



## Influence of life cycle assessment software and database selection on life cycle assessment results: a comparative analysis using two case studies

As environmental concerns continue to grow globally, Life Cycle Assessment (LCA) has become an essential tool for evaluating the environmental impact of products and services. To support the environmental impact assessment, various LCA software tools, such as SimaPro, OpenLCA, and LCA FE, have been developed and are widely used in research and industry. Some LCA software tools rely primarily on external databases, while others combine access to external data with their own proprietary datasets. These differences might, for example, influence the transparency, background data access, and comparability of the results they generate. This thesis aims to critically evaluate and compare three selected LCA software tools based on two case studies. The case studies will represent the life cycle of a product with an automotive application from raw material extraction to processing to recycling, and a process in the printed circuit board sector.



**Product Life Cycle** 

The thesis will be supervised by Environmental Resource Technology (ÖRT) and Neue Materialien Bayreuth (NMB). This collaboration guarantees competent discussion partners for real process modelling (NMB) and evaluation of LCA results (ÖRT).

This thesis will include the following steps:

- 1. Literature review on LCA software programs, databases, as well as methodology for Life Cycle Impact Assessment.
- 2. Modelling the processes of these two case studies in OpenLCA, SimaPro, and LCA FE, supported by ÖRT and NMB.
- 3. Analyzing the assessment results, for example, based on evaluation of data access, database, transparency, methodology methods, user-friendliness, and/or software costs.
- 4. Comparison and discussion of the findings.

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