

# AMFI Newsletter



Fuel Efficiency central in New Regulations ([more](#))

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

The AMFI releases four electronic newsletters each year.

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The AMFI Newsletter is available online at:

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## GENERAL INTEREST

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### Fuel Economy for Road Vehicles

As oil currently powers 92% of the world's transportation and with growth in transportation demand rising in developing countries, the International Energy Agency released two reports to show how the right policies and technologies could improve the fuel efficiency of road vehicles.

Unless action is taken now, the agency said, oil demand in transportation will reach unsustainable levels because conventional combustion engine vehicles are set to be around for a long time.

The reports, "Technology Roadmap: Fuel Economy for Road Vehicles" and "Policy Pathway: Improving the Fuel Economy of Road Vehicles," describe the technologies needed and the policy packages that can help improve fuel economy.

The technologies include high-pressure fuel injection systems, while the policy packages include fuel-economy labeling, standards, and fiscal policies.

While fuel economy standards are in place in most Organization for Economic Cooperation and Development member countries and China, IEA sees these reports to be used as guides for other countries seeking to improve fuel economy. Most major economies should aim to implement fuel economy standards as part of a comprehensive fuel economy policy package by 2015, with strong fuel economy improvement targets for 2020 and even out to 2030, IEA said. Complementary policies include fuel economy labeling, fuel economy or carbon dioxide-adjusted vehicle tax systems (such as "feebates"), and fuel taxes.

While implementing both fiscal incentives to vehicle buyers and automotive fuel efficiency standards might seem redundant, the authors said that fiscal incentives can be changed or eliminated in the short term, but standards not only are typically long term in nature but also they put into place ambitious targets for efficiency gains.

Source: <http://www.ogj.com/content/ogj/en/authors/ogj-editors.html>

### US Fuel Efficiency Standards

The Obama Administration today finalized ground-breaking standards that will increase fuel economy to the equivalent of 54.5 mpg (~4,32 l/100 km) for cars and light-duty trucks by Model Year 2025. When combined with previous standards set by this Administration, this move will nearly double the fuel efficiency of those vehicles compared to new vehicles currently on our roads. In total, the Administration's national program to improve fuel economy and reduce greenhouse gas emissions will save consumers more than \$1.7 trillion at the gas pump and reduce U.S. oil consumption by 12 billion barrels.

In achieving these new standards, the US Environmental Protection Agency and the National Highway Traffic Safety Administration expect automakers' to use a range of efficient and advanced technologies to transform the vehicle fleet. The standards provide for a mid-term evaluation to allow the agencies to review their effectiveness and make any needed adjustments. Major auto manufacturers are already developing advanced technologies that can significantly reduce fuel use and greenhouse gas emissions beyond the existing model year 2012-2016 standards. In addition, a wide range of technologies are currently available for automakers to meet the new standards, including advanced gasoline engines and transmissions, vehicle weight reduction, lower tire rolling resistance, improvements in aerodynamics, diesel engines, more efficient accessories, and improvements in air conditioning systems. The program also includes targeted incentives to encourage early adoption and introduction into the marketplace of advanced technologies to dramatically improve vehicle performance, including

- Incentives for electric vehicles, plug-in hybrid electric vehicles, and fuel cells vehicles;
- Incentives for hybrid technologies for large pickups and for other technologies that

achieve high fuel economy levels on large pickups;

- Incentives for natural gas vehicles;
- Credits for technologies with potential to achieve real-world greenhouse gas reductions and fuel economy improvements that are not captured by the standards test procedures.

Source: <http://www.whitehouse.gov/the-press-office/2012/08/28/obama-administration-finalizes-historic-545-mpg-fuel-efficiency-standard>

## EU Emission Performance Standards for Passenger Cars

Cars are responsible for around 12% of total EU emissions of carbon dioxide. The European Union legislation adopted in 2009 sets mandatory emission reduction targets for new cars and new vans. Under the Cars Regulation, the fleet average to be achieved by all new cars is 130 grams of CO<sub>2</sub> per kilometre (g/km) by 2015 – with the target phased in from 2012 – and 95g/km by 2020. The regulation is currently undergoing amendment in order to implement the 2020 target.

The 2015 and 2020 targets represent reductions of 18% and 40% respectively compared with the 2007 fleet average of 158.7g/km. In terms of fuel consumption, the 2015 target is approximately equivalent to 5.6 litres per 100 km (l/100 km) of petrol or 4.9 l/100 km of diesel. The 2020 target equates to approximately 4.1 l/100 km of petrol or 3.6 l/100 km of diesel.

Following a thorough review of the target's feasibility, in July the Commission proposed legislation setting out the modalities of how this target is to be reached. The proposal includes the following provisions:

- All manufacturers would be required to achieve the same level of reduction – 27% – from the 2015 target;
- The target would continue to be set on the basis of a vehicle's mass;
- Eco-innovations would continue to apply once the new test procedure for vehicle type approval is in place;
- Super-credits with a multiplier of 1.3 would apply in 2020-2023 for vehicles emitting less than 35 g/km; this benefit would be limited to a maximum of 20 000 cars per manufacturer over the period;
- The excess emissions premium would remain at €95 per g/km from the first gram of exceedance;
- Small-volume manufacturers would be given greater flexibility regarding when they can apply for their own reduction target;
- The smallest manufacturers, producing fewer than 500 cars per year, would be exempted from meeting the target;
- Niche manufacturers would receive a new target for 2020 of a 45% reduction from their 2007 level;
- The regulation would be reviewed by end-2014 in order to set reduction targets for post-2020.

Source: [http://ec.europa.eu/clima/policies/transport/vehicles/cars/index\\_en.htm](http://ec.europa.eu/clima/policies/transport/vehicles/cars/index_en.htm)

Legislative Proposal: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0393:FIN:en:PDF>

## R&D for Europe's future mobility

A recent memo of the European Commission states that the EU's oil import bill was 210 billion € in 2010, transport is 95% dependent on fossil fuels. If we do not address this oil dependence, people's ability to travel and the costs of goods transport could be severely impacted with consequences on the overall economy.

