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Techno-economical challenges of H2 microgrid applications

In this new era of energy transition, Europe expects profound changes to achieve a climate-neutral Europe by 2050. In addition to the support and development of renewable energies in Europe over the last decades, hydrogen is now recognised as a new player at the service of the environment and the economy. Renewable electricity is expected to play a vital role in decarbonising the EU's energy consumption. However, it will not do it all through direct electrification, or battery solutions.

Hydrogen, as a versatile energy carrier and chemical feedstock, offers advantages that unite all of Europe’s energy resources — renewables, nuclear, and fossil fuels — and enables innovations in energy production and end uses that can help decarbonise the most energy intensive sectors of our economy. Owing to a continuous European support to research, development and innovation, hydrogen technologies have transitioned from highly specialized applications to commercially available products. As a result, Europe is currently leading in several hydrogen technologies. However, many other countries and regions are equally ambitious about hydrogen and it is by no means guaranteed that Europe can maintain its leading position. The rapid development of a domestic market is therefore crucial to achieve climate neutrality by 2050 but also for preserving and enhancing EU industrial competitiveness, securing jobs and value creation in this new sector. Achieving these objectives will require significant additional research and innovation efforts with several research and innovation challenges to be addressed in the short and medium term.