



Netzwerk Lebenszyklusdaten Deutschland, Berlin, 23. Oktober 2006

Zur Rolle nationaler Netzwerke im Aufbau der Europäischen LCA Plattform

Referenzdaten und empfohlene Methoden für bessere Ökobilanzpraxis

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**European Commission
Directorate-General Joint Research Centre (DG JRC)
Institute for Environment and Sustainability (IES)**



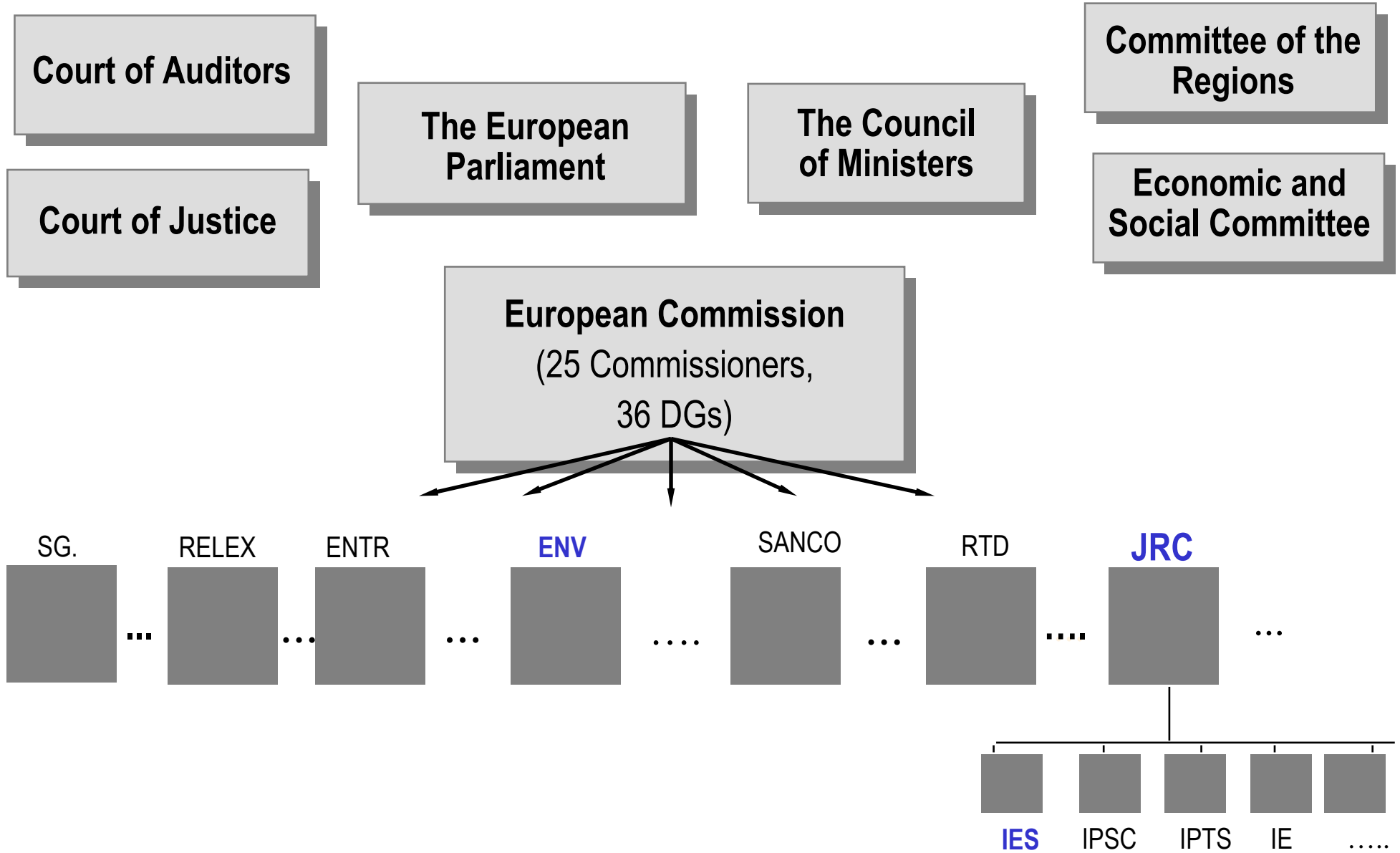
Structure

- Introduction to DG Joint Research Centre (JRC), Institute for Environment and Sustainability (IES)
- European Platform on Life Cycle Assessment
 - Life Cycle Thinking in EU policy
 - Overview of LCA Platform project
 - ELCD data system and recommended methods
 - Outlook
- Coordination with National LCA networks
- Questions and Discussion



