Slovak Society of Chemical Engineering
Institute of Chemical and Environmental Engineering
Slovak University of Technology in Bratislava

PROCEEDINGS

51st International Conference of the Slovak Society of Chemical Engineering SSCHE 2025

Hotel DRUŽBA
Jasná, Demänovská Dolina, Slovakia
May 27 - 30, 2025

Editors: Assoc. Prof. Mário Mihaľ

ISBN: 978-80-8208-158-2, EAN: 9788082081582

Published by the Faculty of Chemical and Food Technology Slovak Technical University in Bratislava in Slovak Chemistry Library for the Institute of Chemical and Environmental Engineering; Radlinského 9, 812 37 Bratislava, 2024

Polakovičová, D., Variny, M.: Hydrogen Position in the Energy Transition: Analysing the Competitiveness of Low-Emission Technologies, Editors: Mihaľ, M., In *51st International Conference of the Slovak Society of Chemical Engineering SSCHE 2025*, Jasná, Demänovská Dolina, Slovakia, 2025.

Hydrogen Position in the Energy Transition: Analysing the Competitiveness of Low-Emission Technologies

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Key words: hydrogen energy, transportation, multi-criteria evaluation.

The role of hydrogen as a clean energy carrier is gaining growing attention in the context of achieving climate neutrality and decarbonizing key sectors of the economy. While hydrogen has already found its place in various industrial processes, its potential extends far beyond traditional applications. Viability of low-emission hydrogen technologies within the broader energy transition is provide by this study, focusing not only on production, but also on other parts of hydrogen supply chain such as transportation and end-use. A comparative analysis is conducted based on several criteria: economic feasibility, environmental performance, technical parameters and technological maturity.

The study also accounts for dynamic variables such as projected energy prices, carbon costs, and efficiency improvements, which can significantly influence the future competitiveness of hydrogen application pathways. The results provide a data-driven evaluation of low-emission hydrogen options and identify the most promising applications in both the energy and industrial sectors. The results highlight its prospects compared to conventional technologies. The role of hydrogen transport is also applied in this study as part of the comparison of the offered options. This contribution aims to provide relevant insights into the role of hydrogen in the energy transition and inform strategic decisions regarding future investments.

Acknowledgement

This work was supported by the call for doctoral students and young researchers of Slovak University of Technology in Bratislava to start a research career (Grant 23-04-11-A) and by the Slovak Scientific Agency, grant no. VEGA 1/0151/24.