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An interpretation of the CPM data quality requirements in terms of ISO/TS 14048 data documentation format

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Preface

In this report the focus has been to interpret the data quality requirements developed within CPM into the terms of the technical specification ISO/TS 14048:2002(E). The report has been developed as part of the work to translate SPINE tools and material into the ISO/TS 14048 format. The CPM LCI data documentation requirements are based on requirements for data quality and data documentation according to ISO 14041:1998 (E).

This report is based on CPM report 1:1997 and CPM report 9:1999. The former was a project report within the frame of the CPM database project, which specified the data quality requirements for the CPM database. The latter, “An interpretation of the CPM use of SPINE in terms of the ISO 14041 standard”, was an adaptation and revision of the CPM report 1:1997 to reflect the final ISO 14041 standard.

For more detailed information about how the standard ISO 14041:1998 (E) was interpreted or the exact definition of ISO/TS 14048 data fields, read the following reports:

- Krav på datakvalitet CPMs databas, CPM report 1:1997
- An interpretation of the CPM use of SPINE in terms of the ISO 14041 standard, CPM report 9:1999
- ISO 14041:1998 (E)
- ISO/TS 14048: 2002 (E)

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1 Reading instructions

This section includes short specification of different parts in the report and explains how the report was developed.

The interpretation is based on CPM's requirements for data quality, described in the CPM reports: "Krav på datakvalitet CPMs database", 1:1997 and "An interpretation of the CPM use of SPINE in terms of the ISO 14041 standard", 9:1999. SPINE data fields corresponding to the CPM requirements have been mapped to ISO/TS 14048 data fields according to the mapping report¹. The original formulations in the CPM report 9:1999 have been retained as far as it was possible. In some cases words specific to SPINE² concepts and nomenclature has been adjusted to the corresponding ISO/TS 14048 concepts and nomenclature. Errors have also been corrected when discovered.

The first part of the report is a description on how the CPM data documentation requirements and ISO/TS 14048:2002(E)³ data documentation format is used for LCI- data documentation. For each CPM requirement one or several ISO/TS 14048 data fields have been identified to fulfil the requirement. The data fields are presented according to the structure in the technical specification. The first name is the set of data fields to which the data field belong, the second and third is a further specification of where to find this field. The last name is the specific data field under where the information should be written, for example; Process – Process description – Technology – Technical content and functionality; where Technical content and functionality is the specific data field in which the information should be written.

The last section of this report includes a description of which data fields according to ISO/TS 14048 to use when documenting a LCI study. This section follows the structure in ISO 14041:1998 (E) section 8(study report).

In some cases the definitions of ISO/TS 14048 data fields have a broader interpretation compared to the CPM data quality requirements. The interpretation of these fields has then been *limited*. Both the limited definitions and the broader definitions can be used, since both fulfil the CPM data quality requirements. In cases where data fields have a broader definition, this is described under the headline *Broader definition*.

Also, in some cases ISO/TS 14048 has a more detailed specification of information, with additional data fields compared to SPINE and the CPM requirements. In such cases the additional data fields are specified under *Additional specification*. These additional data fields are not part of the original requirements, but are recommended since they improve or further specify the process.

It should also be mentioned that the interpretation has in some cases resulted in minor differences between the mapping of fields between SPINE and ISO/TS 14048 described in the mapping report¹, and this report. In such cases a different field than the one specified by the mapping report has been used. The reason for the differences is that the text specifying each data quality requirement has been the focus when writing this report.

¹ Carlson R., Pålsson, A-C., Tivander, J et al., "Data format mapping between SPINE and ISO/TS 14048", CPM report 2002:xx

²Carlson R.; Löfgren G. & Steen B., "Spine A Relation Database Structure for Life Cycle Assessment", IVL Report no. 1203, 1995, Gothenburg

³ ISO/TS 14048:2002 (E) Environmental management – Life cycle assessment – Data documentation format

Comments as well as text under each data field comes from the CPM report 9:1999, and has in some cases been modified to better suit the terminology in the technical specification. The scope and meaning of CPM requirements has however not been changed. Specific notes has been added under the headline *Notes*.

