

## NEWS FROM THE AMF

### Alternative fuels in Spain

By the *Plan for the Promotion of Renewable Energy in Spain 1999-2010*, the use of biofuel is supported. In this plan, the production target of biodiesel and bio-ethanol for 2010 is 100,000 and 400,000 toe/year respectively. One company in Spain is now producing biodiesel and 6 other are expected to come into service within 2 years. Their total production is an estimated 360,000 toe/y. The main raw material used will be waste vegetable oils.

The production of bio-ethanol is based on the use of cereal, corn and beetroot as raw material. The production is converted to ETBE. At present, 2 bio-ethanol plants and 3 refineries produce 180,000 t/year. An additional production of 250,000 is foreseen in the coming years. The development of the biofuels market will mostly depend on the implementation of measures to overcome the fiscal, economical and technical barriers it is facing. An important step has recently been taken with the exemption of excise duties for all biofuels until the end of 2012.

### Natural gas

In Spain, the use of natural gas is restricted to public service vehicles at a local level. In the past few years, more than 400 vehicles were running on CNG, with a total of 20 loading stations. Recently, a reduction of the excise duty on NG was proposed. However, the development of a complete infrastructure for a wider use of this alternative fuel would still be relatively expensive, and is not contemplated in the short term.

LNG pilot projects are currently being developed on inter-urban trucks and waste trucks. In Barcelona for example, a waste collection company participates in a project designed to determine the benefits of using LNG, testing for this purpose 100 CNG and LNG vehicles. A unique experiment is being conducted in Cataluña by a liquefied gas transportation company, which incorporated 10 heavy duty vehicles running on LNG in 2001.

### Hydrogen

With the creation of the Spanish Hydrogen Association (AeH) in May 2002, an important step was taken for the development and promotion of hydrogen. Furthermore, Spain is collaborating in two important projects currently being developed in Europe:

- The CITYCELL project, including the design and testing of an Iveco City class (fuel cell) bus in Madrid.

- The demonstration of 6 Cítaro DaimlerChrysler buses in the CUTE project. BP is developing the hydrogen production and storage plant with a photovoltaic solar panel system, first of its kind in Europe.

### Electric/hybrid vehicles

Few projects are being developed to promote the use of electric/hybrid vehicles. A new program has however recently started in the Castilla y León region. It consists of a financial support to reduce the difference of costs between electric and hybrid vehicles and traditional vehicles. The aim is to promote the purchase of this soft mode of transport in the region.

### Liquefied Petroleum Gas

The use of LPG is limited to taxis and municipal vehicle fleets. The total consumption of LPG in the transport sector was 82,000 toe in 2000. The only remarkable experience is that of Valladolid where more than 65% of the public transport vehicles run on LPG.

Alternative Fuels in Spain was presented at the AMF ExCo meeting in March 2003 by Mr. Carlos Lopez Lopez of IDAE, Spain.  
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## Colophon

*Fuels Update* is released under the authority of the Implementing Agreement of the Advanced Motor Fuels Agreement of the International Energy Agency. *Fuels Update*, issued by IEA AMF/AFIS, gives short summaries on recently published articles, reports and books in the field of (advanced) motor fuels, without giving any rating to the information presented.

For your comments, suggestions or when you have news items that you wish to get known among the IEA AMF members and a wide variety of organisations working in the field of automotive fuels please contact:

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This newsletter is distributed by the delegates of the participating countries of IEA AMF, who are listed on page 4.

## HYBRIDS MAY HAVE A FUTURE AFTER ALL

*Hybrid internal combustion engines (ICE) vehicles may have a future after all. Hybrid ICE's are closer to market introduction than fuel cell vehicles. Alternative and advanced motor fuels can be used with relatively simple technical adaptations, compared to fuel cell vehicles. On the short term, they can considerably reduce the fuel consumption of stop-and-go city traffic. On the long term, hybrid ICE's can contribute to the introduction of alternative fuelled vehicles. This is probably why hybrids seems to be 'hot' these days.*

### 25% Market penetration by 2020 forecasted

Toyota has made public its aim of selling 300,000 hybrid cars a year by 2005. It has also agreed to supply Nissan with its technology for use in the U.S. from 2006, with a sales target of 100,000 units by 2011. Honda is also active in hybrid technology, launching the Insight and then the Civic Hybrid while Ford has prophesied that 'the Big Three' (Ford, General Motors, Chrysler) will introduce 250,000 HEVs to the U.S. market over the next five years. By then the U.S. market could be absorbing around 750,000 units a year, rising to around a million in 2010, figures that could be also be reflected in Europe and Asia. By 2015, hybrids could have a 15% market penetration rising to more than 25% in 2020.

