Quality of LCI data: What, how and why? - a roadmap for the work shop

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Observations -I-

Current drivers in LCI and LCI data quality needs

- Rising availability of LCI data leads to more focus on data quality
- Diversification of application areas within LCA (from past product comparison to present product improvement to future product development) assigns a higher relevance to LCA and hence reliability of decision support
- Novel applications outside traditional LCA (environmental management and reporting, policy making, GHG-Accounting etc.) have specific quality needs
- National and supra-national activities for information about and harmonisation of methods and formats shows different approaches and solutions
- Export of Life Cycle Thinking to learning countries rises questions of data appropriateness (e.g. European power production data for Chilean copper production?)
- Technical advancement of LCA software offers formerly unavailable methods and tools

Observations -II-

Current progress

- Workshop under SETAC on LCA data quality in 1992
- SETAC working groups dealt with various data quality issues
- ISO 14040-14043 and TS 14048 show the width of this issue
- Loads of publications in the last decades from simple check lists to sophisticated uncertainty models
- Guidelines and Best Practice documents compete with different approaches and recommendations
- Implementation of feasible solutions by database and software developers; getting more and more advanced

Observations -III-

Levels of quality issues

Levels for which quality information has to be dealt with (selection):

- Input/Output and its amount
- Other quantitative and qualitative information on unit process level
- Unit process as integrity
- LCI dataset
- Use of unit processes and LCI datasets in product systems (appropriateness)
- Link of LCI dataset to LCIA
- LCI databases
- Documentation (on all levels)
- LCI methodology
- Link of all the above to goal and scope of study

Observations -IV-

Structures and strategies

There are various ways to structure data quality issues. The appropriate one has to be used depending on the purpose, e.g. ...

- ...for types of quality and representativeness information dealt with
- ...for levels for which this information is given
- ...for levels for which this information is needed by decision maker
- ...for ways to aggregate this information
- ...for documenting and communicating information
- ...for integrating the quality assessment results into decision making in practice
- ...

Observations -V-

From theory to practice - areas of conflict

- Confidence and reliability vs effort and feasibility

- Transparency vs data quality / confidentiality
- Technical feasibility of aggregating different types of data quality and representativeness is questioned (qualitative, quantitative, stochastic, systematic, choices etc.)
- Know the unknowable?: dominance of unknown errors (inappropriate assumptions, unknown systematic errors) is pointed to
- Tackling goal&scope-dependency of data quality issues
- Reporting of data quality and representativeness (which indicators, formats etc.)

- Review of data quality

The Workshop as Process -I-

- UNEP/SETAC Initiative + German Network on LCI-Data
- Task Forces within the LCI Work Programme of the LC-Initiative:
  - Overview LCI-Databases
  - Database Property Consistency
  - Methodological Consistency
  - LC Case Studies Library
  - Capacity Building

Core Characteristics

1. Data quality
2. Documentation format
3. Data exchange format
4. Nomenclature

The Workshop as Process -II-

Organisers and Steering Committee

- Liselotte Schebek, Forschungszentrum Karlsruhe, Germany (chair)
- Raul Carlson, Chalmers University of Technology IMI, Sweden
- Alain Dubreuil, NRCan, Canada
- Matthias Finkbeiner, DaimlerChrysler, Germany
- Rolf Frischknecht, ecoinvent Centre, Switzerland
- Atsushi Inaba, AIST, Japan
- Greg Norris, Harvard University, USA
- Toolseeram Ramjeawon, University of Mauritius, Mauritius
- Tomas Rydberg, EC-JRC, Italy
- Guido Sonnemann, UNEP, France
- Bernhard Swarbrick, Falconbridge, Australia
- Bo Weidema, 2.-0 Consultants, Denmark
- Marc-Andree Wolf, University of Stuttgart, IKP, Germany

