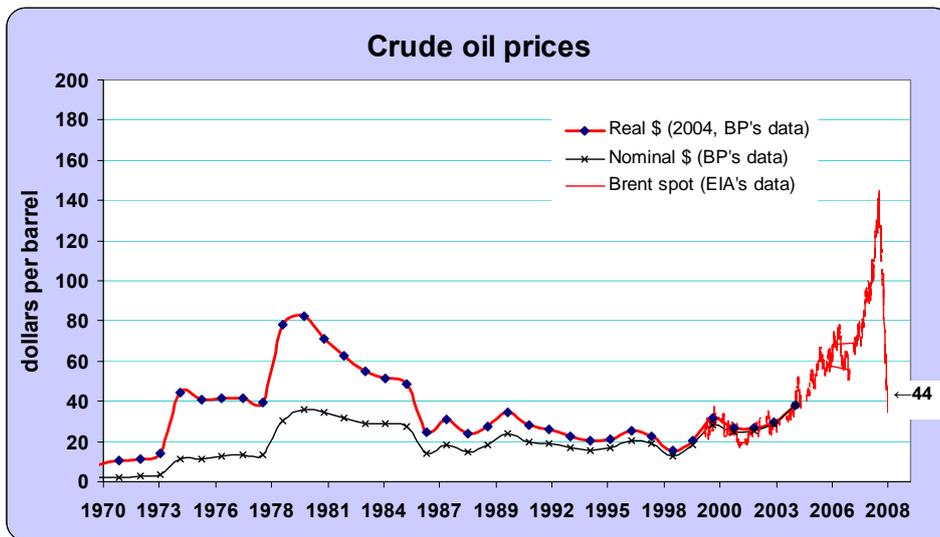


AMFI Newsletter



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 each year, describing recent news on advanced motor fuels, vehicles, energy and environmental issues in general. AMFI Newsletter is available on the website:

www.iea-amf.vtt.fi

The crude oil price is falling, but how far will this go? Data from BP (www.bp.com) and EIA (www.eia.doe.gov). Figure by Editor.

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PUBLICATIONS

GENERAL INTEREST

New energy and environment plan in the U.S.

The New Energy for America plan put forward by Barack Obama, the President of the United States, and Vice President Joe Biden, contains many actions on energy and the environment. Among others, the following objectives and actions are mentioned:

- Provide short-term relief to American families
- Tackle climate change by reducing greenhouse gas emissions 80% by 2050
- Invest in a clean energy economy and create millions of new green jobs
- Increase fuel economy standards of vehicles
- Create a tax credit for purchasing advanced vehicles
- Get 1 million plug-in hybrid vehicles on the road by 2015
- Establish a National Low Carbon Fuel Standard
- Promote the supply of domestic energy
- 10% of electricity from renewable sources by 2012 and 25% by 2025
- Commitment to energy efficiency
- Develop and deploy clean coal technology

In addition, Obama paves the way for California and other states to raise emissions standards above and beyond the national standard. *Adapted from the original text: The White House – Agenda and the Memorandum of the briefing room, 26 January 2009. (www.whitehouse.gov)*

EU's climate change package

The EU's climate change package was adopted by the European Parliament on 17 December 2008. The package includes the "20/20/20" goals for 2020:

- a 20% reduction in greenhouse gas emissions,
- a 20% improvement in energy efficiency
- a 20% share for renewables in the EU energy mix

For sectors covered by the EU Emissions Trading System (ETS), such as power plants and energy-intensive industries, emissions must be cut to 21% below 2005 levels by 2020. Around 60% of the EU's greenhouse gas emissions (GHG) originates from the sectors not covered by the Emission Trading System, e.g. road and sea transport. For these sectors, the GHG emissions are to be cut by 10% from 2013 to 2020 with national targets defined in the effort sharing decision. A directive on the legal framework for the new carbon dioxide capture and storage technology (CCS) was also approved.

