

AMFI Newsletter



DuPont opens commercial-scale cellulosic ethanol plant in Iowa

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

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A group of authors prepares contributions to this newsletter:

- Ralph MCGILL, FEEC
- Werner TOBER and Robert ROSENITSCH, TU Vienna
- Shinichi GOTO, AIST
- Manfred WÖRGETTER, BIOENERGY 2020+

Editing by Dina Bacovsky and Christa Kristöfel, BIOENERGY 2020+.

Checking by Ralph McGill, FEEC and Päivi Aakko-Saksa, VTT.

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GENERAL INTEREST

Renewable Fuel Volumes for the US published

Both the Renewable Fuel Standard (RFS) in the United States and the recent updates to the Renewable Energy Directive (RED) and Fuel Quality Directive (FQD) in the European Union are being disputed within the biofuels community.

The US Environment Protection Agency (EPA) has released the RFS volumes for 2014, 2015 and 2016 late November 2015, mandating volumes which are below the original statutory levels. The reaction from agricultural organizations, biofuels groups and politicians to the RFS announcement ranged from relief to disappointment to outrage.

One of the more positive reactions came from the biofuels advocacy group Growth Energy.

"The EPA volumes announced today are a move in the right direction," said Growth Energy co-chair and POET CEO Jeff Broin, "and they correctly call the oil industry's bluff about our ability to surpass ten percent ethanol in the U.S."

But others disagreed.

"EPA's decision today turns our nation's most successful energy policy on its head," said Bob Dinneen, president and CEO of the Renewable Fuels Association. "When EPA released its proposed RFS rule in May, the agency claimed it was attempting to get the program back on track. Today's decision, however, fails to do that. It will deepen uncertainty in the marketplace and thus chill investment in second-generation biofuels."

National Farmers Union president Roger Johnson was also sharply critical of the announcement.

"The administration's decision to issue RFS volume obligations below their statutory requirements exacerbates the serious damage already done to the renewable fuels industry and America's family farmers," said Johnson. "Clearly the administration has accepted Big Oil's talking points and paved the way for a weaker RFS to the detriment of economic prosperity in rural America and the administration's own climate change goals."

Source : <http://brownfieldagnews.com/2015/11/30/reactions-to-rfs-announcement-vary/>

Majority of Canadians Support Renewable Fuels Industry

According to a new, national survey, more than three quarters (88%) of Canadians believe more renewable fuels should be produced in Canada and that government should do more to promote the industry. The poll of 1,750 Canadians aged 18 and over showed that 85% of respondents feel pride in Canada's biofuels industry. According to the Canadian Renewable Fuels Association (CRFA), the renewable fuels industry provides Canadians with over 14,000 jobs and generates \$3.5 billion in economic activity every year.

Source: http://greenfuels.org/wp-content/uploads/2015/07/06302015_CRFA_Poll_Final.pdf

Renewable energy research progress in Mexico

Mexico ranks 9th in the world in crude oil reserves, 4th in natural gas reserves in America and it is also highly rich in renewable energy sources (solar, wind, biomass, hydropower and geothermal).

However, the potential of this type of energy has not been fully exploited. Hydropower is the renewable energy source with the highest installed capacity within the country (11,603 MW), while geothermal power capacity (958 MW) makes Mexico to be ranked 4th in the use of this energy worldwide. Wind energy potential is concentrated in five different zones, mainly in the state of Oaxaca, and solar energy has a high potential due to Mexico's ideal location in the so called Solar Belt. Biomass energy has the highest potential (2635 to 3771 PJ/year) and has been the subject of the highest number of research publications in the country during the last 30 years (1982–2012). Universidad Nacional Autonoma de Mexico has led research publications in hydropower, wind, solar and biomass energy and Instituto de Investigaciones Electricas in geothermal energy during this period. According to the General Law for Climate Change the country has set the goal of generating 35% of its energy needs from renewable sources by 2024. This paper presents an overview of the renewable energy options available in Mexico, current status, main positive results to date and future potential. It also analyses barriers hindering improvements and proposes pertinent solutions.

Source: <http://www.sciencedirect.com/science/article/pii/S1364032114000148>

European Commission invests to support key transport projects

The European Commission is taking action to stimulate investment in Europe by launching the *second call for proposals of the Connecting Europe Facility (CEF)* endowed with more than €7.6 billion to finance key transport projects. This year's Call for proposal has a special focus on innovative transport. Under the general envelope (€1.1 billion, available to all 28 Member States), sought projects will include Intelligent Transport Systems or traffic management systems such as ERTMS (rail), SESAR (air) or RIS (waterways). The "cohesion" envelope (€6.5 billion, available to 15 Member States) will add to these priorities key infrastructure projects in sustainable transport modes such as rail and inland waterways. This is part and parcel of the Commission's priority to create an Energy-Union with a forward-looking climate policy.

Support will be granted on a competitive basis in the form of EU co-financing, following a thorough evaluation and selection process. Applicants have until 16 February 2016 to submit their proposals. The outcome of the calls will be published by summer 2016.

Source: http://ec.europa.eu/transport/newsletters/2015/11-09/articles/cef_plan_en.htm

Impact of real-world driving on emissions from UK cars

Passenger cars and vans contribute to 17% of the UK's total CO₂ emissions and have an important role in meeting future targets. Despite rapid falls in the official emissions of new cars sold in the UK, evidence of a growing 'gap' between official and real-world driving CO₂ emissions has received attention, and Government has become increasingly aware of the risks. The Committee on Climate Change commissioned Element Energy and ICCT to understand in detail the specific contributions to the emissions gap for the UK car and van fleet. The study also analyses the potential long-term impact of new laboratory and on-road test procedures such as the Worldwide harmonized Light vehicles Test Procedures (WLTP) and the extent to which they can close the gap. The authors of the study recommend that regulators and the industry should continue to work towards a timely introduction of the WLTP as currently planned in 2017, while also turning their attention to further changes in test procedures and a pathway to testing based on real driving emissions.

