



Editorial

This is the Second SUGRE Newsletter presenting results achieved under the SU:GRE – Sustainable Green Fleets project.

In this issue of the Newsletter you can find information on incentives and regulations concerning the development of alternative propulsions systems in the EU Member States in a very interesting paper entitled “**Incentives and Laws**”, p. 2.

We also present some results of the SUGRE Project – this time it is a review on “**Guidance fuels and refuelling logistics**”, p. 3

Another four partner descriptions are provided, to inform you about activities and characteristics of our consortium members, p. 4-5.

We would like to suggest you also to look at the latest news from Europe and South America (Brazil) presenting new technologies (**CO₂ conversion into clean fuel**, p 8.) and experiences and regulations (**Environment Agency backs bioethanol**, p 7.) concerning the promotion and development of alternative fuels.

The Newsletter is prepared in printed and electronic versions in 12 languages, and shall be sent to more than 3000 recipients. The SU:GRE Newsletter is updated every six months, and should be read alongside the information placed on the website: www.greenfleet.info.newsletter.

Think about alternative propulsion - think about a clean and prospering environment!

The project SU:GRE-sustainable greenfleets will support the take up of efficient ultra low emission cars.

Economic as well as ecologic aspects are covered.

We will show the way to successful operational expertise and provide best cases at www.greenfleet.info

List of content:

INCENTIVES AND LAWS: tools for the development of the alternative propulsion and alternative fuel markets	- page 2
RESULTS OF THE PROJECT TASK 4.2 Guidance fuels and refuelling logistics	- page 3
PARTNER'S DESCRIPTION	- page 4
NEWS	- page 6
PARTNERS	- page 8
REVIEW TEAM	- page 8

INCENTIVES AND LAWS: tools for the development of the alternative propulsion and alternative fuel markets

It is well accepted today, that to develop alternative propulsion and alternative fuels markets, the following must be achieved:

1. **Law** – legal compliances, legal incentives and even legal obligations must be developed, at international, national and local levels
2. **Taxation** – taxes should be reduced, for producing cars and fuels, for buying cars and fuels and for distributing fuels
3. **Incentives** – incentives should be given to investigate new technologies (for vehicles, fuels and fuelling stations) and for the application of these new technologies to the production and distribution of cars and fuels
4. **Fuel production** – private and public investments should be made in the production of new fuels
5. **Vehicles** - private investments should be made in the production of new propulsions and vehicles, in different sectors (light cars, heavy-duty, freight lorries, buses, sewage waste collection, etc...)
6. **Fuel distribution** – public and private investments should be made in the creation of networks of fuelling stations, in accordance with the establishment and development of alternative fuel fleets

Although there is already some progress in Europe regarding alternative fuels and vehicles, in general these markets are quite new and clearly depend on support and stimulation from financial incentives and legal regulations. A main characteristic in the EU concerns the disparity among member states in the production and consumption of alternative

fuels and production and promotion of alternative vehicles. Due to the economic, social and political differences across member states, variation will necessarily remain. But good practice can be shared and encouraged in order to achieve the list given above.

The production and use of biofuels in particular is growing fast, especially after the European Union took the decision of promoting production and usage of biofuels, namely through the Directive 2003/30/EC. This Directive requires member states in 2005 to replace 2% of their diesel and petrol with biofuels, and almost all countries in question (with exception of Croatia, Bulgaria and Iceland) have adopted both EU Directives (2003/96/EC and 2003/30/EC). In practical terms, we can now conclude that the EU member states are using two main tools to implement the Biofuels Directive: tax exemptions and biofuel obligations.

Although there is space for improvement in the financial and legal aspects of the biofuels market, prospects are good. Now, it is important that the other alternative fuels and vehicle markets are developed. While there is already strong market development in some countries with compressed natural gas (CNG), liquefied petroleum gas (LPG) and hybrid vehicles, the use of other solutions like biogas, electric propulsion or fuel cell vehicles is only in its infancy. It is thus important that the EU gains maturity in relation to the use of financial incentives and legal regulations, to support emerging technologies.

prepared by Pedro Machado (AGENEAL)

RESULTS OF THE PROJECT – TASK 4.2 Guidance fuels and refuelling logistics

In times of rising fuel prices and depleting oil reserves, biofuels represent a environmental and economical alternative.

