

Conformity and validity rules of the European Platform on LCA, v.1.0.1

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1 Introduction

This text comprises the first release of the validity and conformity rules of the European Platform on LCA, v. 1.0.1. It provides the **specifications of the requirements** for sound documentation of LCA data sets with additional explanations for users. The rules refer to the actual version of the ELCD format (Version 1.0.1). They will be further developed in 2007, together with stakeholders and in parallel to the finetuning of the ELCD format itself.

Note that applying the ELCD validity and ELCD conformity rules do not imply that the data meets a certain quality requirement or that the data set would be endorsed by the European Commission. Please also refer to the license conditions of the ELCD format, accessible from <http://lca.jrc.ec.europa.eu>.

Most but not all of these “ELCD validity” and “ELCD conformity” rules are also implemented in validity and conformity **stylesheets**, that support and efficient automatic checking of individual data sets and whole databases for being valid and conform. In the few cases where a rule can not be part of the respective stylesheet as a certain free text type content has to be read, this is indicated in the following text individually for the respective rule (mainly applicable to certain conformity rules). These stylesheets are also used by the **ELCD editor** software tool to verify for one or a bundle of data sets whether they are ELCD valid and ELCD conform. The editor will be made accessible on the ELCD homepage soon.

“**ELCD validity**” refers to meeting the basic requirements of the ELCD data set format as well as providing the absolute minimum information to have a useful data set following common sense and providing minimum information that it can be handled correctly by a software or database. E.g. should each data set actually BE ELCD-formatted, have a name, a format version number, a date when it was generated, etc.).

“**ELCD conformity**” refers to further requirements for a sufficient degree of documentation to be considered a “ELCD-conform” data set. These requirements refer to that type of information one being an LCA practitioner would usually like to have in order to judge the quality and appropriateness of a data set (with the need to specify the results of a review being not yet included but to be expected for further developed rules). Please note, that some of these requirements are not encoded in the conformity stylesheets, but their fulfilment of these has to be checked manually for the data sets together when evaluating the correctness of the documented information.

Examples for ELCD valid data sets for all data set types are found in the developer kit as HTML files in the folder “mandatory”. Examples for ELCD conform data sets are the data sets in the first ELCD core database - online accessible via <http://lca.jrc.ec.europa.eu>. These ELCD core data sets however document further aspects and/or attach source documents etc. what is not formally required by the conformity-rules but gives examples of “well documented and ELCD conform data sets”.

2 ELCD validity rules v. 1.0.1

A data set is a technically valid ELCD data set, if the conditions in this chapter and subchapters are met. The requirements are specified individually for the different data set types. Note that some requirements refer to the informatics / technical format of the presented information, others to use of the correct method and documentation by the person who is entering the documentation text for a data set:

- The data set is an **XML formatted data set as specified in the ELCD format schema and supporting files** such as stylesheets etc. This means that only allowed fields/tags are present and used in the foreseen way, that the content of each field is of the permissible field type (e.g. text, number, date, UUID, reference to another data set of the correct type (e.g. flow data set) which also has to exist and be ELCD-valid itself, reference to a data-set internal ID that also has to exist, etc.), permissible text-length or permissible pre-defined entry (of the so called “enumerated lists”), etc. For details see the format definitions in the “Developer support” files. (accessible at <http://lca.jrc.ec.europa.eu> --> “LCA Info Hub” --> “ELCD Data System” --> “Developer support”).
- At least **all the documentation sections and fields (i.e. “tags”)** given in the following sub-chapters are present, in the defined section/sub-section and order, are used in the defined way, and carry information in the defined specific field format. In case a field/tag can also be empty, this will especially be stated below.
- The **information given in the fields/tags should also be correct** (what has to be verified manually of course).