Appendix I from CPM report 9:1999 is not included in this report.

For nomenclatures, CPM nomenclatures should be used when documenting data for and when using the CPM database, e.g. for substance names. If data is used in international communication with users of other databases, ISO/TS 14048 nomenclatures are recommended.

2 Principles for the interpretation of ISO 14041:1998 (E)

The CPM LCI data documentation requirements are based on requirements for data documentation according to ISO 14041:1998 (E). These requirements are interpreted partly from the requirements for data quality formulated in section 5.3.6 (data quality requirements) and partly from the general text in the standard.

In CPM report 9:1999 it is further explained how parts of the standard text are interpreted within the CPM group, and how the standard is applied with the SPINE format.

3 LCI data documentation according to CPM

The following is a description on how the CPM data documentation requirements and ISO/TS 14048:2002(E)⁴ data documentation format is used for data documentation in accordance with ISO 14041:1998(E).

The headlines in *italic* refer to data fields in the technical specification ISO/TS 14048:2002 fulfilling the CPM requirements. In the text the original CPM data documentation requirements are given together with the *broader definitions* of certain data fields and/or *Additional specifications* for the CPM requirements. The broader definition describes the full ISO/TS 14048 definition of the data field, in cases where the CPM requirements are more limited, and the additional specification describes more data fields from ISO/TS 14048 format which matches the requirements. These data field is not included in the original requirements but they further specify the data quality requirements.

3.1 Data quality requirements

This section describes how ISO/TS 14048 corresponds to the requirements on data quality in section 5.3.6 in ISO 14041:1998(E). The headlines refer to different parameters that should be included or considered.

3.1.1 Time-related coverage

Data field in ISO/TS 14048: Administrative information – Date completed

The date when the study or the data set was completed or final reported. For instance, the major part of data used in the study may be from 2000 or earlier. The final reporting of the study was however not done until 2003-06-24. This is the date that is referred to in Date completed.

The following format should be used: YYYY-MM-DD

If only the year is known: YYYY-01-01

If only the year and the month are known: YYYY-MM-01

Example:

2003-06-24

Data field in ISO/TS 14048: Inputs and outputs – Collection date

Time period during which data was collected. The data may represent a study, a process or an individual value that describes an input or output. Through the SPINE model the context is clear.

For instance, the data used to compile a data set may be from 2000 to 2003. The time period that comprises the entire data set should be given.

The following format should be used: CCYYMMDD/ CCYYMMDD

⁴ ISO/TS 14048:2002 (E) Environmental management – Life cycle assessment – Data documentation format

Note: The format is adapted to ISO/TS 14048 and it differs slightly from the format in the original document (CPM report 1:1997).

Example:

In a given data set describing a process, the value for the emissions of carbondioxide is a yearly average from 2002-01-01 to 2002-12-31, whereas the value for the emissions of nitrogen is an average from 2002-11-14 to 2002-12-14.

Collection date for the value for the flow of carbondioxide is then: 20020101/ 20021231.

Collection date for the value for the flow of nitrogen is then: 20021114/ 20021214.

Tables in ISO/TS 14048:

Process description – Valid time span - Time-span description

System boundary in time, i.e. the time period during which the process or the technology can be surveyed.

Comment:

Time-related aspects can be described in free text. Examples of such descriptions are an estimation of the “best before date” for a data set with a description and motivation. The motivation may be done through a description of the technology level of the process or plans for investments or alterations of the process that will have a significant effect on the process and consequently the data. With such descriptions it is possible to form an opinion on whether the data still is representative or not.

Additional specification: **Process description – Valid time span – Start date** The start date for the valid time span.

Process description – Valid time span - End date The end date of the valid time span

3.1.2 Geographical coverage

Data field in ISO/TS 14048:

Process - Inputs and outputs – Geographical location

Description of the geographical recipient for the inputs and outputs. A nomenclature for this purpose has been developed within CPM.

