

## **COSMHYC project starts long-term tests of its innovative hydrogen compression solution**

*In October 2020, the COSMHYC consortium partners commissioned a metal hydride compressor prototype and officially started an outdoor testing phase that will last until February 2021. The prototype is tested under conditions simulating its integration into a hydrogen refuelling station. The objective is to demonstrate the reliability and energy efficiency of the solution. It is a major step forward for preparing the market introduction of this innovative compression technology, with the potential to boost hydrogen mobility.*

### **Innovative hydrogen compressor getting tested**

The COSMHYC partners have developed an innovative metal hydride compressor prototype. It was commissioned in October 2020 and a long-term test phase has started, investigating the performance of this new compression technology. The testing set up simulates the refuelling station utilisation profile and the interaction with the mechanical compressor. The tests aim to validate technical KPI's including capacity, compression ratios, energy efficiency and noise level. The generated data will also enable to discuss further optimisation requirements for future commercialisation.



**COSMHYC container at the site of Fraunhofer ICT (close to Karlsruhe, Germany) containing the metal hydride compressor and testing equipment**



### **Innovation through cooperation**

This important achievement is the result of an intensive cooperation between industrial companies (NEL Hydrogen and MAHYTEC), research (EIFER) and consultancy companies (LBST and Steinbeis 2i GmbH). An R&D centre (Fraunhofer ICT) provides support to the consortium for the test site and hydrogen safety. The involvement of stakeholders from 3 different countries (Germany, Denmark and France) contributes to reinforcing pan-European technical exchange and expertise.

### **How the COSMHYC hybrid compression solution works**

While most conventional hydrogen compressors use a mechanical effect, metal hydride compressors use a thermal effect instead: the hydrides absorb low pressure hydrogen at low temperature and release high-pressure hydrogen at high temperatures, enabling to reduce maintenance costs and noise disturbance, and to replace the use of electricity with waste heat. Coupling a metal hydride compressor and a mechanical compressor enables to combine the high flow rates and flexibility of mechanical compressors with the reliability and energy efficiency of metal hydrides, enabling an overall cost-efficient solution.

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### **About the project**

COSMHYC is a Horizon 2020 – FCH 2 JU funded project, coordinated by the European Institute For Energy Research (EIFER) which aims to boost hydrogen mobility by developing innovative compression solutions for competitive refuelling of Fuel Cell Electric Vehicles. With a budget of 2.5 M € the five consortium partners work on improving the performance of hydrogen compression, an essential step of the refuelling process. Cost reductions and improvements of the efficiency of FCEV refuelling are crucial for the success of hydrogen mobility. The project started in 2017 and will continue until early 2021.

More details on COSMHYC can be found on the [project website](#). Regular updates and news can also be found on [twitter](#) and [LinkedIn](#).

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