2.1 Process or LCI result data set

- section/subsection “Process or LCI result information”/“Key data Set Information” with the following documentation fields/subfields:
 - Location (field has to be present but may also be empty)
 - Reference year
 - Name/Base name
 - Category information/Top category
- section/subsection “Process or LCI result information”/“Quantitative reference” with the following documentation fields
 - Type of quantitative reference
 - Field giving the quantitative reference information with the specific field/tag depending of the above selected “Type of quantitative reference”
- section/subsection “Modelling and validation”/“LCI method and allocation” with the following documentation field
 - Type of data set
- section/subsection “Administrative information”/“Data set generator / modeller” with the following documentation field
 - Data set generator / modeller
- section/subsection “Administrative information”/“Data entry by” with the following documentation fields

- Date and time completed
- Data set format(s) (Note that this has at least to be the ELCD format 1.0.1, while up to one other format can be added (which has to be defined and integrated as namespace as foreseen in the ELCD format))
- section/subsection “Administrative information”/”Publication and ownership” with the following documentation field
 - UUID of Process or LCI result data set
- section/subsection “Inputs and Outputs”/”Inputs” with the following documentation fields for at least ONE flow
 - Type of flow
 - Exchange
 - Resulting amount
 - Mean amount
- section/subsection “Inputs and Outputs”/”Outputs” with the following documentation fields for at least ONE flow
 - Type of flow
 - Exchange
 - Resulting amount
 - Mean amount

2.2 Flow data set

- section/subsection “Flow information”/”Data set information” with the following documentation fields/subfields
 - Name/Base name
 - Category information/Top category
- section/subsection “Flow information”/”Quantitative reference” with the following documentation field
 - Reference flow property
- section/subsection “Modelling and validation”/”LCI method” with the following documentation field
 - Type of flow
- section/subsection “Administrative information”/”Data entry by” with the following documentation fields
 - Date and time completed
 - Data set format(s) (Note that this has at least to be the ELCD format 1.0.1, while up to one other format can be added (defined and integrated as namespace as foreseen in the ELCD format))
- section/subsection “Administrative information”/”Publication and ownership” with the following documentation field
 - UUID of flow data set
 - Copyright?
- section “Flow properties and LCIA factors” with the following documentation fields, for at least ONE flow property
 - Flow property
 - Mean value (of flow property)

2.3 Flow property data set

- section/subsection “Flow property information”/“Data set information” with the following documentation fields/subfields
 - Name
 - Category information/Top category
- section/subsection “Flow property information”/“Quantitative reference” with the following documentation field
 - Reference unit (unit group data set)
- section/subsection “Administrative information”/“Data entry by” with the following documentation fields
 - Date and time completed
 - Data set format(s) (Note that this has at least to be the ELCD format 1.0.1, while up to one other format can be added (defined and integrated as namespace as foreseen in the ELCD format))
- section/subsection “Administrative information”/“Publication and ownership” with the following documentation field
 - UUID of flow property data set
 - Copyright?

2.4 Unit group data set

- section/subsection “Unit group information”/“Data set information” with the following documentation fields/subfields
 - Name
 - Category information/Top category
- section/subsection “Unit group information”/“Quantitative reference” with the following documentation field
 - Reference unit
- section/subsection “Administrative information”/“Data entry by” with the following documentation fields
 - Date and time completed
 - Data set format(s) (Note that this has at least to be the ELCD format 1.0.1, while up to one other format can be added (defined and integrated as namespace as foreseen in the ELCD format))
- section/subsection “Administrative information”/“Publication and ownership” with the following documentation field
 - UUID of unit group data set
- section “Units” with the following documentation fields, for at least ONE unit
 - Name of unit
 - Mean value (of unit)

2.5 Source data set

- section/subsection “Source information”/“Data set information“ with the following documentation fields/subfields
 - Source Citation
 - Category information/Top category
- section/subsection “Administrative information”/“Data entry by” with the following documentation fields
 - Date and time completed
 - Data set format(s) (Note that this has at least to be the ELCD format 1.0.1, while up to one other format can be added (defined and integrated as namespace as foreseen in the ELCD format))
- section/subsection “Administrative information”/“Publication and ownership” with the following documentation field
 - UUID of source data set

2.6 Contact data set

- section/subsection “Contact information”/“Data set information“ with the following documentation fields/subfields
 - Name for contact
 - Category information/Top category
- section/subsection “Administrative information”/“Data entry by” with the following documentation fields
 - Date and time completed
 - Data set format(s) (Note that this has at least to be the ELCD format 1.0.1, while up to one other format can be added (defined and integrated as namespace as foreseen in the ELCD format))
- section/subsection “Administrative information”/“Publication and ownership” with the following documentation field
 - UUID of contact data set

2.7 For all data set types applies moreover...

The ELCD format is a true multilanguage format, allowing to consistently document a data set in one or more languages. Information in the data set may be given in any language, but all information to be provided according to the above validity rules has to be given at least once and in the same language, properly naming the language by giving the correct language-property inside each tag (see format specifications). (The fulfilment of this requirement is not yet part of the validity stylesheet but to be checked manually.)