EU Institutions

Joint Research Centre





DG JRC Mission Statement

... to provide customer-driven **scientific and technical support for the conception, development, implementation and monitoring of EU policies.** As a service of the European Commission, the JRC functions as a **reference centre** of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being **independent of special interests, whether private or national.**



Institute for Environment and Sustainability (IES)

Mission Statement

- to provide scientific & technical support to EU policies for the protection of the environment
- to contribute to EU Strategy on Sustainable Development

- Location: Ispra (Italy)
- Institutional budget: 38 Mio Euro
- Institutional staff: ca. 380
- Director: Manfred Grasserbauer
- WEB: <http://ies.jrc.cec.eu.int>





Institute for Environment and Sustainability (IES)

IES Large-scale Research Infrastructures

- Emission reference laboratories (VELA, WIND)
- European Reference Laboratory for Air Pollution (ERLAP)
- European Solar Test Installation (ESTI), accredited ISO 17025
- Super EMEP Station and Greenhouse Gas flux towers

IES Key Information Systems and Databases

- Technical Secretariat of INSPIRE / European Geoportal
- Water Information System for Europe (WISE)
- European Forest Fire Information System (EFFIS)
- European Flood Alert System (EFAS)
- European Reference System for Renewable Energies
- WMO World Data Centre for Aerosols
- Radioactivity Environmental Monitoring Database (REM)
- Global Land Cover 2000 Database
- European Soil Database
- European Reference Life Cycle Data System (ELCD)



European Platform on Life Cycle Assessment



The Growing Role of Life Cycle Thinking in EU Policy

- Sustainable Consumption and Production Action Plan, SCP (2007)
- Thematic Strategy on the Prevention and Recycling of Waste (2005)
- Thematic Strategy on the Sustainable Use of Natural Resources (2005)
- Communication on Integrated Product Policy, IPP (2003)
- Framework Directive on Waste; Waste Directives (*on-going revisions*)
- Directive on Eco-design for Energy-using products, EuP
- Strategic Environmental Assessment Directive (*plans / programs*)
- Environmental Technologies Action Plan, ETAP
- Eco-label and EMAS regulations (*on-going revisions*)
- FP7 RTD projects on waste to carry out LCA (plus economic and social life cycle analysis)
- ...



Mandate of the European Platform on Life Cycle Assessment

Integrated Product Policy Communication (IPP), 2003:

*LCA - **best framework** for assessing the potential env. impacts of products*

*but debate ongoing about **good practice***

→ ***The European Commission will develop ...***

→ ***Handbook** on best practice; best attainable consensus among stakeholders*

→ ***Platform** to facilitate communication and exchanges*

→ ***Directory** of LCA databases to be updated at regular intervals*

→ ***Co-ordination** to make data more accessible and systematically collected*



European Platform on LCA: Summary

Project of the European Commission

Coordination: DG JRC-IES in close collaboration with DG Environment

Initial phase: August 2005 to August 2008

Key purpose: Improve credibility and acceptance of Life Cycle Assessment (LCA)

Core customers: European Business - EC services - Member states

Main deliverables:

- European Reference Life Cycle Data System (ELCD) with Life Cycle Inventory (LCI) data and recommended Life Cycle Impact Assessment (LCIA) factors
- Handbook of recommended LCA methods, guidance and review process
- LCA information hub and communication platform
- *(Training course on "life cycle thinking in policy making")*
- *(Guidance for simplified LCA tools and link to EPDs)*
- Provide Commission-internal policy support



Deliverables -I-

European Reference Life Cycle Data System (ELCD)

- **Core Life Cycle Inventory (LCI) data** of key materials, energy carriers, transport and waste treatment services. Focus on data quality, consistency, and applicability.
- **Life Cycle Impact Assessment (LCIA) factors** for estimating potential impacts on resource consumption, and pressures on the environment and human health. Focus on scientific robustness, relevance, and practicality.