Source: <https://www.theccc.org.uk/publication/impact-of-real-world-driving-emissions/>

Study : <https://d2kjsx2p8nxa8ft.cloudfront.net/wp-content/uploads/2015/09/Impact-of-real-world-driving-emissions-for-UK-cars-and-vans.pdf>

Vehicle standards to improve fuel economy and reduce emissions

Nine countries and regions, which together account for 75% of global fuel consumption by light-duty vehicles, have adopted mandatory or voluntary vehicle standards for increasing fuel economy and reducing greenhouse gas (GHG) emissions. The intent and structure of these emissions policies vary widely around the world.

Read more at: <http://www.eia.gov/todayinenergy/detail.cfm?id=23572&src=email>

EPA: Greenhouse Gas Emissions from Aircraft

The US Environmental Protection Agency (EPA) is releasing information about the international process underway by the International Civil Aviation Organization (ICAO, a body of the United Nations with 191 member states), developing carbon dioxide (CO₂) standards for aircraft. For the past five years, ICAO has been working to develop international CO₂ emissions standards for aircraft. EPA and the Federal Aviation Administration, representing the US, are participating in this process to ensure that any standards achieve meaningful CO₂ emissions reductions through policies that are equitable across national boundaries. The ICAO standards are expected to be adopted in early 2016.

For more information visit <http://epa.gov/otaq/aviation.htm>.

Source: <http://yosemite.epa.gov/opa/admpress.nsf/e51aa292bac25b0b85257359003d925f/4a0cc9026f4cbcc285257e60005c15f8!OpenDocument>

ALCOHOLS AND (BIO)GASOLINE

New enzyme cuts chemical use at ethanol plants

Biological solutions provider Novozymes has launched Avantec Amp, an advanced enzyme product that improves yield and throughput in corn ethanol production, while increasing corn oil extraction and reducing the need for several harsh chemicals used in ethanol production. By switching from standard enzyme technology to Avantec Amp, a typical ethanol plant with a capacity of 110 million gallons can make up to \$2.5 million (€2.3 million) a year in additional net profits.

Avantec Amp is a continuation of the original Avantec, introduced in 2012, with the addition of some new benefits. It combines multiple enzyme activities into one product, squeezing more ethanol from each kernel of corn and enabling increased output from the ethanol plant. This saves energy and water, and increases return on invested capital. It can also boost corn oil production, an increasingly important revenue stream in the industry, by freeing up oil bound in the corn germ.

In addition, Avantec Amp reduces the need for a number of chemicals used to control and accelerate production processes at ethanol plants. Urea, which is used to improve the fermentation of ethanol, can be cut by more than 70%. Surfactants and ammonia, used to extract corn oil and adjust pH levels, can also be reduced. Avantec Amp is the first enzyme product to replace urea and surfactants.

Source: http://biofuels-news.com/display_news/9801/new_enzyme_cuts_chemical_use_at_ethanol_plants/

ICM pilot plant demonstrates performance

ICM Inc. announced successful completion of two 1,000-hour performance runs of its patent-pending

Generation 2.0 Co-Located Cellulosic Ethanol process at its cellulosic ethanol pilot plant in St. Joseph, Missouri. This is an important step toward the commercialization of cellulosic ethanol from switchgrass and energy sorghum. ICM's pilot plant is located next to a corn grain ethanol biorefinery, which lowered the costs because both plants could share utilities and infrastructure.

Read more on the ICM press release.

Source: <http://www.icminc.com/icm-media/whats-new-at-icm/23-press-releases/231-icm-successfully-completes-two-1-000-hour-generation-2-0-cellulose-to.html>

DuPont opens commercial-scale cellulosic ethanol plant in Iowa

Last October, DuPont celebrated the opening of its cellulosic biofuel facility in Nevada, Iowa. This biorefinery is the world's largest cellulosic ethanol plant, with the capacity to produce 30 million gallons per year of clean fuel that offers a 90 percent reduction in greenhouse gas emissions as compared to gasoline.



The raw material used to produce the ethanol is corn stover – the stalks, leaves and cobs left in a field after harvest. The facility will demonstrate at commercial scale that nonfood feedstocks from agriculture can be the renewable raw material to power the future

energy demands of society. Vital to the supply chain and the entire operation of the Nevada biorefinery are close to 500 local farmers, who will provide the annual 375,000 dry tons of stover needed to produce this cellulosic ethanol from within a 30-mile radius of the facility. In addition to providing a brand-new revenue stream for these growers, the plant will create 85 full-time jobs at the plant and more than 150 seasonal local jobs in Iowa.

In Asia, DuPont recently announced its first licensing agreement with New Tianlong Industry to build China's largest cellulosic ethanol plant, and last fall a Memorandum of Understanding (MOU) was announced between DuPont, Ethanol Europe and the government of Macedonia to develop a second-generation biorefinery project. The company also is working in partnership with Procter & Gamble to use cellulosic ethanol in North American Tide® laundry detergents.

Source: <http://www.biomassmagazine.com/articles/12521/dupont-opens-commercial-scale-cellulosic-ethanol-plant-in-iowa>

Woody Biomass Converted to Gasoline by Five-Company Team

An international consortium of five companies and organizations came together in a joint effort to transform woody biomass, including trees and wood waste, into a gasoline product suitable for use in today's automobiles. Through their collaborative efforts, Haldor Topsoe, The Gas Technology Institute, Andritz Oy, UPM-Kymmene Corporation, and Phillips 66 succeeded in producing more than 10,000 gallons of gasoline. This gasoline passed the engine emission test for registration as a transportation fuel by the U.S. Environmental Protection Agency (EPA).

The collaborative project was cost shared between the project participants and the U.S. Department of Energy's Office of Bioenergy Technologies Office (BETO) using funding provided by the American Recovery and Reinvestment Act. The purpose of the project was to design and demonstrate the

conversion of non-food biomass feedstocks to transportation fuel. BETO is focusing its technology demonstration and market penetration efforts on demonstrating pathways of producing biofuels from biomass such as tree harvesting residues, agricultural residue, grasses, and algae.

