

# Hydrogen, Fuel Cells & Alternatives

Monthly Monitor on the latest technology developments,  
policy issues and capacity building opportunities  
in the energy and transport sectors

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## LEAD ARTICLES

### South Africa launches awareness campaign on hydrogen fuel cells and alternatives

As part of its National Hydrogen and Fuel Cell Technologies Research, Development and Innovation Strategy, launched in September 2008, the South African Department of Science and Technology is rolling out a national awareness programme on its long term sustainable development goals for the energy and transport sectors. Through its Green Transport Technologies Programme, currently based at the South African National Energy Research Institute (SANERI),



*Dr. Boni Mehlomakulu, Group Executive, Research, Development & Innovation at the Department of Science and Technology, South Africa, test drives the BMW Hydrogen 7 at a motor show in Germany*

the Department aims to consolidate initiatives relating to hydrogen fuel cells and a number of alternative fuels including Liquefied Petroleum Gas (LPG), Compressed Natural Gas (CNG), electric vehicles and biofuels.

Read full article: <http://www.merit.unu.edu/hfc/HFC&A/docs/SA-leadarticle.doc>

### **Planning for Hydrogen, Fuel Cells and Alternatives: Policy issues for developing countries**

*Hydrogen & Alternatives* will regularly turn the spotlight on key issues facing developing country policymakers as they search for affordable and sustainable solutions for their long term transport and energy needs. In this inaugural edition we summarize some key issues raised in the recently published book: **Making Choices about Hydrogen: Transport Issues for Developing Countries**, edited by Lynn K. Mytelka and Grant Boyle (UNU Press/IDRC, September 2008)



*In South Africa sustainable biofuel applications are part of a broad portfolio of sustainable technologies and infrastructure currently being explored*

As debate rages about whether a “hydrogen economy” is as little as 10 years away, or 50 years down the road, developing countries face some tough choices in designing their long-term energy, transport and environmental policies. Should they continue to try to improve the available, 'dirty' technologies and infrastructure or should they invest now in clean, but more expensive and uncertain technology combinations, including hydrogen?

Read full article: <http://www.merit.unu.edu/hfc/HFC&A/docs/booksummary.doc>

## **RESEARCH UPDATES**

### **1. New hydrogen storage material 60% lighter than batteries**

One of the main barriers to the use of hydrogen in transport is storage. Researchers funded by the Netherlands Organization for Scientific Research have discovered an alloy of magnesium, titanium and nickel that offers excellent hydrogen storage potential, 60% lighter than a battery pack that would enable a vehicle to cover the same distance. This could bring us a step closer to the everyday use of hydrogen as a source of fuel for powering vehicles.

<http://www.sciencedaily.com/releases/2008/11/081104084215.htm>

### **2. Plasma promises ultra low-carbon hydrogen production**

Scientists at Manchester University in the UK are working on a new means of producing hydrogen that could reduce the energy required to produce the gas by a factor of 10, potentially paving the way for a cost-effective and energy-efficient means of powering fuel cells.

<http://www.fuelcelltoday.com/online/news/articles/2008-10/Plasma-promises-hydrogen-product>

### **3. Scientists discover 'biofuel-making' fungus**

*Gliocladium roseum*, a fungus found in a Patagonian rainforest could provide an alternative source of biofuel, according to researchers based at Montana State University in the US. The fungus is said to possess the metabolic machinery to produce a wide variety of hydrocarbons virtually identical to the compounds in diesel obtained from crude oil

<http://www.scidev.net/en/climate-change-and-energy/news/scientists-find-biofuel-making-fungus.html>

#### **4. Indian and American researchers to collaborate on renewable energy**

US and Indian researchers have set up a collaborative project, the Berkeley-India Joint Leadership on Energy and the Environment (BIJLEE) to facilitate research and development, and the commercialization of promising technologies and processes in the area of energy efficiency and renewable energy. The project aims to accommodate rising demands for energy with a richer mix of sustainable alternatives.

