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European-wide harmonized, commonly accepted and applied single life cycle assessment (LCA) approach for a zero-emission road transport system - Pre-standardizing results of the TransensusLCA project

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Zero tailpipe emissions vehicles (ZEVs) are a promising option for more sustainable mobility services. Action needs to be taken in Europe and globally to foster less polluting road transportation prioritizing climate-neutrality targets throughout the whole value chain and not only in the use phase. To this end, decision-making processes need to be informed via robust methodologies to evaluate and monitor sustainability performance. Life cycle-based methodologies, such as LCA, Life Cycle Sustainability Assessment (LCSA), are the logical choice as these can provide a holistic sustainability perspective. They are increasingly used within policy-making, industry, and science to obtain sustainability information on products, services, or technologies. Their scope even extends to large-scale systems, including ZEVs covering the whole value chain from extraction to end-of-life. However, all the methods are not equally mature and include a number of choices that can lead to variations in results. Currently, harmonization is lacking on these choices, which leads to discrepancies in results for the same product, hinders the comparability of studies, and limits the usefulness of the methods for guiding decision makers.

TranSensus LCA [1] aims at developing a baseline for a European-wide harmonized, commonly accepted and applied single LCA approach for a “zero-emission” road transport system. The project’s ambitions are to enhance comparability between LCAs and represent reality as closely as possible. Bringing together relevant stakeholders from industry and research, an evidence- and real-life data-based LCA approach is being conceptualized and harmonized. By consensus, TranSensus LCA will enable industry, mobility providers and planners to provide sustainable products and optimize mobility solutions as needed to combat climate change. Since 2023, the conducted work in the project continuously delivers and improves a description of the building blocks of a recommended approach to enable fair comparison of LCAs of ZEVs.

The development of these building blocks relies on a scientific and consensus-driven approach within the project following the ISO 14040 LCA framework [2]. Based on the state of the art and the analysis of needs and gaps, discussions on regulations, practices, scientific alternatives, methodologies and other similar initiatives enabled providing recommendations, or, a limited number of alternatives to address each treated topic. After two internal votes, already 73 recommendations integrated the building blocks of the Environmental, Economic and Social LCA approach for retrospective vehicle LCA. Following a brief description of the project, this contribution will share the process used to reach such results and will focus on an essential topic, electricity modelling. This topic is of paramount importance when performing an LCA, as it can lead to huge impacts, and especially so for companies using Energy Attribute Certificates. Thus, the status of the discussions on electricity modelling in the ZEV production phase will be presented along with the different approaches possible, namely location-based and market-based. Main polemic points and the pros and cons of each approach will be described.

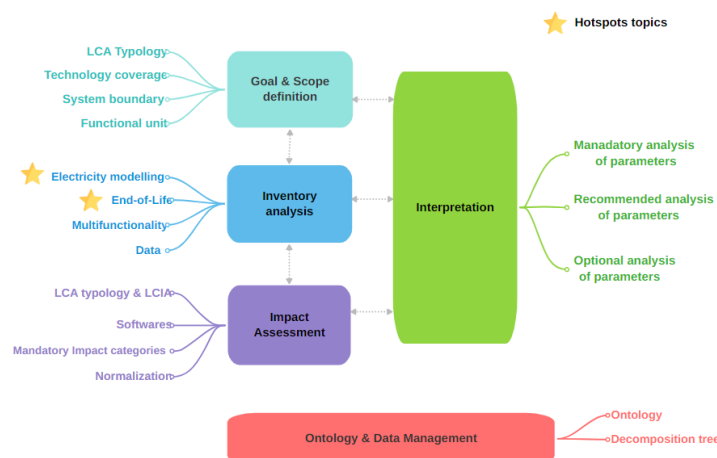


Figure 1. Retrospective LCA-Building blocks of TranSensus LCA methodology in 2024.

REFERENCES

[1] *TranSensus LCA*, (2023), Retrieved April 17, 2024 from <https://lca4transport.eu/>

[2] International Organization for Standardization. *Environmental management: life cycle assessment; requirements and guidelines, ISO 14040:2006*. International Organization for Standardization, 2006.