The Haldor Topsoe process converts woody biomass to green gasoline with 74% lower greenhouse gas emissions than conventional petroleum-derived gasoline. The Haldor Topsoe gasoline has similar octane levels of commercial gasoline blends, and has been demonstrated to provide the same type of engine performance.



The wood pellets were prepared at an independent mill in Ladysmith, Wisconsin, and shipped to the Gas Technology Institute's facility in Des Plaines, Illinois. The wood was converted to a synthesis gas with a fluidized-bed steam-oxygen gasifier, and tars and other impurities were removed from the synthesis gas by a catalytic tar reformer jointly developed by Andritz and Haldor Topsoe.

Following synthesis gas cleanup and compression, the resulting clean synthesis gas was converted to gasoline through the Topsoe Improved Gasoline Synthesis process, which features a combined methanol-dimethyl ether synthesis reactor. This conversion process was then followed by a catalytic transformation of the dimethyl ether into gasoline long hydrocarbons.

After the fuel was produced, Phillips 66 analyzed the resulting gasoline at its research center in Bartlesville, Oklahoma, to determine its chemical contents. Following characterization, some of this gasoline was sent to the Southwest Research Institute in San Antonio, Texas. There, the fuel was used in single-engine emissions testing. The test results were used by Phillips 66 for the EPA registration application. In August 2015, EPA approved the application, thereby registering the gasoline blend that is up to 80% biogasoline from a renewable cellulosic source. The registration belongs to Phillips 66.

Following the engine test, the remainder of the fuel was blended with conventional gasoline, ethanol, and other additives to make a green gasoline blend-fuel for a fleet test that was supervised by Phillips 66. The blend was 45% bio-gasoline, 45% conventional gasoline, and 10% ethanol.

Eight cars and trucks were used in the comparison fleet test. Each vehicle logged 75,000 miles. Four of the vehicles used a green gasoline blend, and four used conventional gasoline. No statistically significant differences in performance were observed between the vehicles used in the fleet test. These test results show that this international consortium have successfully developed a process capable of producing a gasoline fuel that is compatible with existing automobiles.

Source: <http://energy.gov/eere/articles/woody-biomass-converted-gasoline-five-company-team>

BIODIESEL ESTERS

New biodiesel plant in France

French biofuels producer Avril has opened a 100,000 t/year biodiesel plant to meet the higher blending levels issued by the French government. The plant will raise the company's biodiesel production capacity to 1.7 million t. In 2013 Avril shut down its two northern France facilities in the aftermath of the government's refusal to raise biodiesel blending level beyond 7%. However, late last year the government agreed to increase the blend level by 1%, bringing it to 8%. The €13 million Avril plant is set to compete with Total's planned factory, also to be constructed in southern France and expected to have an output of 500,000 t of biodiesel by 2017.

Source: http://biofuels-news.com/display_news/9814/avril_opens_100000_tpy_biodiesel_plant_in_mediterranean_france/

Brazil seeks to increase biodiesel blend in regular fuel

The Brazilian government wants to increase the share of biodiesel in mineral diesel in order to hit the country's greenhouse gas reduction targets. In addition to increasing the biodiesel blend, there are also plans to increase the use of bioenergy sources such as second-generation ethanol for vehicles, and biomass to generate electricity. Biodiesel may also benefit parties other than just the biofuels production chain, as they can potentially reduce Brazil's healthcare bill due to fewer people developing health conditions from air pollution caused by fossil fuels.

Source: http://biofuels-news.com/display_news/9812/brazil_seeks_to_increase_biodiesel_blend_in_regular_fuel/

Argentina's biodiesel production expected to fall 30% in 2015

Argentina's biodiesel production is expected to decrease by 30% in 2015 as growth of domestic demand cannot compensate for declining foreign exports.

The Argentine Biofuels and Hydrogen Association (ABHA) estimates this year's total biodiesel output to cap at 1.8 million tons, a significant decrease from 2.58 million tons in 2014.

Exports are expected to decline by 55% and the domestic Argentinian consumption, due to rise 11%, will not be able to make up the difference. The decrease means that the country's biodiesel industry is working only at approximately 40% of its total 4.6 million tons per year installed capacity.

Argentina biodiesel exports began dwindling in 2012 when the EU raised taxes on biodiesel imports after suspected product dumping by Argentina. Argentina has filed a complaint with the World Trade Organisation against the EU anti-dumping taxes.

Source: http://biofuels-news.com/display_news/9837/argentinas_biodiesel_production_expected_to_fall_30_in_2015/

Thailand: Workshop on partially hydrogenated FAME (H-FAME)

The Workshop was successfully co-organized and conducted by National Institute of Advanced Industrial Science and Technology (AIST) and National Metal and Materials Technology Center (MTEC) under auspicious patronage by Science and Technology Agency (JST) and Japan International Cooperation Agency (JICA), in collaboration with partners from Science and Technology Research Partnership for Sustainable Development (SATREPS) namely Thailand Institute of Scientific

Technological Research (TISTR) and King Mongkut's University of Technology North Bangkok (KMUTNB), with supports from Department of Alternative Energy Development and Efficiency (DEDE), Isuzu group and Thai Oil group.



Since current conventional fatty acid methyl ester (FAME), or biodiesel, has a blending limit of 7% in fossil diesel according to engine manufacturers' warranty, partial hydrogenation technology is developed by the SATREPS project to upgrade conventional biodiesel to H-FAME (partially hydrogenated FAME) in order to increase blending limit. H-

FAME has been produced from palm oil with properties exceeding all international biodiesel standards, including that by guidelines of Worldwide Fuel Charter (WWFC), and rigorously tested as B20 blended fuel in an unmodified common rail vehicle over 50,000km without any problem.

Aligned with the recently revised Alternative Energy Development Plan (AEDP: 2015-2036), H-FAME, for the first time, was included as potential fuel to increase % blending of biodiesel. This workshop has helped to strategies among ASEAN countries for high blend of biodiesel in the future.

