International Reference Life Cycle Data System (ILCD) Data Network

Compliance rules and entry-level requirements

ILCD-compliant - High quality data
ILCD-compliant - Basic quality data
ILCD-compliant - Data estimate
(in variants for goal Situations A, B, C1 and C2)

and

ILCD Data Network - Entry-level

Version 1

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1   Overview

This document identifies the documents/sources for the implementation of the quality, method, nomenclature, review and documentation compliance rules of the International Reference Life Cycle Data System (ILCD) Data Network ("ILCD Data Network"). These requirements build on the requirements of the ILCD Handbook with few further specified requirements to support the electronic data network.

The overall objective is to facilitate the availability and access to consistent and quality-assured life cycle data for robust Life Cycle Assessment (LCA) studies and reliable decision support in public policy and business.

For Process data sets and next to a simplified entry-level requirement, ILCD-compliance systems have been defined for each of the archetype goal Situations A, B, C1 and C2 in each three quality-level variants. Details on the situations and quality-levels are given in the "Specific guide for LCI data sets" and in more detail in the "General guide for LCA" that forms its basis.

"ILCD Data Network - Entry-level" requirements are defined for the first years of building up the ILCD Data Network. These are simplified/less demanding compared to full ILCD-compliance; Tab. 1 gives the overview.

For other data set types (Flows, Flow properties, and Unit groups) a general ILCD-compliance has been defined.

To declare compliance, in the ILCD formatted data sets in the respective field a reference is to be set to the source data sets that identifies the compliance system. This document lists the respective source data sets in overview tables.

Tab. 1   Comparison between "Entry-level" and full "ILCD-compliance"

Compliance area	ILCD Data Network - Entry-level	ILCD-compliance (details see Tab. 6)
Documentation	• **Minimum documentation extent specified** • **ILCD format**	• **Minimum documentation extent specified** • **ILCD format to be used**
Nomenclature	• **Compliance with ILCD nomenclature document (e.g. use of ILCD reference elementary flows for IT compatible inventories),** • ***Certain aggregated elementary flows (e.g. VOC) are permitted*** • ***Terminology use not enforced.***	• **Compliance with ILCD nomenclature document and use of ILCD reference elementary flow, flow property and unit group data sets** • **ILCD terminology to be used**
Data quality	• ***"Not defined", i.e. no data quality levels*** (Note: this requirement is covered as part of "Documentation") • ***Data quality needs to be stated using ISO quality criteria only*** • **Technological, geographical and time-related representativeness to be documented**	• **3 levels of data quality differentiated ("high quality", "basic quality", "data estimate"), covering among others quantitative criteria for accuracy, completeness and precision. Differentiated quality ratings on Data quality, Methodological consistency, Nomenclature etc. are documented inside data set.**

Method	• **ISO 14040 and -44 compliance process-based LCA** • *Methodological ILCD-compliance not enforced; applied modelling framework(s) and allocation/substitution approaches to be documented*	• **ISO 14040 and -44 compliance process-based LCA** • **Methodological ILCD-compliance, differentiated by the archetype goal situations A, B, C1 and C2**

Review	• *Use of reviewers from registry not required*
	 • *"Qualified reviewer" required (based on ISO 14025):*
	    • *knowledge of relevant sector*
	    • *knowledge of represented process or product*
	    • *LCA method expertise and experience*
	 • *Qualified independent external reviewer in line with ISO 14044 (chapter 6.1) requirements BUT separate review report is not required (review documented in data set)* <u>*OR*</u>
	 • *Qualified independent internal reviewer in line with ISO 14044 (chapter 6.1) requirements, BUT* **separate review report is required (minim review scope defined), in addition to documentation provided within data set**
	 • *Review on unit process level may not be required, depending on data quality claims*
		• **ILCD-registered, qualified "Independent external reviewer" [ILCD reviewer registry, point system: LCA expertise and experience, experience in relevance sector, review experience - in line with ISO 14044 and 14025]**
		 • **Separate review report required, in addition to documentation provided in data set**
		 • **Type, scope and methods of review in line with ILCD Handbook (e.g. "Independent external review"), typically on level of the unit processes also of any included background system is required**