Additional info for advanced use and developers:

- As already mentioned, up to ONE additional, other documentation format may be present in the data set as namespace in the foreseen

form and location, as defined in the ELCD format 1.0.1; no other (“free”) tags are permissible in the ELCD part of the data set. This one may be used to allow to document such further information in the data set, that is not foreseen in the ELCD format namespace itself. Typically, it is assumed, that other, National LCA projects and LCA tool and/or database developers define and document (and later also maintain) such namespaces in support of their specific needs and their customers.

Note that the validity rules for “**LCIA method data sets**” will be defined in 2007.

3 ELCD conformity rules 1.0.1

A data set is ELCD-conform, if the conditions of this chapter and subchapters are met. They are differentiated by data set type. Note that similarly as for the “ELCD validity” also for the „ELCD conformity“ some requirements refer to the informatics/technical format of the presented information, others to the use of the correct method and documentation given in a data set:

- The **data set is “ELCD-valid v. 1.0.1”** as specified in the chapter above.
- At least **all the documentation sections and fields (i.e. “tags”)** given in the **following sub-chapters** are present and used as defined in the ELCD format 1.0.1. In case a field/tag can also be empty, this will especially be stated below.
- The **information given in the fields/tags should also be correct** (what has to be verified manually of course).

Note that there are **four groups of conformity rules**, that can separately be referred to: **“Documentation conformity”**, **“Nomenclature and Hierarchy Conformity”**, **“Methodological conformity”**, and **“Review Conformity”**. For easier reading of this document these are used below to group the rules for the different data set types. Reference to fulfilment of these individual sub-conformities can be made by the user in the data set documentation, using the respective fields in the “Validity” section, which have the same name. The statement of the **“Overall conformity”** of a data set refers accordingly to the fact whether all of the above specific conformities (as far as defined) are met by the data set.

3.1 Process or LCI result data set

General:

- <referenceToConformitySystem ...> has to reference to the source data set of “ELCD conformity 1.0.1”
- <approvalOfOverallConformity> with the entry to be “Fully conform”.

Documentation conformity:

- Category information/Top category/Sub-category 1
- <treatmentStandardsRoutes>, <mixTypeAndLocation>, and <functionalUnitFlowProperties> are required if necessary to identify a product or waste flow appropriately. (This will not be checked automatically, but has to be evaluated manually.)
- <dataSetValidUntil>
- <descriptionOfRestrictions> [only required for the <locationOfOperationSupplyOrProduction location="">, but not required for the subLocation...]
- <technologyDescriptionAndIncludedProcessesAndLCIResults>

- <technologicalApplicability>
- <referenceToTechnologyFlowDiagrammOrPicture ... [it has to be checked manually, that this is a flow diagramme of the relevant parts of the life cycle or of the modelled system/unit process or a diagramme showing the exact system boundaries and not just a photo, logo etc.]
- Conditional rule: IF there is an entry in any of the fields of the section <mathematicalRelations>, each set of the entries of the tag <variableParameter ...> has to at least have all these sub-tags meanValue="", variableParameter="" and comment="" with entries AND the tag <modelDescription> of that section has to be present and have an entry, too. [It is to be defined later by those LCA tool developers, which support mathematical relations, which mathematical expressions may be used in the string of formula="" and in which syntax and semantic; these rules will be part of a future version of the ELCD conformity rules.]
- <deviationFromLCIMethodPrinciple> (can also have an entry such as "None")
- <modellingConstants>
- <deviationFromModellingConstants> (can also have an entry such as "None")
- <dataCompletenessPrinciples> (the cut-off rules and other systematic exclusions should precisely be described)
- <deviationFromDataCompletenessPrinciples> (can also have an entry such as "None")
- <dataSelectionAndCombinationPrinciples>
- <deviationFromDataSelectionAndCombinationPrinciples> (can also have an entry such as "None")
- <dataTreatmentAndExtrapolationsPrinciples>
- <deviationFromDataTreatmentAndExtrapolationsPrinciples> (can also have the entry "None")
- <referenceToDataSource> [Data sources should be given as completely as possible, including sources of high relevance for relevant background data. A use of the field subreference is not required]
- <useAdviceForDataSet> (can also have an entry such as "No special advice")
- <completenessProductModel>
- <referenceToCommissioner...>
- <intendedApplication>
- <dataSetUseApproval>
- Data set version
- Permanent data set URI