### CARB switches to gasoline hybrid-electric vehicles

The California Air Resources Board (CARB)'s determination to require up to 10% of new car sales to be zero emissions vehicles (ZEVs) has evolved quickly into a proposal supporting ICE hybrid-electric vehicles in the near term, and hydrogen-fueled fuel cell vehicles in the future.

CARB's so-called ZEV mandate was criticised by the auto industry since its beginnings in 1990, but it succeeded in withstanding challenges and in driving technology until last year, when the auto industry, supported by the Bush Administration, won an injunction in federal district court. CARB, decided to cut its losses and pursue another course.

### Hybrids versus Fuel Cells

Also two recent studies indicate that hybrids may offer advantages, particularly in the short term. An MIT study released in February of this year pointed out that even with substantial investments in research, a hydrogen fuel cell vehicle would not be better than a IC hybrid in terms of energy use and greenhouse gas emissions by 2020.

According to a study conducted by Ricardo Consulting Engineers for the British government a more evolutionary approach using hybrids actually produces faster results at less cost than an aggressive hydrogen pathway, regarding greenhouse gases. The report confirms that "progressive electrification and hybridization offers significant CO2 benefits regardless of the fuel or its source," at lower risk levels as it pertains to infrastructure and other invest-

ments. Research indicates that much could be gained by promoting hybrids and alternative fuels while waiting for the hydrogen revolution.

#### Hybridisation

The German LBST investigated ICE and FC hybrid vehicles. Concluded was that hybridisation reduces fuel consumption in all propulsion systems, but the benefits are larger for ICE engines than for FC, because of the fuel cell's part-load efficiency related to IC engines. Hybridisation also provides a greater benefit on urban type driving, thus in Europe the gasoline hybrid showed greater potential than in North America.

#### I-MoGen

Ricardo is also working together with Valeo of France to develop their own cost-effective hybrid technology, called the I-MoGen (intelligent motor generator). The challenge they set themselves has been to use a mild hybridization systems approach to develop a lightweight, downsized high-speed diesel engine from a donor unit and optimize engine performance for hybrid operation, while matching the driving characteristics of a conventional 2.0-litre turbodiesel. At the same time, it had to achieve anticipated Euro 5 emissions.

The newly developed four cylinder HSDI diesel engine has 20% less fuel consumption compared with a 2.0-litre conventional diesel engine and offers possible total weight savings of up to 30%, thereby compensating for the additional weight normally expected in mild hybridization. The measured particulate matter and NOx, exhaust emissions of the vehicle are half that of the

future mandated light diesel duty Euro 4 limits.

*GM well-to-wheel analysis of energy use and greenhouse gas emissions of advanced fuel/vehicle systems, by L-B-Systemtechnik GmbH, Ötobrunn, Germany; Comparative assessment of fuel cell cars, MIT LFEE 2003-001 RP, by MIT, Cambridge, USA; "Carbon to hydrogen" roadmaps for passenger cars -by Ricardo Consulting Engineers, UK, for the Department for Transport and the Department of Trade and Industry, [www.calstart.org](http://www.calstart.org); [www.autofieldguide.com](http://www.autofieldguide.com)*

## BIOMASS

### Gasoline from bones

The School of Applied Sciences in Gießen, Germany, has developed a technology to obtain artificial crude petroleum from meat-bone flours and waste from municipal clearing constructions. The procedure allows to receive about 250 litres of petroleum from one ton of initial raw material. The first experimental reactor on manufacture of petroleum from waste has been put into operation in Bavaria in March 2003.

*[www.fht-giessen.de/](http://www.fht-giessen.de/)  
WEB\_VERW/jakobs/aktuell.htm#  
Knochen*

## PUBLICATIONS

### Garbage trucks

The study – Greening Garbage Trucks: New Technologies for Cleaner Air – reveals that, while more than 90% of garbage trucks are powered by traditional diesel engines, a slow but successful shift is taking place as fleet operators in 25 cities in the United States move from diesel to cleaner natural gas. There are 179,000 garbage trucks in

the US. Garbage trucks are among the oldest, least fuel-efficient, and most polluting fleet vehicles in the US.

*The study can be downloaded from: [www.informinc.org/ggt.php](http://www.informinc.org/ggt.php)*

### Liquid biofuels

The final report of the Liquid biofuels network (participants: Austria, Belgium, Germany, Greece, Italy, Portugal, Spain and the Netherlands) just became available from ADEME. The report gives an overview of the production of biofuels (biodiesel, ethanol and ETBE) in Europe in the period 2001-2002.

