



Hydrogen Europe: European Hydrogen & Fuel cell Project Database

Project COSMHYC XL

COmbined hybrid Solution of Metal HYdride and mechanical Compressors for eXtra Large scale hydrogen refuelling stations

Hydrogen mobility is one of the most promising solutions for a sustainable energy transition in large-scale transport modes, including trucks, busses, trains and professional vehicle fleets. For these applications, a dedicated hydrogen refuelling infrastructure is necessary, including hydrogen compressors able to meet challenging constraints in terms of flow rate and availability. The COSMHYC XL project aims at developing an innovative compression solution for extra large hydrogen refuelling stations, based on the combination of a metal hydride compressor and a diaphragm compressor. The solution will be scalable and modular and will therefore be adapted to the diversity of large-scale mobility applications. The combination of both technologies will provide a cost efficient solution, by reducing both the investment and the maintenance costs. Thanks to significant research and innovation activities, from core materials and components to system integration, the new compression solution will contain no critical raw materials. The hydrogen flow rates will be drastically increased, as well as the overall compression ratio. In addition, the reliability and availability of hydrogen refuelling stations will be significantly improved. An innovative system integration concept will enable to optimise the thermal synergies between both compressors and lead to an improved electrical efficiency by more than 30%, thereby contributing to reduce the production costs of hydrogen and making it a competitive fuel for large-scale mobility. COSMHYC XL will include the development of a 1/10 scale prototype, and a long-term test phase of 6 months under real conditions. Techno-economic analysis will be performed and an advisory committee will support the partners to better understand the needs of the market. Extensive communication, dissemination and exploitation activities will take place and maximise the economic, environmental and societal impacts of the project.

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Project partners

Coordinator :

Ludwig-Boelkow-Systemtechnik GmbH
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Sub project(s)

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