

IMPACT OUTLOOK

- 'We can facilitate and accelerate the market penetration of innovative products by guiding research strategically'
- 'As we need to change our energy system towards more sustainable and clean solutions, fostering cohesion between different sectors is crucial'

FUELLING INNOVATION

Bart Biebuyck, Executive Director of the **Fuel Cell Hydrogen Joint Undertaking**, offers some insights into the work under way in the fuel cell and hydrogen sector and the importance of building relationships and alliances to stimulate growth



What do you believe are the key challenges technology research in Europe is currently facing, and how can these be addressed?

The European fuel cell and hydrogen sector is likely to be very fragmented in that it is geographically dispersed, covers many activity areas (energy, transport) and involves a wide range of organisations (academia, industrial companies, SMEs). This compromises coordination within the sector, especially in the exchange and pooling of knowledge and experience.

There is the need to keep the research community closely linked with the industry in order to ensure a strategic focus of research activities, which would encourage industry, particularly innovative SMEs, to commit more of their own resources. The Fuel Cells and Hydrogen Joint Undertaking (FCH JU), by pooling resources together and offering a single platform for the actors along the value chain, addresses that specific challenge and improves the position of fuel cells and hydrogen technologies in Europe. The FCH JU programme builds on a long-term, integrated, pan-European research and innovation strategy that allows for research to orient and drive activities towards a market approach. We can facilitate and accelerate the market penetration of innovative products by guiding research strategically.

The new Horizon 2020 programme, under which the FCH JU operates, also allows for more flexibility, simplicity and effective funding mechanisms. This naturally stimulates the research activity to become more effective as it can access additional funding more easily.

In what ways can advances in fuel cell and hydrogen technology improve the European economy?

The fuel cell and hydrogen sector represents a very significant economic potential. It is estimated that the total number of jobs in the sector in Europe has been increasing by about 6 per cent yearly since 2007, to around 4000 full-time employees in 2012, and turnover is expected to rise by on average 35 per cent year on year towards 2020, according to a 2013 report commissioned by the FCH JU (available at www.fch.europa.eu).

Prior to joining FCH JU as Executive Director, **Bart Biebuyck** was at the Fuel Cell department of Toyota Motor Europe where he held the position of Technical Senior Manager. His expertise in the automotive industry includes extensive knowledge related to the deployment of new technologies in the European market. It is as part of the Clean Energy Partnership (CEP) programme in Berlin that Bart worked at reinforcing European trials for the Toyota Fuel Cell Hybrid Vehicle.

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The FCH JU's next Programme Review Days and Stakeholder Forum will take place on 21–23 November. More information can be found on the FCH JU website:

<http://www.fch.europa.eu/>



It is also estimated that the manufacturing of fuel cells worldwide will experience exponential growth in jobs this decade, with almost 700,000 cumulative jobs created by 2020 (over a million total new jobs could be created when fuel cell installation, servicing and maintenance is considered). To ensure that as many of these jobs as possible are created in Europe, incentives for the technology roll-out need to be put in place.

According to industry data, the FCH JU has sparked investments across the fuel cell and hydrogen industry, resulting in significant leverage: almost 60 per cent out of 150 organisations sampled have increased their research and development expenditures/budgets thanks to the FCH JU.

The FCH JU commitment keeps research expertise in Europe, in turn supporting local industry and production. It also ensures European companies can keep ahead of global competitors.

How can fuel cell and hydrogen technology reduce emissions and what impact could this have on public health in terms of air quality?

Hydrogen is an energy carrier and fuel cells are an efficient and non-polluting energy-conversion technology for transforming the hydrogen into electricity. When producing electricity from hydrogen with a fuel cell, the only by-product is water: zero emissions. It offers the means to provide clean fuel, a challenge which most deeply affects the transport sector which currently relies on oil for 96 per cent of its needs.

Inside cities, the deployment of hydrogen-powered buses for urban public transport is becoming widespread. Cities such as Aberdeen, Antwerp, Cologne, London, Oslo and Rome are all gaining fleets of fuel cell buses thanks to FCH JU-backed bus projects (such as CHIC, High V.LO-City, HyTransit and 3Emotion). These and earlier projects are proving the practicality, reliability and safety of hydrogen-powered vehicles: around 40 buses and 100 cars used in EU-funded trials have already travelled more than 9.6 million kilometres and refuelled more than 1.1 million kilograms of hydrogen. The upshot of these projects alone is that around 14,200 tonnes of CO₂ emissions have been avoided, assuming half of the hydrogen fuel was generated using renewable energy.

Fuel cells also present a great potential for domestic solutions. Compared to a state-of-the-art internal combustion engine with condensing boiler and grid electricity supply, fuel-cell micro CHP (combined heat and power) units can slash CO₂ emissions by at least 30 per cent and in some cases by up to 80 per cent.

What about the growing expectation that data generated from projects be made available through open access, or open data? Do you believe

this could alter public perception of technologies such as fuel cells or electric vehicles?

As Commissioner Carlos Moedas mentioned in his recent announcement for the next round of the Horizon 2020 funding, we need to maintain values of openness and diversity in order to optimise research and innovation results. The FCH JU is making significant efforts to reinforce its knowledge management and data processing, while opening more and more channels for an efficient reach-out.

This is indeed essential to address the lack of public awareness about fuel cells and hydrogen technologies. For several application areas, such as transport and domestic solutions, the technology is already on the market. We need to let people know about these advances and facilitating further access to information while increasing communication on different initiatives can certainly alter public perception in a positive way and help market deployment simultaneously.

How important are the Programme Review Days and Stakeholder Forum to achieving the goals of FCH JU?

These two main FCH JU events are acting as the natural prolongation of the FCH JU activities. As the FCH JU goals are mainly pointing at developing market-ready technology solutions, the FCH JU supports research projects that advance the technology and reduce costs, as well as demonstration projects to test hydrogen and fuel cells in real life. To evaluate how the FCH JU projects are expanding, a strong assessment of the programme's progress is of crucial importance. In that respect, the FCH JU is holding its Programme Review Days on an annual basis. Their purpose is to assess, over the years, progress and achievements of the FCH JU programmes, notably in relation to the targets of their multi-annual and annual plans, as well as in relation to international developments in the field.

But the FCH JU is more than a mechanical funding instrument; it brings the supply and the demand together in order to activate the dialogue and trigger new strategies for a common vision. In that respect, the FCH JU Stakeholder Forum acts as the main annual key event where European and global stakeholders across sectors come together to examine and assess the current position of this emerging industry, exchange ideas on next steps, and make contacts. It is the occasion for all players along the value chain to come together to lay the foundations for a greener future.