Handbook of technical guidance documents for LCA

- Series of **technical guidance documents** on best attainable consensus on LCA practice in data collection, modeling, analysis, interpretation, documentation, and review.



Deliverables -II-

LCA Information Hub

- Ease access to data and methods and to facilitate knowledge exchange.
- Internet site with:
 - ELCD reference data system
 - Handbook of Technical Guidance Documents
 - Directory of LCA services, tools, databases, and providers
 - Project documentation

Internal Policy Support to Brussels



Implementation

- In-house work at DG JRC-IES, in collaboration with DG Environment
- External service contracts
- Stakeholder involvement
 - EC-internal steering group and IPP Regular Meeting
 - Advisory groups (industry, LCA tool/database developers, LCIA experts)
 - National LCA projects
 - Public stakeholder consultations



Target groups and applications

Applications: all life cycle related activities

- **LCA studies** for product improvement and advance development, consultation with governments, strategic decision support, marketing, etc.
- **Ecodesign** / Design-for-environment (DfE) databases, tools, and studies
- **Communication** (B2B, B2C, B2G) incl. Eco-labels / EPDs, sustainability reporting etc.
- **Policy making and implementation** of policies TS Resources, TS Waste, IPP --> ETAP, EuP, GPP, EMAS, Eco-label, SEAs, etc.

Target groups: business and policy makers

- European business
- European Commission services
- MS, CC, AC services
- Input into standardisation processes (CEN, CENELEC, ISO)
- Consultants in LCA, Ecodesign, DfE, EMAS II, etc.
- LCA database and tool developers, LCIA methods developers
- Developers of life cycle based Ecodesign tools



Five guiding principles

- Best attainable stakeholder consensus
- Starting from existing LCA standards, practice and knowledge
- Scientifically robust
- Practical and affordable
- Long-term support



Examples for benefits from a successful harmonisation

- Higher consistency and quality of LCA studies
- Greater acceptance of LCA studies and use of LCA among stakeholders and in government
- Lower costs due to reduction in overlapping consultations among companies, associations, member states, EC
- Lower costs due to multiple use by industry of collected data
- Clearer research & development focus (e.g. 7th FP)

Σ = Increased awareness, acceptance, and application of Life Cycle Thinking and Life Cycle Assessment in industry and government for more sustainable production and consumption



LCI data content of first (non-reference) version of ELCD core database

Materials:

- **Metals:** 3 aluminium, 2 copper, 4 steel, stainless steel, *zinc*
- **Inorganic chemicals:** NaCl, NaOH, HCl, (H₂SO₄)
- **Plastics:** ABS, PA6, PA6.6, PBT, PC, PE, PET, PMMA, PP, PS, PVC in 21 variants / routes
- **Other packaging:** corrugated board, *glass, paper*
- **Construction materials:** 6 wood-based, *cement, glass*

Beta version online

Energy:

- **Electricity:** 26 country-specific mixes plus 2 renewables
- **Fuels:** 8 key fossile fuels
- **Thermal energy:** from 3 key fuel sources

Partner industry associations -
with 13 more interested to join



Transport:

- 5 road, 1 rail, 3 water, 2 air in each two variants (w/wo fuel)

End-of-Life treatment:

- **Incineration:** of 16 materials
- **Land filling:** of household waste and of inert waste



Next steps: Extension of ELCD core database

- Extension by further core materials, energy, transport, and waste services
- Data from non-industry association sources replaced by industry-approved data
- 15 additional EU-level industry associations expressed interest to join
- Methodologically harmonised and data independently reviewed
- Life cycle impact assessment characterisation factors identified and integrated



Concept of ELCD core content (LCI data sets)