At present **biodiesel** and **vegetable oil** are the most usual bio fuels in Austria. Both can be used in pure form and as an additive to conventional fuel.

In the future, particularly with new acquisitions, **biofuel E85** is also a pollution free alternative to gasoline, which is used in Flexible Fuel Vehicles (FFV).

FFVs are particularly used in the USA and in Brazil, where about 30 % of all new purchases are FFVs. In Europe only some automakers (Ford, Saab, Volvo) offer FFVs.

Vehicle manufacturers and service shops can provide information on biofuel suitability. If vehicles are not suitable, a conversion can be considered.

It is worth considering establishing a bio fuel tank on-site or converting an already existing one to store biofuel. These fuel tanks are offered in different sizes and designs by suppliers. The costs of a tank or station will depend upon size and location, but amount to approximately 1000€ upwards.

Biodiesel is not defined as a dangerous substance; it has a higher flash point than mineral diesel (120 °C) and biodegrades more rapidly than mineral oil diesel, causing less of a pollution risk. This facilitates transport and storage. Nevertheless storage of biodiesel has to proceed with the same care as the storage of conventional diesel.

Vegetable oil, which can be used as pure plant oil in converted engines, is not a dangerous substance and is 100% biodegradable. Storage and transport are still simpler compared to biodiesel. The tank must be protected against UV radiation, heat and humidity, in order to maintain fuel quality.

If you want to use biofuels at a fuel station the gasoline pump filters, pumps and the fuel tube must be suited to biofuel. Before converting an existing fuel station to biofuels container and piping cleaning should take place. The storage tank should be protected against direct sun exposure. And inflow of water to the fuel must be prevented, because biodiesel is a hygroscopic (= water-attractive) liquid.

Another alternative is **biogas**. Austria has very high quantities of fermentation gas-producing materials. The potential is far higher than for other biogenous fuels such as bioethanol or biodiesel.

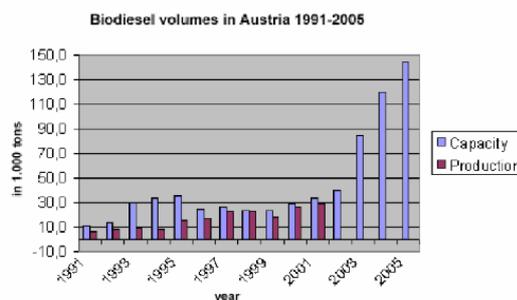


Abb. 27: **Biodieselproduktion und Entwicklung in Österreich 1991-2006** (in 1.000 Tonnen)
Quelle: FRIEDRICH, S.: A world-wide review of the commercial production of Biodiesel, Diplomarbeit der Wirtschaftsuniversität Wien, Wien 2003, S. 65

A substantial problem with the use of biogas in the traffic sector is making the gas available as fuel. In order to bring the product to the consumer (vehicle), there are generally two options: piping it into the public natural gas network or establishing decentralized biogas fuel stations. Once a fuel station network is established, availability of natural gas vehicles is crucial and beyond that suitable political and legal basic conditions must be created to promote biogas as fuel alternative. Biogas in Europe is produced particularly in Sweden and in Switzerland. There are also some pilot projects in Germany.

Hydrogen is a future fuel with good potential, primarily because of its good burn characteristics. Many manufacturers are examining the use of hydrogen as a fuel for the future. Within the industry two different technical approaches have developed: the use of hydrogen in engines with conventional burn technology (lifting cylinder engine, wankel engine) and/or the employment of hydrogen in fuel cells.

prepared by Gerhard Ablasser

Partner's description: The German-Hellenic Chamber of Industry and Commerce

The German-Hellenic Chamber of Industry and Commerce has 1.200 members and was founded in 1924. It supports the development of new commercial opportunities between Greece and Germany within a big range of services and activities. The Chamber handles over 20.000 commercial inquiries per year.