Example 1: Göteborg

Example 2: Africa

Data field in ISO/TS 14048:

Process - Process description – Valid geography – Sites

Process - Process description – Valid geography – Area name

Process - Process description – Valid geography – Geographical Information System (GIS) reference

The geographical location where the described process or system is situated, i.e. address or geographical area. If the data describes a specific plant, the name and the address of the plant is given. If the data describes an average or a geographically extended system, the geographical region should be given e.g. Europe (in the sense European average).

Note: According to the CPM requirements there is only need for one data field here but in ISO/TS 14048 three fields are defined. Depending on type of information, the information would be written where it suits the best.

Example:

Site: Papper AB

Pappersgatan 5B

123 45 Pappersby

Sweden

Area Name: SE

GIS reference: Easting_301230 Northing_6263230

Data field in ISO/TS 14048: Process - Process description – Valid geography – Area description

The geographical extension or geographical limitations of the studied process or system.

Example:

The plant within the gates

The life cycle within the Swedish borders

3.1.3 Technology coverage

Data field in ISO/TS 14048:

Process - Process description – Name

Process - Process description – Technical scope

Process - Process description – Class – Name

Identification of the studied process or system, e.g. a plant or an average of several processes.

The identification is made by the most prevalent name (Name), the type or the scope (Technical scope) and the trade (Class – Name) of the studied process or system.

Nomenclatures have been developed for Class – Name and Technical scope at CPM.

Example:

Name: The most prevalent name for the system, e.g. tissue production

Technical scope: The type or the scope of the studied system e.g. "gate to gate" or "cradle to gate"

Class – Name: The sector to which the system belongs, e.g. pulp and paper industry

Additional specification:

Process - Process description – Class – Reference to nomenclature

The data field Reference to nomenclature enables a specification of the nomenclature from which the name is chosen.

Broader definition: The definition and meaning of Class in ISO/TS 14048 data documentation format is wider than the CPM data quality requirements in this case. For example Class can be not only an industry sector, but can also be other types of classification of processes. The user should define which classes to use.

Data field in ISO/TS 14048:

Process - Process description –Technology – Operating conditions

Description of different conditions, e.g. operational that have an influence on entire sets of measurements or individual measurements. This is described through free text.

Example:

The production was 40000 tonnes/year. The available capacity for production in the plant is 75 000 tonnes/year.

A new purification treatment was installed during the year. The installation brought about abnormal high emissions, which is anticipated to be lower next year.

The measurements were performed during the summer half.

Data field in ISO/TS 14048:

Process - Process description –Technology – Technical content and functionality

Process - Process description –Technology – Process contents

Description of the technical system as thoroughly as possible. The description should enable an identification of technology that may have a large influence on e.g. emissions, energy consumption etc. All process steps that are included in the system should be described, e.g. administration, internal recycling loops, preparation, sewage treatment, scrubber technology etc.

Note: Process contents, is a set of data fields where an aggregated system is described in a flow chart. This was possible in SPINE as well but not mentioned in the CPM report 1:1997 or 9:1999.

Additional specification:

Process - Process description –Technology – Short technology descriptor

A short descriptor for the technology that is included in the process.

Process - Process description –Technology – Technology picture

In ISO/TS 14048 there is a possibility to insert a graphical representation of the technology e.g. the process. This further describes the studied process. The picture is inserted in data field Process - Process description –Technology – Technology picture, in ISO/TS 14048, and can be seen as a complement to the description of the technical system.

Process - Process description –Technology – Operating conditions Description of the operating conditions for the process.

Process - Process description –Technology – Mathematical model

Mathematical model is set of data fields where the operating conditions may be documented for mathematically modelled processes. In other words a mathematical model of the relations between inputs and outputs.

Process - Process description – Data acquisition

Data acquisition is a set of data fields describing the documentation of the data collection and treatment at the process level.

