October 2016, issue no. 3/2016

AMFI Newsletter

Biofuels deployment progressing: read more

Co-optimization of fuels and engines: read more

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RESEARCH AND DEVELOPMENT

Semiconducting organic polymers produce alcohol

The University of Texas at Arlington has been the first to demonstrate that an organic semiconductor polymer called polyaniline is a promising photocathode material for the conversion of carbon dioxide into alcohol fuels without the need for a co-catalyst. The research group provides insights into the unique behavior of polyaniline obtained from photoelectrochemical measurements and adsorption studies, together with spectroscopic data.

Source: https://www.sciencedaily.com/releases/2016/09/160920115723.htm

US federal alternative jet fuels R&D strategy

The "Federal Alternative Jet Fuels Research and Development Strategy published in June 2016 sets out prioritized R&D goals and objectives to address key scientific and technical challenges that inhibit development, production, and use of economically viable advanced jet fuels (AJFs). These fuels would provide energy security and environmental and social benefits relative to conventional fuels, and the strategy aims to reduce duplication of effort, enhance efficiency, and encourage a coordinated R&D approach among Federal and non-Federal stakeholders. The R&D goals and objectives focuses on (1) feedstock development, production, and logistics, (2) fuel conversion and scale-up, (3) fuel testing and evaluation, and (4) integrated challenges.

Source: https://www.whitehouse.gov/sites/default/files/federal_alternative_jet_fuels_research_and_development_strategy.pdf

New data reaffirms carbon benefits of biodiesel

Biomass-based fuels present a tremendous opportunity to transition toward a more sustainable mix of renewable energy. Findings of a recent research (Professor Wally Tyner group at Purdue University) confirm that soybean oil offers very good carbon reduction when used to displace fossil fuel.

The experts are using the latest version of the Global Trade Analysis Project (GTAP) model to build upon the previous work done for CARB. Significant change results from updating the underlying data from 2004 to 2011. The other major factor reflects increased total outputs per farm area through yield improvements and practices such as double cropping. "As the accuracy and reliability of modeling improves, we observe a steady decline in the estimates of predicted land use change. This reaffirms that biodiesel reduces GHG emissions by at least 50 percent and suggests that the real benefit is greater than 80 percent" Tyner says.

Source: http://biodiesel.org/news/news-display/2016/09/14/new-data-reaffirms-carbon-benefits-of-biodiesel.

U.S. Co-Optima initiative

The U.S. Department of Energy (DOE) announced up to $7 million in funding for the Co-Optimization of Fuels and Engines (Co-Optima) initiative. This is a collaboration between DOE's Office of Energy Efficiency and Renewable Energy's (EERE's) Bioenergy Technologies Office and Vehicle Technologies Office and brings together DOE national laboratories and industry stakeholders to simultaneously conduct tandem fuel and engine research, development, and deployment assessments.

Source: http://energy.gov/eere/articles/energy-department-announces-7-million-accelerate-fuel-and-engine-co-optimization

India expands biofuels market

India is targeting a more than sevenfold expansion in its biofuels market over the next six years, stepping up the country's efforts to cut its reliance on energy imports. Blending five percent of biodiesel with regular diesel and 10 percent ethanol with gasoline could boost the market to 500 billion rupees ($7.5 billion) by 2022, from about 65 billion rupees now, Oil Minister Dharmendra Pradhan said August 10, 2016. National requirement will be 6.75 billion liters of biodiesel and 4.5 billion liters of ethanol for blending over the six years.

The $2 trillion economy has struggled for about a decade to blend more ethanol with gasoline, and biodiesel with regular diesel. The goal this year is five percent blending for both gasoline and diesel. India, whose crude consumption growth is expected to outstrip all other nations in the decades ahead, imports about 80 percent of its crude requirement. It is aiming to reduce its overseas energy purchases by 10 percentage points by 2022, through increased domestic output and greater use of alternative fuels. Companies such as Austria's Munzer Bioindustrie GmbH, India's Praj Industries Ltd. and CVC India Infrastructure Pvt. are also planning biofuel projects.