Sources: <http://www.mtec.or.th/h-fame>; <http://www.jica.go.jp/project/thailand/011/index.html>

Jatrodiesel biodiesel plant comes online in US

A 5 million gallon per year supercritical biodiesel plant in Illinois, US, designed and built by Jatrodiesel, has been commissioned and is now operational. The facility is co-located with the 125 million gallon per year Patriot Renewable Fuels ethanol plant in Annawan. It makes use of the existing refinery's infrastructure, steam, and distillers corn oil byproduct to produce biodiesel.

According to Jatrodiesel, the plant uses a single-stage process that eliminates esterification and transesterification and is not limited by the free fatty acid levels in the feedstock. This method reduces the cost of traditional biodiesel production by 25-28%, the company says.

Source: http://biofuels-news.com/display_news/9848/jatrodiesel_biodiesel_plant_comes_online_in_us/

GASEOUS FUELS AND LNG

Methane leakage from the natural gas supply chain

A recently published study has concluded that fugitive methane leakage from the natural gas supply chain significantly exceeds earlier estimates. The study, "Methane Emissions from United States Natural Gas Gathering and Processing" was published in the journal Environmental Science & Technology and says natural-gas gathering facilities, which collect from multiple wells, lose about 100



billion cubic feet of natural gas a year, about eight times as much as estimates used by the Environmental Protection Agency. The study was carried out by researchers at Colorado State University and involved measurements of 114 natural-gas gathering facilities and 16 processing plants in 13 states.

Many gathering facilities use puffs of natural gas in valves that open and close to regulate gas or liquid flow, releasing a bit of methane into the air with every cycle. The study recommends to substitute relatively inexpensive technologies for the methane-leaking systems. This would get the methane back in the sales line, which is the best for both the companies and the environment.

Source: <http://www.ngvtoday.org/2015/08/27/reducing-methane-leakage-from-natgas-supply-chain-in-everybodys-best-interest/>

Methane tractor in Germany

The German University of Rostock has developed a tractor on natural gas in cooperation with manufacturer Deutz AG. Scientists of the university transformed the diesel engine the tractor comes equipped with into a natural gas engine by substituting the diesel injectors with sparkplugs and fitting a system to introduce gas into the cylinders. 'The engine has passed all the tests', says Sasche Prehn of the university of Rostock. The tractor can also run on biomethane. Emissions of methane are practically zero, according to the university.

Deutz is not the only company working on a tractor that can run on natural gas. Manufacturer New Holland presented a prototype in 2013. The company took a second prototype of the tractor to a trade fair in Paris in 2015. It said it's still reviewing market potential before taking a decision to take into production. In the meantime the tractor is being evaluated at a farm in Turin, Italy.

The tractor that University of Rostock developed with Deutz will also be tried in real life conditions on the campus of the Thuenen Institute for ecological agriculture. Both Deutz and New Holland – and other tractor manufacturers - see clear possibilities for extensive use of biomethane as an alternative fuel in agriculture. Many farmers are already familiar with biofuels and would be able to produce their own biomethane from renewable biomass generated by their activities.



Source: <http://www.ngvaeurope.eu/university-in-germany-turns-diesel-tractor-into-ngv-to-stimulate-use-of-biomethane>

New tenders for city buses will favor natural gas and biomethane

Nearly half of new city buses that will be purchased by public transport operators and authorities in the coming years will be fueled by natural gas, a survey by the international organization of public transport operators UITP revealed.

The 70 public transport operators that participated in the survey – serving a population of 100 million people with a fleet of 70.000 buses in 63 cities across Europe –favor alternative fuels across the board. More than 28% of respondents indicate they intend to purchase buses fueled by CNG, another 13% will invest in buses running on biomethane. More than 40% of the respondents want to buy buses with electric propulsion, in particular hybrid systems of which a significant part will be fueled by CNG.

The increased interest in natural gas as a fuel is picked up by manufacturers, many of whom feature natural gas buses in their product line-up. At the Bus World trade fair in Kortrijk (Belgium) manufacturers presented several new models running on natural gas, both for the urban and suburban environment.

Source: <http://www.ngvaeurope.eu/new-tenders-for-city-buses-will-favour-natural-gas-and-biomethane>

China : 6th ANGVA Biennial International Conference & Exhibition

China Automotive Technology and Research Center organized the 6th ANGVA (Asia Pacific Natural Gas Vehicles Association) in Chengdu, China from 4-6 Nov. 2015. 196 exhibitors from 20 countries attended ANGVA 2015 (35 Oversea exhibitors, 161 domestic exhibitors). With an area of 22,800 m², the exhibition attracted more than 5000 visitors (over 300 foreign visitors) surpassing 10,000 visits. ANGVA 2015 has 481 conference delegates, in which 103 are overseas participants from 25 countries and 40 speakers (20 foreign speakers from 15 countries) made presentations.



Source: <http://www.angva2015.com/en/>

RENEWABLE DIESEL / JET

Drop-in biofuels

A new type of renewable diesel fuel is meeting the growing demand for renewable biofuels. Unlike other biofuels, hydroprocessed esters and fatty acids (HEFA) fuels are nearly indistinguishable from their petroleum counterparts. Worldwide, more than a billion gallons of HEFA fuels were produced in 2014. Hydrocarbons from nonpetroleum sources are known as drop-in fuels because they are nearly identical to comparable petroleum-based fuels. HEFA fuels are the most common drop-in biofuels; they can be used in diesel engines without the need for blending with petroleum diesel fuel. Currently, HEFA fuels are approved by ASTM International for use in jet engines at up to a 50% blend rate with petroleum jet fuel.