- **Basic commodities** (materials, energy carriers) **and services** (transport, storage, end-of-life treatment) commonly used in most LCA studies
- **Actual data; consumption mix; EU-level but geographically differentiated** where required (! --> National LCA projects should take over)
- **LCI results plus some parameterised processes**
- **Industry-based** (i.e. approved by product owner / process operator), as far as possible
- Data still **owned and maintained by industry**
- **Association agreed** data, as far as possible
- Focus on **high quality and consistency**
- Methodologically **harmonised and independently reviewed** (only in final version of ELCD)
- Provided to users in **ELCD reference format** via LCA information hub on EUROPA site
- Organisation and hosting/publication of data **by DG JRC-IES**
- **Cost free** access, use and further distribution; source and owner to be cited



Concept of wider, consistent LCA data system

- **ELCD core database**
Key materials, energy carriers, services; maintained by EC, DG JRC-IES; cost-free
- **ELCD-consistent data platform**
Other materials, parts and products, as well as national data; provided and hosted by industry (associations), National DB projects, other database developers; meta-data published by JRC-IES' Info Hub; cost-free or for license
- **ELCD-consistent publicly funded research projects' data library**
Research project LCI data of general interest from FP 7 projects; possibly hosted by DG RTD or other EU governmental body; meta-data published by JRC-IES' Info Hub; typically cost-free



Early stakeholder involvement

Purpose: Improve quality and harmonisation status of deliverables before they go to public stakeholder consultation; support dissemination

- **"EC-internal Steering Group"** and **" IPP Regular Meeting"**
- **"European Business Advisory Group"** of data providing European-level industry associations (7 members, 13 potential new members)
- **"LCIA Method Developers Advisory Group"** of developers providing their impact factors documented in the ELCD format (5 applications)
- **"LCA Tool and Database Developers Advisory Group"** of tool and database developers, that implement an import/export interface to the ELCD data format into their systems (15 applications)
- **International cooperation** with National LCA database projects via MoUs and with the UNEP/SETAC LC Initiative seeked and partly on-going



Further main activities (2006 to 2008)

- Extension of ELCD database by further, predominantly industry-approved core LCI data sets
- Replacement of non-industry data by industry-approved data
- Recommended LCA methods and review process; harmonisation and quality assurance of ELCD core database.
- Recommended life cycle impact assessment factors to be selected / developed and integrated with ELCD's LCI data
- Reference elementary flows, units etc. developed and maintained. ELCD format finetuned; ELCD online-system further developed.
- Attract ELCD-*consistent* LCI data sets from non-core industry, National LCA projects, and other database developers.
- Long-term support: extension and expansion of European LCA Platform project expected; strong policy support

13 additional EU-level industry associations consider to join and to provide data

Support contracts;
Start 01/2007

Support contract;
Start 01/2007

Support contracts;
Start 01/2007

Start early 2008

After 2008



Coordination with National LCA networks



Coordination mandate of the European Platform on LCA project

- *"The Commission will develop a life cycle data reference system, and will launch a coordination initiative involving ongoing data collection efforts in the EU and existing harmonisation initiatives. The data reference system includes a database and data collection methodology for both life cycle inventory and impact data."*

(Admin Arrangement between DG ENV and DG JRC)



Suggested cooperation of European Platform on LCA with German Network Life Cycle Data -I-

- **Bilateral "Memorandum of Understanding":**
- State common interests; mutual acknowledgement of activities
- Joint work towards better practice in LCA and better access to high quality, independently reviewed, and consistent LCA data
- Joint coordination of activities to avoid overlapping work and incompatibilities, and to realise the strong possible synergies
- Exchange of documents, technical deliverables, data, advice



Suggested cooperation of European Platform on LCA with German Network Life Cycle Data -II-

- **Work that is better done on national level should be done on national level**, e.g. National LCI data collection, National LCIA methods, National training materials (e.g. for government and universities), National review process organisation, coordination with life cycle related governmental activities in the MS, providing technical input into MS' standardisation processes, dissemination to LCA practitioners in MS (including implementing and operating national online portals for LCA data)
- **Work that needs EU-wide consistency is coordinated (but not necessarily done) at European level**, reflecting the needs, expertise, and input of National LCA networks, of industry and of other stakeholders e.g. on LCA methodological guidance, common data exchange format, review frame and process, LCIA frame



Input offered from EU side for joint contribution to a wider, high quality and consistent LCA system -I-

- **Online LCA data system** in support of **publication of national reference LCI data sets and LCIA factors**
These will form a growing network of consistent, but independent LCA data systems - with the ELCD-consistent LCI and LCIA data sets of the European Commission's ELCD core database, National LCA projects, industry, consultants, and research groups.
(See EC's operating system at <http://lca.jrc.ec.europa.eu/lcainfohub/datasetCategories.vm>)
- **Common data exchange format ELCD** in support of **developing consistent national format variants** and for developing and disseminating well documented National LCA data sets.
Format explicitly developed to allow non-centralised and complete data exchange and to integrate National "namespaces" in a structured way, that allow to document and exchange further information of national interest, while keeping the data sets consistent.



