

# Fuel Cells & Hydrogen 2: developing clean solutions for energy transport and storage

- Helping to decrease EU's energy dependence;
- Reducing the European CO2 footprint;
- Boosting the European fuel cell and hydrogen sector;
- Creating more growth and jobs in downstream industries;
- Developing long-term strategic research and innovation agenda.



## What is the challenge?

The EU needs to improve its energy security, to balance its entire energy system and to reduce greenhouse gas emissions from its energy and transport sectors. Producing hydrogen using electricity generated from renewable sources such as solar and wind, and using fuel cells that convert it back into electricity more efficiently than conventional technologies, can provide environmentally friendly answers. But major technological and infrastructure barriers need to be overcome before fuel cells and hydrogen technologies can become mainstream. No single enterprise can tackle these barriers by itself despite the eventual commercial and environmental gains. Europe must pool its private and public resources and expertise to exploit the untapped potential of these new technologies.

## What is the Fuel Cells and Hydrogen 2 Joint Undertaking (FCH 2 JU)?

This is a new phase of the first Fuel Cells and Hydrogen Joint Undertaking (FCH JU) set up in 2008 to implement the FCH Joint Technology Initiative (JTI). It will continue to develop

a portfolio of clean, efficient and affordable fuel cells and hydrogen technologies to the point of market introduction and help secure the future international competitiveness of this strategically important sector in Europe.

The new FCH 2 JU runs from 2014 to 2024.

## What results and benefits do we expect?

Thanks to the concentration of European fuel cells and hydrogen research and innovation under the umbrella of the Joint Undertaking, participants will benefit from:

- better use of Europe's limited public research funds;
- more stable and safer investment climate;
- better coordination of research among stakeholders; and
- improved cross-fertilization of knowledge.

In addition, this public private partnership will leverage private investments of at least the same amount as the EU funding. As a result, European high-tech industries developing and producing FCH technologies, as well as those that incorporate them in their products (e.g. combined heat

and power (CHP) units, backup power units, vehicles), will become more competitive, conquer new markets and create quality jobs.

#### Specific objectives include:

- reducing the cost of fuel cell systems for transport applications by a factor of 10;
- increasing the electrical efficiency of fuel cells for power production by 10%;
- demonstrating the viability of large scale hydrogen production with electricity generated from renewable energy sources

#### How much will it cost?

The total scope of activities covered by the FCH 2 JU is worth € 1.3 billion, including an expected EU contribution of up to €665 million. The private contributions of at least €665 million will consist of both in-kind contributions in projects and complementary additional activities that promote the objectives of the initiative.

#### How will it be managed?

JUs are partnerships between the EU and industry. They establish their own strategic research agendas. The projects will be selected through open and competitive calls for project proposals. The selection of the best proposals will be based on independent peer review and concluded by formal funding agreements. A small number of activities are implemented through calls for tender (i.e. public procurement).

The Governing Board of the new FCH 2 JU - comprising representatives of the European Commission, the Industry Grouping and the Research Grouping - will take funding decisions.

#### What has the current JTI achieved so far?

The first phase (budget of €940 million) has already brought together over 500 participants: 342 enterprises, 73 research organisations, 94 universities and other organisations. The initiative has also been successful in attracting SME participation, which accounts for 27% compared to 18% across FP7.

Some early applications, such as forklifts and small back-up power units, have already been introduced to the market.

### Zero emission buses in European Cities

The Clean Hydrogen In European Cities (CHIC) project has provided an essential step towards commercialisation of hydrogen fuel cell powered buses. The project involves integrating 26 such buses into daily public transport operations in five locations across Europe – Aargau, Bolzano, London, Milan and Oslo. CHIC has already demonstrated a significant reduction in fuel consumption of over 50% with respect to previous generations of fuel cell buses, and a very high level of availability of hydrogen refuelling stations (over 98%) in the test regions.

CHIC project video:

<http://www.youtube.com/watch?v=K5pwoDkuWeA&list=PLvpwjZTs-LgH8ePd58pwh0sMwNCMK9TO>

High V.LO City is another example of a project facilitating the rapid deployment of the latest generation hydrogen fuel cell powered buses in public transport. It proposes innovative solutions to current requirements of public transport fleets that require ever greater flexibility in refueling and maintenance infrastructure. They currently operate in Aberdeen and San Remo and later in 2014 should be introduced in Antwerp.

More information:

<http://highvlocity.eu/>



CHIC's hydrogen-powered buses on Europe's streets

For both energy and transport applications, progress has been achieved notably as regards improving materials' performance and durability, as well as reducing costs of both components and systems.

#### Useful links

Fuel Cells and Hydrogen Joint Undertaking:  
[www.fch-ju.eu](http://www.fch-ju.eu)