<http://www.energyefficiencynews.com/policy/i/1416>

### **INDUSTRY NEWS**

#### **5. Indian steelmaker generates hydrogen by-product**

International steel company Tata has reportedly discovered a way to generate hydrogen out of the steel-making process, by spraying water over slag at 1,600 degrees Celsius. A trial operation with 12 tonnes of slag for five minutes generated 3,000 litres of gas / steam mixture, of which 70 per cent was hydrogen. Tata has already obtained a patent for the process.

<http://www.thehydrogenjournal.com/displaynews.php?NewsID=56&PHPSESSID=17902a48a288bd793202a9d8630e21d4>

#### **6. Major fuel cell installation underway in Seoul**

Korean multinational Samsung Everland plans to install 12 UTC Power 400kW fuel cell systems at a power plant in Anyang, Seoul. The fuel cells will provide electricity for 5% of the town's population. One of the largest such installations in the world, the 4.8 megawatt plant, to be operational in September 2009, will produce about 40,000 MW hours of power annually.

<http://www.renewableenergyworld.com/rea/news/story?id=53975>

#### **7. Indian telecom company in major fuel cell deal**

Canadian fuel cell supplier Ballard Power Systems has entered into a high volume development and supply agreement with an Indian affiliate of the ACME Group and IdaTech LLC, to supply 5kW natural gas fuel cell products. The systems will be deployed primarily for telecom backup power applications and, if successful, the deal could lead to the installation of up to 30 000 fuel cell systems over the next five years.

<http://greentech.co.uk/ballard-power-signs-fuel-cell-deal-with-india-260>

### **DEMONSTRATIONS AND TESTING**

#### **8. GM launches global zero-emission test programme**

General Motors has deployed more than 100 vehicles using the HydroGen4 technology in its Project Driveway testing programme in the U.S, Japan, Korea, China, and Germany. The new car's performance is almost equivalent to that of a gasoline powered vehicle. It can travel 320 km on one tank of hydrogen and can reach maximum speeds of 160 km per hour.

<http://www.fuelcelltoday.com/online/news/articles/2008-11/GM-HydroGen4-fuel-cell-vehicle-t>

#### **9. Airlines race to test alternative fuels**

Following a biofuel-powered demonstration flight of a Boeing 747-400 by Virgin Atlantic in early 2008, Boeing, Continental Airlines and GE Aviation have teamed up to find a sustainable fuel source that can provide the necessary quantities of biofuel. A demonstration flight on a Boeing Next-Generation 737 is scheduled to take place in the first half of 2009.

<http://www.energyefficiencynews.com/i/134/>

#### **10. Biogas converted to electric and heat using fuel cells**

Following a four-month trial, Helbio S.A, a subsidiary of Morphics Technologies in Sweden has succeeded in converting biogas from sewage to electricity and heat. Although relatively low outputs were obtained

(20kW and 25kW respectively) the hydrogen generated was pure enough to run a fuel cell without contaminating the membranes and the catalyst. The company plans to scale up the application to achieve higher outputs, namely 125 kW for electricity and 250 kW for heat.  
<http://www.fuelcelltoday.com/online/news/articles/2008-11/Sewerage-works-biogas-converted->

## POLICY DEVELOPMENTS

### 11. UK slows down biofuel production

The UK is scaling down its annual biofuel production targets from 1.25% to 0.5% per year. This follows a recommendation from the Gallagher review published this year which outlines concerns about the negative impact of biofuel expansion on food security and the environment. UK government further suggests that it is still committed to the EU target of 10% by 2020 provided they are produced sustainably.  
<http://www.energyefficiencynews.com/policy/i/1422>

### 12. South Africa boosts funding for renewable energy projects

The South African Department of Minerals and Energy is reviewing more than 100 renewable-energy proposals, involving as much as 5 000 MW of potential generation capacity, in response to a recent call for expressions of interest. 45% of the applications related to wind-energy, 34% to biomass projects and 8% for small-scale hydro schemes. South Africa has set a renewable-energy target of 10 000 GWh by 2013. –  
<http://www.engineeringnews.co.za/article/dme-sifts-through-more-than-100-renewable-project-proposals-2008-11-25>

