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

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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.

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