Remark: italics identifies less strict requirement than full ILCD-compliance

2   Compliance   systems   and   entry-level requirements

2.1   Process data sets

ILCD compliance

This chapter refers to the five sets of requirements that are the basis to ensure the overall quality and consistency of the ILCD Data Network: method, data quality (completeness and representativeness), nomenclature, review, and documentation. These rules have the purpose to ensure the appropriateness and necessary compatibility of the data sets in the ILCD Data Network regarding Life Cycle Inventory (LCI) data collection and modelling methods, use of the same underlying elementary flows and nomenclature, appropriate documentation for data users, and giving an assurance on the data quality via reviews.

The following goal situations are differentiated. These represent the most common types of LCA applications - details see Table 3 and chapter 5.3 in the separate document "General guide for LCA":

- **Situation A "Micro-level decision support":** Decision support on micro-level, typically for product-related questions. "Micro-level decisions" are assumed to have only limited and no structural consequences outside the decision-context, i.e. do not change available production capacity. The effects are too small to overcome the threshold to be able to cause so called large-scale consequences in the background system or other parts of the technosphere

- **Situation B "Meso/macro-level decision support":** Decision support at a strategic level (e.g. raw materials strategies, technology scenarios, policy options, etc). "Meso/macro-level decisions" are assumed to have also structural consequences outside the decision-context, i.e. they do change available production capacity. The analysed decision alone results in large-scale consequences in the background system or other parts of the technosphere

- **Situation C "Accounting":** Purely descriptive documentation of the system under analysis (e.g. a product, sector or country), without being interested in any potential consequences on other parts of the economy. Situation C has two sub-types that need to be identified/differentiated:

  o **Situation C1 "Accounting including external benefits":** Includes existing benefits outside the analysed system (e.g. credits existing recycling benefits)

  o **Situation C2 "Accounting excluding external benefits":** Does not include existing benefits outside the analysed system

Note that in line with the provisions of the ILCD Handbook, LCI data sets for Situation A can identically be used for Situation C1 (while not always vice versa). Data for Situation B are typically reflecting a specific scenario analysed; their applicability / transferability to other cases under Situation B is to be carefully evaluated along the provided documentation.

Note also that single operation unit process data sets can be identically used for all goal Situations. For multifunctional black box unit process data sets this is partly the case while it might imply some distortions of the results.

In addition, and only for Process data sets, three levels of data quality are differentiated for each of the above goal situations; definitions see chapter 12.3 in the separate document "Specific guide for LCI data sets":

- **High quality data**

- **Basic quality data**

- **Data estimate**

In all possible combinations, the following compliance statements of Tab. 2 have been set; the UUID, version number and file name of the source data set that needs to be referenced are given as well. The compliance settings for each data set ease the identification of data sets in the ILCD Data Network that are applicable to the group of LCA applications (as expressed by the corresponding goal Situation) and its quality-level. Detailed quality statements are to be given in the respective Process data set.

Tab. 2 Possible compliance (sub)systems under the ILCD for Process data sets

Compliance system name	File name of source data set (incl. UUID and version number)
ILCD-compliance - Situation A - High quality data	d975693e-d4e0-4c43-a943-539d9f84cac8_01.01.000.xml
ILCD-compliance - Situation A - Basic quality data	d5693c8f-9308-4911-a334-fdbcce4b3ef7_01.01.000.xml
ILCD-compliance - Situation A - Data estimate	0cb541c2-116d-44d8-ad42-cbb23b551f2d_01.01.000.xml
ILCD-compliance - Situation B - High quality data	424b32b5-f279-4fd6-8d33-f106dbe64a95_01.01.000.xml
ILCD-compliance - Situation B - Basic quality data	27389dd4-30dd-4f89-8ceb-6e878ec22cda_01.01.000.xml
ILCD-compliance - Situation B - Data estimate	7bc53f07-4fe0-4619-b08a-061d7eceb585_01.01.000.xml

