

**Bringing hydrogen compression to the next level – the COSMHYC project is entering the testing phase validating the developed compressor system for H2 refuelling at fuel stations**

*The Horizon 2020 / FCH JU funded project COSMHYC pursues the goal to make hydrogen refuelling faster and more flexible, reducing costs for customers at the fuel pump. The COSMHYC compression system combines a mechanical compressor with a compressor based on metal hydrides. Bringing these two compression systems together allows for higher efficiency of the entire refuelling process, cutting costs for operation and maintenance of fuelling stations. After successfully developing designs and producing the compressors' components during the first two years, as well as passing the project's first review meeting, the project enters now into the testing phase for proofing the durability of the system in real-life conditions.*

**Boosting the efficiency of hydrogen refuelling by combining the best of two solutions**

Fuel cell electric vehicles with gaseous hydrogen require high pressure hydrogen to be provided at the refuelling station. The COSMHYC team therefore conceptualised a new approach to compressing hydrogen, combining the advantages of two compressor types. Mechanical compressors enable quick starts and stops and large flow rates at high pressure – ideal features for refuelling a car. Using metal hydride for compression decreases energy consumption and maintenance costs. COSMHYC combines advantageous features of both technologies. During peak demand times, the metal hydride compressor will be supported by a mechanical compressor, able to handle large flow rates at high pressure levels (for fueling at 700 bars). Both compressor types are subject of further research and development within COSMHYC, yielding in significant improvements, performance increase and cost reductions.

**Long-term tests launched**

*“We have reached some of the most challenging milestones of the COSMHYC project from a scientific point of view. Now, we need to build and test a prototype and demonstrate that it works as a system, in order to be ready for a demonstration under real life conditions.”* David Colomar, the coordinator of COSMHYC, summarises the next steps to be addressed within COSMHYC. A joint programme has been developed for testing the combined solution while both compressors remain at different locations. Tests on the mechanical compressor are performed by project partner NEL For the metal hydride compressor a first milestone was set with the delivery of the test container in June. EIFER and MAHYTEC are currently running first tests. The goal of the nine months testing is to validate performances and proof the overall reliability of the combined solution.



Figure 1: COSMHYC Metal Hydride compressor test side at Fraunhofer ICT, Pfinztal Germany

**COSMHYC team goes ‘heavy duty’ with new EU funded project COSMHYC XL**

The COSMHYC research team has secured further Horizon 2020 funding to continue the work started within COSMHYC and extend the innovative concept to heavy duty hydrogen refuelling. COSMHYC XL, pursues the adaptation and further development of the combined concept to increase efficiency of refuelling when large quantity of hydrogen have to be delivered for trucks, buses, ships or large car fleets. Just like COSMHYC the project is funded by the Fuel Cell and Hydrogen Joint Undertaking and will run over three years. For more information, please read the [COSMHYC XL press release](#) and visit the newly launched [project website](#) serving as a joint communication platform for both projects.

**PROJECT SUMMARY**

COSMHYC is a Horizon 2020 – FCH 2 JU funded project which aims aim to boost hydrogen mobility by developing innovative compression solutions for competitive refuelling of Fuel Cell Electric Vehicles. With a budget of 2.5 M € five European project partners from industry and research work on improving the performance of hydrogen compression, an essential step of the refuelling process. Cost reductions and improvements concerning the efficiency of FCEV refuelling are crucial for the success of hydrogen mobility. Over the course of 3 years (2017-2019) the COSMHYC partners gather their expertise to advance hydrogen compression technology, contributing to the market take-off of FCEVs. The project is coordinated by the European Institute for Energy Research (EIFER).

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COSMHYC is coordinated by the European Institute For Energy Research (EIFER) in cooperation with 4 partners: MAHYTEC SARL; Nel Hydrogen; Steinbeis 2i GMBH and Ludwig-Boelkow-Systemtechnik GmbH.

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