The most common HEFA biofuel production to date has been a diesel replacement fuel alternately marketed as hydrotreated vegetable oil (HVO) abroad, or as *renewable diesel* in the United States. HEFA fuels are produced by reacting vegetable oil or animal fat with hydrogen in the presence of a catalyst. The equipment and process are very similar to the hydrotreaters used to reduce diesel sulfur levels in petroleum refineries. There are currently 10 plants worldwide that produce renewable diesel, one of which is *ENI's former petroleum refinery* in Venice, Italy. *Total* is planning to convert its La Mede, France, refinery to HVO production, and four additional renewable diesel projects are being developed by other producers. Finnish *Neste* is the world's largest producer of renewable diesel. Other major producers are Italy's ENI, U.S.-based *Diamond Green Diesel*, and Swedish refiner *Preem*.

Beyond diesel, another outlet for HEFA fuels using similar technology is biojet fuel, which can currently be blended with petroleum jet fuel in proportions up to 50%. As with any alternative jet

fuel, HEFA biojet *has to meet stringent specifications* that ensure it will perform under a wide range of conditions. One potential consumer for this fuel is the U.S. Department of Defense, which intends to use biojet in its JP-8 jet fuel. JP-8 is a versatile fuel used in military vehicles, stationary diesel engines, and jet aircraft. This use of a common fuel simplifies logistics. There is also civilian interest in nonpetroleum jet fuel. Alaska Airlines, KLM, and United Airlines have demonstrated the use of HEFA biojet fuel on commercial flights since 2011.

Source: www.eia.gov/todayinenergy/detail.cfm?id=23692&src=email

NexBTL to power City of Oakland's municipal fleet

The City of Oakland, California began filling up its vehicles with Neste's NexBTL renewable diesel (RD) in order to reduce the emissions of their municipal fleet. Oakland is the first major US city to convert their entire fleet to RD. RD will allow the City to decrease its carbon footprint and help meet ambitious GHG reduction targets established by the City. Oakland operates 250 diesel-powered vehicles, which include street sweepers, dump trucks, tractors, construction equipment, and mowers. The City consumes about 230,000 gallons of RD per year.

NexBTL is supplied to the City of Oakland by Golden Gate Petroleum which is one of the first distributors of NexBTL in the USA. Golden Gate Petroleum sells NexBTL product through NeXgen Fuel, a company dedicated to bringing next generation fuels to the market.

Source: <https://www.neste.com/en/nestes-nexbtl-renewable-diesel-power-city-oaklands-municipal-fleet>

UPM begins field tests of wood-based diesel in Helsinki region bus traffic



In Finland, UPM will start field tests of its wood-based BioVerno diesel fuel in urban buses together with Helsinki Region Transport (HSL) and the VTT Technical Research Centre. The field tests are also supported by the St1 petrol station chain, the auto manufacturer Volvo, and the transportation company Transdev Finland. The new round of tests with UPM BioVerno fuel will start in October and run for a minimum of one year.

The BioVerno diesel has previously been studied in several engine and vehicle tests conducted by various research centers as well as in fleet tests with positive results. The studies have shown the diesel works exactly like the best quality fossil diesel fuels and reduces tail pipe emissions significantly compared to fossil diesel. The heavy duty vehicle field tests will focus on investigating UPM's renewable diesel in terms of fuel functionality in bus engines, their emissions, and fuel consumption compared to fossil diesel.

The bus field tests are part of a larger BioPilot project coordinated by VTT with the goal of encouraging companies to commercialize renewable energy solutions in traffic. According to Nils-Olof Nylund, research professor at VTT, advanced sustainable biofuels are a great opportunity for Finland.

UPM's renewable diesel, known as UPM BioVerno, reduces greenhouse gas emissions by up to 80% when compared with fossil fuels, with the latest studies also showing that the BioVerno diesel also reduces tailpipe emissions.

The biofuel is produced from crude tall oil, a residue of the pulp industry, with no edible materials

being used. UPM started the production of wood based renewable diesel in January 2015 at the UPM Lappeenranta Biorefinery with a production capacity of 120 million liters per year.

Source: http://biofuels-news.com/display_news/9783/upm_begins_field_tests_of_woodbased_diesel_in_helsinki_region_bus_traffic/

Pushing for Aviation Biofuel

All airline companies operating in Indonesia will be obliged to use aviation biofuel for their aircraft instead of avtur from 2018 onwards, which aims to help reduce air pollution, Minister of Transportation Ignasius Jonan has said. According to the minister, the government had planned to produce aviation biofuel from palm oil or water hyacinth as raw materials, the supply of which is abundant in Indonesia.

Source: <http://www.globalindonesianvoices.com/23247/pushing-for-aviation-biofuel/>

Neste and Boeing: commercialization of renewable aviation fuels

Neste and Boeing will work together to promote and accelerate the commercialization of renewable aviation fuel. The companies will work toward American Society for Testing and Materials (ASTM) fuel standard approval allowing the commercial use of high freezing point renewable aviation fuel by airlines. The goal is also to gain widespread market acceptance for renewable aviation fuels, and to progress sustainability accreditation efforts.

Neste anticipates that its high-quality renewable aviation fuel could help the aviation industry to achieve its greenhouse gas saving targets: carbon-neutral growth from 2020 and a net reduction in carbon emissions of 50% by 2050 compared to 2005.

Source: *Neste Corporation Press Release 4 November 2015 at 4 pm (EET)*

OTHER FUELS AND VEHICLES

Two thirds of Sweden's buses run on renewable fuels

In Sweden, renewable fuels now make up two thirds of total fuel consumption of buses in public transport, new statistics show.

According to the Swedish Public Transport Association data, the use of renewables in Sweden's public transportation has increased from six to 58% from 2006-2014. This year, renewables accounted for 67% of fuel used by buses. The biggest consumer of biofuels is Stockholm County, where renewables make up 85.7% of public transport's fuel consumption. Biodiesel is the most popular choice of renewable fuel, followed by biogas and ED95 ethanol. In 2014, renewables accounted for 12.1% of fuel used by the whole Swedish transport sector.

