

Crude oil price over \$85 per barrel! Data from BP (www.bp.com) and EIA (www.eia.doe.gov). Figure by Editor.

AMFI Newsletter is prepared for the members of the Implementing Agreement on Advanced Motor Fuels of the International Energy Agency (IEA/AMF).

AMFI provides four electronic Newsletters yearly describing recent news on advanced motor fuels, vehicles, energy and environmental issues in general. AMFI Newsletter is available on the website:

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OECD report abandons traditional biofuels

A report prepared by OECD's roundtable on sustainable development (government representatives, scientists, business leaders and NGOs) concluded that large-scale production of traditional biofuels (corn ethanol and vegetable oil esters) presents a risk to food supplies, food prices, the environment and biodiversity. The title of the report presents the question: "Biofuels: Is the cure worse than the disease." Biomass production will likely put increased environmental pressure on tropical regions. The report states: "When such impacts as soil acidification, fertilizer use, biodiversity loss and toxicity of agricultural pesticides are taken into account, the overall environmental impacts of ethanol and biodiesel can very easily exceed those of petrol and mineral diesel".

The report says that it is unlikely for biofuels to achieve a market share of some 25% of the liquid fuels in 2050. A more realistic estimate is some 13%, as presented by IEA in 2006. The advanced next-generation biofuels could help with the problems linked to traditional biofuels, e.g. feedstock can be grown on marginal and degraded land. Advanced biofuels could represent an additional potential of 23 EJ in 2050 depending on technological breakthroughs and feasibility of using residue material on a large scale.

The Government policies play a large role in the production and trade of biofuels. The report states that liberalising trade in biofuels is essential for global objectives, as the biofuels produced in tropical regions have an economical advantage. Ethanol from sugarcane in Brazil is the cheapest biofuel today, South America, Africa, South-East Asia and Australia have a large potential as efficient producers. Bioenergy provides a chance to enhance growth in many of the poorest countries and can supply modern energy (biomass electricity) to a third of the world's population. Biofuel mandates today have ambitious targets without an understanding of sustainable production. The report asks national governments to phase out current mandates for biofuels by replacing them with technology-neutral policies, such as carbon taxes.

The report points out that the certification of biofuels is useful, but cannot be trusted as a safeguard. Only worldwide certification makes a difference. Selective certification creates appearance of sustainable production for some, while some others may continue the unsustainable production. Criteria on trade rules, minimum requirements for allowance and exclusion of fuels or tax treatments should be addressed urgently.

Source: Doornbosch, R. and Steenblik, R. OECD Round Table on Sustainable Development, biofuels: is the cure worse than the disease? 11-12 September 2007. [Link \(http://www.oecd.org/dataoecd/40/25/39266869.pdf\)](http://www.oecd.org/dataoecd/40/25/39266869.pdf).

IEA Bioenergy evaluates bioenergy potential

IEA's Bioenergy Agreement has prepared a report called "Potential Contribution of Bioenergy to the World's Future Energy Demand". The report states that the potential contribution of bioenergy to the world energy demand can be increased considerably from the current 45-55 EJ; possibly to some 200-400 EJ per year during this century. World energy demand was some 467 EJ in 2004. The report assumes, based on certain average conversion efficiencies, that the potential for transport fuels would be some 130-260 EJ per year or for electricity 100-200 EJ per year. *Source: IEA Bioenergy: Potential Contribution of Bioenergy to the World's Future Energy Demand. September 2007. (www.ieabioenergy.com)*

Volvo's demo on seven renewable fuelled trucks

Volvo Group of Sweden started a demonstration of seven renewable fuelled trucks. The trucks are equipped with Volvo's own 9-liter engines that have been specially modified to operate on different renewable liquid and gaseous fuels. CO₂ emissions from the road transport sector are discussed vividly, but the focus has been on passenger cars. However, cargo may represent as much as 40% of the CO₂ emissions from road transport in Europe.



Volvo's renewable fuelled trucks, (0Hwww.volvo.com).

