Carbon2Chem®

The Carbon2Chem® Communities

PRE-PROCESSING Simulation | ENGINEERING Process Design | POST-PROCESSING GWI Analysis | POST-PROCESSING Cost Estimation | Regulatory Framework

LCA Community

Holistic Evaluations through Collaboration

Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT | Siemens AG | thyssenkrupp AG | RWTH Aachen University | Fraunhofer Institute for Solar Energy Systems ISE | Covestro Deutschland AG

Challenge

A constellation of project partners collaborate in the Carbon2Chem® project, each for various parts along the CCU process chain. Each project partner has a unique perspective on the environmental impacts of process(es) under their consideration. Providing a platform to exchange these perspectives openly and enrich the life cycle assessment (LCA) knowledge base is essential to harmonize methods and interpretations for LCA results in the project.

Objective and methodology

The LCA Community is a common platform for all project partners to exchange ideas, results and perspectives relevant to life cycle assessment in the Carbon2Chem® project.

The LCA Community arranges

- **LCA Community meetings**: The latest developments as well as individual assessment results are discussed. Members from other communities also participate to provide their perspectives regarding utilization of results from the LCA Community.
- **Internal workshops**: Technical aspects of LCAs are discussed deeply to improve the methodology, interpretations and overall understanding of LCA. Technological possibilities within CCU systems are also explored.

These discussions have resulted in collaborative publications and holistic LCA studies in phase 2 of Carbon2Chem®, e. g.:

- Prospective (i. e. future-oriented) LCAs
- Multifunctionality analysis
- Dynamic LCA

Transferability

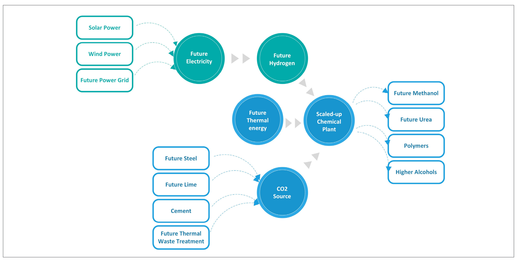
The LCA Community strives to further enhance the successful cooperation by conducting more workshops. Such workshops would result in several technical publications like journal articles, roadmap studies, internal LCA presentations, in addition to improving internal LCA studies.

The diverse, modular LCA models developed during phase 2 of Carbon2Chem® will be enhanced further for prospective LCAs of several systems relevant to CCU, e. g.:

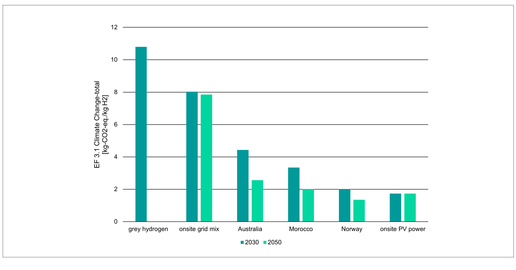
- Hydrogen
- CO_2 sources
- Reference technologies for CO_2 source industries and CCU chemicals

The technical understanding gained through community meetings and workshops will be applied to advance the field of LCA in terms of:

- **LCA modeling**: Consequential modeling, LCA modeling as per regulatory guidelines
- **LCA interpretation**: Multifunctionality, scenario analysis, sensitivity analysis, statistical uncertainty analysis



Prospective aspects considered in LCAs for Carbon2Chem® phase 2.



LCA of prospective hydrogen supply chains for imports in Germany CO_2 impact varies depending on supply chain.

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A KEY BUILDING BLOCK FOR THE CLIMATE PROTECTION

CO_2 reduction by cooperation of process industrial sectors