A new directive will lay down a mandatory target of at least 10% renewable energy (biofuels, hydrogen, green' electricity, etc.) in transport energy supply in each country. The following rules and criteria are set for fuels to be taken into account when fulfilling the target:

- Biofuels must meet agreed sustainability criteria.
- "Second-generation" biofuels produced from waste, residues, or non-food cellulosic and ligno-cellulosic biomass will be double credited (meaning that, e.g., 5 % will be calculated as 10 %)
- Renewable electricity consumed by electric road vehicles will be counted by a factor of 2.5; for trains, the factor is only one (this takes into account the higher end-use efficiency of electric vehicles compared to conventional vehicles)
- Biofuels must reduce GHG emissions by at least 35% compared to fossil fuels; from 2017, at least 50% reductions for existing installations and at least 60% for new installations

The Commission will develop a methodology to measure the GHG emissions caused by indirect land use changes. These mean production in areas that have been used to grow a food crop that then move to other places, e.g. in existing forests. *Source: Press release, European Parliament seals climate change package. 17 December 2008 (europa.eu).*

The EREC Technology roadmap shows that the bioenergy sector will cover the majority of the overall 20% target of renewable energy by 2020. Combining energy applications for biomass in the heating sector, electricity sector and renewables in the transport sector, bioenergy will contribute approximately 13% of the 20% target of renewables in final energy consumption. *Source: European Biomass Industry Association (www.eubia.org); Renewable Energy Technology Roadmap 20% by 2020, EREC, the European Renewable Energy Council, November 2008. (www.erec.org).*

Fuel quality directive

An Amendment to Fuel Quality Directive 98/70/EC was confirmed as part of the EU's Climate Change Package of 17 Dec 2008. The amendment aims at tightening environmental quality standards, enabling increased use of ethanol and FAME, and reducing life cycle greenhouse gas emissions from fuels. The following issues are included in the amendment:

- Fuel suppliers must reduce greenhouse gas emissions caused by fuels by 10% by 2020. This is to be achieved by 1) a binding target of 6% through the use of biofuels and alternative fuels, or by reducing flaring and venting in production 2) a 2% reduction by using other means, e.g. electricity, in transport or CCS (review in 2012) 3) 2% by the use of the Kyoto Protocol Clean Development Mechanism credits.
- Biofuels are required to meet the sustainability criteria. A Joint Committee with the Renewable Energy Directive will coordinate the future development of biofuel sustainability criteria.
- Allowance for 10% ethanol (E10) into gasoline. Gasoline with max. 5% ethanol must be available at least until 2013. Derogation for vapour pressure for cold summer conditions is allowed.
- Member States may permit higher content of FAME than 7% in diesel. CEN is encouraged to develop standard B10 for biodiesel.
- Metallic additives are allowed, MMT with maximum limit, on condition that labelling is used.
- Reduction of the sulphur content of inland waterway fuel in one step to 10 ppm by Jan. 1, 2011.

The European Automobile Manufacturers Association, ACEA, has stated that the allowance of more than 7% FAME in diesel can lead to difficulties. ACEA is also disappointed regarding the allowance of metallic additives and the degradation of vapour pressure of ethanol containing gasoline. ACEA would also like to add a requirement for labelling of biofuel content. ACEA does not agree with the allowance of "other oxygenates" in gasoline. *Source: European parliament, P6_TA(2008) 0613, 17 December 2008 (www.europarl.europa.eu).*

Passenger cars – CO₂

A new regulation will set a binding average target of 120g of CO₂/km for cars registered in the EU by 2012. An average target of 130g CO₂/km must be reached by improvements on the vehicle itself, and a further 10g/km reduction by additional measures. The compromise introduces a long-term target of 95 g CO₂/km (average for the new car fleet) for 2020. Each manufacturer has specific targets and check-points; 65% of a manufacturer's fleet must meet specific targets in January 2012, 75% in January 2013, 80% in January 2014 and 100% from 2015. In cases where the average emissions of CO₂ exceed the targets, manufacturers will have to pay fines.