- <referenceToOwnershipOfDataSet...>
- “Access and use restrictions” (can also have an entry such as “No restrictions”)
- <dataSourceType>
- <documentationConformity> and the entry in has to be “Fully conform”.
- Additional requirement on specific conditions and on which entry has to be filled in into specific fields:
 - IF the entry in field <typeOfDataSet> is “Unit process, not pre-allocated” or “Pre-allocated unit process”, THEN the fields <samplingProcedure>, <dataCollectionPeriod>, and <uncertaintyAdjustments> have to be filled in. [It is subject to manually verify these entries in the LCI model of the LCI results data sets. Note that the documentation of this information on the LCI result data set level for all included processes of the complete product system is not seen useful.]

Methodological conformity

- <methodologicalConformity> and the entry as to be “Not defined”.

[REMARK: Whether the right LCI method was applied depends on the intended use of the data set and consequently on the Goal and Scope definition. This will have to be checked manually, of course.]

Nomenclature and hierarchy conformity

- <categoryInformation>: both <category level="0"> AND <category level="1"> have to be filled in AND may only use entries of the enumerated lists.
- For all Inputs and Outputs in the inventory of the Process or LCI result data set exclusively the “ELCD reference elementary flow data sets” may be used, unless other types of elementary flows occur in the process or LCI result. This may be the case if e.g. an emission of a substance occurs, that is not found among the list of reference elementary flows, OR if an emission shall be inventoried in further differentiation regarding speciation, country of occurrence, or receiving environmental media, OR if a specific mixed ore body is used as resource that needs a newly specified resource flow). The creation and naming of such new Flow data sets should follow the same nomenclature and pattern as applied for the reference data sets. The actual version of these ELCD reference elementary flow data sets can be found in the download package of the ELCD core data base, accessible from <http://lca.jrc.ec.europa.eu>. After unzipping the package, the data sets are found in the folder “flows”. Please note that of course the naming of process and waste flows is fully free while a correct and as specific identification has to be possible, using the

respective “Name” subfields. (The verification of these conditions is not yet part of conformity stylesheet but to be checked manually.)

- <nomenclatureAndHierarchyConformity> with the entry to be “Fully conform”.

3.2 Flow data set

General

- <referenceToConformitySystem ...> has to reference to the source data set of “ELCD conformity 1.0.1”
- <approvalOfOverallConformity> with the entry to be “Fully conform”.

Documentation conformity

For flow data sets only of the “Type of flow” “Product flow” or “Waste flow” (and the field / tag <functionalUnitFlowProperties> also for those flow data sets of the “Type of flow” “Elementary flow” and of the “Top category” “Resources”):

- <treatmentStandardsRoutes>, <mixTypeAndLocation>, and <functionalUnitFlowProperties> are required if necessary to identify a product or waste flow appropriately. The relevant properties e.g. the content of main metals in ores, net calorific value/mass for energy resources/carriers should be given in this field and additional as Flow properties in the respective section of the Flow data set. (This will not be checked automatically, but has to be evaluated manually.)

For all flow data sets:

- Data set version
- Permanent data set URI
- <documentationConformity> and the entry to be “Fully conform”.

