products
   GUID, version management, product categories

2. Transparency of content → data format and rules
   in international context more stress on:
   classification of data (type, purpose, background data, …)?

3. Data quality
3. Data quality – verification procedures

- EPD-program operator
- PCR (Product category rules) and EPD
- Data transferred to the system

Auditing against compliance rules: ✓
Verification against compliance rules: ✓
Validation against compliance rules: ✓

Guidelines: ECO Platform audit procedure
ÖKOBAUDAT procedures and guideline as basis for discussion
Conceptual framework

1. Unique identification of products
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   in international context more stress on:
   classification of data (type, purpose, background data, …)?

3. Data quality
   in international context: eventually cross approval?

4. Business modell
Thank you

- Hildegund Figl: hildegund.figl@ibo.at
- WG InData: http://www.oekobaudat.de/en/info/working-group-indata.html