"The diesel engine is an extremely efficient energy converter that is perfectly suited to many different renewable fuels, liquid or gaseous," says Jan-Eric Sundgren from Volvo Group Management. The supply of renewable fuels is limited and there is no large-scale production or distribution for the alternative transport. "With these vehicles, we have shown that Volvo is ready, that we possess the technology and the resources for carbon-dioxide-free transport, but we cannot do this alone," says CEO Leif Johansson.

Volvo has carried out its own analyses of the renewable fuels that are most suitable for carbon-dioxide-free transports. In these analyses, Volvo considered important aspects such as the impact on the environment, energy efficiency, the efficiency level in the use of the land for cultivating crops for the respective fuels, the amounts of the different fuels that can potentially be produced, the level of vehicle adaptation required in purely technical terms, the costs of the fuels and how easy it is to distribute the fuels.

"We know that in the foreseeable future there will be insufficient biomass or renewable fuels to fully replace fossil fuels," says Jan-Eric Sundgren. Despite the current shortage of both biomass for the production of renewable fuels, and finished fuels, the Volvo Group does not view carbon-dioxide-free transport as a utopian idea. One of the reasons for this is the second generation of renewable fuels that are produced through gasification and that generate both large volumes and a greater number of fuels to choose between.

The following renewable fuels are used in the Volvo's demonstration in Stockholm:

- Biogas: gaseous fuel comprised of methane. Chemically similar to natural gas.
- Biogas + biodiesel: combined in separate tanks and injection systems. Some 10% of diesel (bio or synthetic) is used for achieving compression ignition. The biogas in this case is in liquid form.
- Hydrogen + biogas: hydrogen is mixed in small volumes with compressed biogas (8% volume).
- Biodiesel: ester of vegetable oils. Rapeseed oil and sunflower seed oil are the most common raw materials in Europe.
- DME – Dimethyl ether: a gas that is handled in liquid form under low pressure.
- Ethanol/Methanol
- Synthetic Diesel: produced through gasification of biomass.

Source – Volvo Group, Press release: *Volvo Displays Carbon-dioxide-free Trucks*, 29 August 2007 (www.volvo.com).

CO₂ limit for cars in Europe – progress

Earlier this year, in February, the European Commission proposed a limit of 130 g/km for cars by 2012 (AMFI Newsletter, April 2007). On 25 October 2007, the European Parliament backed a non-binding report, which insists that the limit should be more stringent: 125 g/km by 2015 with engine and vehicle technology alone. (www.euractiv.com)

GASEOUS FUELS (NG, LPG, biogas)

California's Carbon Fuel Standard (LCFS) gives opportunities to NGVs

The California Energy Commission has prepared a report that reviews various pathways to regulate the carbon content of motor vehicle fuels used in California. The report follows the Part 1 report from May 2007, which evaluated the feasibility of reducing carbon intensity of motor vehicle fuels by 10% by 2010 (AMFI Newsletter January 2007). That report included a finding that natural gas provides about a 25% reduction in full-fuel cycle emissions of GHG when compared with gasoline.

The Part 2 report includes 22 recommendations for the low carbon fuel standards in California, such as establishing a credit trading program, and limiting participation to motor vehicle fuels used in California. The program would establish an industry wide average for gasoline and diesel, and require e.g. refiners and petroleum importers to lower climate impact of the fuels sold by at least 10% by 2020. This would be established by selling lower-carbon content fuels, blending these fuels with petroleum, or purchasing offsets from other participants. The report has recommended that gas and electric utilities would earn credits for sales of natural gas and electricity to the transportation sector. CARB officials have indicated that this kind of regulations could start in 2010.

Source: *NGVAmerica: Report Outlines Regulatory Framework for California Low Carbon Fuel Standard*, 15 August 2007.

ENGVA has been active in the European policy

ENGVA's annual conference gathered about 200 participants, including representatives of 24 NGV OEMs. The conference included a Political Round Table at the European Parliament. Representatives from ENGVA, Mr Seisler and Mr Boisen, pointed out that NGVs can already now achieve 114-119 g/km tailpipe CO₂ emissions, and biogas can be used as a fuel. Mr Harbour, MEP from UK, pointed out that the biocomponent should be blendable into conventional fuel without impacting the vehicle, which is currently not the case with biogas. He added that, according to EUROPIA, within the next few years there will be difficulties to meet the fuel demand by current refinery capacity, which should be taken into account. Mrs Morgan,

MEP Wales, pointed out that the NGV stakeholders should take care of the "chicken and egg problem", as the European Community is not going to build up infrastructure for NGVs.

