Making an impact on the clean energy transition

TRANSPORT

THE SHAPE OF HYDROGEN FUEL TANKS TO COME

FCH JU projects are optimising hydrogen tanks for vehicles with a bold new approach to shapes, materials and manufacturing. Results have boosted business for industry partners and highlight how research and innovation are key to driving this critical fuel cell technology forward.

Thinking inside the box

Hydrogen storage in vehicles has long been a challenge. The gas is typically kept in high-pressure cylinders that are heavy, bulky and expensive, complicating car designs and commercialisation. Other constraints relate to efficiency, safety and the reliance on costly carbon fibre to reinforce the tanks.

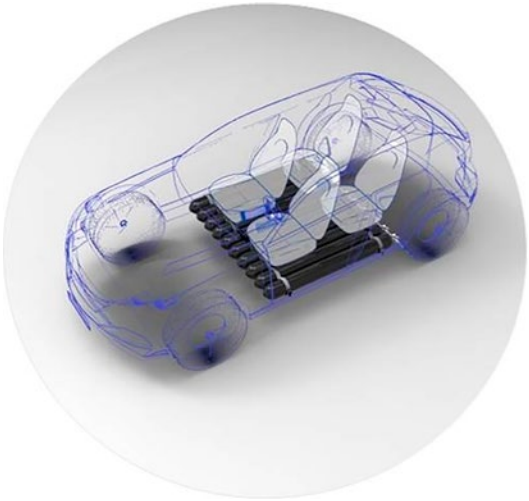
FCH JU projects are powering solutions. TAHYA, for example, developed a safe and efficient tank comprising carbon fibre and a plastic liner that is cheaper than conventional ones because it uses less material. The THOR project created a thermoplastic tank that uses less carbon fibre, is recyclable and therefore also more sustainable. SH2APED, meanwhile, has designed a conformable tank that is rectangular and fits into the flat space of car underbodies.

Brand and business boosters

With clean mobility gaining momentum, the projects have sparked interest – and helped partners win new contracts. This, in turn, has benefitted European excellence and manufacturing.

In May 2021, French automotive supplier Plastic Omnium, involved in TAHYA and SH2APED, announced a partnership with Hopium to develop a storage system for the Māchina, set to become the first French hydrogen-powered car. This followed a major order for 10 000 hydrogen bus tanks from a German manufacturer in late 2019.

French automotive technology company and THOR coordinator Faurecia saw success with a significant June 2020 deal to supply hydrogen-storage systems – including 10 000 tanks – for Hyundai trucks.



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FROM INNOVATION TO OPTIMISATION

To facilitate the large-scale production and adoption of hydrogen-powered vehicles, European research and innovation are needed for tank designs, materials and manufacturing.

NEW SPIN ON STORAGE

Experts from across the European supply chain have collaborated to improve hydrogen fuel tanks, boldly rethinking designs, materials and production processes to better meet the needs of the automotive industry. **The goal?** To optimise hydrogen fuel tanks with alternative materials such as thermoplastics, improved manufacturing and space-saving shapes, while cutting costs and monitoring sustainability. **Key results?** Cost-effective storage systems that are efficient, durable, safe, easily integrated into cars – and recyclable.

KEY ACHIEVEMENTS

TAHYA

3 patents

Cost-competitive H_2 storage system (500€/kg H_2) with mass production capability

100 % recyclability

THOR

Development of an optimised design for the first 64-litre thermoplastic tank
that includes a winding pattern and bosses.

First tank prototypes produced
to be used for burst and rupture tests

SH2APED

Box-like tank that fits into a rectangular space

IMPACT

PROMOTION OF EUROPE AS A PREMIER HYDROGEN TANK PRODUCER

TAHYA

Updates expected to GRT13 and EC79 safety standards
based on project test results

THOR

Unlocked potential of thermoplastics

SH2APED

Cost reductions expected for Type IV conformable hydrogen tanks

FIND OUT MORE

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A partnership dedicated to clean energy and transport in Europe

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