Terminology of Circular Carbon in the Technosphere and CCU Pathways – a Systematic Literature Review and Case Studies

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Motivation

Consistent **key terminology** in **LCA** is an essential tool to work towards **sustainability**. Therefore the following points are addressed:

- Definition of key LCA terminologies
- Delineation to achieve a common understanding
- Application of different terms

Thus, this **structured literature research** and **undermining case studies** explore *circular carbon* terminology in the technosphere and evaluate CCU pathways.

To improve the **consistency of key terminology** in circular carbon in LCA the following research efforts are performed:

- Definition search in **standard works, (ISO) norms** and **European legal frameworks**
- **Bibliometric analysis** is conducted with three search engines from 2000 to 2022
- **Analysis** of **key terminology usage** of LCA works in scientific literature
- **Case studies** of different scenarios of circularity to show relevance of defined key terminology

Research Question

Do misleading or ambiguous terms exist which impair transparency and scientific accuracy in carbon (dioxide) accounting in LCA with an emphasis on anthropogenic point sources?

Conclusion

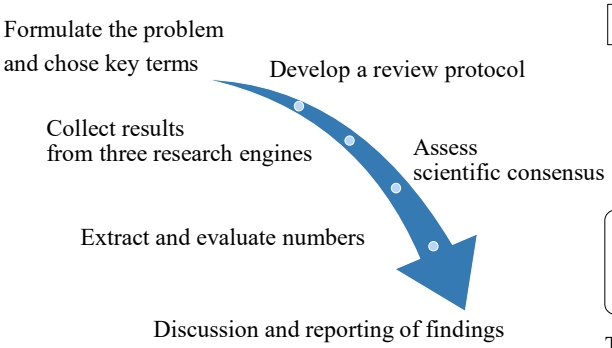
- **Objective:**

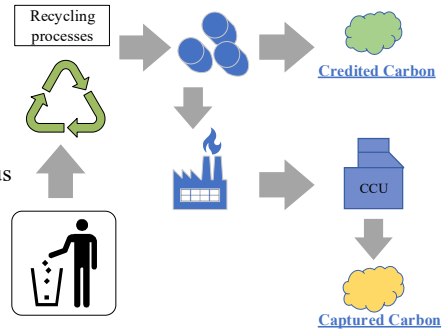
Providing key terminology definitions in LCA as proven, valid tools to describe circular carbon processes

- **Long-term perspective:**

Recommendations of key terminologies in circular carbon applications

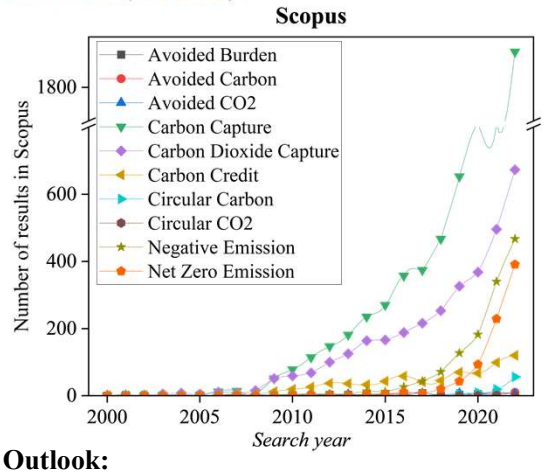
Method - Literature Review & Case Studies





They are modelled with10.7 GaBi by Sphera

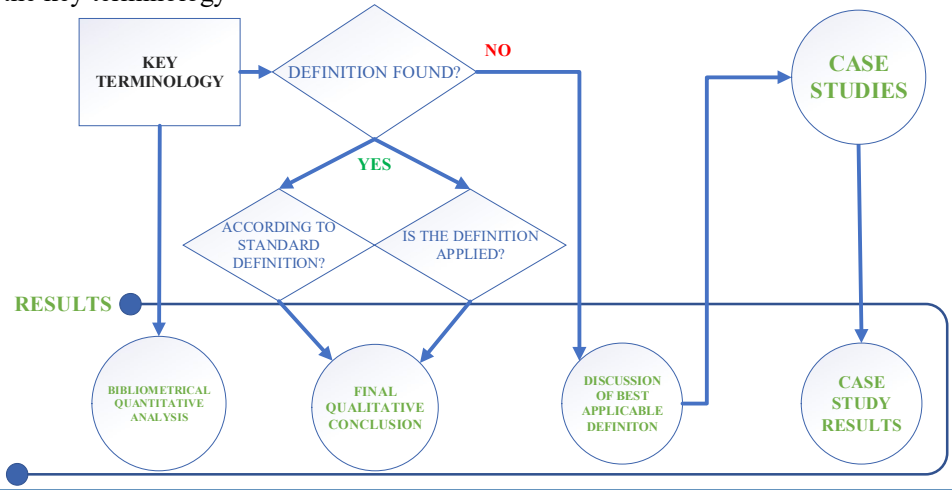
Results (selection)



Results from literature reviewed "Avoided Carbon"		
Features of usage	Papers with feature	% of total
Total paper	34	100%
Used to reduce global warming	18	53%
Explicit definition of avoided carbon that includes:		
Follows Avoided Burden Method:	2	6%
Used as "Avoided Carbon Emissions" - compares a delta in CO_2-eq. :	13	38%
Describing the financial aspect in reduction in CO_2-eq.	4	12%
Used as a synonym to avoided GHG-emissions, CO_2-eq or just CO_2 emissions:	3	9%
Used in sequestering carbon in soil:	2	6%

Outlook:

- Detailing in validation of key terminology definition
- Usage case studies modelling to undermine the key terminology



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