The European Union has committed to reducing its greenhouse gas emissions; a reduction of 60% by 2050 is required from the transport sector. Innovative technologies need to be deployed quickly, new technologies are also essential to winning the global race for sustainable mobility. This requires the development of ambitious R&D roadmaps. Actions are a Europe-wide issue that

cannot be resolved by individual Member States and the deployment of new technologies is more effective if coordinated Europe-wide.

#### Facts and Figures:

- The overall investments dedicated to transport-related R&D in the EU from all public funders and industry exceeded €43 billion in 2008. They are dominated by corporate investments from road transport industries, while public funds from EU Member States account for 8 % and those from the EU through FP7 for 1.4%.
- It is estimated that at the EU-25 level, public bodies purchase 110,000 passenger cars, 110,000 light duty vehicles, 35,000 heavy duty vehicles, and 17,000 buses. The potential for innovation through public procurement is currently under-exploited. The fragmented public procurement markets remain too small to reach a critical mass for innovation.
- EU-based transport companies hold a large share in global transport-related R&D investment (43% of the total), followed by companies with headquarters in Japan and the USA.
- Research efforts of the automotive industry are clearly dominating, followed by those of the aviation sector. R&D investments in rail and waterborne are more limited.
- Around 56% of the total R&D investment stemmed from German companies (Volkswagen, Daimler, Bosch, BMW, Continental) followed by French (19%) and Italian-based companies (10%).
- The EU and its Member States may not exploit the full potential of joint technology-push mechanisms through alignment of R&D efforts. This may be influenced by the heterogeneous institutional set-up of transport policy making and research across Member States, but also by divergent transport research policies.

Read the full memo:

<http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/12/678&format=HTML&aged=0&language=EN&guiLanguage=en>

## **EU Biofuels Regulation to be amended?**

The European Commission published a proposal to limit global land conversion for biofuel production, and raise the climate benefits of biofuels used in the EU. The use of food-based biofuels to meet the 10% renewable energy target of the Renewable Energy Directive will be limited to 5%. This is to stimulate the development of alternative, so-called second generation biofuels from non-food feedstock, like waste or straw, which emit substantially less greenhouse gases than fossil fuels and do not directly interfere with global food production. For the first time, the estimated global land conversion impacts – Indirect Land Use Change (ILUC) – will be considered when assessing the greenhouse gas performance of biofuels.

Energy Commissioner Günther Oettinger said: "This proposal will give new incentives for best-performing biofuels. In the future, biofuels will be saving more substantial greenhouse gas emissions and reduce our fuel import bill." Commissioner for Climate Action Connie Hedegaard said: "For biofuels to help us combat climate change, we must use truly sustainable biofuels. We must invest in biofuels that achieve real emission cuts and do not compete with food. We are, of course not closing down first generation biofuels, but we are sending a clear signal that future increases in biofuels must come from advanced biofuels".

The Commission is therefore proposing to amend the current legislation on biofuels through the Renewable Energy and the Fuel Quality Directives.

Press Release: [http://europa.eu/rapid/press-release\\_IP-12-1112\\_en.htm](http://europa.eu/rapid/press-release_IP-12-1112_en.htm)

## US Investments in Biofuels and Biobased Products

As part of the Obama Administration's all-of-the-above strategy to enhance U.S. energy security, reduce America's reliance on imported oil and leverage our domestic energy supply, while also supporting rural economies, the U.S. Departments of Agriculture (USDA) and Energy announced a \$41 million investment in 13 projects that will drive more efficient biofuels production and feedstock improvements.

Five of these projects - financed through the joint Biomass Research and Development Initiative (BRDI) - will help to diversify the nation's energy portfolio and replace the need for gasoline and diesel in vehicles. Eight research projects are aimed at applying biomass genomics to improve promising biofuel feedstocks and drive more efficient, cost-effective energy production. These projects will use genetic mapping to advance sustainable biofuels production by analysing and seeking to maximize genetic traits like feedstock durability, how tolerant feedstocks are to various environmental stresses, and the potential for feedstocks to be used in energy production.

Source: <http://energy.gov/articles/agriculture-and-energy-departments-announce-new-investments-drive-innovations-biofuels-and>

## FEEDSTOCK ISSUES

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### Cereal Straw for Advanced Biofuel Production

The Renewable Energy Directive (RED), with its target of 10 per cent of transport fuel to be from renewable sources by 2020, has created a significant demand for biofuels in the EU. This IEEP report, commissioned by Novozymes, considers the existing barriers, environmental risks and opportunities and the potential agricultural policy stimuli needed in order to mobilise cereal straw for advanced biofuel production in the EU.

This report assesses the (energy) potential of agricultural residues and in particular straw; reviews the competing uses of straw and the associated environmental effects of mobilising straw for biofuel production; considers the opportunities and barriers for increasing the use of straw for bioenergy production; and examines the potential role and need for public support through EU funding instruments.

Source: IEEP (*Institute for European Environmental Policy*),

Download: [http://www.ieep.eu/assets/938/IEEP\\_Agricultural\\_residues\\_for\\_advanced\\_biofuels\\_May\\_2012.pdf](http://www.ieep.eu/assets/938/IEEP_Agricultural_residues_for_advanced_biofuels_May_2012.pdf)

### Neste Oil Microbial Oil Pilot Plant

Neste Oil has completed the first phase of its project to build a pilot plant for producing microbial oil. The first phase will enable the growth of oil-producing micro-organisms, and the following phases will concentrate on raw material pretreatment and oil recovery. The goal is to develop the technology so that it is capable of yielding commercial volumes of microbial oil for use as a feedstock for NExBTL renewable diesel. Commercial-scale production is expected by 2015 at the earliest.

The pilot plant is expected to be fully complete in the second half of 2012 and represents an investment of approx. EUR 8 million by Neste Oil. The technology is designed to produce feedstock for NExBTL renewable diesel by using yeast and fungi to convert sugars from waste and residues into oil highly efficiently. It utilizes bioreactors similar to those used in the biotech and brewing industries. A wide range of different waste and residue materials can be used, such as straw and sidestreams from the pulp and paper industry, which makes feedstock optimization possible.

