Development of a Tool for Simplified Life Cycle Assessment and Ecodesign of Electrical and Electronic Products

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Goal & Scope of the software
Three development axes were identified for the tool specification:
- providing a highly accessible and user-friendly tool
- meeting general E&E products specific requirements for LCA
- proposing a database that is adapted to E&E product issues.

The challenge of this project was to meet all the regulation requirements by making ergonomics and flexibility the priority.

Introduction
European environmental regulations introduced constraints associated with each stage of Electrical and Electronic (E&E) product life cycle:
- End-of-life (EOL)
- Use (U)
- Manufacturing (M)

Performing a Life Cycle Assessment (LCA) and implementing an ecosdesign approach is an opportunity to meet all these requirements and to get an overview of the E&E product environmental impact.

Methodological constraints – Short review
Practicing LCA is generally based on the use of ISO 14040 standard series and of the ILCD handbook recommendation. Some complementary guidelines adapted to E&E products are also existing:

- Type III declaration programs: PR 15804, EPO, PEP Ecopassport
- Environmental labeling: BP X30-323-0 & BP X30-323-9
- LCA of ICTs: ITU-T L1410 & ETSI TS 103 199

Use of a specific database
The E&E sector built its global business on the basis of a very complex supply chain (global supply chain, multiple and variables suppliers, ...). An adapted database has to include generic and specific data for E&E products.

Simplified data collection
Less representativeness of data
Less differentiation between products
Facilitated product LCA modeling
Lack of flexibility
Facilitated product LCA modeling
Time saving
Introduction of uncertainties
Facilitated product LCA modeling
Time saving
Use of generic data
Use of aggregated components
Use of mix of cradle to grave, cradle to gate, gate to gate & cradle to gate LCI datasets
Use of appropriate nomenclature & classification

Solution for simplifying the modeling
Analysis of typical data collection actors & Available data format

Project actors
- R&D Designer
- Production
- Logistics
- Buyers
- Inst*
- Dist**
- Sales
- Environment Service

Tools
- CAD
- ERM
- SCM
- Purchase Order
- Reporting tools

Extracts /Outputs
- CAD
- Extract. .xls of Bill of material
- Annual reports
- Delivery order
- Purchase order
- Statistics on needs and use
- Control certificate
- Statistics on Eco. treatment

Software: Development, upgrade and right management

Accessiblity & deployment
Challenges for the software development:
- providing a highly accessible tool meeting with:
  - ECD recommendations
  - collaborative work requirements

EIME is a web application developed using the framework Ruby on Rails and a PostgreSQL database. The hosting is insured by Amazon using cloud computing solutions.

Right Management

Administrator
- Manage users

Project Manager
- Create project
- Has a global view of projects

Database Manager
- Complete LCI database
- Create LCI datasets

Designer
- Perform LCA
- Model his products
- Analyze his results
- Exchange data with colleagues

Conclusions
Four pillars for the software development:
- the target audience: non-expert LCA practitioners ➔ Easy to use and designer oriented modeling rules and practices
- the target organization: SMEs and global firms ➔ hosting and maintenance insured by external experts
- the studied products: E&E products ➔ Adapted modeling rules and specific databases
- the goal of the studies: LCA, Environmental labeling and Ecodesign ➔ powerful analysis functions

The software is still undergoing improvements. One of the next development aims at allowing other tools to interface with EIME. And since E&E is a fast developing sector, the database has to be updated on a regular basis.