Process - Process description – Aggregation type

Aggregation type is used to indicate the type of aggregation that has been performed on aggregated unit processes.

Data field in ISO/TS 14048:

Modelling and validation – Modelling choices – Allocations performed – Allocation explanation

Descriptive text on allocations that have been performed, the basis for the allocations and rules and assumptions that have been used to allocate the environmental load to the studied system.

Example:

Allocation explanation: Allocation of the environmental load between the products produced at the plant is made on the basis of mass.

Additional specification:

Modelling and validation – Modelling choices – Allocations performed – Allocated co-products

The co-products that have been allocated should be described according to ISO/TS 14048. Example of allocated co-products is Refinery products.

Data field in ISO/TS 14048:

Modelling and validation – Modelling choices – Process expansion

Modelling and validation – Modelling choices – Process expansion – Process included in expansion

Modelling and validation – Modelling choices – Process expansion – Process expansion explanation

Descriptive text on system expansions that have been performed, the system expansions should be explained and justified.

Data field in ISO/TS 14048:

Modelling and validation – Modelling choices – Criteria for excluding intermediate product flows

Modelling and validation – Modelling choices – Criteria for externalising processes

Description of system boundaries other than towards the surrounding natural environment, geographical extension, extension in time and system expansion. Examples of such boundaries are boundaries towards other technical systems (e.g. exclusions of technical subsystems, basis for choice of flows to and from other technical systems).

Example:

Criteria for excluding intermediate product flows:

Flows of raw material that are lower than 0,7 % have not been studied

Criteria for externalising processes:

The system does not include:

- heating of the premises
- erection of the building and infrastructure
- internal transports
- administration

3.1.4 Precision

Data field in ISO/TS 14048:

Process – Inputs and outputs – Amount – Parameter – Name

Process – Inputs and outputs – Amount – Parameter – Value

Process – Inputs and outputs – Amount – Unit – Symbol or name

The size of flow may be given with corresponding minimum value, maximum value and standard deviation.

General remark regarding statistical information; Numerical information may be supplied with statistical information. Standard deviation, minimum and maximum values are at present not a requirement within CPM. This type of information should however be reported when available. It is also strongly recommended that an increased focus be put on this issue in data collection.

Example 1:

Name: max

Value: 950

Unit: kg

Example 2:

Name: min

Value: 854

Unit: kg

Additional specification:

Process – Inputs and outputs – Amount – Name

To further specify an amount with a commonly understood name e.g. range, mean, this data field can be used.

Process – Inputs and outputs – Amount – Unit – Explanation

An explanation of the unit.

Data field in ISO/TS 14048: Process - Process description - Technology - Mathematical model

Process parameters, such as transportation distances or process time may be given with corresponding minimum value, maximum value and standard deviation.

In some aggregated activities different data from transports are used, for example 10 km of transport X and 55 km of transport Y. The formula for connecting these data sets can be described in the set of data fields Mathematical model including Formulae, Name of variable and Value of variable. The mathematical model can also be used when for example one input have a relation which can be expressed mathematically with another input or output.

3.1.5 Completeness

Data field in ISO/TS 14048: Process - Inputs and outputs - Documentation – Data treatment

Description on the basis for and the methods used to acquire the numerical values in a data set. This may both be given for the entire data set and for each flow in the data set. Naturally it should also be described for how well the statistical information has coverage in the basis for the data.

3.1.6 Representativeness

Data field in ISO/TS 14048: Process - Inputs and outputs - Documentation – Data treatment

In cases where values have been acquired from other processes to represent the studied process, the data field Data treatment can be used. Documentation of numerical assumptions of inputs and outputs to the process regarding values acquired from sources that describes other processes. The documentation should especially contain an argumentation of how well the assumed value may be considered to correspond to the 'true' value. A description of relevant aspects of the original conditions for the data i.e. what the data originally represents should also be included.

Broader definition: Data treatment according to ISO/TS 14048 has a broader meaning than the data field in SPINE QMetaData; Column: Represents. Data treatment includes the description of methods, sources and assumptions used to generate, recalculate and reformat the presented amounts.