"Extending our feedstock base is a central component of our cleaner traffic strategy," continues Petri Lehmus, "and our aim is to focus on making use of waste and residues with the smallest possible carbon footprint for producing our renewable fuels. The new microbial oil pilot plant will make a contribution to achieving these goals."

Press release: <http://www.nesteoil.com/default.asp?path=1;41;540;1259;1260;18523;19872>

## **Algae-to-Energy Facility Operational**

Sapphire Energy announced the first phase of the world's first commercial demonstration algae-to-energy facility, is now operational. Construction of this first phase, which began on June 1, 2011, was completed on time. The facility will produce 1.5 million gallons per year of crude oil and consist of approximately 300 acres of algae cultivation ponds and processing facilities. The Green Crude Farm was funded with both private and public funds, including \$85 million in private investment from Sapphire Energy backed by a USDA loan guarantee and a \$50 million grant from the US DOE. The cultivation area consists of some of the largest algae ponds ever built with groupings of 1.1 acre and 2.2 acre ponds which are 1/8 of a mile long. The initial phase also includes all the necessary mechanical and processing equipment needed to harvest and extract algae and recycle water for the 300 acre Green Crude Farm.

In March, the first seeding of ponds with algae, otherwise known as inoculation, took place and a series of "shakedown" tests began. Today, the farming operations are exceeding Sapphire Energy's internal productivity goals in terms of biomass yield, demonstrating that large scale cultivation is possible and much larger cultivation systems can be implemented with the proper agronomic processes in place. The company harvested its first crop in June and has since harvested algae biomass totaling 81 tons. Next, the Green Crude Farm is preparing to transition its operations to a winter variety of algae while continuous cultivation, harvest and extraction activities continue.

Sapphire Energy will continue to conduct "shakedown" testing, as well as operate and expand farming operations over the winter, as the facility is commissioned into 2013. By the end of 2014, the Green Crude Farm will produce 100 barrels of Green Crude per day. The commercial demonstration project is expected to prove "commercial" techno-economics, and Sapphire's commercial scale Green Crude facility.

Source:

<http://www.sapphireenergy.com/documents/Sapphire%20Announces%20Green%20Crude%20Farm%20Commissioning%208-27-12.pdf>

## **Solazyme and Bunge Joint Venture for Algae**

The promise of using algae to make biofuels — a dream scientists have chased for decades — might seem particularly welcome in a time of stubbornly high gasoline prices. But the path to commercial-scale production has been circuitous.

Young companies have attracted investors and interest, but as they struggle to make large quantities of ethanol and biodiesel at a competitive cost, some have branched out into making oils for products with higher profit margins, like cosmetics, food and soap.

Now, one of these companies, Solazyme, is about to take a step toward large-scale fuel production. On Tuesday, it will announce an agreement with Bunge Global Innovation to build a factory in Brazil that would make triglyceride oils for both chemical and fuel products.

Under the joint venture, whose financial terms were not disclosed, the factory would rise next to Bunge's Moema sugar cane mill and have an annual capacity of 100,000 metric tons, or about 110,250 short tons, of oil. It would start production in the second half of next year, making oils for fuel as well as additives for soaps, detergents and plastics.

Ben Percy, a managing director of Bunge Ltd., a global agribusiness and food company, said in a prepared statement that the partnership would "enable us to link our sugar and vegetable oil value chains," and expand the company's reach in fuels and chemicals. For Solazyme, which has skin care and nutritional supplement lines, the arrangement provides a boost in production capacity "to meet the strong demand we're seeing in our initial target markets," said Jonathan Wolfson, the company's chief executive.

So far, the company has produced only limited quantities of biofuels, including several hundred thousand liters to the United States military, which is seeking to promote alternatives to conventional fuels.

Source: <http://green.blogs.nytimes.com/2012/04/03/solazyme-and-bunge-plan-factory-to-make-oil-from-algae/?ref=biofuels>

## GASEOUS FUELS

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### Golden Rules for a Golden Age of Gas

Natural gas is prepared to enter a golden age, but this future depends critically on the successful development of the world's vast unconventional gas resources. North American experience shows unconventional gas - notably shale gas - can be exploited economically. Many countries are lining up to emulate this success.

But some governments are hesitant, or even actively opposed. They are responding to public concerns that production might involve unacceptable environmental and social damage.

This report, in the World Energy Outlook series, treats these aspirations and anxieties with equal seriousness. It features two new cases: a Golden Rules Case, in which the highest practicable standards are adopted, gaining industry a "social licence to operate"; and its counterpart, in which the tide turns against unconventional gas as constraints prove too difficult to overcome.

Source: *International Energy Agency (IEA) Publications & Papers*

Download: [http://www.worldenergyoutlook.org/media/weowebiste/2012/goldenrules/WEO2012\\_GoldenRulesReport.pdf](http://www.worldenergyoutlook.org/media/weowebiste/2012/goldenrules/WEO2012_GoldenRulesReport.pdf)

### US NGV Grant Recipients

The U.S. Department of Energy announced the recipients of \$30 million in grants for natural gas vehicle research, choosing 13 projects with focuses on improved gas tanks and innovative compressors, according to a July 12 news release.

The department's Methane Opportunities for Vehicular Energy, or MOVE, program will concentrate on engineering lightweight, affordable natural gas tanks and developing compressors that can efficiently fuel NGVs at home, circumventing the need to establish a network of fueling stations.

Current NGV technology requires tanks that can withstand high pressures and are often too large or expensive to be practical for smaller passenger vehicles, the department said. The projects DOE chose will try to eliminate those barriers, the agency said.

NGV America President Richard Kolodziej said low-pressure gas tanks hold great potential to lower the cost of not only the vehicles themselves but also their fueling by reducing the need to compress the gas.

Source: [http://www.downstreamtoday.com/news/article.aspx?a\\_id=36831&AspxAutoDetectCookieSupport=1](http://www.downstreamtoday.com/news/article.aspx?a_id=36831&AspxAutoDetectCookieSupport=1)

### Natural Gas Vehicles Market Forecast

Worldwide sales of light-duty natural gas vehicles including passenger cars, light-duty trucks and commercial vehicles will reach 3.2 million vehicles in 2019, with 25.4 million such vehicles on the road in that year, Pike Research forecasts. This represents a compound average annual growth rate (CAGR) of 6.2 percent between 2012 and 2019.

