August 2019, issue no. 1/2019

AMFI Newsletter

The shipping sector is searching for fuel alternatives as to decrease sulphur, NOx and GHG emissions *more*

CONTENTS

DEMONSTRATION / IMPLEMENTATION / MARKETS

New alcohol fuel: A20

Eni and FCA have developed a new fuel that pairs emissions reduction with energy efficiency. "A20" is a fuel with a low level of emissions due to its 15% methanol and 5% bio-ethanol alcohol content. The new alternative fuel emits up to 3% less in CO2 exhaust emissions quantified using the new Worldwide Harmonized Light Vehicle Test Procedures (WLTP).

The formula was designed to reduce direct and indirect CO2 emissions and is compatible with the majority of petrol cars sold from 2001 onwards, which accounts for more than 60% of the petrol cars in Italy, equivalent to approximately 12 million vehicles.

An initial test run of five Fiat 500s from the Eni Enjoy fleet in Milan ended successfully a few weeks ago. The cars were rented out around 9,000 times and travelled for 50 thousand kilometres during the 13 months of the test without experiencing any problems, demonstrating a reduction in emissions and better performance as a result of the high octane number.

Source: ENI, https://www.eni.com/en_IT/media/2019/04/eni-and-fca-have-developed-a20-a-new-fuel-that-pairs-emissions-reduction-with-energy-efficiency#

NEXT and Shell partner on renewable diesel

NEXT Renewable Fuels and Shell have entered a long-term agreement for the purchase of renewable diesel from NEXT's Oregon facility opening in 2021. The NEXT plant represents more than a $1 billion investment and will have an annual processing capacity of 600 million gallons. The renewable diesel will be made from feedstocks including used cooking oils, animal tallows, and virgin seed and vegetable oils.

Source: http://biomassmagazine.com/articles/15926/shell-trading-to-purchase-biofuel-from-next-renewable-fuels

Renewable, high-Octane gasoline

Producing biofuels from woody biomass can be expensive. Researchers at the National Renewable Energy Laboratory combined fundamental science with an economic analysis to find a solution, pioneering a cheaper method to produce high-octane gasoline from methanol. The novel method uses a copper catalyst that resulted in 38% more yield and reduced costs by 29%. The process resulted in a higher carbon efficient gasoline with a higher value and compatibility with existing methanol plants that use natural gas or solid waste to generate syngas.

Source: DOE Office of Energy Efficiency and Renewable Energy
Link: https://content.govdelivery.com/accounts/USEERE/bulletins/2570f8a

Trans-European gas infrastructure

The required sharp decrease in CO2 and other greenhouse gas emissions by 2050 – as committed to in the Paris Agreement - may drastically reduce the share of natural gas in the European energy mix. Therefore, the role of European gas infrastructure may change substantially within the next thirty years.

In this context, a study has undertaken to assess the role of Trans-European gas infrastructure in the light of the EU's long-term decarbonisation commitments. The report provides an overview of different existing storylines developed by various stakeholders from industry, policy makers,

research and NGOs. Based on this, well-reasoned storylines were developed for the expected development of the gas sector in Europe until 2050 in an ambitious decarbonisation context.

Source: European Commission Energy Studies, https://publications.europa.eu/en/publication-detail/-/publication/1796ecd6-cb71-11e8-9424-01aa75ed71a1/language-en?WT.mc_id=Searchresult&WT.ria_c=null&WT.ria_f=3608&WT.ria_ev=search

Download Report: https://publications.europa.eu/en/publication-detail/-/publication/1796ecd6-cb71-11e8-9424-01aa75ed71a1/language-en

Concept for hybrid heavy-duty trucks

Heavy-duty trucks, such as the 18-wheelers that transport many of the world's goods from farm or factory to market, are virtually all powered by diesel engines. They account for a significant portion of worldwide greenhouse gas emissions, but little has been done so far to curb their climate-change-inducing exhaust.

Now, researchers at MIT have devised a new way of powering these trucks that could drastically curb pollution, increase efficiency, and reduce or even eliminate their net greenhouse gas emissions. The concept involves using a plug-in hybrid engine system, in which the truck would be primarily powered by batteries, but with a spark ignition engine (instead of a diesel engine). That engine, which would allow the trucks to conveniently travel the same distances as today's conventional diesel trucks, would be a flex-fuel model that could run on pure gasoline, pure alcohol, or blends of these fuels.

