

## Helion system demos back-up power at CEA

**F**rench-based Helion has now been operating its first 30 kW industrial back-up fuel cell power system directly at a customer's site for nearly a year. The system was installed in time for the inauguration of the new headquarters of the French Commission for Atomic Energy (CEA) in Saclay last July.

This 30 kWe back-up power system, comprising Helion's PEM fuel cell and an inverter, has been set up in real-world operating conditions at the new CEA building. The system guarantees the power supply for a vital part of the CEA offices. Compared with existing solutions using batteries and diesel generators, the system offers notable advantages: a high level of autonomy, no noise, no greenhouse gases, and reliable and rapid startup to supply the required load demand.

After the start-up of its first 20 kWe prototype in November 2005 [*FCB*, January 2006], this 30 kW system marks a new step in the growth of Helion, an Areva subsidiary specializing in hydrogen energy and fuel cells.

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## Project to turn beer wastewater into power

**I**n Australia, a joint project between the University of Queensland and beverage company Foster's Group aims to turn beer wastewater into electricity. The venture is to receive A\$140 000 (US\$120 000) from the Queensland government's Sustainable Energy Innovation Fund. The technology uses a microbial fuel cell that 'feeds' continuously on the organics in the brewery wastewater, turning it into electrical energy, while also producing clean water and reusable CO<sub>2</sub>.

'With the current drought, the smart use of natural resources had never been more important. Energy and water supply are among the biggest challenges we will face in the coming decades,' says Dr Korneel Rabaey, postdoctoral research fellow at the university's Advanced Wastewater Management Centre (AWMC). 'Therefore, we must learn how to diversify our portfolio of fuels – and we must learn to reduce our energy and water usage.'

The team is carrying out the work in collaboration with the University of Ghent in Belgium.

It is backed by a A\$1.3 million (US\$1.1m) Australian Research Council Discovery grant, in addition to on-site and financial support from Foster's, which has been recognized for its innovative water-reduction and recycling programs.

AWMC Director Professor Jürg Keller reports that the team is achieving good progress with a 10 liter prototype, with plans to have a pilot-scale model up and running to coincide with an international bio-energy conference hosted by the university this September. A patent is pending for the technology – believed to be a world first – which is designed for small to medium-sized operations and could be used across a number of food, beverage and manufacturing industries.

Meanwhile, the University of Queensland and the University of South Carolina in the US are collaborating to accelerate the development of hydrogen energy as a clean alternative to oil, according to a report in the *Queensland Business Review*.

The University of Queensland has struck an agreement with the US university – which has significant expertise in hydrogen and fuel cell technologies – to collaborate on research projects and business development in this field. The agreement comes ahead of the 2008 World Hydrogen Energy Conference, taking place in Brisbane next June, for which the University of Queensland is a key supporter.

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## Successful trial for AFC

**U**K-based alkaline fuel cell developer AFC Energy has announced the successful completion of its first technological milestone, the operation of a small-scale single cell unit for a period of 500 h.

The cell was tested successfully under specific, high-corrosion conditions designed to demonstrate its corrosion resistance. The trial, which was completed on schedule, demonstrated a consistent output with minimum degradation and little evidence of corrosion.

AFC says the single-cell unit demonstrates the successful generation of electricity from hydrogen and oxygen, using both cathode and anode. The only by-product is water and a little heat. The company believes that the fuel cell will ultimately have a conversion efficiency of about 60%.

The successful test of the single cell unit is an important part of AFC Energy's goal to deliver functional systems during 2008, in preparation for full commercialization in 2009.

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## IN BRIEF

### Ceramic hydrogen separator to supply fuel cells from natural gas

The Japan Fine Ceramics Center in Nagoya ([www.jfcc.or.jp](http://www.jfcc.or.jp)) has collaborated with ceramics specialist Noritake and others to develop a high-performance hydrogen separation membrane made from ceramic materials, according to the *Nikkei Business Daily*. The group has also developed a prototype device based on this membrane, which can be attached directly to a gas pipeline, allowing the supply of hydrogen for fuel cells via natural gas.

The cylindrical membrane is approximately 3 mm in diameter, and comprises three layers of ceramic materials with progressively smaller pores. The inner layer is made from multiporous alumina with 150 nm pores. Surrounding this is a layer made from a finer-grained ceramic with 4–8 nm pores. The outer layer is made from amorphous silica with 0.3 nm pores. Attached to this layer are catalysts such as nickel and palladium.

When methane and steam are flowed down the outside of the membrane, the catalyzed reaction decomposes the methane to yield hydrogen and CO. The amorphous silica pores are only large enough to allow the passage of hydrogen molecules, which can be recovered from inside the cylinder. The catalysts are so tightly attached to the membrane that the reaction to generate hydrogen can be carried out at around 500°C, about 300 degrees lower than normal.

### Ford, GM focused on contrasting records for their FCVs

The team behind Ford's HySeries Drive Edge is teaming up with Ohio State University to create a special fuel cell powered Fusion, according to a report on *AutoblogGreen*. This fall the Fusion XV1 will travel to the Bonneville Salt Flats in Utah to make a run at the land speed record for production FCVs. The Ohio State team will be providing the motor and fuel cell technology it is using on a second-generation vehicle design, while Ford engineers are integrating systems into a production body shell with optimized aerodynamics.

Meanwhile, General Motors recently saw its Chevy Sequel become the first electrically driven FCV to achieve 300 miles (480 km) on one tank of hydrogen, driving in regular traffic on public roads. The drive through upstate New York began at GM's Fuel Cell Activity Center in Honeoye Falls. The Sequel achieved the 300 mile mark and crossed the finish line in Tarrytown, as the automaker reiterated its commitment to bring part of its next fleet of more than 100 Chevrolet Equinox FCVs to the greater NY metropolitan area this fall, under its Project Driveway demonstration program [*FCB*, November 2006].