ENGVA was participating in a public hearing on the developing Fuel Quality Directive (see AMFI 3/2007). ENGVA pointed out that biogas-to-biomethane should be considered equally in the Directive, and that equal and consistent energy units should be considered. In addition, hydrogen-methane blends should be taken into account.

Mr Boisen attended the Biofuels Conference in Brussels in July 2007. He pointed out i.a. that Europe's organic waste resources are some 350 Mtoe, which is roughly as much as European transport fuel demand. He also presented various examples of countries where NGVs have significant share of car population, such as Pakistan with 50% share and Argentina, Iraq and Bangladesh with 25% share. He also described biomethane projects in China and Sweden.

Source: ENGVA News, June/July 2007, Number 4.

Biogas for transport - best use of organic waste

A French study has concluded that the best use of methane generated from organic waste is using the fuel for transport, buses and refuse trucks. This is more efficient and productive than using it for heating or electricity. The study, ordered by the French environmental and energy control agency ADEME and Gaz de France, was carried out by RDC-Environment and was conducted to provide guidance to local governments on the issues of waste management and biogas recovery.

Source - BIOGASMAX, 11 October 2007. (www.biogasmax.org). Biogas can be used to produce heat and electricity, and when cleaned, it can be used also as a motor fuel. Several evaluations on upgrading and utilisation technologies of biogas can be found on the website of the BIOGASMAX project (www.biogasmax.org/downloads).

World's largest biogas upgrade plant in Spain

Swedish based Flotech Ltd has announced that the company has almost completed construction of the world's largest upgrade plant of biogas, in Madrid, Spain. The project, awarded to Flotech as part of the La Paloma Biogas Upgrading System, will upgrade biogas to biomethane for use in city bus fleets, producing the gas from household waste. *NGV Global news, 22 August 2007.*

FuelMaker into Finland

FuelMaker Corporation of Canada has appointed Gasum, Finland, as its latest new dealer. Gasum will market, sell and service FuelMaker's line of products including Vehicle Refuelling Appliances (VRA) and Phill, the home refuelling appliance. *NGV Global News, 29 August 2007.*

Methane/hydrogen car from Fiat

Fiat showed their Panda Aria concept car at the Frankfurt Motor show in September 2007. This car has very low tailpipe CO₂ emissions: only 69 g/km. The Aria, with its bi-fuel gasoline and methane/hydrogen engine, is a demonstration of 'Fiat's viewpoint of cars with a low environmental impact'. This concept car makes use of technology already on or close to being readily available on the market. *Source - NGV Global News, 5 September 2007.*

ALCOHOLS, (BIO)GASOLINE

Cooling down of the ethanol boom in the US

The real costs of the ethanol boom are becoming apparent in the US. Ethanol production is highly dependent on subsidies. The price of ethanol has dropped by 30% in one year, but the price of corn has remained high. This is a difficult situation especially for many small ethanol producers. Thus the ethanol producers are asking for more support from the Government, but the food industry is strongly against this. Price of corn feed has increased 60% due to increased demand of ethanol demand. The ethanol industry claims that the price of food has increased due to increased demand in Asia and South America, and that ethanol production will be based on non-food cellulosic feedstocks in future. In the US, 120 ethanol plants are running, and 75 new plants are under planning. *Source: Kauppalehti. 15 October 2007 (in Finnish).*

Biodiesel trials in UK suspended

National Express Group announced that it has suspended its 'first generation' UK biodiesel bus trial due to concerns over the sustainability of food crop as biodiesel feedstock. The Group will wait until advanced, next generation non-food biofuels are available, or issues relating to the sustainability of the production have been addressed. The move follows an internal review and consultation with a number of environmental organizations. National Express Group serves more than one billion passengers a year worldwide. *Press release, National Express Group PLC. National Express Group Biodiesel Trials, 6 August 2007 (www.nationalexpressgroup.com).*

Biofuel standards - global harmonization

Biofuel is becoming a global trading commodity and thus authorities in the USA and Europe saw the need for global harmonization of the quality standards. Task Forces with experts from Brazil, USA and Europe have been established. Their aim is to review existing documentary standards and identify areas where greater compatibility can be achieved in the short and long term. Standards for biodiesel existed already in the 90s e.g. in Germany and France, and a European EN 14214 standard for FAME (neat or as a component) followed. There are problems with some test methods in terms of precision, application and availability. Iodine value was chosen as an indicator for product stability in Europe.