Source: http://www.renewableenergyworld.com/articles/2016/08/india-seeks-to-expand-biofuels-market-to-7-5-billion-by-2022.html

20 Latin American countries pitch for biofuels

In El Salvador, 20 Latin American countries have promised to promote biofuel production and use, with the support of development finance institutions. The region has a wide variety of possible feedstocks available from sugarcane and palm oil to corn and soy. Between increasing petroleum scarcity, the future return of high oil prices and negative impacts on the climate, the countries agreed there was no time to wait before fast-tracking biofuels. The Inter-American Development Bank is seen as the key financing partner to get the ball rolling.

Source: http://www.biofuelsdigest.com/bdigest/2016/08/08/20-latin-american-countries-pitch-for-biofuels/

Finland: 30% share of biomethane

Biomethane accounts for 30% of the gas sold as a fuel in Finland, according to the Finnish Ministry of Transport and Communication. The green fuel is available at almost all of the 24 Finnish filling stations for compressed natural gas (CNG). According to data by gas provider 45% of their customers choose green "biogas" as it is called in Finland despite the extra costs, allowing for up to 90% reduction of CO2 emissions compared to petrol. In total the country has 1900 vehicles powered by natural gas (NGVs) on its roads, with a growth of 46% or 600 vehicles compared to the previous year. The 1700 light vehicles and cars account for the vast majority of the domestic fleet running on gas, which also includes 100 heavy duty buses and trucks.

Source: http://www.gasum.com/Facts-about-gas-/Biogas/biogas-certificates/

POLICY / LEGISLATION / MANDATES / STANDARDS

HVO accepted for passenger cars and vans

As Europe's first passenger car manufacturers to do so, Peugeot and Citroën together with the parent company PSA Group have announced their acceptance of the use of fully fossil-free, HVO-type (Hydrotreated Vegetable Oil) renewable diesel in the group's passenger cars and vans.

This is a long-awaited first formal announcement of such an acceptance from manufacturers of light-duty vehicles, as the heavy-duty sector - such as the major truck manufacturers Volvo, Scania, Mercedes, DAF, and MAN - have already published their acceptance of the fuel and promoted its use to reduce carbon emissions.

All Peugeot and Citroën passenger cars and vans with Euro 5 and Euro 6 standard engines in Norway and Sweden are now approved to run on the HVO-type renewable diesel, such as Neste Renewable Diesel, as long as these fuels meet the new standard EN 15940.

Source: https://www.neste.com/en/hvo-type-renewable-diesel-formally-accepted-peugeot-and-citro%C3%ABn-passenger-cars-and-vans

EU ratifies Paris Agreement

The European Parliament has approved the ratification of the Paris Agreement by the European Union on 4th October 2016. With the European Parliament approval of the Paris Agreement ratification the last hurdle is cleared. The political process for the European Union to ratify the Agreement is concluded.

So far, 62 parties, accounting for almost 52 % of global emissions have ratified the Paris Agreement. The Agreement will enter into force 30 days after at least 55 parties, representing at least 55% of global emissions have ratified. The EU ratification and deposit will cross the 55% emission threshold and therefore trigger the entry into force of the Paris Agreement.

Next steps: With today's approval by the European Parliament, the Council can formally adopt the Decision. In parallel the EU Member States will ratify the Paris Agreement individually, in accordance with their national parliamentary processes.

Source/ read more: http://europa.eu/rapid/press-release_IP-16-3284_en.htm

California climate change legislation

California Governor Jerry Brown has signed two bills that extend California GHG emission reduction targets to 2030. Now the California Air Resources Board (ARB) has to develop technologically feasible and cost effective regulations to achieve the targeted 40% GHG emission reduction below 1990 levels by 2030. The ARB shall prioritize regulations to protect disadvantaged communities; a definition for the social costs of GHG emissions for the ARB to include in evaluating the cost effectiveness of the developed GHG reduction measures, and accountability and transparency provisions to guarantee greater public oversight of state climate programs are also part of the new legislation.