Source: http://biofuels-news.com/display_news/9855/two_thirds_of_swedens_buses_run_on_renewable_fuels/

Preparing the next 40 years of IEA technology collaboration

The International Energy Agency (IEA) is made up of 29 member countries. IEA supports a global network of some 6,000 energy technology researchers and experts that enable the sharing of best practices across the planet. On 18 September 2015 the IEA convened a consultation meeting



"Preparing the next 40 years of multilateral energy technology collaboration". "We are on the verge of a new era of energy system transformation and innovation", said Alicia Mignone, Chair of the IEA Committee on Energy Research and Technology. "We need to take full opportunity of these amazing instruments that are the IEA Implementing Agreements to ensure that the IEA remains at the forefront of energy technology analysis."

Worldwide 268 distinct entities participate in Implementing Agreements; 38 % are dedicated to efficiency followed by Renewable Energy including hydrogen (24%) and fusion (22 %). A full participation tables may be viewed here: www.iea.org/media/impag/CurrentparticipantsinIIAs.pdf.

ExCo 50 in Jerusalem, Israel

16 AMF Delegates and Annex Operating Agents, and 15 experts from industry, academia and government in Israel attended the 50th meeting of the AMF Executive Committee 26-29 October 2015. Intense information exchange on the topics of the current projects took place, and 3 new projects were initiated.

The first one, Annex 53: Sustainable Bus Systems, has the objective to develop a methodology for setting requirements for clean and energy efficient busses for use in public transport systems. A second objective is to develop guidelines for operating public bus systems (operation and maintenance, driving cycle, test program). Current participants are Canada, Chile, Finland, Israel and Sweden, with Chile taking the lead.

The second one, Annex 54: GDI Engines and Alcohol Fuels, addresses tailpipe particle matter emissions of DISI (direct injection spark ignited) or GDI (gasoline direct injected) engines, investigates the formation of secondary aerosol emissions and GPF gasoling particle filter technologies. Current participants are Canada, Israel and the US, with Canada taking the lead.

Finally, Annex 55: Real Driving Emissions and Fuel Consumption, addresses the gap between emissions during certification cycles and real driving emissions. In real driving, especially in cities, if the ambient temperature is cold, NOx emissions of LDV are much higher than in the certification cycle. The objective of this project is to develop trustworthy real driving emissions data from existing

fleet, investigating the effects of different driving conditions, ambient temperatures and different fuels. Current participants are Canada, Israel, Sweden and the US, with the US taking the lead.

The AMF Technology Subcommittee specifically appreciated the project on real driving emissions. AMF should contribute to the understanding of the problem, provide an understanding if this is just a problem of Volkswagen or also of others, and investigate whether technology is available to fulfill the expectations.

Information exchange on advanced motor fuels, and Implementing Agreement business was rounded off by visit to the Weizmann Institute of Science and a small scale gas-to-liquid pilot plant, a tour through Jerusalem and one through the old port in Jaffo.



New member: Chile

AMF welcomes Chile as a new member to the Implementing Agreement. Chile is the first country in South America to join, and will provide a link between South America and AMF. In South America, harmonization of standards regarding vehicles and fuels is very important but difficult to achieve. South America faces problems with local air pollution, much of it resulting from transport.

One major challenge in Latin America is that the sulfur level in fossil fuels is >500 ppm in most countries, which is too high for applying modern and clean engine and/or after-treatment technologies. Also, the system of enforcement of vehicle standards is not strong, and type approval is often not strictly enforced by the government.

In Chile, the current growth of the vehicle fleet has three major impacts: it increases the energy supply risk, leads to air pollution in big cities, and currently accounts for 30% of Chile's CO₂ emissions. In reaction to this, there is an awareness raising campaign, (<http://www.compraunautolimpio.cl>), and the government has introduced the first mandatory fuel efficiency and CO₂ emission labeling system for LDV in developing countries.

Current AMF Annexes / Projects

Annex 28: Information Service & AMF Website (AMFI)

Annex 43: Performance Evaluation of Passenger Car, Fuel, and Powerplant Options

Annex 44: Alcohol fuels including methanol, by CATARC, China

Annex 47: Reconsideration of DME Fuel Specifications for Vehicles

Annex 48: Value Proposition Study on Natural Gas Pathways for Road Vehicles

Annex 49: COMVEC – Fuel and Technology Alternatives for Commercial Vehicles

Annex 50: Fuel and Technology Alternatives in Non-Road Engines

Annex 51: Methane Emission Control

Annex 52: Fuels for Efficiency

NEW! Annex 53: Sustainable Bus Systems

NEW! Annex 54: GDI Engines and Alcohol Fuels

NEW! Annex 55: Real Driving Emissions and Fuel Consumption

Next ExCo Meetings

ExCo 51 will be held 2-5 May 2016 in Chicago, USA.

