LCI Review report (reviewed against "ILCD Data Network - entry-level requirements")

Draft template

Table 1: General review reporting items

REVIEW REPORTING			
General information			
Data set name	**chlorine, sodium hydroxide, hydrogen, sodium hyporchlorite, chlor-alkali production mix, at plant**		
Data set UUID and version number	To be determined		
Data set locator (e.g. Permanent URI, URL, contact point, or database name and version, etc.)			
Data set owner	**Euro Chlor**		
Review commissioner(s)	**CEFIC/Euro Chlor**		
Reviewer name(s) and affiliation(s), contact	**Matthias Schulz, Dr.-Ing. Ivo Mersiowsky** **DEKRA Consulting GmbH**		
Review type applied	**Independent external**		
Date of review completion (DD/MM/YYYY)	**12/09/2013**		
Reviewed against / Compliance system name	**ILCD Data Network - Entry-level requirements**		
Reviewer assessment:			
Aspect	**Yes**	**No**	**Comments**
Quality compliance (aspects of ISO 14040 & 14044) fulfilled (see table 2)	X		
Method compliance (as in ISO 14040 & 14044) fulfilled and documented in data set	X		
Nomenclature compliance (see table 3) fulfilled	X		
Documentation compliance (see table 3) fulfilled	X		
Review compliance (Independent external review OR independent internal review + review report) fulfilled	X		
Overall compliance with ISO 14040 & 14044	X		
Overall compliance with "Compliance system"	X		

Date, location, reviewer signature	Stuttgart, 12/09//2013

Table 2: Specific/detailed review reporting items for LCI data set: Quality compliance (ISO 14040 & 14044). Please note that for aggregated LCI result data sets, this includes key processes in the background system.

ITEMs	Comments
Time-related coverage/representativeness: "age of data and the minimum length of time over which data should be collected" "qualitative assessment of the degree to which the data set reflects the true population of interest"	**Very Good** Foreground: 12 month averages representing the year 2011. Background: 2005—2010, Electricity grid-mixes from 2009 Exception ship transport from 1999 Maximum temporal validity until end of 2016. (p.24-25)
Geographical coverage/representativeness: "geographical area from which data for unit processes should be collected to satisfy the goal of the study" "qualitative assessment of the degree to which the data set reflects the true population of interest"	**Good** European production average (data from 50 chlor-alkali sites from 25 companies). It has to be noted, that for France and Belgium, the largest chlorine-producing countries in Europe after Germany, only 36 % and 42 % respectively, of the chlor-alkali electrolysis capacity is covered by the participating production sites. (p.23)
Technology coverage/representativeness: "specific technology or technology mix" "qualitative assessment of the degree to which the data set reflects the true population of interest"	**Fair** Technology mix representing European production (see above). 68%/71% of the European chlorine/sodium hydroxide production capacity (EU-27 + EFTA) in 2011. All three production technologies (mercury, diaphragm, membrane) are considered. Whereas the dominant technologies, i.e. mercury and membrane, are well represented, the diaphragm technology coverage is quite low. (p.11, 23)
Precision: "measure of the variability of the data values for each data expressed (e.g. variance)"	**Very Good** Relevant foreground data is primary data, or modelled based on primary information sources of the owners of the technologies. See also Uncertainty below for additional explanation. (p. 13)
Completeness: "percentage of flow that is measured or estimated"; assessed on level of process	**Good** Primary data used for the gate-to-gate chlor-alkali process covers all related flows in accordance with the following cut-off criteria. In the foreground processes all relevant flows were considered, trying to avoid any cut-off of material and energy flows. For commodities with an input of approx. 3 wt.-% and less of the chlorine output (e.g. H2SO4, agents for brine preparation, cooling agents, etc.) generic

ITEMs	Comments
	datasets from the LCA database Ecoinvent v 2.2 have been used. In Ecoinvent datasets, waste for recycling is generally cut off. Furthermore, expenses for capital equipment were not considered in this Eco-profile. Consequently, an influence of cut-offs less than 1 % on the total in expected. (p.24)
Consistency: "qualitative assessment of whether the study methodology is applied uniformly to the various components of the analysis"	**Very Good** To ensure consistency, only primary data of the same level of detail were used. For background datasets, it can be ensured that the underlying methodology was applied consistently. While building up the model, cross-checks ensured the plausibility of mass and energy flows. The methodological framework is consistent throughout the whole model as the same methodological principles are used both in foreground and background system. (p.26)
Sources of the data; Appropriateness of use primary/secondary data source	The main data source was a primary data collection from European chlor-alkali producers, providing site-specific gate-to-gate production data for processes under operational control of the participating companies. Data for the upstream supply chain until the precursors are taken from various databases as indicated in the report. Sodium chloride input was modeled based on primary data complemented and validated with literature data (p.24-25)
Uncertainty of the information (e.g. data, models and assumptions).	Variation of single data was not recorded. Variation of the model/dataset not applicable due to vertical average of production lines and technologies. Reliability of the collected primary data can be considered very high due to almost exclusively measured data across the entire sample. Furthermore, the background data can be considered very precise. (p.26)
Others	

Table 3: Specific/detailed review reporting items for LCI data set: Nomenclature and Documentation

ITEMs	Comments
Nomenclature	
Correctness and consistency of applied nomenclature (Preferred use of ILCD flows etc.; Correct nomenclature of other flows; Exclusion of not permissible waste flows, sum indicator elementary flows etc.)	Yes – database format is aligned and compatible with ILCD requirements (consistent nomenclature) -- conducted spot checks on the LCI (xls and ILCD xml) • Minor amounts of unspecified substance groups (e.g. hydrocarbons in group VOC), probably due to insufficient detail of primary data; • Only elementary waste flows (final deposits after treatment).
Documentation	
Appropriateness of documentation (see Document "Documentation of LCA data sets")	Yes – meta-data completed and appropriate; documentation aligned with ILCD standards.
Appropriateness / correctness of documentation form (ILCD Format)	Yes – Database format is aligned and compatible with ILCD requirements (consistent format of meta-data and content) -- spot checks were conducted on dataset.