Source: https://www.dieselnet.com/news/2016/09ca.php

California program on zero-emissions vehicles

California's Zero-Emission Vehicle (ZEV) program is expected to increase sales of electric, plug-in hybrid, and other alternative light-duty vehicles in the United States. The ZEV program is administered by the California Air Resources Board and affects model year 2018 and later vehicles, requiring automakers to earn credits for alternative fueled vehicles based on a percentage of their sales in California. The value of the credits for vehicles sold within each of the following categories depends on certain vehicle characteristics including the electric driving range of electric vehicles:

- Full zero-emission vehicles (such as battery-only electric or hydrogen fuel cell vehicles)
- Transitional ZEVs (plug-in hybrid electric or hydrogen internal combustion engine vehicles)
- Advanced Technology Partial-ZEVs (gasoline- or diesel-electric hybrid, CNG, or methanol fuel cell vehicles)
- Conventional Partial-ZEVs, which are considered extremely clean conventional vehicles

Source: https://www.eia.gov/todayinenergy/detail.php?id=28192

Stage-V emission standards for NRMM

The European Parliament has adopted a regulatory text that is likely to be the final version of the Stage V emission regulations for nonroad mobile machinery (NRMM) engines. The regulation defines new, Stage V emission limits for diesel and spark-ignited engines used in land-based machinery, such as agricultural and construction equipment, in inland waterway vessels, in rail vehicles and in outdoor powered equipment. The standards will be phased-in beginning from 2019. Arguably the most important change compared to the current Stage IV standards is the addition of a particle number (PN) limit for many categories of nonroad engines, which will force the use of particulate filters.

The PN emission limit of 1×1012 1/kWh applies to nonroad engines between 19 and 560 kW, to engines above 300 kW used in inland waterway vessels (main and auxiliary), and to all railcar engines. The PN limit has been introduced to force the use of diesel particulate filters (DPF) on the affected engines. Under the current Stage IV and the US Tier 4 standards—that are harmonized to a large degree—some 50 percent of nonroad engine families are certified without a DPF, even though the standards include PM (mass) limits that were designed to force the use of DPF technology.

The adoption of Stage V standards will effectively de-harmonize the EU and US nonroad emission regulations, unless the US EPA develops and adopts new Tier 5 emission standards that would ensure the use of DPFs on nonroad engines.

Source: https://www.dieselnet.com/news/2016/07eu.php

Japan supports LNG market development

In response to the changes in the supply-demand situation of liquefied natural gas (LNG) including the start of LNG exports from United States and full liberalization of electricity and gas markets in Japan, the Ministry of Economy, Trade and Industry (METI) has compiled the "Strategy for LNG Market Development" regarding future actions to achieve a stable LNG supply with reasonable prices, and made a presentation on the strategy at the G7 Energy Ministerial Meeting.

For the purpose of reducing CO2 emissions from road vehicles, in the 2016 fiscal year the Japanese Ministry of the Environment subsidizes the project of the development and demonstration of heavy-duty LNG trucks which range is more than 1,000 km and of the optimum LNG filling station which can also supply CNG. Isuzu Motors Limited, Shell Japan Limited and Organization for the promotion of low emission vehicles(LEVO) participate in this project. CO2 emissions of heavy-duty LNG trucks will be reduced by about 10% from the latest diesel trucks.

Sources: *https://www.env.go.jp/press/93263/103707.pdf* and *http://www.meti.go.jp/english/press/2016/0502_01.html*

Indonesian energy policy

The 2014 amendment of the Indonesian energy policy foresees that alternative energy provides 31% of the national energy mix by 2050. To support the market introduction of renewable fuels the government has submitted to the parliament an ethanol subsidy of USD 17 Million or around 34 cents per liter for 2017 budget. This is sufficient for blending 50 thousand kiloliters ethanol with gasoline in the transportation sector. Due to lack of blending facilities as well as the domestic supply of ethanol, such a blend will only be available in selected major cities such as Jakarta, Bandung and Surabaya.

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Source of the photo: http://www.thejakartapost.com/news/2015/11/20/pertamina-ups-biofuel-quota-signs-11-producers.html

Korea: Demonstration of HCNG bus and H2/HCNG station in Incheon

KIMM and Doosan infracore developed the world's first HCNG engine . This engine emits less exhaust gas emissions (1/3 of EURO-6) and also less CO2 (18% reduction) and gives 8% energy gain compared with the base CNG engine. Two HCNG buses are under demonstration in two cities (Ulsan and Incheon) and KOGAS erected a H2/HCNG station which uses CNG and H2 that is produced by reforming CNG. The capability of this station is 3 HCNG buses and 5 fuel cell vehicles a day.