In its report, Pike Research says light-duty vehicles make up about 97 percent of the total natural gas vehicle market. The report identifies four main growth drivers: economic benefits, environmental benefits, availability of fuel and vehicles, and energy security.

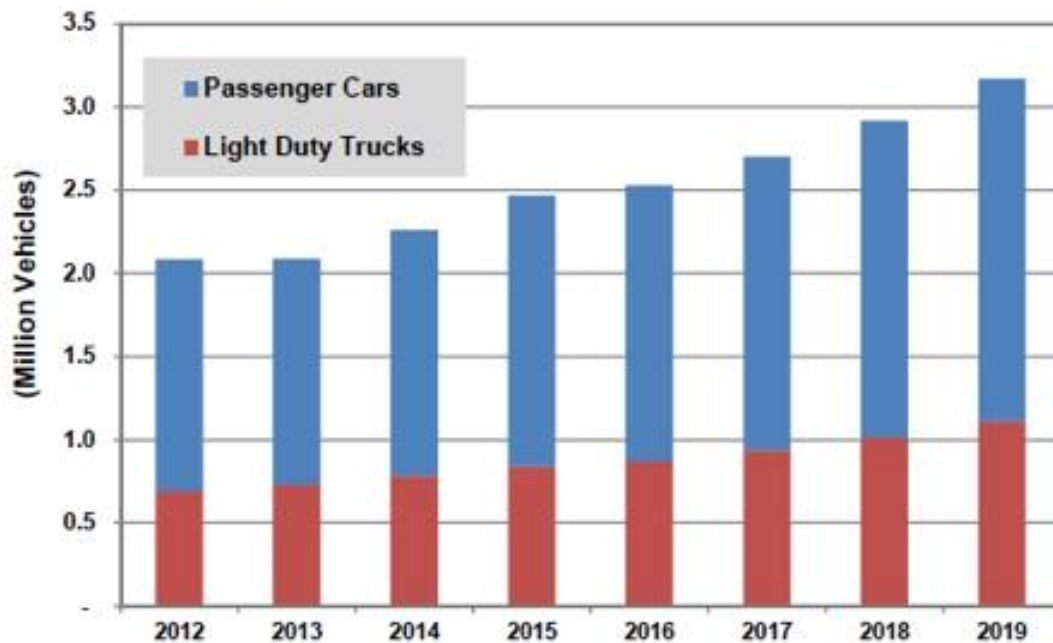
While North America is experiencing 10 percent CAGR, Pike Research says that because the market is small, it doesn't expect growth to lead the continent to a dominant market spot by 2019. This market largely consists of fleet purchases, not individual consumers.

The largest market for natural gas vehicles is the Asia Pacific region, Pike Research says, because of growing refueling networks there. The strongest markets in this region will be Thailand (24 percent CAGR), India (23 percent) and China (20 percent), according to the report.

Analysts expect a two percent CAGR between 2012 and 2019 for the Middle East and Africa regions, because of volatility in the Iranian market. Egypt has a relatively strong light-duty vehicle market due to its taxi fleets, according to Pike Research.



**Chart 1.2 Light Duty NGV Sales by Segment, World Markets: 2012-2019**



(Source: Pike Research)

Figure 1: Light Duty NGV Sales on world markets

The Latin American market will continue to grow. The report says Argentina and Brazil are two of the largest natural gas vehicle markets in the world – 25 percent of total natural gas vehicles globally.

Europe's largest light-duty natural gas vehicle market is Italy, where 2012 sales will reach 159,046 vehicles, Pike Research says. It's followed by Ukraine, where analysts expect sales to reach 151,487 this year. Both countries will see slowed growth over the next few years, while Germany and Sweden – comparatively small markets today – will have steady growth, the report says.

Source: <http://www.environmentalleader.com/2012/07/10/light-duty-natural-gas-vehicles-will-reach-25-million-in-2019-but-north-america-wont-lead/?graph=full&id=1>

## M/S Viking Grace Launched

M/S Viking Grace, said to be the first large passenger vessel (gross tonnage 57,000) in the world fuelled by liquefied natural gas (LNG), was launched at STX Finland's shipyard in Turku in August 2012. By using this fuel alternative, Viking Line will reduce emissions: nitrogen by 85%, CO<sub>2</sub> by 20%; sulphur and particulate emissions are practically zero.

The LNG tanks are located outside on the rear deck. All gas pipes are double-mantled, which means that no gas is emitted into the engine room in case of any leakage. The vessel, capable of 22 knots, will refuel from an LNG supply ship under arrangement with AGA Gas AB, a member of the Linde Group.

The natural gas powered ferry, ordered by Viking at the end of 2010, will begin scheduled service on January 15, 2013. A maiden voyage, which will also be sold to the public, is planned for January 13. Tickets for this unique all-inclusive cruise will go on sale in the autumn.

Source: NGV Global News

Link: <http://www.ngvglobal.com/ms-viking-grace-launched-0828>

## ALCOHOLS AND (BIO)GASOLINE

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### **Chemtex wins USDA partnership**

Global engineering and technology company Chemtex has won a partnership with the US Department of Agriculture (USDA) to build a new advanced biofuels plant.

Backed by a federal-private partnership and earmarked to open in 2014, the biorefinery will create 315 jobs and produce cellulosic ethanol from energy crops. The location of the site is believed to be Sampson County, North Carolina.

The partnership with the USDA will see \$99 million (€78.7 million) support to the plant's construction.

'Realizing a commercial scale cellulosic ethanol plant in the US and proving that it can produce cost competitive sustainable ethanol is an important milestone in the commercialization process of advanced biofuels,' says Chemtex Group president Guido Ghisolfi.

Chemtex will work with Novozymes to produce the cellulosic ethanol. Chemtex with its BetaRenewables joint venture is in the construction phase of a 60 000 tons per year cellulosic ethanol production facility in Crescentino, Italy.