Input offered from EU side for joint contribution to a wider, high quality and consistent LCA system -II-

- **Recommended LCIA method data sets and frame on EU level** as technical input for developing **National LCIA method data sets**
... that reflect the specific national situation, such as e.g. different relevancy of resources (e.g. water, land area, energy carriers) or to model country-specific impact factors, that are consistent with the EU-level LCIA factors and vice versa. (Developed in 2007)
- **Methodological guidance documents (and policy maker's training material)** as technical input in support of developing **nationally adjusted LCA guidance handbooks and training materials**.
While translation into some EU key languages might be done already in the EU, these could be the basis to start from towards national variants, reflecting national experience or needs in industry and government, and to further develop them for specific applications of life cycle thinking. (Guidance developed in 2007, training until early 2008)



Questions and Discussion



Thank you very much for your interest and time!

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Platform project and LCA Info Hub: <http://lca.jrc.ec.europa.eu>





Additional slides: Common data exchange format and LCA Info Hub



Ease access to well documented, quality LCA data: Need for an LCA data format

- **LCA data storage and working format**

for ELCD unit process LCI data sets as well as LCI results of product systems, including data documentation, review aspects, later for LCIA data, etc.

- **ELCD data exchange format**

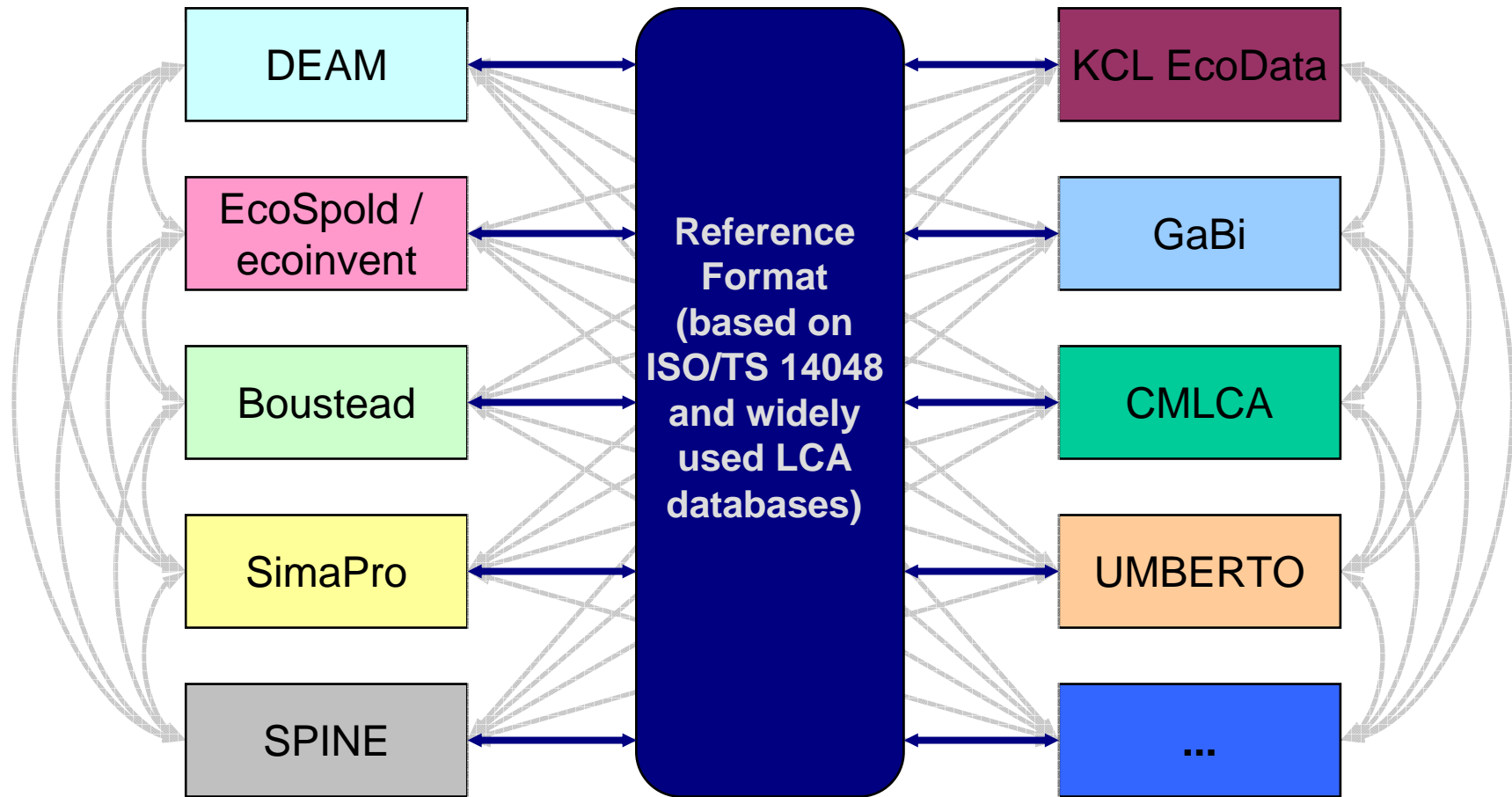
to support exchange (import and export) of ELCD data sets (LCI and LCIA) with market relevant LCA databases and software tools