Supercredits are to be given for cars emitting less than 50 gCO₂/km. Such new passenger cars shall be counted as 3.5 cars in 2012-2013, then the credit will gradually diminish by 2016. For FFV cars, the CO₂ emissions as stated in the certificate of conformity for the vehicle shall be reduced by 5%, if at least 30% of the filling stations in the Member State provide E85 fuel complying with the sustainability criteria. Innovative CO₂ saving technologies can be counted as up to a 7 g CO₂ reduction in each manufacturer's average specific emissions target. *Source: Press release, 17 December 2008, European Parliament seals climate change package. EP: position, T6(2008)0614 (www.europarl.europa.eu).*

International Renewable Energy Agency, IRENA

The International Renewable Energy Agency (IRENA) was founded in Bonn on January 26, 2009. More than 120 government delegations from across the world attended the conference and a total of 75 nations, a broad cross-section of developing and industrialized countries, signed the Agency's statute. Many others expressed their strong commitment to IRENA's goals and their intention to join in the near future. Mandated by governments worldwide, IRENA aims at becoming the main driving force in promoting a rapid transition towards the widespread and sustainable use of renewable energy on a global scale. The agency will facilitate access to all relevant information, including reliable data on the potential of renewable energy, best practices, effective financial mechanisms and state-of-the-art technological expertise. *Source: Press releases, 26 January 2009 (www.irena.org); 23-24 October 2008 (www.irena.org).*

ICLEI, the leading local government network on sustainable development welcomes the launch of IRENA and offers its support. ICLEI anticipates strong co-operation with IRENA in the rapid global deployment of renewable energy. Collaboration between ICLEI and IRENA can lead to strong links with local governments around the world in a short time. *ICLEI, Press Release, 27 January 2009.*

DOE to Invest in Integrated Biorefineries

The DOE will invest up to \$200 million over the next six years to support the development of pilot- and demonstration-scale biorefineries that use feedstocks such as algae or produce advanced biofuels such as bio-butanol, green gasoline and other innovative biofuels. The DOE anticipates making approximately 5-12 awards under this announcement. This funding opportunity announcement is aimed at funding biorefinery projects on both the pilot- and demonstration-scale levels. The facilities should lead to commercialization in

the near term. This announcement adds to the more than \$1 billion the DOE has already committed to research, development and demonstration of cellulosic biofuels technology. *Source: EERE News, 22 December 2008 (apps1.eere.energy.gov).*

GASEOUS FUELS (NG, LPG, biogas, DME)

Ecolabel for methane

Methane from the Swedish company FordonsGas Sverige AB is the world's first ecolabelled fuel, fulfilling the criteria of the Nordic Ecolabel. 15,000 cars and buses in Sweden use methane, an increase of 60% over the past few years. In Sweden, methane for fuel is a 50/50 mixture of fossil natural gas and biogas from digestion plants. The Nordic Ecolabel has requirements for the entire product lifecycle, from the raw materials to the finished product, taking into account emissions affecting climate change, lifecycle CO₂, energy used for production, traceability and sustainability of crops and farming and health effects (see AMFI 3/2008).

The Nordic Ecolabel is the official Nordic environmental award given to products and services that fulfil stringent environmental criteria. FordonsGas Sverige AB runs gas filling stations in Sweden. *Source: Miljömärkning Svanen, 11 November 2008 (www.svanen.nu).*



Methane car at filling station. Photo by courtesy of FordonsGas.

Dual Fuel Euro 5 Technology to Volvo Trucks

Clean Air Power Limited (CAP) will incorporate Air Power's Dual-Fuel™ technology into Volvo Truck engines. This technology will give significant reductions in GHG emissions and fuel cost savings compared with standard diesel engines. In addition, these Dual-Fuel™ trucks are expected to be around 20% more efficient than equivalent spark-ignited natural gas engines. The first commercial products are anticipated to be available in late 2009 or early 2010. Some earlier variants of vehicles fitted with Clean Air Power technology are now more than seven years old and have completed more than one million miles in commercial operation. *Source: Clean Air Power Ltd Press Release, 5 January 2008 (www.cleanairpower.com).*

ALCOHOLS, (BIO)GASOLINE

Australian Ethanol Health Study, 2008

The Ethanol Health Study in Australia studied the potential health impacts of use of E10 (10% ethanol blended with gasoline) in 21 vehicles. In Australia, it has been permissible to blend ethanol with up to 10% petrol (E10) since 2003, and in 2006 about 60% of the Australian vehicle fleet was compatible with E10, and this will further increase.

Generally, emissions from vehicles using E10 showed that some pollutants marginally increased, such as oxides of nitrogen and aldehydes, while other emissions, such as particulate matter (PM), CO and benzene, decreased. The PM_{2.5} emissions from tailpipe tests showed reductions of 5% to 31% with E5 use, and reductions of 12% to 52% with E10 use relative to gasoline.