### 13. France accelerates development of electric car industry

France has announced plans to invest €400 million in its electric car industry. The aim is to stimulate innovation and promote the emergence of new-generation vehicles that are clean, competitive and ecologically friendly, including hydrogen and fuel cells cars. France will be one of the first countries to receive all-electric models manufactured by the Renault Nissan Alliance.  
<http://www.energyefficiencynews.com/policy/i/1420>  
<http://www.automotiveworld.com/VMSI/display.asp?contentid=63233&vmsiid=30>

## FUNDING AND PARTNERSHIP OPPORTUNITIES

### 14. European Public-Private Partnership to accelerate hydrogen diffusion

The Hydrogen and Fuel Cell Joint Technology Initiative (JTI) brings together the European Commission, European Industry and the European Research Community with the goal of achieving mass-market roll-out of hydrogen fuel cells before 2020. The JTI will invest nearly one billion euro over six years for research, technological development and demonstration.  
[https://www.hfpeurope.org/uploads/2434/3813/PressRelease\\_IndustryGrouping\\_FCH-JTI\\_GSA08\\_081008.pdf](https://www.hfpeurope.org/uploads/2434/3813/PressRelease_IndustryGrouping_FCH-JTI_GSA08_081008.pdf)

### 15. UN Funding for viable hydrogen energy projects

UNIDO's International Centre for Hydrogen Energy Technologies (ICHET) has allocated up to two million US dollars a year to support hydrogen energy projects, particularly in the developing world. ICHET funding and technical assistance focuses on the production of hydrogen from indigenous and preferably renewable energy sources, and favours projects involving local public-private partnerships.  
<http://www.unido-ichet.org/ichet.org/index.html>

### 16. Governments still eligible for REEEP 7<sup>th</sup> Call funding

Although the latest Renewable Energy and Energy Efficiency Partnership (REEEP) call for proposals has closed, applications are being received from governments, development and finance institutions and

replication projects, until 20th February 2009. The 7th call earmarked more than 4.3 million Euro for projects in least developed countries and emerging market economies.

<http://www.reeep.org/index.php?id=31&special=showHotTopic&iHotId=115>

## UPCOMING EVENTS

25-27 February 2009, Tokyo, Japan. **5<sup>th</sup> International Hydrogen and Fuel Cell Expo**. FC EXPO 2009 is a major international exhibition and conference featuring technologies, equipment and products related to the R&D and manufacture of fuel cells and hydrogen. <http://www.fcexpo.jp>

19-22 April 2009, Orlando, Florida. 15<sup>th</sup> annual **Alternative Fuels & Vehicles Conference and Expo**. The conference will focus on alternative fuels, vehicles and advanced technologies for public and private fleet applications. <http://www.afvi.org/>

20-24 April 2009, Hanover, Germany. **15<sup>th</sup> Group Exhibit Hydrogen & Fuel Cells at Hanover Messe**. Around 200 international companies and institutions will exhibit a range of products and developments for hydrogen production, fuel cell components, stationary, portable and mobile fuel cells, fuel cell applications, test systems, hydrogen transport, storage & infrastructure, reformers and so on. <http://www.fair-pr.com>

27-29 April 2009, Paris, France. **EE Global 2009**. Organized by the Alliance to Save Energy, EE Global 2009 aims to facilitate exchange of the latest technical, commercial and policy information, and forge partnerships and develop best practices, policies and strategies for global implementation. <http://www.reeep.org/index.php?id=31&special=showHotTopic&iHotId=114&sQuiteName=event&iQuitId=116#>

31 May – 3 June 2009, Vancouver, Canada. **Hydrogen + Fuel Cells 2009: International Conference & Trade Show (HFC2009)**. The fourth edition of this biennial conference will focus on the theme: “Partnerships for Global Energy Solutions.” <http://www.hfc2009.com>

23-24 June, Trondheim, Norway. **International Symposium on Diagnostic Tools for Fuel Cell Technologies: Revealing the state of health of fuel cells**. Organized as part of the EU Fuel Cell Testing and Dissemination project (2007-2009) the symposium will bring together researchers and developers in this area. [http://www.iphe.net/docs/Events/Diagnostics%20Workshop\\_Trondheim\\_2009.pdf](http://www.iphe.net/docs/Events/Diagnostics%20Workshop_Trondheim_2009.pdf)