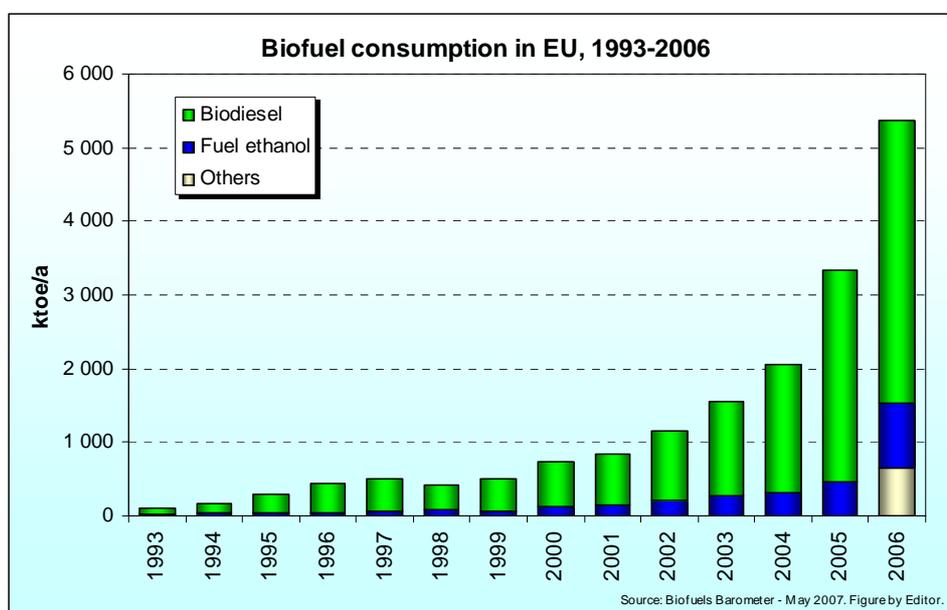
The National Biodiesel Board is working on standardization in the US under ASTM. The work has resulted in a specification for a blending component up to 10% (ASTM D6751, accepted in the diesel specification D975). There are many differences in biodiesel feedstock, use of fuels, vehicle fleet and regular diesel quality between Europe and the US. Consequently, the biodiesel specifications show many differences.

The goal of the task forces for on the harmonization of biofuel standardization is to submit a White Paper to the Brazilian, EC and US authorities by the end of 2007. This document will be used as basis for the work at the ISO level to form global biofuel standards. *Source: Biofuel-cities. A European Partnership. Biofuel Specification Standards Global Harmonisation Efforts (www.biofuel-cities.eu).*

Germany's biodiesel slowdown

Biodiesel industry sources in Germany estimate that only about one half of the five million ton capacity will be used in 2007 following a drop in demand after taxes on biofuels were introduced. The European Commission complained that Germany's tax relief scheme overcompensated biofuel suppliers. Therefore, since August 2006, fuel taxes have been imposed on traditional biofuels. Starting from 2007, low-level E5 and B5 are subjected to full fuel tax (e.g. 0.47 €/l for the FAME component). The government introduced legislation for binding biofuel quotas for both gasoline and diesel will also come into effect in 2007.

Source: www.biofuels-news.com



EurObservER's estimate for 2006 shows biofuel consumption of 5.38 Mtoe in the EU, which corresponds to a 1.8% share of the transport fuels in EU (vs. 1% in 2005). Source: System Solaires, Biofuels Barometer °179, May 2007.