The study concluded that the health impacts of E10 were marginal and over 97% of potential health cost savings were due to decreases in PM-related mortality. The marginal potential health cost savings from the use of E10 were expected to reduce over time as newer vehicles with advanced emission control replace older vehicles. The report 'Evaluating the Health Impacts of Ethanol Blend Petrol' is now available at www.environment.gov.au.

Methanol from glycerol

Oxford University's Department of Chemistry has discovered a method of producing methanol from glycerol. Methanol could be used as feedstock for the FAME process, which would improve the economy of FAME production. The new process is direct and does not require multiple costly processing steps, and it works at a low temperature (100 °C) and low pressure (20 bar).

Glycerol is the major by-product of biodiesel and oleochemical production. For every 9 kg of vegetable oil processed into FAME, 1 kg of glycerol is produced. Although glycerol is used in foods and personal care products, there is no large-scale industrial demand for the chemical. Until now, there has been no viable commercial process for direct conversion of glycerol into methanol. *Source: Oxford University discovers new methanol process, 5 November 2008 (www.biofuelreview.com)*

SYNTHETIC AND RENEWABLE DIESEL

Overview: 1st- to 2nd-Generation Biofuel Technologies

IEA Bioenergy Task 39 and IEA HQ have jointly composed a report on the technical challenges facing 2nd-generation biofuels that evaluates their costs and examines related current policies to support their development and deployment. The 1st-generation biofuels, produced from edible crops, are limited in their ability to achieve the targets for oil-product substitution, climate change mitigation and economic growth. Their sustainable production may be questionable with regard to land and water used for food and fibre production. An exception is ethanol produced from sugar cane, which appears to meet many of the acceptable criteria. The 2nd-generation biofuels from non-food biomass could avoid many of these concerns. However, 2nd-generation biofuels still face major constraints in their commercial deployment; thus policy recommendations are given in the report to overcome these constraints. *Source: IEA Bioenergy: From 1st to 2nd generation biofuels. Sims, M., Taylor, M. and Saddler, A. © OECD/IEA, November 2008. (www.ieabioenergy.com).*

MISCELLANEOUS

Sweden considers future of MK1 diesel

From 1 January 2009, the sulphur content of diesel fuel in Europe is to be less than 10 mg/kg. However, in Sweden, the tax on this fuel is higher than for the Swedish Environmental Class 1 diesel fuel (MK1). Transport companies see that sulphur-free diesel, similarly to MK1, would be beneficial with regard to the substantial emission benefits by enabling the use of effective exhaust after-treatment devices. However, the energy content of sulphur-free diesel is higher than that of MK1. An initiative on the new taxation has been given to the Swedish government. *Source: Sveriges Åkeriföretag, 28 October 2008 (www.akeri.se).*

Editorial: Emission benefits achieved by MK1 diesel fuel are not related only to the sulphur content of fuel. For instance, the aromatic content plays a role.

Euro VI emission standards adopted

The European Parliament has adopted Euro VI emission standards for heavy-duty highway engines. The limit values are identical to those in the earlier versions ($\text{NO}_x = 0.4 \text{ g/kWh}$, $\text{PM} = 0.01 \text{ g/kWh}$), but the implementation dates have been advanced to 31 December 2012 for new type approvals and to 31 December 2013 for all new vehicles.

The emission limits are still based on ESC and ETC testing, but by 1 April 2010 at the latest, the limits will be based on the new world-harmonized WHSC and WHTC cycles. A particle number standard is to be defined by 1 April 2010. The particle number limits will probably reflect the emission levels obtained with particle filters. The proposal does not introduce a separate emission limit for the NO_2 . Retrofitting of heavy-duty vehicles with diesel particulate filters may result in high NO_2 emissions and this could be taken into account in the legislation on retrofitting.

