

PROJECT

COSMHYC XL

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

Funding: European (Horizon 2020)

Duration: Jan 2019 - Dec 2021

Status: Ongoing

Total project cost: €2,749,614

EU contribution: €2,749,614



Call for proposal: H2020-JTI-FCH-2018-1

[CORDIS RCN : 219831](#)

Background & policy context:

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.

Objectives:

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.

Parent Programmes:

[H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport](#)

Institute type: Public institution

Institute name: European Commission

Funding type: Public (EU)

Other programmes: FCH-01-7-2018 Improvement of innovative compression concepts for large scale transport applications

Lead Organisation:

Eifer Europaisches Institut Fur Energieforschung Edf Kit Ewiv

Address:

EMMY NOETHER STRASSE 11
76131 KARLSRUHE
Germany

Organisation Website:

<http://www.eifer.org>

EU Contribution: €977,775

Partner Organisations:**Mahytec Sarl****Address:**

Avenue De Verdun 210
39100 Dole
France

EU Contribution: €786,000

Ludwig-Boelkow-Systemtechnik Gmbh**Address:**

Daimlerstr. 15
85521 Ottobrunn
Germany

Organisation Website:

<http://www.lbst.de>

EU Contribution: €107,775

Steinbeis 2I Gmbh**Address:**

Kienestrasse
70174 Stuttgart
Germany

EU Contribution: €377,250

Nel Hydrogen As**Address:**

INDUSTRIPARKEN 34 B LIND
7400 HERNING
Denmark

Organisation Website:

<http://www.h2logic.com>

EU Contribution: €500,814

Technologies:

Fuel cells and hydrogen fuel
Hydrogen refuelling station using ionic compressor

Development phase: Demonstration/prototyping/Pilot Production

STRIA Roadmaps: Transport electrification, Low-emission alternative energy for transport

Transport mode: Road transport

Transport sectors: Passenger transport

Transport policies: Environmental/Emissions aspects, Decarbonisation

Geo-spatial type: Other