*The pdf document can be downloaded from: [www.novem.nl](http://www.novem.nl)*

## ETHANOL

### UK tax cut ethanol blends 'too little'

The United Kingdom announced a new tax rate for ethanol-blended diesel, at 20 pence per litre below the rates for ultra-low sulphur fuels from Jan. 1, 2005. It aims to spur development and use of ethanol to diversify energy sources and help improve air quality. Trade sources however said the cost of producing bio-ethanol remains steep without a duty cut of more than 30 pence per litre due to costs involved in investment and equipment. A UK supplier of blended biodiesel preferred the government's new tax rate to be 25 pence per litre below those of ultra-low sulphur fuels to stimulate large-scale ethanol production. They believe without further incentives for biofuels the UK will struggle to meet the EU targets for 2005.

*[www.planetark.org/](http://www.planetark.org/)  
[www.gasandoil.com](http://www.gasandoil.com)*

### Australia limits ethanol blends

After months of community and industry pressure, the federal government of Australia has agreed to set a 10% limit on the blend of ethanol in petrol. The 10% limit and mandatory labels should restore confidence among consumers and industry. The move comes after car manufacturers warned their warranties would be voided if their vehicles used fuels containing more than 10% ethanol. Some service stations in Sydney were found to be selling fuel with an ethanol content exceeding 20%.

*[www.news.com.au](http://www.news.com.au)*

## GASOLINE

### African phasing out leaded gasoline

Around 90% of the world's petrol supplies are now unleaded, but the 10% that is still leaded is concentrated in developing countries, especially Africa. Research presented to some 100 environment ministers who were attending the United Nations Environment Programme (UNEP) Governing Council in Nairobi last February shows that within five years most African countries will have phased out the lead.

Egypt, Libya, Mauritius and the Sudan are now completely free of leaded gasoline. This year Morocco, Reunion, Tunisia and Western Sahara will join them. Another 22 nations, including Eritrea, Ghana, Kenya, Nigeria, South Africa, Togo and Uganda, are drawing up action plans to phase out leaded fuel by 2005 to 2006 or have already done so.

Studies have demonstrated that children living near areas where leaded petrol is used can suffer brain dam-

age. This is why it has been phased out and banned in countries in Western Europe, North America, parts of the Far East and elsewhere and why it is being rapidly phased out in many other parts of the world.

With unleaded gas motorists are able to drive vehicles with catalytic converters which can reduce emissions by 90%, according to UNEP.

*[www.unep.org](http://www.unep.org)*

## NATURAL GAS

### Brazil second leading user of natural gas

Sales of natural gas for use as vehicle fuels rose 54% in Brazil in 2002, and the country is now the 2nd leading user in the world, after Argentina, with sales of 982.7 mm cubic meters. The number of vehicles converted to use natural gas rose by 80%, to 450,000 vehicles. There are 550 supply posts in 70 Brazilian cities, more than twice the number available in 2000. 336 are however concentrated in the states of Sao Paulo and Rio de Janeiro. Other problems for the sector include pricing of natural gas, which needs to be maintained at a competitive level against gasoline and diesel; and the loss of a new car guarantee in the case of a conversion.

*[www.gasandoil.com](http://www.gasandoil.com)*

### Qatar top GTL supplier

Qatar is aiming to become the biggest producer of gas to liquids (GTL) in 2010, as it pushes ahead with mega projects, and the top LNG exporter in the world. As it climbs to the top in the league of LNG exporters, Qatar has also embarked on

the Middle East's first GTL venture and said more projects were planned given its mammoth gas reserves. Qatar Petroleum (QP) would soon launch its first GTL plant as a joint venture with Sasol International of South Africa.

According to QP, the plant will initially include two trains producing around 33,000 bpd, comprising nearly 24,000 barrels of GTL diesel, 8,000 barrels of GTL naphtha and 1,000 barrels of LPG.

Qatar's first GTL plant would produce almost zero sulphur, high cetane and low aromatic diesel and naphtha which will be sold regionally and internationally. GTL fuel is cleaner than any conventional fuel, which will help the environment. It can be used in conventional diesel engines to reduce emission and an overall better performance.

*[www.gulf-news.com](http://www.gulf-news.com)*

## IEA NEWS

### IEA hydrogen seminar

*In response to the increased attention to hydrogen and fuel cells as key technologies for energy supply security and environmental protection in the mid-long term, the IEA Renewable Energy Working Party organised in Paris in March the seminar **Toward Hydrogen - R&D Priorities to Create a Hydrogen Infrastructure**. This was a first action to assess hydrogen prospects in the light of new, emerging technologies, and to identify R&D priorities to create a hydrogen infrastructure. Representatives from relevant organisations were invited to discuss and compare views and programmes. Their contributions can be downloaded from: [www.iea.org](http://www.iea.org).*