SYNTHETIC DIESEL AND RENEWABLE DIESEL

Petrobras postpones production of H-Bio

Petrobras is postponing the commercial production of its renewable diesel, H-Bio, due to high soy prices, which in São Paulo have climbed to US\$18 per 60 kg bag from US\$13 a year ago. H-Bio is based on the co-hydrotreatment of vegetable oil and mineral oil. Petrobras originally intended to develop H-Bio production in two refineries during 2007-2008, and expanding to the remaining refineries during 2009-2011. Petrobras planned to use 10% soy oil in the first two refineries. Petrobras is maintaining its production target of 425 million liters of H-Bio in 2008, and 1.6 billion liters in 2012.

Source: *Petrobras to Postpone Commercial Production of H-Bio*. 31 August 2007. (www.greencarcongress.com)

CEN Workshop for specification of XTL

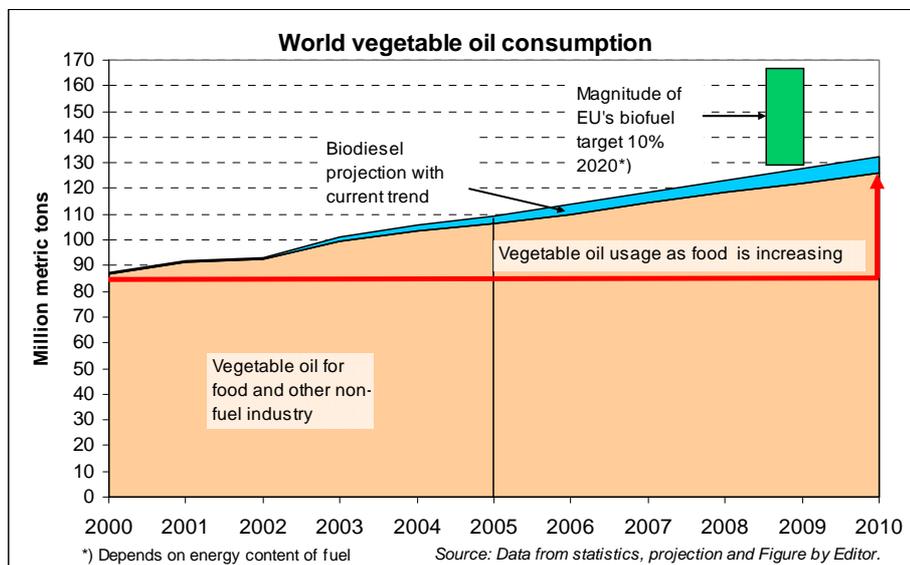
ASFE, the Alliance of Synthetic Fuels in Europe, has proposed to develop a specification for XTL fuels (biomass-, coal- and gas-to-liquids) as a CEN Workshop Agreement. The CEN Workshop Agreement specification would be used on a voluntary basis supporting local regulations and international trade. In the longer term, a more formal standard could be developed depending on future volumes of XTL as automotive fuel. The Workshop would maintain close contact with CEN/TC 19 "Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin". Production of GTL fuel is expected to approach 100,000 barrels per day by 2012, and 1 million barrels per day by 2020 (10 large-scale GTL plants). Source: *Draft Business Plan - Doc N 02, WS 38 -XTL, version 0.6*. 13 September 2007 (www.cen.eu)

Greenpeace against palm oil usage as biodiesel feedstock

In Finland and Sweden, Greenpeace is running a campaign against usage of palm oil as feedstock for biodiesel. The Swedish distribution chain, OKQ8, announced that they will not use biodiesel components based on palm oil. The Finnish oil refinery Neste Oil started production of NExBTL (hydrotreated oils and fats) in June 2007 using palm oil as one of the feedstocks. Also other facilities to produce biodiesel by hydrotreatment are under planning in e.g. Europe, Brazil and US (AMFI Newsletter 3/2007). The hydrotreatment process can use various feedstocks, also non-food oils and animal fats. In response to Greenpeace's campaign, one vehicle manufacturer is pointing out that hydrotreatment is a technology to produce biodiesel with good end-use properties, without an obligation to use palm oil as feedstock. In addition to transport, another new sector using palm oil is power generation, e.g. in Italy.