Source: Press release IP/08/1982, 16 December 2008 (europa.eu). Adopted proposal (ec.europa.eu)

Vehicle exhaust linked to lung cancer

A recent study reported that workers in the trucking industry who have had regular exposure to vehicle emissions have an elevated risk of lung cancer. The authors studied the lung cancer risk for 31,135 workers: long-haul drivers, pickup and delivery drivers, dockworkers, mechanics, hostlers, clerks and men employed in a combination of the first three categories. Lung cancer risks were significantly elevated for dockworkers and combination workers, but not for hostlers, mechanics or men working in other jobs. The mortality risks increased with increasing years of employment.

The workers in the study were exposed to mixtures of air pollutants, diesel trucks, gasoline vehicles, propane-forklifts, local traffic, ambient background pollutants and cigarette smoke. The authors define diesel exhaust as a major contributor to the increased lung cancer risk; however, lung cancer risks were not elevated in the mechanics who were exposed to the highest PM and elemental carbon (EC) levels. In addition, the dockworkers had the second-highest cancer risk, but the lowest PM and EC exposures. *Source: California Environmental Protection Agency, Press Release on 7 December 2008 (www.arb.ca.gov). Eric Garshick et al. Lung Cancer and Vehicle Exhaust in Trucking Industry Workers, Environmental Health Perspectives. Vol. 116 (10) 2008 (www.ehponline.org).*

Possible dioxin emissions

U.S. EPA is concerned on possible dioxin emissions from EPA 2010 compliant diesel trucks equipped with

selective catalytic reduction (SCR) that utilizes copper zeolite. Copper could promote the formation of dioxin emissions in diesel engines. Cummins Inc. uses copper based SCR system, whereas many other manufacturers use iron zeolite based SCR system. *Source: Heavy Duty Manufacturers Association, 12 January 2009 (hdma.org).*

IEA & IEA/AMF News

From the Executive Committee

The 36th ExCo meeting of the IEA/AMF was held in Osaka, Japan, in December 2008. The Executive Committee elected a Chairman, two Vice Chairmen, and a Secretary for a two-year period from 1st January 2009.

The past Chairman, Stephen Goguen of US DOE, was recognised for his services to the Committee.

The Executive Committee decided to elect Nils-Olof Nylund, VTT, Chairman, and Kazunori Nagai, NEDO, and Jean-Francois Gagné, CanmetENERGY, Vice Chairmen of the Executive Committee on Advanced Motor Fuels.

In order to facilitate a clear and transparent Secretariat selection process, the document "Expression of interest for Secretary Services for the IEA Implementing Agreement on Advanced Motor Fuels" was launched on the AMF website in September 2008. Three applications were received. Claës Pilo was re-elected Secretary to the Executive Committee. The Secretary position will be opened up again in 1.5 years' time. This will allow a smooth transition phase.

Several presentations were given at the meeting. Dr. Nobuo Iwai from NEDO presented development programmes in Japan. Mr. Andrew Saunders gave an update on the situation in New Zealand. Gabriel Plassat of ADME, France, presented the European Starbus project for environmental performance rating of buses.

For AMF, the year 2008 was a great success with regard to membership. Three countries joined AMF: Austria, The People's Republic of China and Thailand.

The AMF Implementing Agreement expires on 31st August 2009 and a request for extension is in progress. The End-of Term Report 2005-2009 and Strategic Plan 2009-2013 are in progress. The AMF IA text has been amended to incorporate the new IEA Framework for Implementing Agreements.

The Executive Committee carried out a complete self-evaluation following "Criteria for Implementing Agreement Extensions" introduced by CERT (Committee on Energy Research and Technology)

Progress of Annexes

[Annex XXVIII, Information Service & AMF Website \(AMFI\)](#) - VTT will take over the responsibility as Operating Agent of Annex XXVIII from TEC TransEnergy Consulting Ltd. The Annex XXVIII report, "Status and outlook for biofuels, other alternative fuels and new vehicles", which is publicly available on the website, was downloaded more than 50,000 times in 2008.

Report of Sub-task 1, "Outlook on Standardization of Alternative Vehicle Fuels", was delivered.

[Annex XXXIII, Particle Emissions of 2-S Scooters](#) - Work related to toxicity is going on in 2009, and a joint EC JRC – SAE Conference on 2-S Scooters is under preparation. Prolongation of the Annex until the end of 2009 is under consideration.

