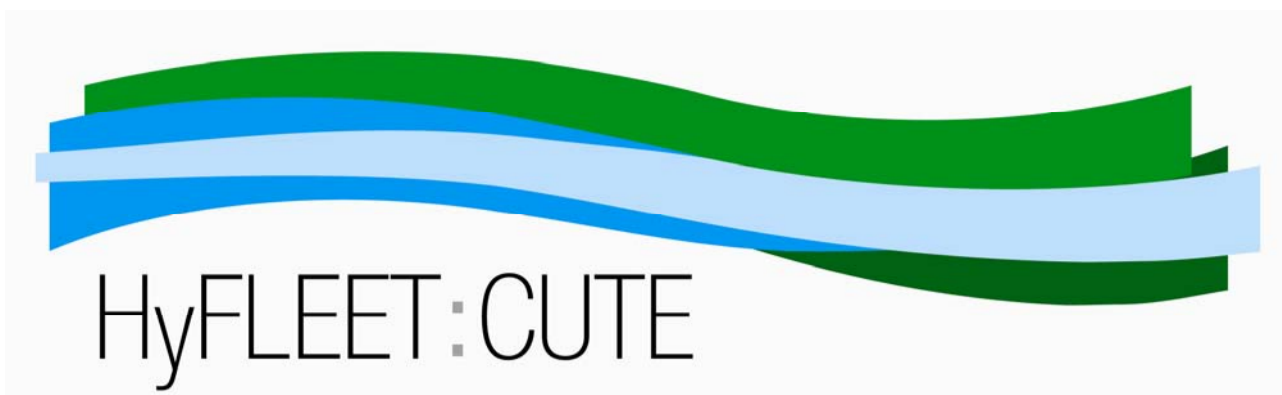


Modeling Hydrogen Production Costs with LCA-based Methods



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Abstract

Costs are major market drivers for the installation of new technologies. The identification of such drivers is one question for Life Cycle Costing (LCC) to answer. One example, where a specifically adjusted LCC approach addresses an area of high relevance for the forecast of technological development is the implementation of hydrogen as a road vehicle fuel. The task to accomplish hereby is to identify and remove major technological barriers. Different cost models provide bases for tackling this challenge. In the United States, with the "H2A studies", a sophisticated hydrogen cost calculation model exists, focusing on economic boundary conditions. In Europe, the "E3database" of the "Hyways" research project provides si-

milar analyses.

The European research project HyFLEET:CUTE of the "6th Framework Programme" performed cost analyses, using a modeling approach that stems from LCA. Here, cost structures have been set up in an LCA modeling environment, providing a technical basis of hydrogen costs. This includes the use of unit processes and flows – representing cost contributions, not mass or energy flows – the use of parameters to allow for user interaction into the model and the model layout in a hierarchical structure. The model is set up in a way to distinguish between costs for hydrogen production, for monitoring purposes and for means of purification.

Based on this technical cost structure, the influence of different elements of small scale production units on hydrogen costs is assessed. Special focus is hereby directed to the question of purity requirements on hydrogen as vehicle fuel and the impacts on costs through different purity requirements. The model can be used by the industry partners to identify the cost-related barriers in their respective area of engagement to analyze the possibilities of hydrogen as an energy carrier. The model is also used to compare the cost calculations of HyFLEET:CUTE with the results of the U.S. model of the H2A studies.

The presentation will lay out, how the principles and mechanisms of LCA modeling

are used to perform this technology-based cost analysis and it will compare cost results of the HyFLEET:CUTE project with H2A hydrogen cost results and the E3database results.

<Subtitle>

FIG. #:

Literature

- [2]...
- [3] LBP, PE (2008): *GaBi 4 Software-System und Datenbanken zur Ganzheitlichen Bilanzierung*. Stuttgart, Echterdingen. Online: URL: <http://www.gabi-software.com/>.

HyFLEET:CUTE

The HyFLEET:CUTE project involves the operation of 47 hydrogen powered buses in regular public transport service in 10 cities on three continents. The aim of the four year project, funded by the European Union, is to develop and demonstrate advanced hydrogen drive concepts for city buses as well as technologies and processes for the production and distribution of sustainable supply pathway for hydrogen.

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