The use of vegetable oils is increasing rapidly in the food industry (Figure), and palm oil covers the major part of the increase. Currently, 80% of all palm oil is used by the food industry. Palm oil is used in the making of solid fat products, such as margarine, shortenings, confectionery, snack foods, bread, crackers, chips, and cereals as well as personal care and beauty products such as soap and lipstick. Also in Finland, where many companies have an environmental certification, most food industry related companies are not aware of the origin of the palm oil they use. Friends of the Earth has reported that the same applies for producers and supermarkets in the UK too.

Source: *Finnish and Swedish Newspapers, Helsingin Sanomat, Huvudstadsbladet, 29-31.10.2007*. Friends of the Earth (www.foe.co.uk)



OTHER FUELS AND VEHICLES

EU plans to boost hydrogen use in cars

The Commission has proposed simplifying market approval for hydrogen-powered cars and support research. However, the Commission admits that the technology will have little impact for the next 10-15 years. Joint Technology Initiatives (JTIs) are set to be long-term public-private partnerships on research topics defined by industry and represent a move away from the traditional approach of case-by-case public funding of projects. The Commission adopted, on 10 October 2007, its first 'hydrogen package' including a proposal for a regulation to simplify the market approval of hydrogen cars and a proposal for a regulation setting up the Fuel Cells and Hydrogen Joint Technology Initiative (JTI).

Commissioner Günter Verheugen said that, even though being a promising option, he was "not convinced that the hydrogen car will be the car of the future". Verheugen also said that one needs to ensure that the production of hydrogen does not itself lead to an increase in CO₂ emissions. Hydrogen could be produced by nuclear power as the "EU does not have anti-nuclear policy". The hydrogen JTI will get €470 million from the budget of the FP7 over the next six years and the industry has committed to matching at least the same amount.

Green MEP Claude Turmes found "regrettable that the European Commission is still wasting time flogging the dead horse of hydrogen cars when even the car industry itself has abandoned the dream that the technology will be viable in the near future." "There are clear solutions to the environmental damage caused by vehicle emissions that will deliver real results in the short-term, such as through the enforcement of ambitious efficiency standards or the promotion of hybrid vehicles. The Commission should have the courage to promote these solutions as part of a sustainable transport policy and not hide behind smokescreens like hydrogen cars," said Turmes. *Source: EurActiv.com, 11 October 2007.*

MISCELLANEOUS

Earthrace: trial to break the world record for circumnavigating the globe in a powerboat using only renewable fuels. 18-month tour promoting fuels like biodiesel, and raising awareness about sustainable use of resources. (www.earthrace.net)

IEA & IEA/AMF News

New Executive Director of the IEA

On 1 September 2007, Nobuo Tanaka of Japan succeeded Claude Mandil of France as Executive Director of the International Energy Agency. *Source: IEA Open Bulletin Issue 44, 6 September 2007. (www.iea.org)*

IEA EU WP Transport vice chair

The Cabinet of IEA's Working Party on End-Use Energies (EUWP) has a new constitution. Peter Cunz from Switzerland continues as Chairman and Jeppe Bjerg from the IEA Secretariat as Secretary. Liaison Officer to CERT is Sabine Semke from Germany. There are four Vice Chairmen, one for Buildings, one for Industry, one for Electricity and one for Transport. Each of the Vice Chairs will overlook some of the Implementing Agreements and deliver progress reports to the EUWP using a uniform form. The Chairs and Secretaries of Implementing Agreements will be approached by the respective EUWP Vice Chair. The Vice Chairs are responsible to maintain a solid and fruitful contact with the Implementing Agreements and to offer their advice and support for the necessary liaison with the EUWP, CERT and the IEA Secretariat. They also extract for their sectors trends, gaps, overlaps and recommendations.

New vice chair of EUWP Transport is Nils-Olof Nylund, who has acted as a Chair, Vice Chair and Member of the IEA Advanced Motor Fuels Agreement since 1990. Nylund succeeds Peter Finckh who held the office since its establishment in 2002. Peter Finckh, who attended several AMF ExCO meetings, did a great job in promoting cooperation and coordination amongst the transport related Implementing Agreements. Peter Finckh developed a reporting system, which hereafter will be used for all activities within EUWP.