Source: [http://www.biofuels-news.com/industry\\_news.php?item\\_id=5311](http://www.biofuels-news.com/industry_news.php?item_id=5311)

### **End the US Ethanol Mandate – by Bloomberg**

Since 2005, the U.S. government has mandated that gasoline contain ethanol, almost all of it derived from corn. The policy, aimed at reducing the country's dependence on foreign oil and at improving the environment, has been a bonanza for farmers. Land planted with corn soared by 25% after Congress passed the Energy Independence and Security Act of 2007, which required that gasoline producers blend 15 billion gallons of ethanol into the nation's gasoline supply by 2015.

Now, the drought of 2012, the worst in more than 50 years, is making clear the downside of a policy that leads the U.S. to devote 40 percent its corn harvest to fuel production. With this year's crop expected to be the smallest in six years, corn prices have jumped 60 percent since June. The ethanol requirements are aggravating the rise in food costs and spreading it to the price of gasoline, which is up almost 40 cents per gallon since the start of July.

The damage is far-reaching. Beef and pork producers are slaughtering their stocks at a record pace to cut use of corn feed that costs two-thirds more than three months ago. This week, President Barack Obama told a campaign rally in Iowa that the federal government will buy \$170 million of meat to prop up the market. U.S. cattle herds next year are forecast to be the smallest since 1952, a guarantee of more expensive food in years to come.

Ethanol production and the drought are hardly the only forces contributing to higher prices. Exports of corn to other countries also play a role, as do ethanol policies in Europe. And it is true that ending the ethanol mandate might cut food prices by no more than 5 percent at best.

This isn't to say ethanol doesn't have a place in the U.S. energy mix. Gasoline needs to be combined with agents that carry oxygen to help cars and trucks run more efficiently. Ethanol fits the bill. But the government should let the demand for ethanol obey the laws of the market, rather than the desires of the agricultural lobby.

Source and full article: <http://www.bloomberg.com/news/2012-08-16/ethanol-in-gas-tanks-makes-food-on-your-table-cost-more.html>

## US ethanol production edges up

In Washington, the Energy Information Agency reported in August 2012 that US ethanol production averaged 823,000 barrels per day (b/d). The 4-week average for ethanol production stood at 817,000 b/d for an annualized rate of 12.52 billion gallons. Stocks of ethanol stood at 18.5 million barrels. Gasoline demand for the week averaged 381.4 million gallons daily.

On the co-products side, ethanol producers were using 12.479 million bushels of corn to produce ethanol and 91,849 metric tons of livestock feed, 81,884 metric tons of which were distillers grains. The rest is comprised of corn gluten feed and corn gluten meal. Additionally, ethanol producers were providing 4.28 million pounds of corn oil daily.

Source: <http://www.biofuelsdigest.com/bdigest/2012/08/24/us-ethanol-production-edges-up/>

## BIODIESEL ESTERS

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### Industry improves biodiesel specifications

Fuel quality and a strong set of standards remain one of the highest priorities for the biodiesel industry. That is why the industry continues to refine the ASTM biodiesel specifications to meet the needs of customers with Ultra-Low Sulfur Diesel (ULSD) and new diesel engine and after-treatment technology. A new voluntary No. 1-B grade for biodiesel (B100) passed the ASTM D2 Committee on Petroleum Products and Lubricants this past spring and the results were sanctioned by the ASTM Committee on Standards in a meeting held in July 2012.

The new grade provides more stringent controls for minor components in raw materials used to make biodiesel, such as vegetable oils and animal fats. The specification values of the current standard will become the No. 2-B grade in D6751 without change. Producers or blenders can continue to utilize the current specification under the No. 2-B grade at any time of the year exactly as done today, or they may opt to use the more stringent No 1-B grade. The finished blended fuel standards—D975 for on/off road diesel up to 5% biodiesel (B5), D7467 for B6-B20 on/off road applications, and D396 for heating oil up to 5% biodiesel—do not change. B100 used for D975, D7467, and D396 must continue to meet D6751 (either the No. 1-B or the No. 2-B grade) prior to blending.

The choice of the No. 1-B and No. 2-B designations were selected to make the standard as similar as possible as the current mode of operation with No. 1 and No. 2 diesel fuel. Most users utilize No. 2 diesel fuel, but if they experience unexpected filter clogging they can switch to No. 1 diesel fuel, use additives or other means to prevent unexpected filter clogging. The same philosophy is to be maintained with the No. 1-B and No. 2-B biodiesel specification, i.e. most users will continue to utilize the No. 2-B biodiesel but if un-expected filter clogging is experienced, No. 1-B can be used for blending.

Source: <http://www.biodiesel.org/news/biodiesel-news/news-display/2012/07/25/industry-improves-biodiesel-specifications-to-meet-needs-of-today's-fuels>

## SYNTHETIC AND RENEWABLE DIESEL/JET

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### NSE Renewable Diesel Project stopped

Neste Oil and Stora Enso have decided not to progress with their plans to build a biodiesel plant, for which the two companies had applied for funding under the EU's NER 300 program. The European Commission recently published a review on its Web site of projects that have applied for NER funding, and Neste Oil's and Stora Enso's project is not among those listed as scheduled to receive this funding. "We have calculated the cost of the project very carefully and realistically. It would have represented a very significant investment and we concluded that we would not have gone ahead in any case, even if we had won public funding," said Neste Oil's President & CEO, Matti Lievonon, and Stora Enso's CEO, Jouko Karvinen.

The trials carried out by Neste Oil and Stora Enso at a pilot plant in Varkaus between 2009 and 2011 on the entire chain needed for the planned plant - from wood biomass to biowax suitable for use as a raw material for producing renewable diesel - proved very successful. "Technically speaking, our work was a great success and we are very satisfied with what we achieved. Cooperation between the two companies has also been very smooth and will continue in the future in the area of other bio-based products," add Lievonon and Karvinen.

Source: <http://www.nesteoil.com/default.asp?path=1;41;540;1259;1260;18523;19844>

## **Air Canada Flight with cooking-oil Biofuel**

In June, Air Canada Flight AC991 flew from Toronto to Mexico City using 50 per cent biofuel made from recycled cooking oil.

A first for the company, the test-flight was expected to generate 40 per cent fewer emissions, making it "the most environmentally-friendly flight ever flown by Air Canada," the company wrote in a statement.