ILCD-compliance - Situation C1 - High quality data	85c70ebb-6909-462a-9efa-8d97cee275ee_01.01.000.xml
ILCD-compliance - Situation C1 - Basic quality data	55a9c38d-6190-4cd4-b589-45268e4c9475_01.01.000.xml
ILCD-compliance - Situation C1 - Data estimate	9d42c820-1a10-49f3-a387-5a1d355d37ed_01.01.000.xml
ILCD-compliance - Situation C2 - High quality data	43160353-af6f-40e7-bd9a-6930b960885a_01.01.000.xml
ILCD-compliance - Situation C2 - Basic quality data	fec6171f-e2ef-4bb6-934a-37fa323b254b_01.01.000.xml
ILCD-compliance - Situation C2 - Data estimate	50d961dc-0b6a-4796-a2b5-1a12d4f53343_01.01.000.xml

Regarding the quality level ONLY the highest attained level shall be given (e.g. only "ILCD-compliance - Situation A - Basic quality data" but NOT also "ILCD-compliance - Situation A - Data estimate".

In case more than one of the goal Situations compliance systems are met, in contrast, all those that are met may be given. E.g. if "ILCD-compliance - Situation A - Basic quality data" applies for an LCI result data set also "ILCD-compliance - Situation C1 - Basic quality data" may be given. For unit process data sets accordingly all four Situations and compliance systems (of the specifically attained quality-level) may be given. This serves to ease identification and sorting/filtering data sets in the ILCD Data Network.

The reference to the respective compliance system is to be stated in the section "Compliance declarations" of the ILCD data set format by setting in the field "Compliance system name" a reference to the corresponding source data set of the applicable compliance.

Establishment phase and entry-level requirements

In the establishment phase of the ILCD Data Network, there is the need to operate with entry-level requirements. These are defined to be in place for up to 3 years. This will help data developers have time for preparing and move forward to the full compliance with the ILCD requirements. Data sets that meet the entry-level requirements are not necessarily methodologically compliant with the ILCD Handbook or methodologically consistent with each other. However, as the applied methods are documented in a systematic way data that are consistent can be identified. The achieved data quality is documented along data quality indicators; there are no data quality levels as in the ILCD-compliance. By using the same elementary flows and documentation format and extent a basic consistency is

achieved that supports this process. The detailed entry-level requirements are found in Tab. 3.

This results in one additional, alternative requirement level below the ILCD-compliance:

Tab. 3 Entry-level requirements under the ILCD Data Network for Process data sets; note that the entry-level is below ILCD-compliance and does not imply methodological compliance with the ILCD Handbook

Compliance system name	File name of source data set (incl. UUID and version number)
ILCD Data Network - Entry-level	d92a1a12-2545-49e2-a585-55c259997756_01.01.000.xml

2.2 Other data set types (Flow, Flow property, Unit group)

Since for all other data sets types - in contrast to the Process data set - a differentiation of the compliance requirements is required by neither the archetype goal situations nor quality levels, only one, common "ILCD-compliance" exists. Tab. 4 identifies the reference source data set.

Tab. 4 ILCD-compliance only for Flow, Flow property and Unit group data sets

Compliance system name	File name of source data set (incl. UUID and version number)
ILCD Data Network - compliance (non-Process)	9ba3ac1e-6797-4cc0-afd5-1b8f7bf28c6a_01.01.000.xml

Note that for contact and source data sets it is not foreseen to declare compliance in the data set; the requirements for documentation should nevertheless be met to ensure appropriate information for data set users.

2.3 LCIA method data set

In preparation.

3 ILCD compliance elements

3.1 Overview of the compliance elements and rules

The International Reference Life Cycle Data System (ILCD) Data Network provides a registry for consistent, quality-assured life cycle inventory ("Eco-profile") data sets. Quality and consistency is ensured through compliance with the ILCD Handbook.

Five sets of requirements are essential to ensure the overall quality and consistency of the data in the data network: method, data quality (completeness and representativeness), nomenclature, documentation, and review. These rules have the purpose to ensure the appropriateness and necessary compatibility of the data sets in the ILCD Data Network regarding data collection and modelling methods, use of the same underlying elementary flows and nomenclature, appropriate documentation for data users, and giving an assurance on the data quality via reviews.