Source: http://www.todayenergy.kr/news/articleView.html?idxno=112499

SPOTLIGHT AVIATION

Agreement on carbon reduction for aviation

Following six years of negotiations, governments meeting at the International Civil Aviation Organization (ICAO) have reached agreement on the design elements of a global market-based measure for international aviation. It is part of a series of actions the aviation industry is taking to reduce its carbon emissions which includes investing in new technology, scaling up the use of sustainable alternative fuels, improving operational performance of aircraft in the fleet already and using more efficient infrastructure.

The carbon offsetting and reduction scheme for international aviation (CORSIA) will be the world's first market mechanism for dealing with climate change from any industrial sector. The global aviation industry has been instrumental in proposing the plan and has been encouraging States to support it.

Source: Air Transport Action Group, http://www.atag.org/our-news/press-releases/97.html?tmpl=pressrelease

Gevo - Lufthansa offtake agreement

Gevo, Inc., announced that it has entered into a heads of agreement with Deutsche Lufthansa AG ("Lufthansa") to supply Gevo's alcohol-to-jet fuel (ATJ) from its first commercial hydrocarbons facility, intended to be built in Luverne, MN. The terms of the agreement contemplate Lufthansa purchasing up to 8 million gallons per year of ATJ from Gevo, or up to 40 million gallons over the 5 year life of the off-take agreement. The heads of agreement establishes a selling price that is expected to allow for an appropriate level of return on the capital required to build-out Gevo's first commercial scale hydrocarbons facility. The heads of agreement is non-binding and is subject to completion of a binding off-take agreement and other definitive documentation between Gevo and Lufthansa, expected to be completed in the next few months.

Source: http://ir.gevo.com/phoenix.zhtml?c=238618&p=irol-newsArticle&ID=2200139

SkyNRG - KLM - AltAir offtake agreement

For the coming years, KLM purchases sustainable jet fuel for all flights departing from Los Angeles, making it part of their day to day business. The fuel, produced by AltAir Fuels and supplied by SkyNRG, is made from used cooking oil and delivered via the airport's hydrant system.

AltAir is a bio-refinery with production capacity for sustainable jet fuel, enabling KLM to fly on biofuel from Los Angeles airport on a continuous basis. KLM's flights are made possible by a multitude of partners in the Corporate BioFuel Programme; these partners pay a surcharge that covers the price difference between sustainable biofuel and traditional kerosene. The investment is fully utilized by KLM to purchase sustainable biofuel. Consequently, the participating corporations reduce CO2 emissions resulting from their business travel and contribute to the further development of the biofuel market for aviation.

Source: read more: http://skynrg.com/wp-content/uploads/2016/09/20160908_Press_Release_SkyNRG-KLM-and-AltAir-prove-that-sustainable-jet-fuels-are-here-to-stay-by-signing-a-3-year-offtake-agreement.pdf

IEA & IEA-AMF NEWS

Current AMF Annexes / Projects

Annex 28: Information Service & AMF Website (AMFI)

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

Annex 47: Reconsideration of DME Fuel Specifications for 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

Annex 53: Sustainable Bus Systems

Annex 54: GDI Engines and Alcohol Fuels

Annex 55: Real Driving Emissions and Fuel Consumption

Next ExCo Meetings

ExCo 53 will be held 29 May to 1 June 2017 in Helsinki, Finland.

ExCo 54 will be held 30 October to 2 November 2017 in Tsukuba, Japan.

PUBLICATIONS

Indonesia: ERIA annual report 2015

ERIA's 2015 Annual Report gives a picture of how the Institute has continued to support and contribute to the community building efforts of the ASEAN and the East Asia region in FY2015 through its various activities. The report summarizes the Institute's research and research-related activities, events, seminars and symposia, publications, capacity building seminars, and media exposure--all geared towards responding to and anticipating the challenges faced by the region in an emerging new global environment.

Source: *http://www.eria.org/publications/annual_report/eria-annual-report-2015.html*

ePURE´s Roadmap to decarbonize road transport

ePURE, the European renewable ethanol association, has published a "Roadmap to 2030 - the role of ethanol in decarbonizing Europe`s road transport". This Roadmap outlines policy measures that ePURE considers essential for Europe to harness the benefits of sustainable ethanol and its contribution to achieving Europe's 2030 targets.