Nomenclature and hierarchy conformity

- <categoryInformation>: <category level="0"> has to be filled in AND may only use entries of the enumerated list.
- For all Flow property data sets in the respective section of the Flow data set exclusively the “ELCD reference flow properties data sets” may be used, unless other types of flow properties are required for the flow data set (e.g. to document the element-content of Iron in an Iron ore flow, which is not found among the list of reference flow properties). One illustrative file for such “Chemical flow properties” (“Carbon_content_...xml”) is among the “Flow properties data sets” of the ELCD core database. The creation and naming of such new Flow property data sets should

follow the same nomenclature and pattern as applied for the reference data sets. The actual version of these ELCD reference Flow property data sets can be found in the download package of the ELCD core data base, accessible from <http://lca.jrc.ec.europa.eu>. After unzipping the package, the data sets are found in the folder “flowproperties”. (The verification of these conditions is not yet part of conformity stylesheet but to be checked manually.)

- <nomenclatureAndHierarchyConformity> with the entry to be “Fully conform”.

3.3 Flow property data set

General

- <referenceToConformitySystem ...> has to reference to the source data set of “ELCD conformity 1.0.1”
- <approvalOfOverallConformity> with the entry to be “Fully conform”.

Documentation conformity

- Data set version
- Permanent data set URI
- <documentationConformity> with the entry to be “Fully conform”.

Nomenclature and hierarchy conformity

- <categoryInformation>: <category level="0"> has to be filled in AND may only use entries of the enumerated list.
- For all Unit group data sets in the respective section of the Flow properties data set exclusively the “ELCD reference unit group data sets” may be used, unless other types of unit groups are required for the flow property data set. This addition of new Unit group data sets should be minimised as far as possible and will most likely not be necessary. Note, that e.g. the same Unit group data set can be used for all those Flow properties that go back to the same unit, e.g. both the Flow property “Mass” and “Carbon content” can be measured in the Unit group “Mass” with its reference unit “kg”. Similarly, all energy-related flow properties should use the Unit group “Units of energy” with its reference unit “MJ” etc. The actual version of these ELCD reference Unit group data sets can be found in the download package of the ELCD core data base, accessible from <http://lca.jrc.ec.europa.eu>. After unzipping the package, the data sets are found in the folder “unitgroups”. (The verification of these conditions is not yet part of conformity stylesheet but to be checked manually.)

- <nomenclatureAndHierarchyConformity> with the entry to be “Fully conform”.

3.4 Unit group data set

General

- <referenceToConformitySystem ...> has to reference to the source data set of “ELCD conformity 1.0.1”
- <approvalOfOverallConformity> with the entry to be “Fully conform”.

Documentation conformity

- Data set version
- Permanent data set URI

Nomenclature and hierarchy conformity

- The “Reference unit” for any eventually newly created Unit group data set must be an SI unit, or SI-derived unit. The creation of new unit groups will however be an absolute exception; see comment above in chapter “Flow properties data set”. (The verification of this condition is not yet part of conformity stylesheet but to be checked manually.)
- <nomenclatureAndHierarchyConformity> with the entry to be “Fully conform”.

3.5 Source data set

Documentation conformity

- “Source citation” and an appropriate citation must be given with which the source is uniquely identified. (Appropriateness-check not part of conformity stylesheet but to be checked manually.)
- Data set version
- Permanent data set URI

3.6 Contact data set

Documentation conformity

- An appropriate contact information has to be provided, best in the field “Central contact point” and in any case in a way with which the organisation and/or person is uniquely identified.

(Appropriateness-check not part of conformity stylesheet but to be checked manually.)

- Data set version
- Permanent data set URI

3.7 For all data set types applies moreover...

Information in the data set may be given in any language, but all information to be provided according to the above conformity rules has to be given at least once and in the same language, properly naming the language by giving the correct language-property inside each tag (see format specifications). (The fulfilment of this requirement is not yet part of the conformity stylesheet but to be checked manually.)

It is advised, while this is no formal “ELCD conformity” rule, to use the field **<common:shortDescription ...>** throughout all data sets of all data set types, as this renders the display in web-browsers more robust and eases the work-flow.

Note that the conformity rules for “**LCIA method** data sets” will be defined in 2007.