Data field in ISO/TS 14048: Process – Inputs and outputs– Documentation – Data collection

Type of method that has been used in the data collection.

Example:

Unspecified

Monitored, continuous

Additional specification: Short specification of the methods that have been used for the data collection referred in the data field Data collection.

Data field in ISO/TS 14048: Modelling and validation – Data quality statement

General description of numerical and other qualities, or quality deficiencies in the overall documentation of a process, regarding how representative the process data is.

3.1.7 Consistency

Data field in ISO/TS 14048: Modelling and validation – Data quality statement

General description of numerical and other qualities, or quality deficiencies in the overall documentation of a process, regarding the consistency of the data. A quality analysis of how uniform the study methodology is applied to the various components of the study, is considered.

Additional specification: Data quality statement includes a description of known general and specific strengths and weaknesses in the process.

3.1.8 Reproducibility

A data set, thoroughly documented with ISO/TS 14048 is reproducible. If that is not the case or if there are other issues that should be considered for the application of the data set, this should be documented in:

Data field in ISO/TS 14048: Modelling and validation – Intended application

Description of an assumed area of application for the data set regarding e.g. geographical, technology or other trade specific applicability. Also, other general cautions and recommendations regarding how data can be used may be given.

Example:

The design of the plant is principally the same all over the world, except for Eastern Europe and the developing countries, where a different technology is used.

Broader definition: There is a broader definition of the ISO/TS 14048 data documentation field Intended application, for example purpose or background for the study as well as a description the objective for the study can be documented in the field. For further information see section 3.2.3: Further descriptors.

Additional specification: Modelling and validation – Other information

In the data field Other information, information may be supplied regarding for instance recommendations on the applicability of the process, known limitations etc

3.2 General aspects and requirements

This section describes different general aspects and requirements that should be considered according to ISO 14 041:1998(E).

3.2.1 Input and Output Descriptors (including data categories)

(See also section 3.1.4 Precision)

Substances may have many different properties that are useful in LCA. Such properties may be described in the same way as flows, see below. An example of a substance property is density.

Data field in ISO/TS 14048:

Process – Inputs and outputs - Property – Name

Process – Inputs and outputs - Property – Unit

Process – Inputs and outputs - Property – Amount

Flows may have many different properties that are useful in LCA. Some of these properties are not specific for the substance, but can be dependent on the conditions that prevail at e.g. a plant. Such properties may be described by name, amount and unit.

Example:

Name: Temperature

Unit: K

Amount: 273

Data field in ISO/TS 14048:

Process – Inputs and outputs – Name – Specification of name

Substances may be known under synonym names, e.g. the trade name and the chemical formula. To allow for a proper and easy identification of the substance, known synonym names should be given.

Broader definition: The given data field Specification of name in ISO/TS 14048 includes a further specification of the name. ISO/TS 14048 allow use of different specified nomenclatures, which may contain synonyms.

Additional specification:

Process - Process description – Class – Reference to nomenclature.

The alternative names can be found in the report or document specified in Reference to nomenclature.

Data field in ISO/TS 14048: Process - Inputs and outputs - Geographical location

Description of the geographical recipient for the inputs and outputs. A nomenclature for this purpose has been developed within CPM.

Data field in ISO/TS 14048:

Process - Inputs and outputs – Receiving environment

Process - Inputs and outputs – Receiving environment specification

Description of the environmental recipient for the inputs and outputs. A nomenclature for this purpose has been developed within CPM, which has also been included in the ISO/TS 14048 document. Please note that the nomenclature for Receiving environment in ISO/TS 14048 is exclusive, i.e. that the nomenclature is mandatory.

Example:

Receiving environment: Air

Receiving environment specification: Urban air

Receiving environment: Water

Receiving environment: Ground

Receiving environment: Technosphere

Additional specification: Process - Inputs and outputs – Environmental condition

A description of the environmental conditions indicated in the data field Receiving environment and Receiving environment specification.