The compliance requirements for the ILCD Data Network build on the ILCD-compliance of the ILCD Handbook. Since the use of the ILCD data set format has only "should" status in the ILCD Handbook (i.e. other formats can be used) but is technically required for the operation of the ILCD Data Network, the use of the format and a specified minimum documentation extent are additional requirements for the ILCD Data Network.

The following compliance rules are defined for the different data set types; Tab. 5 gives an overview:

Tab. 5 Overview of ILCD compliance rules and data set types

Data set type	Compliance area				
	Method	**Quality**	**Nomenclature**	**Review**	**Documentation**
Process	X	X	X	X	X
Flow	X		X		X
Flow property	X		X		X
(LCIA method)[1]	(X)	(X)	(X)	(X)	(X)
Unit group	X		X		X

[1] Implementation and defintion of compliance rules not yet finalised

Source			**X**		**X**
Contact			**X**		**X**

3.2   References to documents with the detailed rules

The following list provides the documents and chapters where the detailed compliance rules of the ILCD are laid down; these form also the basis for the somewhat simplified requirements for the "ILCD Data Network - Entry level". The named documents are accessible or become accessible currently at http://lct.jrc.ec.europa.eu :

Tab. 6 focuses on the "Process data set" as central element, giving an overview of the ILCD Data Network compliance requirements for all five compliance areas.

Tab. 6   Overview of ILCD Data Network compliance requirements for Process data sets; details are given in the separate guidance documents

Aspect	Components	Description / Comment	Main chapters
Quality	Completeness	3 levels of data quality defined ("high quality", "basic quality", "data estimate"). Details see Table 5, Table 6, and Table 7 of the "Specific guide for LCI data sets".	Chapter 12.3 of the "Specific guide for LCI data sets"
	Technological representativeness		
	Geographical representativeness		
	Time-related representativeness		
	Precision / uncertainty		
	Methodological appropriateness[2] and consistency		
Method	Application of LCI modelling and method provisions of this document	ISO 14040 and -44 compliant process-based LCA Methodologically ILCD compliant, differentiated by the goal situations A, B, C1, and C2.	Chapter 6.5.4 and referenced chapters of the "Specific guide for LCI data sets".
	Application of other method provisions of this document	Adhering to the other method provisions of this document.	Other chapters of the "Specific guide for LCI data sets" with method provisions.
Nomenclat	Correctness and consistency of	Appropriate naming of flows and processes, consistent use of ILCD	Separate document "Nomenclature and

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[2] See text for reason to include "method…" in both data quality and as separate item "Method"

ure	applied nomenclature and basic reference data set objects	reference elementary flows, appropriate and consistent use of units, etc.	other conventions" as well as using the ILCD reference elementary flows, flow properties and unit group data sets as basis for the Input and Output inventory of the Process data set. See also chapter 7.4.3 of the "Specific guide for LCI data sets".
	Correctness and consistency of applied terminology	Correct and consistent use of technical terms (LCA and other domains).	Key terms of chapter 3 of the "General guide for LCA", "terms and concepts" boxes throughout the document, and application of the separate terminology.
Review	Appropriateness of applied review type	Selection of the minimum required review type, i.e. here an "Independent external review", as ILCD-registered qualified reviewer (ILCD reviewer registry, point system: LCA expertise and experience, experience in relevance sector, review experience).	Chapter 11 and separate document "Review schemes for Life Cycle Assessment (LCA)".
	Correctness of applied review scope	Correct scope of what is reviewed.	Separate document on "Review scope, methods, and documentation".
	Correctness of applied review methods	Correct methods of how to review each of the items within the review scope.	Separate document on "Review scope, methods, and documentation".
	Correctness of the review documentation[3]	Correct scope, form and extent of what is documented about the final outcome of the review, i.e. a separate review report using the "ILCD Handbook - Review report template" is required.	Separate document on "Review scope, methods, and documentation".
Document ation	Appropriateness of documentation extent	Documentation-compliant as defined in the "ILCD Handbook - Specific guide for LCI data sets". Note: Depending on intended	Separate document "ILCD - Documentation of LCA data sets" and

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[3] Note: The documentation of the review findings belongs to the "Review" part, since it does not relate to the documentation of the object of the data set.

