

Experience of LCI Database Update – chemical processes case **Cecilia Tiemi Makishi¹, Martin Baitz², Harald Florin², Matthias Fischer¹**

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The objective of this work is to report the recent LCI Database update process promoted by the University of Stuttgart and PE Europe GmbH. This process has shown that independently of the area (e.g. energy, chemicals, metals, etc.), steps imposed by an LCI Database update process are basically very much the same as the methodology used for the database creation process: system boundary definition, data sources, type of database, level of aggregation and documentation, having always the ISO 14040 ff as a reference.

In the case of data sources, apart from a literature review, the establishment of different stakeholders: industry, government and research institutes at an early stage of the process is essential to ensure the success of the work. This will provide an overall common understanding and an accepted outcome of the project.

Once the geographical area is determined, one has to define if the database will focus on the technologies applied in this specific area ('technology mix') or if it will reflect the end consumer situation ('consumption mix'). The decision about which approach to take has to take the users of this database into consideration and for which purpose they plan to use the database in their Life Cycle Assessment studies.

The level of aggregation (e.g. unit process level, average unit process chain, etc.) for publication depends very much on the confidentiality agreements done with the involved parties. In practice some unit processes are public, some always will be confidential (as it is property of companies). Despite of this fact, the expert team must have access to the unit process level – secured e.g. by secrecy agreement with industry – in order to control the quality of the work.

Hence the (confidential) unit process level information can be used to produce actual up-to-date aggregated datasets, which could not be used as unit process otherwise. Further – if enough experience is available – it is often possible for LCA experts to check the quality of aggregated LCI datasets without knowing details of every unit process. Documentation should follow international standards, so that it can be used by other parties and consistency is assured.

In this presentation, the particular case of the LCI Database of chemical processes will be exemplified. Such general proceeding must be applied in each different process in this field. No generic models can be generated like in the case of energy models. A literature review of the stoichiometric reactions and the best available technologies should be followed by a close cooperation with the industry to reflect the real situation in chemical industry. In the case of update, changes in the emission and disposal laws as well as new technologies should be also taken into consideration. A very good example is the drastic reduction of N₂O emissions in the adipic acid process some years ago or the question of landfill in Germany. This change in the process affects not only the process itself and its environmental impact, but all other processes in which this process is involved. This and other particularities, together with the methodology for the update of a LCI database in the case of chemical processes will be

reported. At the moment, more than 2000 processes in most different areas were updated using the basis of the procedure described above.

The target group of the presentation are data provider and database user from industry, entities or persons setting up databases as well a academia researching with a focus to industrial applications and practical solutions.