The commercial flight on an Airbus A319 also benefited from lightweight cabin equipment — lightweight carpets were installed and pilots used iPads instead of paper documents — intended to help reduce the plane's environmental impact.

The "perfect flight," was part of an environmental demonstration by the International Civil Aviation Organization (ICAO) "to underscore the aviation industry's commitment to the environment at the UN sustainability conference," said Duncan Dee, Executive Vice President and Chief Operating Officer at Air Canada.

Source: <http://ca.news.yahoo.com/blogs/good-news/air-canada-conducts-first-flight-cooking-oil-biofuel-152813003.html>

## **Jet Fuel produced from Sugarcane**

Azul Brazilian Airlines, in partnership with Amyris Inc., Embraer and GE, made a demonstration flight on 19 June using a renewable jet fuel produced from Brazilian sugarcane. The Embraer E195 jet operated by Azul departed from Campinas Viracopos Airport, flew over Rio de Janeiro, which is hosting the U.N. Conference for Sustainable Development (Rio+20), and landed at Rio's Santos Dumont Airport.

Known as Azul+Verde, this project began in November 2009 with the objective of evaluating a new concept in the development of a renewable jet fuel. A lifecycle analysis and sustainability study developed by a Brazilian Institute for International Trade Negotiations (ICONE) indicates that the Amyris renewable jet fuel could reduce greenhouse gas emissions up to 82%.

This fuel is made using modified microorganisms converting sugar into pure renewable hydrocarbon. Such a process results in a renewable jet fuel that, once approved, will meet the requirements of the aviation industry as well as the American Society for Testing and Materials (ASTM).

Developed as drop-in, the renewable jet fuel did not require any modification or adaptation in the aircraft for the demonstration flight. During ground tests at GE's engine testing facility in Ohio earlier this year, the Amyris renewable fuel met all the required test objectives.

Source: <http://www.amyris.com/en/newsroom/225-photo-release-azul-brazilian-airlines-makes-successful-demonstration-flight-with-amyris-renewable-jet-fuel-produced-from-sugarcane>

## **OTHER FUELS AND VEHICLES**

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### **Battery-Electric Vehicles**

Electric mobility is often seen as the solution for future mobility. Yet, its effect on sustainability - reduced use of primary energy and reduced GHG emissions in real live applications - is still unclear. A recent study addresses the advantages and disadvantages of battery-electric vehicles compared to modern conventional diesel cars. Four battery-electric cars and a modern diesel-fueled car were compared:

- Mitsubishi i-MiEV
- Mercedes Benz A-Klasse E-Cell
- Smart Fortwo Electric Drive
- Nissan Leaf
- Volkswagen Polo BlueMotion (diesel-fueled car)

The report is available in German only.

Source: Chamber of Economy Vienna [http://portal.wko.at/wk/startseite\\_th.wk?sbid=3382&dstid=686](http://portal.wko.at/wk/startseite_th.wk?sbid=3382&dstid=686)

Download:

[http://portal.wko.at/wk/dok\\_detail\\_file.wk?angid=1&docid=1909076&conid=645045&stid=685816&titel=Batterieelektrische%2cFahrzeuge%2cin%2cder%2cPraxis](http://portal.wko.at/wk/dok_detail_file.wk?angid=1&docid=1909076&conid=645045&stid=685816&titel=Batterieelektrische%2cFahrzeuge%2cin%2cder%2cPraxis)

## Overview of Electric Vehicles

CE Delft has recently completed a study commissioned by the European Commission on the market and development of electric vehicles. In the near-term future, the market penetration of EVs will remain fairly low compared to conventional vehicles. The estimation based on several government announcements, industry capacities and proliferation projects sees more than five million new electric vehicles on the road globally by 2015 (excluding two- and three-wheelers), the majority of these in the European Union. The main markets for electric vehicles are in order of importance the EU, the US and Asia (China and Japan). Some further target markets like Israel and the Indian subcontinent are also expected to evolve. In the long term, the share of EVs will most likely increase as additional countries adopt technologies and initiate projects.

1. It can be assumed that in the short run, i.e., until 2015, EVs will not differ significantly from today's cars concerning their outward appearance and function, albeit with shorter ranges than conventional ICE cars.
2. Until 2015, the market penetration of EVs will remain fairly low: compared to global sales forecasts of 53 million conventional cars in 2010 alone, EVs will account for over five million cars until 2015. The main markets for EVs still being the EU, the US and East Asia (China and Japan).
3. As research activities and investments are relatively high, EV technology may advance rapidly and might account for greater shifts in the future than our findings suggest.
4. There is a significant risk of electric 'depression' after 2012 if expectations are not met and market penetration remains low.

Source: CE Delft publication, [www.cedelft.eu](http://www.cedelft.eu), commissioned by the European Commission;

download full report: [http://ec.europa.eu/clima/policies/transport/vehicles/docs/d1\\_en.pdf](http://ec.europa.eu/clima/policies/transport/vehicles/docs/d1_en.pdf)

## Fuel Cells in America 2012

The U.S. Department of Energy's Fuel Cell Technologies Program has issued the third annual State of the States: Fuel Cells in America 2012 report. The report, written by Fuel Cells 2000, details fuel cell and hydrogen activities and policies in the 50 states and the District of Columbia and includes an analysis of new policies and funding, recent and planned fuel cell and hydrogen installations, and activities by industry and academia.

The report confirms that in the past year in the United States, there have been more than 1,700 fuel cell-powered forklifts deployed or ordered, 25 fuel cell buses placed or planned for transit service, and more than 74 MW of stationary power installed or purchased. These numbers include companies such as Apple, eBay, Coca-Cola, and Walmart, all investing in fuel cells to provide reliable power to company data centers, stores, and facilities. Some are purchasing multi-MW systems. Others are replacing fleets of battery forklifts with fuel cells.

Source: Fuel Cell Technologies Program, August 2012 Newsletter

Link: [http://www1.eere.energy.gov/hydrogenandfuelcells/newsletter\\_august\\_2012.html](http://www1.eere.energy.gov/hydrogenandfuelcells/newsletter_august_2012.html)

## MISCELLANEOUS

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### US EPA Clean Diesel Grant Awards

The U.S. Environmental Protection Agency (EPA) is awarding \$30 million for clean diesel projects as part of its ongoing campaign to reduce harmful diesel exhaust that can lead to asthma attacks and premature deaths.