[Annex XXXIV, Biomass Derived Diesel Fuels](#) - Annex XXXIV covered biodiesel fuels from 1st-generation biodiesel fuels (FAME made from vegetable oils) to 2nd-generation fuels (made in biorefineries, possibly along with petro-diesel, and using a wider variety of biomass feedstocks). The final report was distributed to the 5 participating countries in June 2008. This report will be publicly available on the AMF Website at the end of April 2009.

[Annex XXXV, Ethanol as Motor Fuel](#) - Annex XXXV (ethanol as motor fuel) distributed a draft final report. A prolongation was proposed to include country reports on the status of ethanol as a transportation fuel in the various AMF countries.

[Annex XXXVI, Measurement Technologies for Emissions from Ethanol Fuelled Vehicles "METEV"](#) - Annex XXXVI consists of 3 tasks: 1) A literature study of regulations and test methods in EU, USA and Brazil, 2) Measurements and analyses of THC and ethanol, and 3) Vehicle tests. Task 1 has been finalised, and tasks 2 and 3 are expected to be finalised in 2009. A draft report will be prepared before the end of July 2009 and the final report is expected to be ready in October 2009.

37th ExCo Meeting

37th ExCo Meeting will be held on 26-28 May 2008 in Helsinki, Finland.

Country Reports – China, Spain

Reports on Advanced Motor Fuels in China and Spain are now available in the Member Area of the website.

Annex XXXVII, Fuel and Technology Alternatives for Buses - The objectives of Annex XXXVII are: 1) to access the overall energy efficiency, emissions and costs, both direct and indirect, of various technology options for buses, 2) to provide solid IEA-sanctioned data for policy- and decision-makers, and 3) to bring together the expertise of various IEA Implementing Agreements. Preparations started in 2008, testing and collecting data is scheduled in 2009, and estimations, modelling and synthesis will be carried out in 2010. Six countries are now participating in this Annex (Canada, Finland, France, Japan, Sweden and USA). The IAs on Bioenergy and Hybrid and Electric vehicles have been invited to actively take part in this Annex, and negotiations are continuing.

Information on proposals is available in the Member Area of the AMF website.

IEA related activities

N-O Nylund participated in a meeting in Moscow organised by NEET (IEA Networks of Expertise in Energy Technology). NEET is trying to establish contacts in the "Plus five" countries - i.e., Brazil, China, India, Mexico and South Africa plus Russia. The meeting in Moscow did not, however, result in contacts of interest for AMF. In Moscow, Nylund also represented HEV.

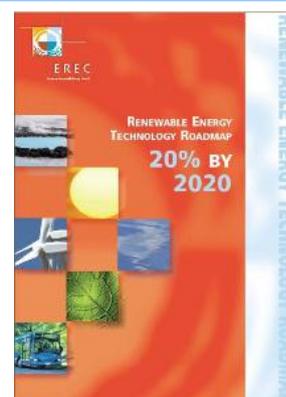
Nils-Olof Nylund reported on the new IEA Transport Contact Group (TCG), which consists of representatives of

- IEA Transport Related IAs
- the EUWP Vice Chair for Transport
- the IEA Secretariat.

TCG's first meeting was held in Paris on 28-29 March 2008 with 6 of the 7 transport-related IAs participating. The next meeting will be in March 2009 in connection with the Geneva Motor Show and the International Advanced Mobility Forum Conference.

PUBLICATIONS

- IEA Bioenergy: From 1st to 2nd generation biofuels. Sims, M., Taylor, M. and Saddler, A. © OECD/IEA, November 2008. (www.ieabioenergy.com).
- IEA Bioenergy: Biofuels for Transport – Part of a Sustainable Future? Summary and Conclusions from the IEA Bioenergy ExCo61 Workshop, December 2008. (www.ieabioenergy.com).
- IEA: Deploying Renewables - Principles for Effective Policies, © OECD/IEA
- EIA: Annual Energy Outlook 2009 (AEO2009), 17 December 2008 (www.eia.doe.gov)
- Renewable Energy Technology Roadmap 20% by 2020, EREC, the European Renewable Energy Council, November 2008. (www.erec.org).
- EEA Signals 2009 - Key environmental issues facing Europe, 9 January 2009 (www.eea.europa.eu).
- Australian Ethanol Health Study (www.environment.gov.au).



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