Data field in ISO/TS 14048:

Modelling and validation – Modelling choices - Criteria for excluding elementary flows

Description of system boundaries towards the environmental system, primarily through a description of e.g. the choice of parameters that have been included.

Comment:

A system boundary is defined by what is communicated between the system and its surroundings, i.e. in LCA by emissions and waste and the resources extracted from the environmental system.

Example:

The emissions and resources that are represented in the EPS-system have been included.

3.2.2 Relating data to unit process

Data field in ISO/TS 14048:

Process – Process description – Quantitative reference – Type

Process – Process description – Quantitative reference – Name

Process – Process description – Quantitative reference – Unit

Process – Process description – Quantitative reference – Amount

The functional unit addresses the function or product of the studied process or system

Example:

Type: Functional unit

Name: CO₂

Unit: kg

Amount: 1

Broader definition: In ISO/TS 14048 there is a broader definition than just functional unit for the above data fields e.g. the reference flow can be inserted. The broader interpretation can also be used.

Data field in ISO/TS 14048: Process – Process description – Technology – Technical content and functionality

Explanation of the functional unit.

Note: The functional unit of the process is specified in Process – Process description – Quantitative reference

Broader definition: The data field Technical content and functionality, also contain detailed information about the process e.g. included operations and how they are technically and materially related.

3.2.3 Further descriptors

Data field in ISO/TS 14048: Administrative information - Copyright

A person or an organisation may hold the publishing rights for the data set. This should be identified.

Example:

ETH

APME

Data field in ISO/TS 14048: Administrative information – Access restrictions

Often the data supplier has certain conditions or agreements on how the data may be distributed. Such restrictions or agreements should be described.

Example:

“The data supplier allows unrestricted use of the data set. This promise was given orally to Sven Svensson at Xerxes Inc. In May 2003”

“The data supplier requires a special agreement when the data is used in a study that will be publicly available”

Data field in ISO/TS 14048: Administrative information – Data generator

Administrative information – Data documentor

The person or persons responsible for the data set or the study should be specified with name, organisation and address.

Example:

Data generator: Sven Svensson Xerxes Inc.

Note: The data generator is the person responsible for modeling and compiling the process, where the data documentor is the person responsible for entering the information into the data format. In the original CPM requirements it was not required to specify the data documentor. This requirement has been added during the work with the CPM database.

Data field in ISO/TS 14048: Administrative information – Data commissioner

The person or persons or organisation responsible for initiating the data acquisition or the study should be specified with name, organisation and address.

Example:

Xerxes Inc.

Data field in ISO/TS 14048: Modelling and validation – Validation - Validator

The person, persons or organisation responsible for reviewing the data set or the study should be specified with name, organisation and address.

Example:

Inga Andersson, Xerxes Inc.

Additional specification:

Modelling and validation – Validation – Method

Modelling and validation – Validation – Procedure

Modelling and validation – Validation – Result

These data field further specifies the validation method performed, quality aspects checked and results of the validation.

Data field in ISO/TS 14048: Administrative information – Publication

Literature reference to where the data set or the study has been published (when applicable), or contact person. Note that this reference refers to the entire data set, with the compilation and interpretation (cf. Process – Inputs and outputs – Documentation – Reference to data source)

Broader definition: The ISO/TS 14048 defines Publication as a reference to a printed or otherwise stable and published literature source where the original copy of this document may be found. The broader meaning differs therefore from the CPM requirements. Both definitions can be used when documenting the study.

Data field in ISO/TS 14048: Modelling and validation – Intended application

General purpose or background for the study as well as a description of the detailed purpose or the objective for the study. A description of the intended target groups and users of the study is also included.