Source: http://epure.org/media/1364/epures-roadmap-to-2030-the-role-of-ethanol-in-decarbonising-europes-road-transport.pdf

Finland: How to reduce transport emissions

The most cost-efficient scenario to reduce transport emissions by 40% by 2030 would be to invest in domestic drop-in fuels and bio-methane but the use of gas in the transport sector is limited by the slow increase of gas vehicles. The report prepared by VTT estimates that by 2030, there could be around 50,000 passenger cars, 6,000 vans and 1,200 heavy duty vehicles fueled by methane in Finland. The bio-methane production is not limited by the amount of available feedstock; 50,000 toe/a could be reached by anaerobic digestion and more could come from wood-based SNG. At the moment there are 24 fueling stations providing gas.

Source: http://european-biogas.eu/2015/06/23/vtt-the-deployment-of-biomethane-in-the-finnish-transport-sector-hampered-by-limited-amount-of-gas-vehicles/

GAIN report-Australia biofuels annual

Production of ethanol is relatively stable and is supported by a mandate in New South Wales and a now legislated mandate in Queensland from 2017. Biodiesel output has significantly declined following a surge of imports. A new excise arrangement has now made biodiesel imports fully subject to prevailing excise on diesel and the industry is restructuring. Second generation biofuels such as energy crops and algae-based fuels have been successfully demonstrated but are not yet commercially viable. The Queensland government has provided support for an advanced biofuels plant. Australia exports non-GM oilseeds to the EU for the production of biodiesel.

Source: http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Biofuels%20Annual_Canberra_Australia_7-15-2016.pdf

EVENTS

Airports Going Green Conference, 31 October 31- 2 November 2016, Amsterdam, Netherlands
Conference website: http://www.aaae.org/aaae/Green2016/Welcome/Green2016/Welcome.aspx?hkey=e8985fc7-0841-4fec-a0d7-23021fda309d

Symposium on Thermal and Catalytic Sciences for Biofuels and Biobased, 1-4 November 2016, North Carolina USA
Conference website: https://www.ncsu.edu/mckimmon/cpe/opd/tcs2016/index.html

Workshop-VDI-Spezialtag-„Grundlagen alternativer Kraftstoffe", 22nd November 2016, Dresden, Germany
Website: https://www.vdi-wissensforum.de/weiterbildung-automobil/grundlagen-alternativer-kraftstoffe/

VDI-Tagung „Innovative Antriebe", 23-24 November 2016, Dresden, Germany
Website: https://www.vdi-wissensforum.de/weiterbildung-automobil/innovative-fahrzeugantriebe

8th International Conference on Biofuels and Bioenergy, 29-30 December 2016, Paris France
Conference website: https://www.waset.org/conference/2016/12/paris/ICBB/home

14th International conference on renewable mobility "Fuels of the Future 2017", 23-24 January 2017, CityCube Berlin, Germany
Conference website: http://www.fuels-of-the-future.com

JSAE Congress (Spring), 24-26 May 2017, Pacifico Yokohama, Japan
Conference website: http://www.jsae.or.jp/2017haru/english/index.html

IMPRINT

The **Advanced Motor Fuels Technology Collaboration Programme** (AMF TCP) is one of the International Energy Agency's (IEA) transportation related Technology Collaboration Programmes. These are multilateral technology initiatives that encourage technology-related activities that support energy security, economic growth and environmental protection.

AMF provides an international platform for co-operation to promote cleaner and more energy efficient fuels and vehicle technologies. This newsletter contains news articles on research, development and demonstration of advanced motor fuels, information about related policies, links to AMF projects, and an overview over publications and events.

The newsletter is prepared based on contributions from Ralph MCGILL, FEEC, Werner TOBER and Robert ROSENITSCH, TU Vienna, Shinichi GOTO, AIST, and Manfred WÖRGETTER, BIOENERGY 2020+. It is edited by Dina Bacovsky and Vijay Kumar Verma, BIOENERGY 2020+. The Newsletter is available online at: *www.iea-amf.org*

AMF welcomes interested parties to make contact and to become members of the AMF family. If you wish to get in touch please contact the AMF Secretary, the AMF ExCo Chair or your national AMF Delegate, see contact information below.

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