



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

COMPETITIVE, COMMERCIAL AUTOMOTIVE FUEL CELLS



© ZSW



State-of-the-art stacks

Because hydrogen fuel cells produce little energy individually, many need to be layered or 'stacked' together to power vehicles. However, until recently, Europe had neither state-of-the-art fuel-cell stack products nor competitive stack suppliers for automotive applications. Performance, weight, size and cost issues also posed barriers to the commercial adoption of the technology. FCH JU co-funded projects have addressed these challenges. AUTO-STACK established a research cluster to drive the development of automotive fuel-cell stack technology in Europe. It was followed by STACKTEST, which created industry-wide harmonised test procedures for fuel-cell stacks. AUTO-STACK CORE then set up a platform to develop automotive stack hardware to address critical challenges to fuel cell commercialisation. The project's successive generations of stacks achieved increasingly high-performance results and power density at lower cost, while substantially improving economies of scale.

On the road by 2020

These developments led car-equipment manufacturers to start a limited production of fuel-cell stacks and laid the foundations for an 'Autostack industry' project in Germany, bringing together automotive companies and suppliers to prepare for the commercial launch of fuel-cell vehicles in Europe by 2020. The project will enable the transition to the cost-effective automated assembly of high-quality, high-performance stacks, while further boosting fuel-cell performance, service life and reliability. Thanks to these initiatives, the competitive industrial-scale production of automotive fuel cell stacks in Europe is now close to becoming a reality.

Fuel-cell-powered vehicles would reduce polluting emissions from transport while reducing Europe's reliance on imported fossil fuels. The FCH JU has been instrumental in the development of this transformative automotive technology, which is on the verge of being deployed commercially.



© Powercell Sweden



COMPETITIVE, COMMERCIAL AUTOMOTIVE FUEL CELLS

KEY ACHIEVEMENTS

10-150 kW

power range of new fuel-cell stacks

5 500 HOURS

life-expectancy objective of new fuel-cell stacks in AUTO-STACK CORE

EUR 30-40/kW

cost projections in AUTO-STACK CORE for large-scale production of 95 kW fuel-cell stacks

4 kW/LITRE

volumetric power density

≈ 55 %

stack electrical efficiency



BUILDING A EUROPEAN INDUSTRY

By overcoming the lack of state-of-the-art fuel-cell stack products and competitive stack suppliers for automotive applications in Europe, while addressing fuel-cell performance, weight, size and cost issues, the aim is to drive commercial take-up.

DRIVING DEVELOPMENT OF AUTOMOTIVE SOLUTIONS

By combining the collective expertise of automotive original equipment manufacturers, component suppliers, system integrators and research institutes, FCH JU projects successfully addressed the lack of competitive automotive fuel-cell stack production in Europe. **The goal?** To create a competitive industrial supply chain enabling the standardisation of stack production, while improving the performance and lowering the cost of fuel cells. **Key results?** The commercial launch of fuel-cell vehicles in Europe by 2020.

IMPACT

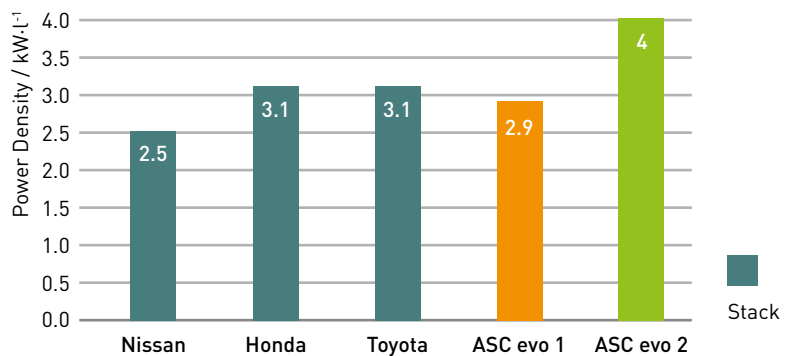
30 000

planned production volume of fuel-cell stacks per year from Germany's Autostack industry project

EUR 23 MILLION

overall budget (12 EUR million FCH JU budget) for three projects (AUTO-STACK, STACKTEST, AUTO-STACK CORE) supporting the commercialisation of fuel-cell stacks in Europe

PEAK POWER DENSITY COMPARISON



FIND OUT MORE



www.fch.europa.eu/page/fch-ju-projects
<http://autostack.zsw-bw.de>
<http://stacktest.zsw-bw.de>



@fch_ju



FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

A partnership dedicated to clean energy and transport in Europe