EUWP Vice Chair Transport is covering four Implementing Agreements within EUWP: Advanced Fuel Cells (AFC), Advanced Motor Fuels (AMF), Advanced Materials for Transport (AMT) and Hybrid and Electric Vehicles (HEV). There are also some transport related activities within the Implementing Agreement on Combustion, which is handled by the Vice Chair Industry, and the Implementing Agreements on Bioenergy and Hydrogen within the Renewable Energy Working Party (REWP). The IAs within REWP also have responded to Peter Finckh's questionnaire. There are preliminary plans to

establish a Transport Contact Group (TCG), which would facilitate cooperation and coordination for transport related activities. A similar group exists for the Building sector. The first workshop is preliminary planned for March 2008 in Paris in conjunction with the spring EUWP meeting. *Source: Announcement letter from Peter Cunz, Chairman of Working Party on Energy End-Use Technologies, EUWP. 17 October 2007. Information from Nils-Olof Nylund.*

Fuel Efficiency for HDVs - IEA/International Transport Forum Workshop

The IEA International Transport Forum Workshop on Standards and Other Policy Instruments on Fuel Efficiency for HDVs took place on 21-22 June 2007, in Paris. This workshop aimed at bringing together policy makers, technical experts, manufacturers and other stakeholders in Heavy Duty Vehicle transportation. Participants pointed out that there are many engine and non-engine innovations that have the potential to deliver significant fuel efficiency gains. These include aerodynamic improvement, downsizing, tyre pressure, selective catalytic reduction, hybrid drivetrains and telematics. In addition, auxiliary power units are more efficient than running auxiliary equipment off of the main engine. Negative effect of engine downsizing can be compensated for through increased turbo charging. It was emphasized that cumulative impact of small improvements may lead to significant fuel efficiency gains and not all fuel efficiency improvements are costly (e.g. improved tyres and lubricants). One of the fears is that the tightening NO_x and PM regulations may reduce fuel efficiency. However, it was pointed out that in past this did not happen despite of stringent emission regulations. Combined effects of NO_x and PM reductions and fuel efficiency improvements are difficult to evaluate. It is necessary to take overall GHG emissions into account.

The potential for improving the energy efficiency of HDV use is great, but policies are needed for implementation of measures needed, e.g. improvements with long payback time need public support. Policies should account for total truck productivity, not only fuel efficiency. HDV fuel efficiency policies should be comprehensive, addressing all aspects from technology, components, materials, telematics to driver behaviour and logistics. The rise in vehicle kilometers should be taken into account as well. It is noted that fuel economy improvements might be increased by a factor of 1.5 to 2 with government support or regulatory "push".

There are already now policy actions on HDV efficiency. In 2006, Japan introduced fuel efficiency standards for HDVs (12% improvement for 2015 over 2002), and tax incentives for vehicles meeting this together with more stringent NO_x and PM emission regulations. Manufacturers have already introduced some vehicles meeting the new standards, which may indicate availability of fuel efficiency technologies, but also fast reactions thanks to a collaborative ownership structure in the HDV industry. In India, the government has introduced a truck engine efficiency test. Eco-driving has been promoted in Europe and Japan as one effective means of increasing fuel efficiency.

Nils-Olof Nylund gave a presentation with the title "HDV Fuel Efficiency: Methodology, Vehicle Performance and Potential for Fuel Savings". The presentation described work carried out at VTT in Finland. Information on VTT's activities on heavy-duty vehicles can be found at www.rastu.fi (English versions are available of the most important reports). *Source: International Workshop Fuel Efficiency Policies for Heavy-Duty Vehicles (www.iea.org), Transport Forum (www.internationaltransportforum.org).*

PUBLICATIONS

- **IEA Bioenergy**, Potential Contribution of Bioenergy to the World's Future Energy Demand. September 2007. (www.ieabioenergy.com)
- **IEA Bioenergy**, Black Liquor Gasification: summary and conclusions - ExCo54 workshop, September 2007. (www.ieabioenergy.com)
- **EC project PROCURA**: reports on Alternative Fuels Vehicles: www.procura-fleets.eu.

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