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## ABSTRACT:

### **Hydrogen and membrane engineering in the field of Green Energy: industrial impacts, social dimension and perspectives**

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To limit the effects of the global warming, the European Green Deal aims to contribute to the transition from a carbon-based to a sustainable hydrogen economy, promoting the decarbonisation of the industrial infrastructures, focusing on hydrogen - as the new energy carrier - and on the exploitation of renewable sources, as an alternative to fossil fuels, according to the principles of the Circular Economy. In this regard, membrane engineering plays a strategic role if adopted in the field of decarbonized hydrogen production as it constitutes an intensified solution presenting several benefits over the conventional processes [1], useful to meet the stringent targets promoted by the European Clean Hydrogen Alliance, under the Strategic Research & Innovation Agenda 2021-2027 [2]. This work deals with an overview of the membrane reformer technology potential in the area of clean hydrogen generation, paying particular attention to the catalytic processes involving renewable feedstocks and, in particular, biogas as an emergent and sustainable hydrogen source [3]. As a case study, the most relevant outcomes of a relevant ongoing research project supported by the Next Generation EU about hydrogen are presented and discussed.

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