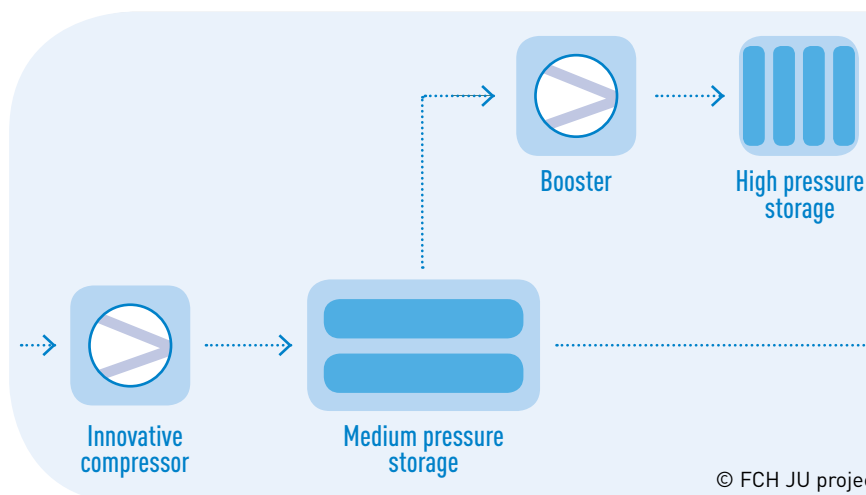




**Making an impact  
on the clean  
energy transition**

**TRANSPORT**

# BRINGING HYDROGEN COMPRESSION TO THE NEXT LEVEL



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## Greater efficiency and reliability

Hydrogen is usually produced at low pressure and must be compressed before it can be used at a hydrogen refuelling station. Current compressor technologies are expensive and energy consuming, thereby reducing the efficiency of hydrogen mobility. Therefore, breakthrough solutions to increase the efficiency of hydrogen compressors are needed. Two FCH JU-financed projects are aiming to make hydrogen compression more flexible and reliable, reducing costs for customers at the fuel pump.

The COmbined hybrid Solution of Multiple HYdrogen Compressors (COSMHYC) project, launched in 2017, is developing and testing a hybrid compression system which combines a mechanical compressor with a compressor based on metal hydrides. This innovative solution contains no rare earth material, reduces maintenance and operating costs while achieving top performance levels.

## COSMHYC goes heavy-duty

A follow-up project, COSMHYC XL, is extending this new technology to extra-large refuelling stations. It will develop a hybrid compression concept suitable for heavy mobility operations such as trucks, buses, regional trains and taxi fleets. Industry partners for both projects are targeting a short time-to-market period after a variety of long-term tests on the prototypes. In addition, a technical economic assessment and exploitation plan will help industry to adopt the new compressor technology.

**Hydrogen-fuelled vehicles could help the drive to a greener European future. But to be used as vehicle fuel, gaseous hydrogen must be compressed at refuelling stations. Funding from the FCH JU has led to new technologies that will significantly facilitate hydrogen compression, providing better refuelling stations offering transport an attractive renewable fuel.**



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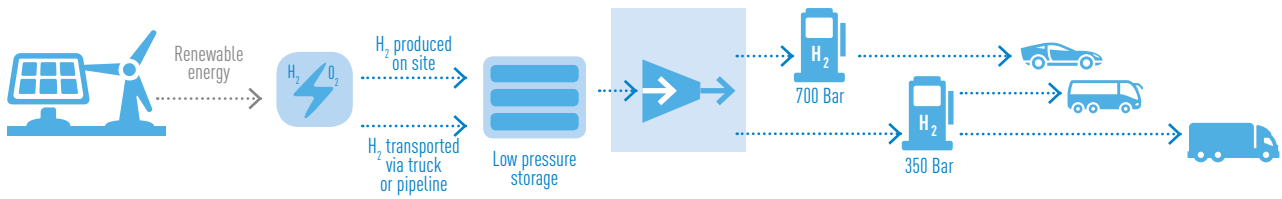


**FCH JU Success Stories**

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## COMPRESSION FOR CLEAN AND EFFICIENT HYDROGEN MOBILITY



## KEY ACHIEVEMENTS

**THE MANUFACTURE OF RARE-EARTH-FREE METAL HYDRIDES**

providing the right properties and performances for hydrogen compression

**OPTIMISED SYSTEM INTEGRATION**

specifically adapted to maximise metal hydride compression performance while matching end-user requirements

## IMPACT

**BELOW 60 DB**

compressor noise level at 5 metres

**20 %**

overall reduction in hydrogen costs

**20 %**

increased energy efficiency of the compression process

**UP TO 50 %**

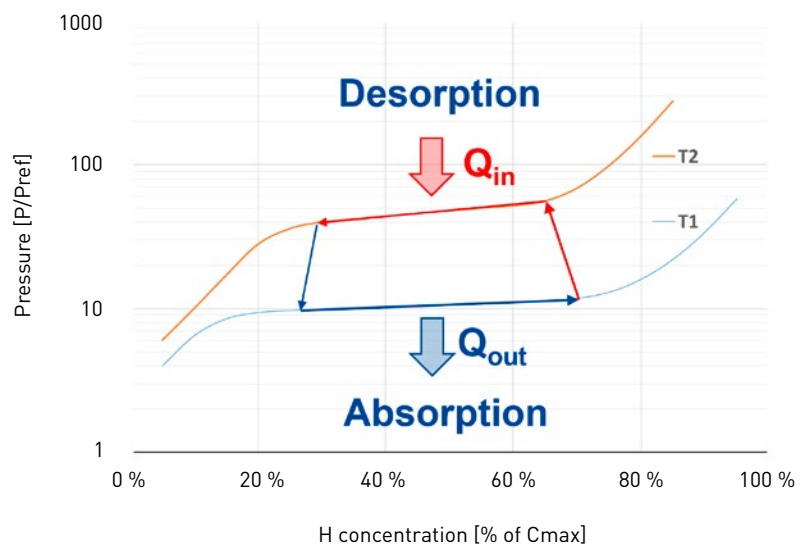
reduction in maintenance costs for hydrogen refuelling

## WHAT'S AT STAKE?

Advanced hydrogen compression technologies increase the energy efficiency of compression and enable reductions in hydrogen costs at the refuelling station.

## ACTION STATIONS!

To find better ways to compress hydrogen at refuelling stations, the FCH JU brought together manufacturers, innovators and operators. **The goal?** To develop cutting-edge hydrogen compression technologies to enable reliable and cheaper hydrogen refuelling. **Key results?** Outcomes include an innovative compression solution based on metal hydrides which offer the best performance for compression, without using rare earths. The new metal hydride compressor is combined with a new mechanical compressor to provide various compression levels.



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