3.3 Documentation of the LCI study (study report)

This section follows the structure in ISO 14 041:1998 (E) section 8 (Study report).

a) Goal of the study

reasons for carrying out the study, its intended application and the target audiences

Data field in ISO/TS 14048: Modelling and validation – Intended application

b) Scope of the study

1) modifications together with their justification

Modelling and validation - Other information

2) function

i) statement of performance characteristics

Data field in ISO/TS 14048: Process - Process description –

Technology – Technical content and functionality

Process - Process description –Technology – Operating conditions

ii) any omission of additional functions in comparisons

Data field in ISO/TS 14048:

Modelling and validation – Modelling choices – Criteria for excluding intermediate product flows

Modelling and validation – Modelling choices – Criteria for externalising processes

3) functional unit

i) consistency with goal and scope

Data field in ISO/TS 14048: Process – Process description –

Technology – Technical content and functionality

This data field would contain an explanation of how the functional unit was selected.

ii) definition

Data field in ISO/TS 14048:

Process – Process description – Quantitative reference – Type

Process – Process description – Quantitative reference – Name

Process – Process description – Quantitative reference – Unit

Process – Process description – Quantitative reference – Amount

iii) result of performance measurements

Data field in ISO/TS 14048: Process – Process description –

Technology – Technical content and functionality

4) system boundaries

i) inputs and outputs of the system as elementary flows

Data field in ISO/TS 14048:

Process – Inputs and outputs – Amount – Parameter – Name

Process – Inputs and outputs – Amount – Parameter – Value

Process – Inputs and outputs – Amount – Unit – Symbol or name

Process – Inputs and outputs – Receiving environment

Process – Inputs and outputs – Receiving environment specification

Process – Inputs and outputs – Geographical location

ii) decision criteria

Data field in ISO/TS 14048:

Modelling and validation – Modelling choices - Criteria for excluding elementary flows

Modelling and validation – Modelling choices –Criteria for excluding intermediate product flows

Modelling and validation – Modelling choices –Criteria for externalising processes

iii) omissions of life cycle stages, processes or data needs

Data field in ISO/TS 14048:

Modelling and validation – Modelling choices - Criteria for excluding elementary flows

Modelling and validation – Modelling choices –Criteria for excluding intermediate product flows

Modelling and validation – Modelling choices –Criteria for externalising processes

iv) initial description of the unit processes

Data field in ISO/TS 14048:

Process - Process description – Technology – Technical content and functionality

Process - Process description – Technology – Technology picture

Also the flow chart in an aggregated process, described in: **Process -**

Process description – Technology – Process contents

v) decision about allocation

Data field in ISO/TS 14048:

Modelling and validation – Modelling choices – Allocations performed – Allocated co-products

Modelling and validation – Modelling choices – Allocations performed – Allocation explanation

5) data categories

i) decision about data categories

Data field in ISO/TS 14048: Modelling and validation – Modelling choices - Criteria for excluding elementary flows

ii) details about individual data categories

Data field in ISO/TS 14048: Process - Inputs and outputs – Name

iii) quantification of energy inputs and outputs

Data field in ISO/TS 14048:

Process – Inputs and outputs – Amount – Parameter – Name

Process – Inputs and outputs – Amount – Parameter – Value

Process – Inputs and outputs – Amount – Unit – Symbol or name

iv) assumptions about electricity production

Data field in ISO/TS 14048: Process – Process description – Technology – Technical content and functionality

v) combustion heat

Data field in ISO/TS 14048:

Process – Process description – Technology – Technical content and functionality

Process - Inputs and outputs – Documentation – Data treatment

Process - Inputs and outputs – Property

vi) inclusion about fugitive emissions

Data field in ISO/TS 14048:

Process - Inputs and outputs – Documentation – Data treatment

Modelling and validation – Modelling choices - Criteria for excluding elementary flows

6) criteria for initial inclusion of inputs and outputs

i) description of criteria and assumption

Data field in ISO/TS 14048:

Modelling and validation – Modelling choices - Criteria for excluding elementary flows

Modelling and validation – Modelling choices –Criteria for excluding intermediate product flows

Modelling and validation – Modelling choices –Criteria for externalising processes

ii) effect of selection on results

***Data field in ISO/TS 14048:* Modelling and validation – Other information**

iii) inclusion of mass, energy and environmental criteria (comparisons)

