

FCH JU: accelerating towards a low-carbon economy

Climate and energy policy is one of the European Union's most important priorities. Affordable, clean and secure energy for all Europe's citizens and enterprises is key to a sustainable and competitive future. Through its Energy Union initiative, the

EU is working to establish a fully integrated internal energy market, improve energy efficiency, decarbonise the economy, and fund research, innovation and competitiveness to support breakthroughs in low-carbon and clean energy technologies.

FUEL CELL TECHNOLOGY

Fuel cells are such a low-carbon and clean energy technology. A fuel cell is a highly efficient conversion technology that produces electricity and heat through a simple, clean chemical reaction between oxygen and a fuel. It produces no pollutants or carbon

Photo: HyFive project, © BMW



**FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING**

dioxide. Fuel cell technology is very flexible, can operate with a range of fuels, and can be easily integrated into existing energy infrastructures.

The most promising fuel for fuel cells is hydrogen: the most plentiful chemical element in the Universe and present

in abundance on Earth as water, hydrocarbons and in other organic matter. Hydrogen can be produced in several ways including steam reforming of methane (the main component of natural gas) or the electrolysis of water using electricity. When the electricity used is from renewable sources, such as wind or solar, the hydrogen production is essentially carbon-free and avoids any greenhouse gas (GHG) emissions.

Fuel cells bring many benefits being versatile, scalable and with a very wide range of potential uses. Typical applications include in transport – ranging from cars, buses, lorries, forklifts, boats, trams and trains to aircraft; portable applications embrace small charging stations for mobile phones; domestic heating and energy units (micro-CHP); and larger power plants, including for back-up power and power in remote, off-grid locations.

A PUBLIC-PRIVATE PARTNERSHIP

Established in 2008, the Fuel Cells and Hydrogen Joint Undertaking (FCH JU) acts as a catalyst to enable a sustainable energy and transport future through a productive partnership between the European Commission, industry and the research sector. It is a unique European public-private partnership (PPP) with a focus on accelerating the development and deployment of fuel cell and hydrogen technologies.

The PPP contains three members: the European Union, represented by the European Commission, the industry grouping 'Hydrogen Europe' and the research grouping 'N.ERGHY'. During its first phase of operation (2008-2014) the FCH JU held a total ring-fenced budget of EUR 940 million under the EU's FP7 research programme. Its work continues with an allocated budget of

EUR 1.33 billion under the current EU Horizon 2020 research and innovation framework programme covering 2014-2020.

By pooling resources and creating a common platform where policymakers, industry and research come together, the FCH JU facilitates industry involvement and collaboration and supports the environment for investment.

The FCH JU's ability to act as a focus for European experts on fuel cell and hydrogen technologies has enabled these fuel cell technologies to progress significantly, especially in terms of reduced life-cycle costs and increased overall performance, durability and efficiency.

EARLY TO MARKET

FCH JU's projects have helped boost commercialisation in some specific markets including public transport (hydrogen powered buses), low noise and emissions-free passenger cars and forklift trucks, in CHP units, and portable and back-up applications. During 2017 FCH JU jumped over the mark of 200 projects.

Two major projects have started in 2017 and are typical of the PPP's approach. The Joint Initiative for hydrogen Vehicles across Europe (JIVE) project will pave the way to full commercialisation of zero-emission hydrogen fuel cell buses with the deployment of 139 cell buses across nine European locations. JIVE will use coordinated procurement to unlock the economies of scale required to reduce the implementation costs. The project will demonstrate the reliability required for commercialisation including testing new hydrogen refuelling stations able to serve large scale commercial bus fleets.





Similarly the H2FUTURE project will build and demonstrate a 6MW electrolysis power plant in Austria that will be prequalified to provide grid-balancing services. The demonstration will access low-cost power to generate hydrogen economically for use in steel-making processes, and also attract additional revenues from grid balancing services. The project should lead to rapid deployment of this technology in the steel, fertilizer and other process industries requiring 'low-carbon' hydrogen streams.

GLOBAL AND LOCAL

Fuel cells and the hydrogen economy are gaining greater recognition in the frame of the global discussion on Climate Change policy, in particular at the recent COP22 meeting in Marrakech. With the ratification of the Paris Agreement governments all over the world are setting up research

programmes for green technologies including programmes for fuel cells and hydrogen. With the FCH JU, Europe is already ahead of the game.

The PPP is also reaching out to European regions and cities, which are increasingly acknowledging the unique potential of this innovative technology. Participants are working together to reinforce synergies and collaborations to facilitate and accelerate market introduction.

To find out more about the activities of the FCH JU please visit our website at <http://www.fch.europa.eu>.

During 2017, amongst many other events, FCH JU will organise, together with its transport projects, a major conference on Transport and Fuel Cells in September; and its 10th annual Stakeholder Forum will take place in November. ●