The Diesel Emission Reduction Program, also known as DERA, is designed to replace, retrofit or repower older diesel-powered engines like marine vessels, locomotives, trucks and buses.

Diesel engines are durable, fuel-efficient workhorses in the American economy. However, older diesel engines that predate newer, cleaner standards emit large amounts of air pollutants, such as nitrogen oxides (NOx) and particulate matter (PM). These pollutants are linked to health problems, including asthma, lung and heart disease and premature death. The clean diesel projects funded through these grants will work to address the more than 11 million older diesel engines that continue to emit higher levels of pollution.

In this year's competition, winners were selected based on a proposal's potential for maximizing health and environmental benefits by targeting areas that have significant air quality issues. Reduced air pollution from diesel engines in these areas can have a direct and significant impact on community health.

New this year is an increased funding availability per award that will allow EPA to target larger engines used in marine vessels and locomotives, which will result in significant emissions reduced per engine.

DERA was enacted in 2005 and since it was first funded in FY 2008, EPA has awarded over 500 grants nationwide. These projects have reduced hundreds of thousands of tons of air pollution and saved millions of gallons of fuel.

Source: <http://www.epa.gov/cleandiesel>

### EU Air Quality Reporting

Much of the air pollution that damages human health and the environment today is the result of human activities. But natural sources also emit air pollutants, contributing to the exposure of European citizens and ecosystems to bad air quality. These sources are potentially undermining EU Member State efforts to meet the air quality standards set out in EU legislation.

This report by the European Environment Agency provides a first evaluation of Member State reporting on natural air pollution under the Air Quality Directive.

Source: European Environment Agency (EEA) - Publications (<http://www.eea.europa.eu/publications/particulate-matter-from-natural-sources>)

Download: [http://www.eea.europa.eu/publications/particulate-matter-from-natural-sources/at\\_download/file](http://www.eea.europa.eu/publications/particulate-matter-from-natural-sources/at_download/file)

## IEA & IEA/AMF News

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### ExCo44 held in Beijing, China

The 44th Meeting of the AMF Executive Committee was held 24-26 October 2012 in Beijing, China, kindly hosted by CATARC. There were 31 participants, including Israel and ANGVA as Observers. South Korea was welcomed as a new Contracting Party.

Four Annex Proposals were presented, and one of these - the project „Alcohol Application in CI Engines“ - was started as Annex 46 with DTU as Operating Agent.

The Executive Committee has for a two-year period of service elected a new team of chairpersons:

- ExCo Chair: Sandra Hermle
- Regional Vice-Chair for Asia: Shinichi Goto
- Regional Vice-Chair for North America: Kevin Stork
- Senior Vice-Chair: Nils-Olof Nylund

Outreach activities include production of a printed Annual Report, refreshing of the website (soon to be found at [www.iea-amf.org](http://www.iea-amf.org)) and distribution of USB drives with AMF reports and outreach documents. USB drives are available from the Secretary upon request.

Cooperation with other Implementing Agreements includes joint work with IEA Bioenergy in Annex 39, possible joint work with the Combustion Implementing Agreement in Annex 46, and possible joint sessions with IEA Bioenergy Task 39 at ISAF 2013 and ISAF 2015.

ExCo 45 is scheduled for 28 - 30 May 2013 in Gothenburg, Sweden.

### Personal Move to IEA Secretariat

Jean-Francois Gagne, former Canadian Delegate to AMF and Chair of the AMF Executive Committee, has left National Resources Canada to take on the role of Head of the Energy Technology Policy Division within the IEA Secretariat in Paris.

“I am very happy to announce that in my new role with the IEA Secretariat, I hope to continue to work with AMF and other Implementing Agreements to help increase the cooperation between actors in the energy technology network and the IEA Secretariat, and to help build communication channels to ensure that the work of Implementing Agreements is relevant to, and has a proper impact on, the information produced by the IEA. I hope to contribute to helping AMF continue on its great path of strategically thinking about its work in light of CERT and IEA priorities, and to help provide clear guidance on how this can be done. I will work towards providing the Secretariat with inside knowledge of Implementing Agreements mechanisms, to help desk officers provide the best support they can, and to also help Implementing Agreements increase their opportunities for inputting into IEA information and advice”, JF says in his farewell to his AMF colleagues.

The AMF Executive Committee deeply appreciates the valuable contributions that JF Gagne has made to AMF both as Canadian Delegate and as Chair to the Executive Committee. AMF is looking forward to continue cooperating with JF in his new role at the IEA Secretariat.

### AMF Annexes / Projects

- Annex 28: Information Service & AMF Website
- Annex 35 Subtask 2: Particulate Measurements: Ethanol and Butanol in DISI Engines
- Annex 37: Fuel and Technology Alternatives for Buses (closed at ExCo 43)
- Annex 38 Phase 2: Environmental Impact of Biodiesel Vehicles

- Annex 39 Phase 2: Enhanced Emission Performance of HD Methane Engines
- Annex 40: Life Cycle Analysis of Transportation Fuel Pathways (closed at ExCo 43)
- Annex 41: Alternative Fuels for Marine Applications
- Annex 42: Toxicity of Exhaust Gases and Particles from IC-Engines
- Annex 43: Performance Evaluation of Passenger Car, Fuel, and Powerplant Options
- Annex 44: Alcohol fuels including methanol, by CATARC, China
- Annex 45: Hydrotreated vegetable oil, by Germany and Denmark
- Annex 46: Alcohol Application in CI Engines, by DTU

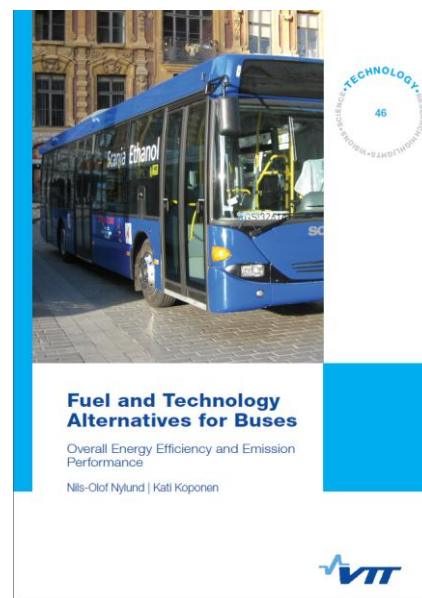
## Recently released Annex Reports

- **Fuel and Technology Alternatives for Buses:** This is the final report of the Advanced Motor Fuels Implementing Agreement Annex 37, which was prepared in cooperation with IEA Bioenergy and other transport related Implementing Agreements. The objective of the project was to generate unbiased and solid data for use by policy- and decision-makers responsible for public transport using buses.