PUBLICATIONS

- **IEA Statistics - CO₂ Emissions from Fuel Combustion:** In recognition of fundamental changes in the way governments approach energy related environmental issues, the IEA has prepared this publication on CO₂ emissions from fuel combustion. This annual publication was first published in 1997 and has become an essential tool for analysts and policy makers in many international forums such as the Conference of the Parties, which will be meeting in Paris, France from 30 November to 11 December 2015. The data in this book are designed to assist in understanding the evolution of the emissions of CO₂ from 1971 to 2013 for more than 140 countries and regions by sector and by fuel. Emissions were calculated using IEA energy databases and the default methods and emission factors from the 2006 *IPCC Guidelines for National Greenhouse Gas Inventories*.
Link: http://www.iea.org/bookshop/669-CO2_Emissions_from_Fuel_Combustion
- **World Energy Outlook Special Report 2015: Energy and Climate Change:** The report presents a detailed first assessment of the energy sector impact of known and signaled national climate pledges for COP21. It proposes a bridging strategy to deliver a near-term peak in global energy-related greenhouse-gas emissions, based on five pragmatic measures that can advance climate goals through the energy sector without blunting economic growth. The paper highlights the urgent need to accelerate the development of emerging technologies that are, ultimately, essential to transforming the global energy system into one that is consistent with the world's climate goals and recommends four key pillars on which COP21 can build success, from an energy sector perspective.
Link: <http://www.iea.org/publications/freepublications/publication/WEO2015SpecialReportonEnergyandClimateChange.pdf>
- **The Economic Consequences of Climate Change:** This report provides a new detailed quantitative assessment of the consequences of climate change on economic growth through to 2060 and beyond. It focuses on how climate change affects different drivers of growth, including labor productivity and capital supply, in different sectors across the world. The sectoral and regional analysis shows that while the impacts of climate change spread across all sectors and all regions, the largest negative consequences are projected to be found in the health and agricultural sectors, with damages especially strong in Africa and Asia.
Link: http://www.oecd-ilibrary.org/environment/the-economic-consequences-of-climate-change_9789264235410-en
- The **IEA-RETD report "Driving renewable energy for transport – next generation policies (RES-T-NEXT)"**, carried out by CE Delft and Stratas Advisors, evaluates in detail 17 renewable policy instruments for the three pathways of electric, hydrogen and biofuels, under consideration of three dimensions: the vehicle fleet, energy infrastructure and energy carriers. The study finds that most policy instruments increase the share of alternative powertrains, but few (also) directly target the share of renewable energy consumption.
Link: <http://iea-retd.org/archives/publications/res-t-next>

- **IEA Bioenergy Conference 2015 Conclusions:** In the context of the COP21 meeting in Paris, the IEA Bioenergy Conference 2015 had as its focus “Realising the world’s sustainable bioenergy potential”. The conference concluded that bioenergy is the largest global renewable energy contributor today; has a crucial role amongst the renewable sources of energy in providing energy storage, efficient heating, and biofuels for heavy duty vehicles, marine and aviation sectors; can significantly increase the sustainable biomass supply; can deliver substantial greenhouse gas emission reductions if done properly; and good practices examples exist and were showcased through the conference.

Link: <http://www.ieabioenergy.com/publications/iea-bioenergy-conference-2015-conclusions/>
- **Low carbon transport fuels** (Low Carbon Technology Partnerships initiative): This report gives an overview made by low carbon fuel companies. Eleven leading low carbon fuel companies from around the world have joined forces to publish a comprehensive guide of sustainable fuel technologies available today that can drive down emissions in the transport sector. The guide should help to identify the most suitable low carbon fuel technologies that can enable our societies to meet climate commitments. The report presents the current and future status of decarbonizing the transportation sector, some country case studies and an overview of the relevant technologies.

Link: <http://www.wbcsd.org/low-carbon-fuel-companies-unite-to-present-opportunities-to-reduce-greenhouse-g.aspx>
- **Trends and projections in Europe 2015 – Tracking progress towards Europe's climate and energy targets:** The 2015 edition of the annual European Environment Agency (EEA) 'Trends and projections' report provides an updated assessment of the progress of the European Union (EU) and European countries towards their climate mitigation and energy targets. The assessment of Member States’ progress towards their climate and energy targets is based on: national data on GHG emissions, renewable energy and energy consumption for 2013; and projections reported by Member States concerning expected trends in greenhouse gas emissions until 2035. The report also presents preliminary ('approximated' or 'proxy') data for the year 2014. The report supports and complements the annual assessment, by the European Commission, of the progress of the EU and its Member States towards meeting the Kyoto and EU 2020 objectives, as required by EU regulation (the Monitoring Mechanism Regulation).

Link: http://www.eea.europa.eu/publications/trends-and-projections-in-europe-2015/at_download/file
- **Renewable energy progress report:** REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. The achievement of the Energy Union requires a fundamental transformation of Europe's energy system. Renewable energy is essential for this transformation to take place as it contributes to all of the Energy Union objectives. The Renewable Energy Directive¹ with the legally binding 20% EU target, 10% target for renewable energy use in transport and the binding national targets for 2020 forms an integral part of the EU energy policy. In accordance with the requirements set out in the Renewable Energy Directive², this report provides a mid-term assessment of the progress of the EU and its Member States towards the 2020 renewable energy targets, and includes an assessment of the feasibility of 10% renewable energy target for transport, the sustainability of biofuels and bioliquids consumed in the EU and the impacts of this consumption in accordance with the requirements of the Directive.

Link: <http://www.ipex.eu/IPEXL-WEB/dossier/files/download/082dbcc54df44e0f014df680740e0283.do>

- **Eco-Mobility 2025plus – Roadmap:** Requirements on future vehicles will become more demanding than ever before. On the one hand they will need to comply with stringent future emission regulations (e.g. EU6c) under more challenging conditions (WLTP, RDE). On the other hand it seems to be certain that the European legislature will head for CO2 emission targets between 68 and 75 g/km in 2025. Additionally, social aspects which are difficult to predict such as changing consumer behavior or new mobility concepts must be taken into account. The A3PS members have summarized the following variety of technologies with the term “eco-mobility”: Environmental impact, Efficiency, Safety (zero fatality), Demographic change, Limited fossil fuels and raw material shortage. Those drivers, in the short and medium terms, will cause the development of a variety of alternative vehicle technologies and fuels, which optimally correspond to the respective application purpose and vehicle class as assumed in the figure below.

Link: <http://roadmap.a3ps.at/>

- The **European Biomass Association (AEBIOM)** recently released its annual statistical report, providing an outlook on European bioenergy for 2015, with a comprehensive overview of the latest market trends in bioheat, bioelectricity and biofuel sectors. The report mentions that while indigenous energy production—mentioned as primary in Eurostat—in the EU’s 28 countries is continuing to steadily decrease from 941 million tons in 2000 to 789 million tons in 2013, renewable energy sources (RES) have almost doubled from 97 million tons in 2000 to near 192 million tons in 2013.

Link: <https://form.jotform.com/52944405898974>

- **Algae Bioenergy Siting, Commercial Deployment and Development Analysis** - Final report available: The Project, started in January 2014, is mainly focused on the scaling up of algal bioenergy and co-product chains in European market, and it is articulated in following tasks: Siting of algae cultivation systems; Identification of the most promising bioenergy and co-product chains; Overcoming the barriers; Final wrap up and awareness raising.