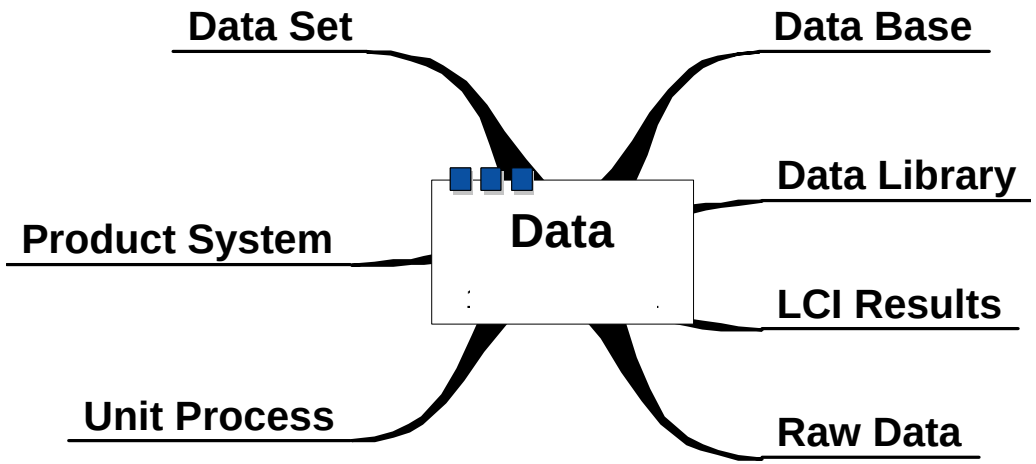
The Workshop as Process -III-

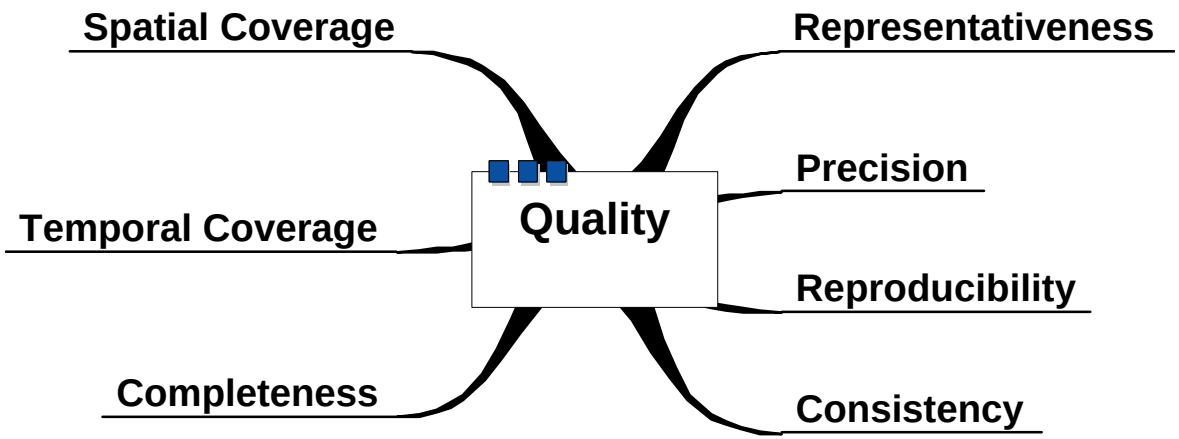
Objectives (Steering Committee meeting Hamburg April 2003)

- Gap analysis on the difference between the state of the art for quality issues and a long term goal for LCI-quality
- Guidelines and/or recommendations for consensual issues
- Action programmes for contentious issues
- Answers to the question which information is needed to address or evaluate the appropriateness of LCI-data (application-specific)
- Motivation for data providers
- Documentation of quality: how and what should be reported
- Requirements for a third-party review
- Positioning of ISO TS 14048 to existing data and data bases

Wording and Definitions

! see handout !





“Appropriateness of LCI data”

Data quality information for facilitating appropriate use of LCI data

What does it mean?, How to achieve this ?, What does this imply ?

“Data quality information for review”

How to review LCI data sets and quality information ?

“Vision”

What does an ideal, "long-term" goal for measuring, reporting and use of LCI data set quality look like?

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Sessions and Questions -II-

Structure of workshop sessions

Session A: Quality Criteria and Measurement

Criteria for data sets, methodology and uncertainty; criteria for databases, methodology, consistency, and reliability; subjective and objective methodology and modeling choices; quantitative vs. qualitative measures; stochastic vs. systematic errors.

Session B: Documentation and Communication of Quality Information

Interaction of LCI and LCIA uncertainty; application fields and data appropriateness; technical needs and solutions for documentation, communication, and reporting; integration of data of different origin

Session C: Application of Data Quality Information in Decision-Making

Integration of data with different appropriateness & quality; significance of results, reliability of decision support; data quality vs. transparency

Review and Appropriateness as Cross-Cutting issues

„Criteria and Indicators“

- Which criteria and indicators on inputs and outputs, unit process raw data and LCI result level exist and which can be recommended and why?

“Combination”

- Is it feasible/necessary to combine qualitative and quantitative DQ information to the level of LCI results and how?

“Limitations”

- Limits of DQ-Information - How can subjective choices be dealt with?

“Reporting”

How to close the gap between reporting (elements, language, structure) and the audience (LCA-experts, engineers, public etc.) ?

“LCI-LCIA”

What reporting requirements are there on LCI data sets to facilitate LCIA ?

“Integration”

How to deal with different quality issues when compiling one LCI data set from LCI data sets of different origin ?

“Decision Context”

- What is the role of LCI-Data quality information in decision making ?
- How has data quality information been used and what are incentives and barriers for determination and use of data quality information?

“Effort”

- Which level of documentation and quality assessment is affordable in industry, consultancy and database build-up practice ?

Outlook

Proceedings for common findings

- Summary of work shop outcomes to be prepared by session moderators: answers found to overarching and session-specific questions; open issues; lessons learned (e.g. on form of workshop etc.)
- Selected, reworked and reviewed papers framing the workshop outcome summary
- Form of publication: intended to be under UNEP/SETAC

Follow-up events for contentious issues

- Upcoming workshops
- Other addressees
- Targeted projects
- Input to the work programme of UNEP/SETAC Initiative, LCI programme, TF1-5