Link: <http://www.vtt.fi/inf/pdf/technology/2012/T46.pdf>

- **Life Cycle Analysis of Transportation Fuel Pathways:** This is the final report of the Advanced Motor Fuels Implementing Agreement Annex 40. It delivers advice to policy makers on how to use LCA results for transport fuels and what the constraints of the tool are.

Link: <http://www.iea-amf.vtt.fi/8annexreports.html>



## PUBLICATIONS

- **Renewables Information 2012:** This IEA Brochure provides a comprehensive review of historical and current market trends in OECD countries, including 2011 preliminary data.  
Link: [http://www.oecd-ilibrary.org/energy/renewables-information-2012\\_renew-2012-en](http://www.oecd-ilibrary.org/energy/renewables-information-2012_renew-2012-en)
- **Energy Balances of non-OECD Countries 2012:** This volume contains data for 2009 and 2010 on the supply and consumption of coal, oil, natural gas, electricity, heat, renewables and waste presented as comprehensive energy balances. Data are expressed in thousand tonnes of oil equivalent for over 100 non-OECD countries.  
Link: [http://www.oecd-ilibrary.org/energy/energy-balances-of-non-oecd-countries-2012\\_energy\\_bal\\_non-oecd-2012-en](http://www.oecd-ilibrary.org/energy/energy-balances-of-non-oecd-countries-2012_energy_bal_non-oecd-2012-en)
- **Technology Roadmap: Fuel Economy of Road Vehicles:** This roadmap explores the potential improvement of existing technologies to enhance the average fuel economy of motorised vehicles; the roadmap's vision is to achieve a 30% to 50% reduction in fuel use per kilometre from new road vehicles.  
Link: <http://iea.org/publications/freepublications/publication/name,31269,en.html>
- **Policy Pathways: Improving the Fuel Economy of Road Vehicles - A policy package:** The transportation sector accounts for approximately one-fifth of global final energy consumption and will account for nearly all future growth in oil use, particularly for road vehicles. The right policy mix can allow countries to improve the fuel economy of road vehicles, which in turn can enhance energy security and reduce CO2 emissions.  
Link: <http://iea.org/publications/freepublications/publication/name,31268,en.html>
- **CARS 21 (Competitive Automotive Regulatory System for the 21st century) Final Report:** Alternative long-term options for substituting oil as energy source for propulsion in transport are electricity, hydrogen, liquid biofuels and bio-methane; methane as a complementary fuel; and LPG as a possible supplement.  
Link: [http://ec.europa.eu/enterprise/sectors/automotive/files/cars-21-final-report-2012\\_en.pdf](http://ec.europa.eu/enterprise/sectors/automotive/files/cars-21-final-report-2012_en.pdf)



## EVENTS

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2<sup>nd</sup> Aachen Colloquium China, 6-7 November 2012, Beijing, China

Conference website: <http://www.aachen-colloquium-china.com/>

NGV Global 2012 Conference and Exhibition, 7-9 November 2012, Mexico City, Mexico

Conference website: <http://www.ngv2012.com/>

IEA Bioenergy Conference 2012, 13-15 November 2012, Vienna, Austria

Conference website: <http://www.ieabioenergy2012.org/>

4<sup>th</sup> International Conference on Biofuels Standards: Current Issues, Future Trends, 13-15 November 2012, Gaithersburg, USA

Conference website: <http://www.nist.gov/mml/biofuels-standards.cfm>

FISITA 2012 World Automotive Congress, 27-30 November 2012, Beijing, China

Conference website: <http://www.fisita2012.com/>

Fuels – Conventional and Future Energy for Automobiles, 15-17 January 2013, Stuttgart/Ostfildern, Germany

Conference website: <http://www.tae.de/en/kolloquien-symposien/7th-international-colloquium-fuels.html>

20<sup>th</sup> International Symposium on Alcohol Fuels (ISAF 2013), 25-27 March 2013, Stellenbosch, South Africa

Conference website: <http://www.isaf2013.co.za/>

Transportation Technology and Fuels Forum (TTFF), February 2013, Ottawa, Canada

3rd International Conference on Lignocellulosic Ethanol, 3-5 April 2013, Madrid, Spain

Alternative Clean Transportation Expo, 24-27 June 2013, Washington, DC, USA

Conference website: <http://www.actexpo.com/index.html>

## IEA AMF Delegates

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### **Australia**

Department of the Environment  
Sharon Rees

### **Austria**

Austrian Federal Ministry for Transport  
Andreas Dorda

### **Canada**

CanmetENERGY  
Cheri-Ann MacKinlay

### **People's Republic of China**

CATARC, Maodong Fang

### **Denmark**

DTU, Jesper Schramm

### **Finland**

VTT, Nils-Olof Nylund

### **France**

ADEME, Patrick Coroller

### **Germany**

FNR, Birger Kerckow

### **Italy**

Eni SpA, Pietro Scorletti

### **Japan**

AIST, Shinichi Goto  
LEVO, Nobuichi Ueda

### **South Korea**

KETEP, Hyun-choon Cho

### **Spain**

IDAE, Francisco José Domínguez Pérez

### **Sweden**

Swedish Transport Administration  
Olle Hådel

### **Switzerland**

SFOE, Sandra Hermle

### **Thailand**

NSTDA, Coovattanachai Naksitte

### **The United States**

DOE, Kevin Stork

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