Main activities

- The Chamber is mainly involved in:
- Management Consulting
- Business cooperation between German and Greek companies
- Market analysis
- Development of Business Plans
- Studies and know-how-transfer in the fields of Energy (Renewable Energy), Waste management and ICT (Information & Communication Technologies).
- Organization of training seminars.

Relevant projects

The Chamber operates a project, financed from the Federal Minister for Economics and Technology of the Federal Republic of Germany within the framework "Export Initiative Renewable Energies" with the topic:

"On-line platform for Renewable Energy Sources, www.b2brenenergy.com".

The German-Hellenic Chamber of Industry & Commerce realizes the importance of the R&D in the competitive market and invests in the know-how utilization by participating (either as partner or as coordinator) in EU and National Research programs.

Contact persons for SU:GRE:

George C. Dimitriou
German-Hellenic Chamber of Industry and Commerce
Papadaki 41
54248 Thessaloniki – GREECE
Tel: +30-2310-328048
Fax: +30-2310-321790
Email: g.dimitriou@mail.ahk-germany.de



Partner's description: BREMER ENERGIE-KONSENS

The Bremer Energie-Konsens GmbH is the climate protection agency of Bremen. In the centre of its work stands the aim to save energy directly and indirectly and to reduce carbon dioxide and other emissions. The Bremer Energie-Konsens indicates ways to a more efficient energy use, initiates and promotes research and pilot projects (renewable energies, rational use of energy), organises campaigns of information, establishes networks and provides knowledge to experts and consumers. The primary objective is to get through to a multitude of people and institutions and to contribute to an understanding of energy-relevant business and energy-relevant processes as well as to an improving climate-conscious behaviour. In the past nine years Bremer Energie-Konsens has realised about 400 projects.

The non-profit organisation Bremer Energie-Konsens was founded in 1997 as a non-profit Public-Private-Partnership. Shareholders are the Free Hanseatic City of Bremen, the swb AG, the

Deutsche Essent GmbH and the EWE AG.

In 2003 the Bremer Energie-Konsens started, together with other partners, to promote natural-gas powered vehicles (as a part of the EU-project Vivaldi). Main tasks as a local partner of SUGRE are information and dissemination of project results.



Partner's description: AGENEAL, Agência Municipal de Energia de Almada



AGENEAL, the Local Energy Management Agency of Almada, is a private, non-profit association, created in March 1999, with the support of the SAVE Programme and the Municipality of Almada. Almada is located in the south bank of the Tagus River, opposite to Lisbon.

With 15 partners, AGENEAL congregates some the most important actors at a local and national level, namely the three main transport operators. It's a member of Energie-Cités and of the ECEEE.

AGENEAL does consultancy, awareness campaigns, advice on decision making, lobby, partnership in pilot projects, etc. Nowadays, the agency areas of activity cover not only

sustainable mobility and energy efficiency in transports, but also efficiency in buildings, implementation of renewable energy systems, sustainable urban planning, and other energy efficiency in public equipment.

In the mobility/transport sector, AGENEAL has already acquired a small but rewarding experience: Better Without Cars in Almada (awarded the Ambassador Project status by the Stockholm Partnerships for Sustainable Cities), the European Car Free Day/European Mobility Week in Almada (European Mobility Week Award runner-up in 2004 and nominee in 2006), Almada's energy and CO₂ emission matrix, eco-driving, municipality fleet renovation (that lead to the acquisition of 7 hybrid cars by the City Council), Almada Cycling Plan, among several other projects to promote urban sustainable transport.

In SU:GRE, beside participating in every task and decision making, AGENEAL is specifically responsible for the , along with OEINERGE, for the diagnosis of Portugal alternative fuels and vehicles status and the dissemination of the SU:GRE results.

