

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

## Draft template

**Table 1: General review reporting items**

<b>REVIEW REPORTING</b>			
<b>General information</b>			
Data set name	<b>Process data set: High impact polystyrene (HIPS) ; polymerisation of polybutadiene rubber in a styrene solution; production mix, at producer; (en)</b>		
Data set UUID and version number	aed8d428-25bc-4b69-8722-d3e26975dc5b (06.10.000)		
Data set locator (e.g. Permanent URI, URL, contact point, or database name and version, etc.)			
Data set owner	<b>PlasticsEurope</b>		
Review commissioner(s)	<b>PlasticsEurope / JRC</b>		
Reviewer name(s) and affiliation(s), contact	<b>Dr.-Ing. Ivo Mersiowsky, DEKRA Consulting GmbH</b>		
Review type applied	<b>Independent external</b>		
Date of review completion (DD/MM/YYYY)	<b>23/08/2013</b>		
Reviewed against / Compliance system name	<b>ILCD Data Network - Entry-level requirements</b>		
<b>Reviewer assessment:</b>			
<b>Aspect</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
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, 28/08/2013		

**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
<p>Time-related coverage/representativeness:</p> <p>“age of data and the minimum length of time over which data should be collected”</p> <p>“qualitative assessment of the degree to which the data set reflects the true population of interest”</p>	<p><b>Very good</b></p> <p>Foreground: 12 month averages representing the year 2010.</p> <p>Background: 2008—2010.</p> <p>Maximum temporal validity until 2022.</p> <p style="text-align: right;">(p.11)</p>
<p>Geographical coverage/representativeness:</p> <p>“geographical area from which data for unit processes should be collected to satisfy the goal of the study”</p> <p>“qualitative assessment of the degree to which the data set reflects the true population of interest”</p>	<p><b>Very good</b></p> <p>European production average (data from six HIPS producers with thirteen plants in nine different European countries).</p> <p style="text-align: right;">(p.11)</p>
<p>Technology coverage/representativeness:</p> <p>“specific technology or technology mix”</p> <p>“qualitative assessment of the degree to which the data set reflects the true population of interest”</p>	<p><b>Very good</b></p> <p>Technology mix representing European production (see above).</p> <p>95 % of the European HIPS production capacity (EU-27) in 2010.</p> <p>Two different routes for the production of styrene (EBSM and POSM) were modelled as per the actual supply situation.</p> <p style="text-align: right;">(p.10—11)</p>
<p>Precision:</p> <p>“measure of the variability of the data values for each data expressed (e.g. variance)”</p>	<p><b>n/a</b></p> <p>Relevant foreground data is primary data, or modelled based on primary information sources of the owners of the technologies; deviation among sites was found to be low.</p> <p>See Uncertainty below for explanation of “n/a” rating.</p> <p style="text-align: right;">(p. 13)</p>
<p>Completeness:</p> <p>“percentage of flow that is measured or estimated”; assessed on level of process</p>	<p><b>Very good</b></p> <p>Primary data used for the gate-to-gate production of HIPS 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. In single cases additives used in the HIPS unit process (&lt;0.1 % m/m of product output) were neglected. In such cases, it was assured that no hazardous substances or metals were present in this neglected</p>

ITEMs	Comments
	<p>part. According to the GaBi database 2011 [GABI 5 2011], used in the background processes, at least 95 % of mass and energy of the input and output flows were covered and 98 % of their environmental relevance (according to expert judgment) was considered, hence an influence of cut-offs less than 1 % on the total is expected. All transports in the pre-chain contribute less than 0.2 % to the overall environmental burden. Considering the entire system under assessment, the contribution of all transports is expected to be less than 1 %; hence, transports were excluded from this investigation.</p> <p style="text-align: right;">(p.11—12)</p>
<p>Consistency: “qualitative assessment of whether the study methodology is applied uniformly to the various components of the analysis”</p>	<p><b>Very good</b></p> <p>To ensure consistency, only primary data of the same level of detail and background data from the GaBi 5 databases [GABI 5 2011] were used. 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> <p style="text-align: right;">(p.12)</p>
<p>Sources of the data; Appropriateness of use primary/secondary data source</p>	<p>The main data source was a primary data collection from European producers of HIPS, 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 the database of the software system GaBi 5 [GABI 5 2011].</p> <p style="text-align: right;">(p.3)</p>
<p>Uncertainty of the information (e.g. data, models and assumptions).</p>	<p>Variation of single data was not recorded. Variation of the model/dataset not applicable due to vertical average of production lines and technologies.</p> <p>The critical assumption within the model is the benzene mix, i.e. the proportion of the cracker route vs the reformer route. While the benzene mix is realistically set to a current European average, the uncertainty of this assumption cannot be verified in the course of this review (broad market study with analysis of variable supply chains would have been necessary).</p> <p style="text-align: right;">(p.32)</p> <p>Hence, Precision above rated “n/a”.</p>
<p><b>Others</b></p>	

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

ITEMs	Comments
<b>Nomenclature</b>	
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.)	<p>Yes – GaBi internal database format is aligned and compatible with ILCD requirements (consistent nomenclature) -- conducted spot checks on the LCI (xls and ILCD xml)</p> <ul style="list-style-type: none"> <li>• Minor amounts of unspecified substance groups (e.g. hydrocabons in goup VOC), probably due to insufficient detail of primary data;</li> <li>• Only elementary waste flows (final deposits after treatment).</li> </ul>
<b>Documentation</b>	
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 – GaBi internal database format is aligned and compatible with ILCD requirements (consistent format of meta-data and content) -- spot checks were conducted on dataset.