- **Common LCA data exchange format**

in support of LCA practitioners for complete LCA information transfer along the supply-chain; for use among widely used LCA tools and databases



Support efficient LCI data exchange along supply-chain

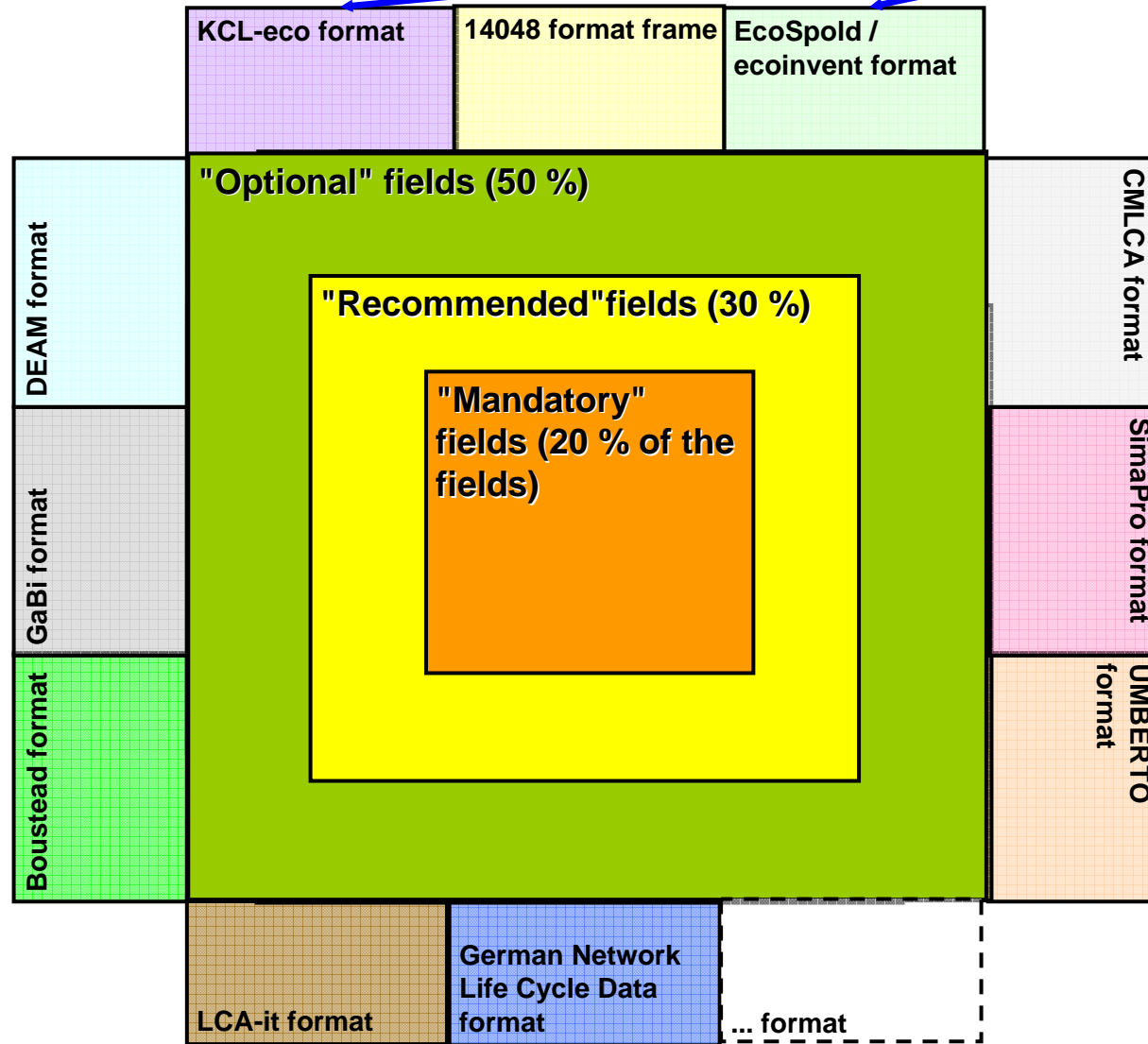


... with a common reference LCA format



ELCD format approach

Sets of "additional format fields"



The common core of LCA database formats



Relationship to widely used LCA formats

Solutions of particular formats (input provided by Boustead, CML, Ecobilan, PE, KCL; plus available documentation on EcoSpold) used to further develop and specify ISO/TS 14048 e.g. regarding:

- Inclusion of LCIA factors
- Object orientation, i.e. differentiation into Process, Flow, LCIA Method, Flow property, Unit group, Source, Contact
- Use of XML as format language
- Coded lists with pre-defined instances of elementary flows, units etc.
- Multilanguage capability; Globally unique identifiers for data sets
- Symmetric format design, i.e. using analogous fields for the different object types such as Process, LCIA method etc.
- Mathematical relations
- Reminder flows
- Emission source type
- History of objects
- Various solutions for codes, labels and for data organisation to fields etc.



Stakeholder-inputs received July 2005 - March 2006:

- Provision of format definitions and example data sets: Boustead Consulting (Boustead model, United Kingdom), CML (CMLCA tool and databases, The Netherlands), Ecobilan (TEAM software and DEAM database, France), IKP and PE (GaBi software and databases, Germany), KCL (KCL EcoData, Finland)
- Specific comments received via email and telephone from all the above named institutions plus from Chalmers (Sweden), ecoinvent centre (Switzerland), Force Technology (Denmark), IPU (Denmark), Pre Consultants (The Netherlands)
- Direct inputs received during general discussions at the stakeholder meeting at DG JRC, 3rd August 2005
- Discussions with experts at CEN/STAR workshop on "PDT for LCA" in context of CASCAE project in Vico Equense near Naples, 15-16 Sept. 2005
- Specific comments received during and in follow-up of independent LCA format test panels from industry and from LCA tool and database developers; meeting 27-28th September 2005.
- Various feedback received until spring 2006 from the members of the above named test panels

Considered information sources, which were available by July 2005:

- ISO/TS 14048 (2002)
- ISO 14040-14043 (2000)
- Work at DG JRC, Ispra (Status by May 2005); especially the existing implementation and documentation of a "prototype database and web application for management and exchange of inventory data for LCA", which is based on ISO/TS 14048
- COST Action 530 (Status by June 2005)
- UNEP&SETAC Life Cycle Initiative; LCI programme, TF 2 (Status by 6th July 2005, as received by email from the chair C. Bauer) and TF 3 (Status by end of 2005) Covering formats, examples, arguments from the following organisations: Chalmers (SPINE), CML (CMLCA), Ecobilan (TEAM and DEAM), ecoinvent centre (EcoSpold/ecoinvent), FZK (Coordinator German Network Life Cycle Data), IKP and PE (GaBi), nrel (USA), Pre consultants (SimaPro)
- SETAC LCA Working Group on Data availability and Data Quality, Subgroup "Recommended List of Exchanges", Final Report March 2001
- SETAC WG; subgroup 3 on data exchange among existing (LCA) tools, 2001
- UNEP&SETAC Life Cycle Initiative; LCIA programme, TF 1 (Status by beginning of 2005)
- German Network LCI data; "Methodology" working group (Status by May 2005); "Application in product development/IPP" working group (Status by May 2005)
- EcoSpold01 Schema documentation (Status by beginning of 2005)
- CASCADE-Project webpage
- SPINE format documentation webpage
- Nomenclatures, structure and further conventions used in widely used LCIA methods, such as CML 2001, eco-indicator 99, Impact 2002+ etc. (Status by 2004)
- SPOLD format, 1999
- IUPAC Nomenclature on Chemical Substances (Status by June 2005)



LCA Tools, Services and Data
Important legal notice

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List of databases

This page lists databases for your search or chosen category. Click on the name of the database to see the description of the database

Database + version	Supplier	Database Languages
CML-IA 2.7	Leiden University, Institute of Environmental Sciences (CML)	English
DEAM™	Ecobilan - PricewaterhouseCoopers	English
DEAM™ Impact	Ecobilan - PricewaterhouseCoopers	English
DIM 1.0	ENEA - Italian National Agency for New Technology, Energy and the Environment	English Italian
ecoinvent Data v1.2	ecoinvent Centre	Japanese English
EIME v8.0	CODDE	English French Spanish
esu-services database v1	ESU-services Ltd.	English German
Eurofer data sets	EUROFER	English
GaBi 4 professional	PE Europe GmbH	Japanese English German
IO-database for Denmark 1999	2-0 LCA consultants	English
IVAM LCA Data 4.04	IVAM University of Amsterdam bv	English
KCL EcoData	Oy Keskuslaboratorio-Centrallaboratorium Ab, KCL	English
LCA Database for the Forest Wood Sector	Bundesforschungsanstalt für Forst- und Holzwirtschaft (BFH)	
PlasticsEurope Eco-profiles	PlasticsEurope	English
ProBas	Umweltbundesamt	German
SALCA 061	Agroscope Reckenholz-Tänikon Research Station ART	English German
SimaPro database	PRé Consultants B.V.	English
sirAdos 1.2	LEGEP Software GmbH	German
Societal Life Cycle Inventory, Version 0.1	AQUA+TECH Specialities	English
The Boustead Model 5.0.12	Boustead Consulting Limited	English
US Life Cycle Inventory Database	Athena Sustainable Materials Institute	English
Waste Technologies Data		



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Policy activities and instruments referring to life cycle thinking or assessment

Communication on Integrated Product Policy (IPP)
<http://europa.eu.int/comm/environment/ipp/>

Thematic Strategy on The Sustainable Use of Natural Resources (Resources TS)
<http://ec.europa.eu/environment/natres/index.htm>

Thematic Strategy on The Prevention and Recycling of Waste (Waste TS)
<http://ec.europa.eu/environment/waste/strategy.htm>

Environmental Technology Action Plan (ETAP)
<http://ec.europa.eu/environment/etap/index.htm>

Directive 2005/32/EC on the eco-design of Energy-using Products (EuP)
http://europa.eu.int/comm/enterprise/eco_design/

Directive 2002/96/EC Waste Electrical and Electronic Equipment (WEEE)
http://europa.eu.int/comm/environment/waste/weee_index.htm

Directive 2002/95/EC Restrictions of Hazardous Substances (RoHS)
<http://europa.eu.int/comm/environment/waste/index.htm>

Directive 2000/53/EC on end-of-life vehicles (EoL)
http://ec.europa.eu/environment/waste/elv_index.htm

Green (Public) Procurement (GPP):
<http://ec.europa.eu/environment/gpp/index.htm>

Regulation on Eco-labeling: voluntary scheme of the European Eco-label