Contact persons for SU:GRE:

Pedro Machado
Pedro.machado@ageneal.pt
t. +351 21 2722385

Partner's description: MUNICIPALITY OF CELJE

The Municipality of Celje was set up in 1994 as the third largest municipality in Slovenia. The Municipality has well developed and experienced departments focused on specific areas. The main activities are to manage municipal property, to ensure conditions for economic and social development of municipality in all fields, to plan spatial development, to arrange and manage local public services in the range of its competences, to stimulate social care services, to regulate protection of air, soil and water resources, to control waste collection and disposal and to execute other activities in the field of environmental protection, to support educational system, research and development, NGOs etc. The **Traffic and Environment Protection Office**, which cooperates in the SU :GRE project, is the main local authority in spatial planning and transport infrastructure development. The expert staff has experiences in carrying out research, studies and projects in the field of sustainable planing of the municipality's infrastructure.

Tasks to be completed under SU:GRE project

- attendance at steering committee meetings and local coordination,
- assistance in Baseline Analysis,
- elaboration of the Municipality of Celje Case Study,

- assistance in writing and printing/publishing of the materials for the training,
- assistance in organising a network of proud fleet owners with alternative propulsion,
- assistance in evaluation.

Contact for SUGRE

Miran Gaberšek
Head of Traffic and Environment Protection Office
t: +386 (0)3 42 65 835
f: +386 (0)3 42 65 802
miran.gabersek@celje.si

MUNICIPALITY OF CELJE

Trg celjskih knezov 9
SI-3000 Celje, Slovenia

t: + 386 3 42 65 700
f: + 386 3 42 65 682
mestna.obcina.celje@celje.si
<http://www.celje.si>



ENVIRONMENT AGENCY BACKS BIOETHANOL



The Environment Agency has become the sixth organisation in the UK to include a Ford Focus Flexible Fuel Vehicle (FFV) on its fleet. The leading public body for improving the environment took delivery of the Ford bio-ethanol car at the agency's Bridgwater offices, Somerset, in September 2006. Since launching the Ford Focus FFV in August 2005, the majority have been sold in Somerset where Ford is a participant in the European BEST (Bio-Ethanol for Sustainable Transport) project. Ford put its second bio-fuel model – Ford Focus C-MAX FFV – on sale at July's British International Motor Show, when supermarket and bio-ethanol retailer Morrisons became the fifth fleet customer to buy Ford FFVs. The other four fleet purchasers of Ford FFV vehicles are Somerset BEST project members Somerset County Council, Avon & Somerset Police, Wessex Water and Wessex Grain. The BEST project has secured vehicle and fuel supplies to encourage more widespread interest in FFV motoring. Andy Taylor, Ford's European sustainability director, said: "Ford has supported Somerset bio-ethanol activities from the start and I'm delighted to welcome another organisation in the South West as a FFV customer."

Bio-ethanol is an alcohol/petrol mix bio-fuel commonly called E85 reflecting its 85 per cent bio-ethanol content. The 15 per cent of petrol is required for efficient and reliable ignition. The renewable fuel can be produced in this country from home grown crops such as wheat or sugar beet. Carbon dioxide absorbed by crops used for bio-ethanol production means that CO₂ emissions from a FFV are effectively reduced by up to 70 per cent. Independent analysis of total CO₂ released by a Ford Focus FFV by Imperial College, London, put the car's emissions at under 100g/km. While Ford's 1.8-litre FFV emits 169g CO₂/km from its exhaust pipe, the Imperial College research says this drops to 99.6g when CO₂ absorption by crops grown for bio-ethanol is factored in. FFVs are capable of running on any mixture of E85 and petrol in the same fuel tank. The Environment Agency can refuel at five bio-ethanol pumps that have been installed in Somerset. "The availability of bio-ethanol in our area makes this a real alternative to using vehicles which can operate only on conventional fossil fuels," said Mark Walmsley, Environment Agency fleet operations manager. "We hope that people will begin to see the huge environmental and economic potential bio-fuels can offer. The team at Bridgwater is extremely enthusiastic about their new bio-ethanol car, which will be used for site visits and inspections."

For more information see www.best-europe.org

CHIRAC FOR BIOFUEL FARMING AND DEFENDING SUBSIDIES

French President Jacques Chirac has called on the EU to plan for future agriculture based on non-food farming.