Link: https://ec.europa.eu/energy/sites/ener/files/documents/ENER_C2_2012_421_1.pdf

EVENTS

Fuels of the Future, 18-19 January 2016, Berlin, Germany

Conference website: <http://www.fuels-of-the-future.com/>

World Future Energy Summit (WFES) 2016, 18-21 January 2016, Abu Dhabi, UAE

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

Lignofuels 2016 Summit, 20-21 January 2016, Munich, Germany

Conference website: <http://www.wplgroup.com/aci/event/lignocellulosic-fuel-conference-europe/>

SAE 2016 Government/Industry Meeting: The Power of Safe Sustainable Mobility, 20-22 January 2016, Washington, DC

Conference website: <http://www.sae.org/events/gim/>

Biomass & BioEnergy Asia, 26-28 January 2016, Bangkok, Thailand

Conference website: <http://www.cmtevents.com/eventschedule.aspx?ev=160102&>

Methanol Seminar on the 15-16 February 2016, Dubai, UAE.

Conference website: <http://www.gpca.org.ae/event/gpca-methanol-seminar/>

Novel Material Technologies for Alternative Powertrains, 25-26 February 2016, Thessaloniki, Greece

Conference website: http://www.aptstep.certh.gr/2nd_apt_step_workshop.en.aspx

National Biodiesel Conference & Expo, 25-28 January 2016, Tampa, Florida

Conference website: <http://biodieselconference.org/2016/>

12th Kingsman Dubai Sugar Conference, 31 January – 3 February 2016, Dubai, UAE

Conference website: http://events.platts.com/kingsman-sugar-dubai?WT.mc_id=AGEM201601CF_SC653%20Kingsman%20Dubai&WT.tsrc=Eloqua

National Ethanol Conference: Fueling a High Octane Future, 15-17 February 2016, New Orleans, LA

Conference website: <http://nationalethanolconference.com/about/>

Algae Commercialization, R&D and Business Networking Forum, 17 February 2016, Frankfurt, Germany

Conference website: <http://www.globalnetworkforums.com/algae-forum-2016>

ARPA-E 2016 Energy Innovation Summit, 29 February – 2 March 2016, National Harbor, Washington, DC

Conference website: <http://www.arpae-summit.com/Home>

37th International Vienna Motor Symposium, 28 - 29 April 2016, Vienna, Austria

Conference website: http://www.övk.at/index_en.htm

SugarTech Indonesia 2016, 16-17 March 2016, Surabaya, Indonesia

Conference website: <http://sugarindo.com/>

Symposium on Biotechnology for Fuels & Chemicals, 25-28 April 2016, Baltimore, MD

Conference website: <http://www.simbhq.org/sbfc/>

ACT Expo, 2-5 May 2016, Long Beach, CA

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

Base Oils & Lubricants Forum, 10 May 2016, Hamburg, Germany

Conference website: <http://global-network-forums.sites3.bonlineapp.com/blank>

SugarEx Philippines, 12-13 May 2016, Negros, Philippines

Conference website: <http://worldsugarexpo.com/>

TechConnect World Innovation Conference & Expo, 22-25 May 2016, Washington DC

Conference website: <http://www.techconnectworld.com/World2016/>

Alternative Fuels World Fair, 25-28 May 2016, Bologna, Italy

Conference website: http://www.altfuels2016.com/?utm_source=emBlue%20-%20Bologna&utm_medium=email&utm_term=&utm_content=&utm_campaign=Bologna%20-%20Alternative%20Fuels%20World%20Fair%201

International 100% Renewable Energy Conference 26-28 May 2016, Istanbul, Turkey

Conference website: <http://www.irenec.org/giris.php>

BIO International Convention, 6-9 June 2016, San Francisco, CA

Conference website: <http://convention.bio.org/about-bio-convention/>

20th Annual Green Chemistry & Engineering Conference, 14-16 June 2016, Portland, OR

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

Oleofuels 2016, 21-22 June 2016, Liverpool, UK

Conference website: <http://www.wplgroup.com/aci/event/oleofuels/>

International Fuel Ethanol Workshop & Expo, 20-23 June 2016, Milwaukee, WI

Conference website: http://www.fuelethanolworkshop.com/ema/DisplayPage.aspx?pageId=7_Reasons_to_Attend

6th Annual World Congress of Bioenergy, 30 June – 03 July 2016, KINTEX, Gyeonggi-do, South Korea

Conference website: <http://www.bitcongress.com/wcbe2016/default.asp>

Global Agribusiness Forum, 4-5 July 2016, Sao Paulo, Brazil

Conference website: <http://www.globalagribusinessforum.com/en>

Bioenergy 2016, 12-13 July 2016, Washington, DC

Conference website: <http://www.energy.gov/eere/bioenergy/conferences>

RENEXPO® Poland, 19-21 October 2016, Warsaw, Poland

Conference website: <http://www.renexpo-warsaw.com/index.php?id=7&L=1>

IEA AMF Delegates

Austria

Austrian Federal Ministry for Transport,
Andreas Dorda

Canada

CanmetENERGY, Niklas Ekstrom

People's Republic of China

CATARC, Donglian Tian

Denmark

DTU, Jesper Schramm

Finland

VTT, Nils-Olof Nylund

France

IFPEN, Jean-Francois Gruson

Germany

FNR, Birger Kerckow

Israel

Ministry of Energy and Water Resources,
Bracha Halaf

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,
Magnus Lindgren

Switzerland

SFOE, Sandra Hermle

Thailand

PTT, Arunratt Wuttimongkolchai

The United States

DOE, Kevin Stork

Editor: *BIOENERGY 2020+*, Gewerbepark Haag 3, A-3250 Wieselburg-Land dina.bacovsky@bioenergy2020.eu Dina Bacovsky