		applications and target audience further information may be required in line with ISO 14044 and the ILCD Handbook; see under "Reporting" in "Specific guide for LCI data sets". Minimum documentation extent specified in separate document "ILCD - Documentation of LCA data sets". Appropriate coverage and correctness and appropriateness of what is reported / documented.	chapter 10 of the "Specific guide for LCI data sets", depending on target audience and intended applications.
	Appropriateness of form of documentation	Selection of the applicable form(s) of reporting / documentation, i.e. here a Process data set, preferably with an attached/referenced LCI study report.	Chapter 10.3 of the "Specific guide for LCI data sets".
	Appropriateness of documentation format	Selection and correct use of the data set format or report template, plus review documentation requirements. (Additional requirements for ILCD Data Network (is only "should" requirement in ILCD Handbook).	ILCD data set format and LCA report template (for LCI study reports).

4   Entry-level requirements

Less strict requirements are put in place for the first years of building-up the ILCD Data Network. Accordingly, next to the three data quality levels as specified in the "ILCD Handbook - Specific guide for LCI data sets", a forth level of unspecified data quality is introduced for this establishment-phase.

This aims firstly at making as many data available as soon as possible without compromising too much in terms of consistency and quality-assurance. Via the data set documentation the potential user is clearly informed about the applied methods and can thereby judge suitability and compatibility of the data sets for the specific application and product system at hand. Secondly this aims at providing both incentives and a clear time-plan for stepwise improving the minimum quality of the data that is available via the network.

In doing so, also the effort / cost involved to meet the specific requirements is considered together with data updating cycles and internal communication / coordination needs e.g. in business associations to get approval by their members on revised data sets.

The following Tab. 7 accordingly provides this "phasing-in" information, focussing on Process data sets as interim step towards full ILCD-compliance.

Tab. 7   ILCD Data Network - Entry-level requirements

Compliance area	ILCD Data Network - Entry-level
Documentation	• **Minimum documentation extent specified** • **ILCD format**
Nomenclature	• **Compliance with ILCD nomenclature document (e.g. use of ILCD reference elementary flows for IT compatible inventories),** • ***Certain aggregated elementary flows (e.g. VOC) are permitted*** • ***Terminology use not enforced.***
Data quality	• ***"Not defined", i.e. no data quality levels (***<u>Note: this requirement is covered as part of "Documentation"</u>***)*** • ***Data quality needs to be stated using ISO quality criteria only*** • **Technological, geographical and time-related representativeness to be documented**
Method	• **ISO 14040 and -44 compliance process-based LCA** • ***Methodological ILCD-compliance not enforced; applied modelling framework(s) and allocation/substitution approaches to be documented***

Review	*▪ Use of reviewers from registry not required*
	▪ "Qualified reviewer" required (based on ISO 14025):
	   ● knowledge of relevant sector
	   ● knowledge of represented process or product
	   ● LCA method expertise and experience
	● Qualified independent external reviewer in line with ISO 14044 (chapter 6.1) requirements BUT separate review report is not required (review documented in data set) OR
	● Qualified independent internal reviewer in line with ISO 14044 (chapter 6.1) requirements, BUT separate review report is required (with the ILCD template / minimum review documentation scope), in addition to review documentation provided within data set
	● Review on unit process level may not be required, depending on data quality claims

Remark: italics identifies less strict requirement than full ILCD-compliance

Abstract

Life Cycle Thinking (LCT) and Life Cycle Assessment (LCA) are the scientific approaches behind modern environmental policies and business decision support related to Sustainable Consumption and Production (SCP). The International Reference Life Cycle Data System (ILCD) provides a common basis for consistent, robust and quality-assured life cycle data and studies. Such data and studies support coherent SCP instruments, such as Ecolabelling, Ecodesign, Carbon footprinting, and Green Public Procurement. This document supports the International Reference Life Cycle Data System (ILCD) Data Network. It identifies the documents/sources for the implementation of the data network's quality, method, nomenclature, review and documentation compliance rules. These requirements draw on related requirements of the ILCD Handbook with some further specified requirements to support the electronic data network. The principle target audience for this document is the LCA practitioner and reviewer. This document is based on and conforms to the ISO 14040 and 14044 standards on LCA.

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