Mr Chirac said that crops should be used to produce vegetable-based fuels and chemicals in France.

He set a target of 10% of French fuel production to come from vegetables (biofuels) by 2015. He also stressed the central role of agriculture for France and underlined its objectives.

At the same time Mr Chirac rejected any overhaul of the EU Common Agricultural Policy before 2013.

Mr Chirac presented his vision to farmers in Cournon d' Auvergne, saying agriculture must remain "at the heart of European ambition".

He stated that European farmers have to begin planning for a future that which should include the "non-food use dimension of farming products". Advances in technology will lead to the use of food crops for production of bio-fuels.

Mr Chirac said EU subsidies for farmers should not be changed until 2013, when the Common Agricultural Policy (CAP) is scheduled for review.

France is a major recipient of CAP funds and has a history of robustly defending subsidies for farmers.

<http://news.bbc.co.uk/2/hi/europe/5412528.stm>

BRAZILIAN GOVERNMENT ASKS EUROPEAN UNION TO CHANGE CLASSIFICATION OF BIOETHANOL

The Brazilian government is taking steps to change international trade classification for ethanol. Ethanol is currently classified as an agricultural product which imposes additional taxes when exported to the EU countries.

Brazil is the second largest producer and importer of ethanol in the world after the USA. Its main argument is that changes in classification will improve international free trade.

It is likely that the EU will overtake Brazil to be the second largest bioethanol importer. Production of ethanol in the EU rises every year. The level of ethanol production reached 3,4 billions litres in 2006.

France and Germany are the biggest producers of ethanol in the EU. From the 1st January 2006 Germany will take over lead position as it is introducing regulations imposing an obligation to add 1.2 – 2% ethanol blends in fuels.

We have written more about Brazilian ethanol production in the First SUGRE Newsletter – see paper "THE BEST WE DRINK, THE REST WE BURN".

Source: www.biodiesel.pl/aktualnosci

PUBLIC CONSULTATIONS ON HYDROGEN POWERED VEHICLES



The European Commission has started public consultations on future development and production of hydrogen powered vehicles. Results of these consultations will be used as background for the EC regulation concerning requirements for safety systems for storing hydrogen in vehicles.

Hydrogen vehicles offer significant environmental benefits through lower pollution and zero exhaust pipe greenhouse gas emissions. The Commission wants to encourage and speed up the introduction of such cars. As a first step, the Commission is asking for the views of stakeholders and the general public on planned new rules to ensure the safe operation of hydrogen powered vehicles. This is crucial, since hydrogen is a highly flammable substance. The Commission draft proposal put out for consultation intends to incorporate hydrogen fuelled vehicles in the European type-approval framework, which is necessary to make sure that such vehicles can be marketed in the EU according to common standards. Stakeholders were invited to

comment on the issues covered by the proposal, in particular, whether it would impose any undue burden on manufacturers or suppliers compared to the benefits in terms of safe operation of the vehicles. The closing date for comments was 15 September.

Hydrogen can be used in mobile applications like cars, delivery vans and buses. Hydrogen is a clean energy carrier. When used either in combustion motors or in fuel-cell systems, it does not produce any carbon emissions (carbon monoxide, carbon dioxide, unburned hydrocarbons or particulates). Thus, using hydrogen will contribute to the improvement of air quality in cities. Moreover, no greenhouse gases are produced from motor vehicles, although care will have to be taken that the production of hydrogen itself does not lead to an increase in CO₂ emissions. This can be achieved by producing hydrogen from non-fossil energy sources or by CO₂ sequestration.

The Commission has produced a preliminary draft proposal for a Regulation on hydrogen powered motor vehicles. The proposed Regulation aims to ensure the safe operation of hydrogen powered vehicles by incorporating them in the European vehicle type-approval framework through establishing safety requirements for the hydrogen storage system of these vehicles. The proposal will permit the approval and placing on the market of vehicles using hydrogen and will contribute to the confidence in the new technology for potential users and the public at large.