Data field in ISO/TS 14048:

Modelling and validation – Modelling choices - Criteria for excluding elementary flows

Modelling and validation – Modelling choices –Criteria for excluding intermediate product flows

Modelling and validation – Modelling choices –Criteria for externalising processes

7) data quality requirements

For further information about the data quality requirements, see descriptions in section 3.1

c) inventory analysis

1) procedures for data collection

Data field in ISO/TS 14048:

Process - Inputs and outputs - Documentation – Data treatment

Modelling and validation – Modelling choices - Criteria for excluding elementary flows

Modelling and validation – Modelling choices –Criteria for excluding intermediate product flows
Modelling and validation – Modelling choices –Criteria for externalising processes

2) qualitative and quantitative description of unit processes

Data field in ISO/TS 14048: Process - Inputs and outputs

See also documentation of the enclosed processes in an aggregated process.

3) source of published literature

Data field in ISO/TS 14048:

Process - Inputs and outputs - Documentation - Reference to data source

Modelling and validation – Information sources

4) calculation procedure

Data field in ISO/TS 14048: Process - Inputs and outputs - Documentation –

Data treatment

5) validation of data

i) data quality assessment

Data field in ISO/TS 14048:

Process – Inputs and outputs – Documentation – Data treatment

Modelling and validation - Other information

Modelling and validation – Data quality statement

ii) treatment of missing data

Data field in ISO/TS 14048:

Process – Inputs and outputs – Documentation – Data treatment

Modelling and validation – Other information

Modelling and validation – Validation

6) sensitivity analysis for refining system boundaries

If a sensitivity analysis have been performed this should be documented in the set of data fields: Modelling and validation - Modelling choices.

7) allocation principles and procedures

i) documentation and justification of allocation procedure

Data field in ISO/TS 14048:

Modelling and validation – Modelling choices – Allocations performed – Allocated co-products

Modelling and validation – Modelling choices – Allocations performed – Allocation explanation

Note: For the whole system.

ii) uniform application of allocation procedure

Modelling and validation – Modelling choices – Allocations performed – Allocated co-products

Modelling and validation – Modelling choices – Allocations performed – Allocation explanation

Note: For the processes included in a flow chart.

d) limitations of LCI

1) data quality assessment and sensitivity analysis

Data field in ISO/TS 14048:

Process – Inputs and outputs – Amount – Parameter – Name

Process – Inputs and outputs – Amount – Parameter – Value

Modelling and validation – Intended application

Modelling and validation – Other information

Modelling and validation – Data quality statement

2) the system functions and functional unit(s)

Data field in ISO/TS 14048:

Process – Inputs and outputs – Amount – Parameter – Name

Process – Inputs and outputs – Amount – Parameter – Value

Modelling and validation – Intended application

Modelling and validation – Other information

3) the system boundaries

Data field in ISO/TS 14048:

Process - Process description – Valid geography – Area description

Process description – Valid time span - Time-span description

Modelling and validation – Intended application

Modelling and validation – Other information

Modelling and validation – Modelling choices - Criteria for excluding elementary flows

Modelling and validation – Modelling choices –Criteria for excluding intermediate product flows

Modelling and validation – Modelling choices –Criteria for externalising processes

4) uncertainty analysis

Data field in ISO/TS 14048:

Process – Inputs and outputs – Amount – Parameter – Name

Process – Inputs and outputs – Amount – Parameter – Value

Modelling and validation – Intended application

Modelling and validation – Other information

5) limitations identified by the data quality assessment and sensitivity analysis

Data field in ISO/TS 14048:

Process – Inputs and outputs – Amount – Parameter – Name

Process – Inputs and outputs – Amount – Parameter – Value

Modelling and validation – Intended application

Modelling and validation – Other information

6) conclusions and recommendations

Data field in ISO/TS 14048:

Modelling and validation – Intended application

Modelling and validation – Other information