



Chapter III

Ecoinvent Database: Quality Control and User Interfaces for a Web-Based Life Cycle Assessment Database

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Abstract

In late 2000 the project ecoinvent 2000 was officially launched. Several Swiss Federal Offices and research institutes of the ETH domain agreed on a joint effort to harmonise and update life cycle inventory (LCI) data for its use in life cycle assessment (LCA). Life cycle assessment is a technique for assessing the environmental aspects and potential impacts associated with a product or service from resource extraction, manufacturing and use to final disposal.

Introduction

In order to accommodate LCI data a central database has been developed building on past experiences with a large network-based LCI database built up at ETH Zürich. The ecoinvent database comprises LCI data from the energy,

transport, building materials, wood, chemicals, paper and pulp, waste treatment and agricultural sector. Furthermore, several actual and widespread impact assessment methods such as the Danish EDIP 1998, the Dutch Eco-indicator 99 and the CML characterisation scheme 2001, the Swedish EPS 2000 or the Swiss ecological scarcity 1997 are implemented.

Quality guidelines are established in order to ensure a coherent data acquisition and reporting across the various institutes involved. Aspects that require a harmonised procedure comprise the reporting of pollutants (e.g., heavy metals), the modelling of electricity consumption, the system boundary definitions, the reporting and quantification of data uncertainty, the treatment of transport service requirements, the naming of processes and elementary flows and so forth.

The content of the database is publicly available via the Internet (www.ecoinvent.ch). Processes as well as impact assessment methods are documented with the help of meta- information and flow data (unit process raw data and LCI results). The structure of the data format takes pattern from the ISO/TS 14048 data documentation format. The Web interface allows for an easy as well as a sophisticated search for processes, elementary flows and impact assessment methods. Meta-information and flow data can easily be downloaded and imported into commercial LCA software. Data exchange between project partner institutes and between the database and its clients is based on XML technology.

Motivation and Problem Setting

Up to now, several public Life Cycle Assessment (LCA) databases exist in Switzerland, partly covering the same economic sectors (Frischknecht et al., 1994, 1996; Gaillard et al., 1997; Habersatter et al., 1996, 1998; Künniger & Richter, 1995). However, life cycle inventory data for a particular material or process available from the databases often do not coincide and therefore the outcome of an LCA is (also) dependent on the institute working on it. Furthermore the efforts required to maintain and update comprehensive and high quality LCA-databases are beyond the capacity of any individual institute.

At the same time, LCA gets more and more attention by industry and authorities as one important tool for example, integrated product policy, technology assessment or design for the environment (see Chapter IV). In parallel with this increasing trend in LCA applications the demand for high-quality, reliable, transparent and consistent LCA data increased as well. Only a few publicly available LCI databases fulfil these criteria and most of them were published in the '90s.

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