Cordis Focus newsletter – August/September 2006
<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/984&format=HTML&aged=0&language=EN&quILanguage=en>

CO₂ CONVERSION INTO CLEAN FUEL

Research project ELCAT – Electrocatalytic gas-phase conversion of CO₂ in confined catalysts, financed from the 6th Framework Programme, is a pioneer approach to retrieve CO₂ from atmosphere and convert it into clean fuel.

CO₂ is one of the most detrimental gases in the atmosphere, but at the same time it is the most frequently occurring gas. Constant monitoring of the CO₂ levels in the atmosphere shows the correlation between with the rise of the air and sea waters temperatures. However scientists from the University of Mesyna, which is project coordinator, claim that CO₂ conversion into fuel is not only possible but also needed.

Research results of the scientists working in the ELCAT project helped to solve the greatest problem of the conversion – the stability of CO₂ gas. Atomic bonds in CO₂ are hard to break when initially settled. New technology based on catalysts lead to breaking the atomic bond and creating long carbon atomic chains,

which can be easily converted into fuel.

This is a turning point in the research. Until now, a huge amount of energy was needed for breaking up the carbon-oxygen atomic bonds. New technology requires less energy and involves a two stage approach. The first stage takes advantage of solar light and titanium as catalysts for splitting H₂O particles and releasing protons, electrons and gaseous oxygen. In the second stage released electrons are used for CO₂ reduction and creation of carbon bonds. In this phase platinum and palladium catalysts are used.

The efficiency of the new technology is very high and is two times higher than any currently used technology in the industry. There are plans to increase the scale of efficiency by taking advantage of ecologically friendly technologies.

Sources: Cordis Focus newsletter – September 2006, www.newscientist.com "Solar alchemy turns fumes back into fuel"

PARTNERS

- Austria Graz FGM-AMOR
- Portugal Almada AGENEAL
- Slovenia Ljubljana ALIANTA
- Italy Roma ATAC
- Greece Thessaloniki AUTH
- Spain Madrid BESEL
- Germany Bremen Freie Hansestadt Bremen
- Hungary Budapest Department of Environmental Economics BUTE DEE
- Italy Torino Agenzia Energia e Ambiente di Torino
- Romania Bukarest Chiminform Data S.A.
- Greece Thessaloniki Deutsch-Griechische Industrie- und Handelskammer - German-Greek Chamber of Industry and Commerce (DGIHK)
- Netherlands Rotterdam ECORYS
- Germany Berlin EFA - Erdgas-Fahrschul-Agentur GmbH
- Austria, Graz, City of Graz, European Programmes and International Cooperation Unit
- Austria Graz GVB Public Transport Operator
- Germany Heidelberg IFEU - Institute for Energy and Environmental Research Heidelberg
- Sweden Stockholm Inregia AB
- Bulgaria Sofia IVECOL Co.
- Portugal Oeiras OEINERGE - Energy and Environment Agency of Oeiras
- Great Britain Berkshire TV Energy, The Enterprise Centre
- Slovenia Celje City of Celje
- Poland Warsaw University of Technology, Faculty of materials Science (WUT-FSME)
- Island Reykjavik Icelandic New Energy Ltd.(INE) / Islensk NyOrka ehf.
- Germany Bremen BrEK
- Slovakia Bratislava Slovnaft VURUP, a.s.
- France Lyon Rhônâlpénergie-Environnement

**Warsaw University of Technology
Faculty of Materials Science
and Engineering (WUT-FSME)**

Newsletter Contact Person:

Lukasz Ciupinski lukas@inmat.pw.edu.pl

Izabela Kijenska kijenska@inmat.pw.edu.pl

REVIEW TEAM

- Belgium Brussels AVERE, c/o VUB-TW-ETEC
- Finland Espoo IEA-AMF (IMPLEMENTING AGREEMENT on ADVANCED MOTOR FUELS), VTT PROCESSES
- Ireland Dublin UCD Richview, Planning and Environmental Policy
- Slovenia Ljubljana Laboratory of Catalysis and Chemical Reaction Engineering, National Institute of Chemistry (KI)