Source: MIT http://news.mit.edu/2019/electric-hybrid-heavy-duty-trucks-0409

Fuel cell buses demonstrate reliability

The U.S. Department of Energy (DOE) reports that 12 of 15 fuel cell transit buses in early on-road deployments have met 2016 durability targets of 18,000 hours without major repairs or replacement of the fuel cell stack. In addition, 5 buses have met the DOE "ultimate target" for durability of 25,000 hours, similar to the life expectancy of a diesel engine in a transit bus. New vehicles continue to be added to the demonstration, 32 in total currently, to continue to identify improvements needed to optimize reliability and durability.

Source: https://www.greencarcongress.com/2019/01/20190125-fceb.html

POLICY / LEGISLATION / MANDATES / STANDARDS

30 % biofuels in road traffic in Finland

The Parliament of Finland has voted on 6th February 2019 in favor of a law for gradually increasing the share of biofuels in road traffic to 30% by 2029. In addition, the Parliament has approved a law for the distribution obligation of bio-based light fuel oil. According to the new law, a share of light fuel oil intended for heating, construction machines and fitted motors will be replaced by bio-based fuel oil starting in 2021.

The new law is an important step towards lower-emission transport. The obligation is well aligned with the targets already set in Sweden and Norway and it brings Finland to the same ambitious level with its Western neighbours.

Source: Neste,
http://news.cision.com/neste/r/the-share-of-biofuels-in-road-traffic-to-increase-to-30--in-finland,c2733677

France: Increased biofuel mandates

Last December, the French National Assembly passed the 2019 finance bill, which stipulates an increase in the proportion of biofuels in road transport. The minimum incorporation rate of biofuels, which in 2018 was 7.5% in energy density (corresponding to around 10% in ethanol volume in gasoline), increases to 7.9% in 2019 and 8.2% in 2020. The bill includes heavy incentives to encourage distributors to effectively incorporate the legal minimum amount of biofuels. Lawmakers also give priority to local feedstock used to manufacture these biofuels. Additional provisions have been adopted in support of biofuels that come from residual or lignocellulosic matter; a specific segment that will represent 0.2 point in 2019 and then 0.4 point in 2020 is reserved for non-extractible sugars.

Source: https://www.global-bioenergies.com/wp-content/uploads/2019/01/20190107_pr_en.pdf

SPOTLIGHT SHIPPING

LNG fueled ships in 2018

DNV GL published an update of the current status of LNG fueled ships. Actually 121 vessels are in operation and some 132 in order. Half of them operate in Norway, 20% in the EU. Hence, it is primarily the EU regulations which forced the change to alternative fuels. Looking at the orders, there will be a considerable change due to the sulfure cap in the fuel at 0.5% (today 3.5%) introduced by the International Maritime Organisation (IMO). The dominant applications are car and passenger ferries.

Link: http://www.golng.eu/files/Main/20180417/2. Ole Vidar Nilsen - DNV GL.pdf

Sweden plots course to zero-emissions shipping

The Swedish Shipowners' Association is currently preparing a road map with the government initiative Fossil Free Sweden to totally decarbonize domestic shipping by 2045, five years ahead of the International Maritime Organization's deadline. With a goal of becoming climate-neutral by 2045, Sweden aims to cut greenhouse gas emissions from domestic transport by 70% by 2030, despite freight being expected to increase by around half over the same period. The road map for domestic shipping has not been published in its entirety, but the two organizations behind it outlined the seven areas in which the industry will have to act.

Link: http://artfuelsforum.eu/news-articles/sweden-plots-course-to-zero-emissions-shipping/

Swedish shipping company takes on liquefied biogas

Skangas, a subsidiary of Gasum, has supplied liquefied biogas (LBG) to Furetank, a major Swedish shipping company. The LBG was delivered to Furetank's tanker ship, Fure Vinga, from Gasum's biogas facility in Lidköping. The fuelling was carried out at the port of Gothenburg with the fuel transferred directly from tanker truck to ship. Fure Vinga is one of two vessels in Furetank's fleet powered by liquefied gas. The shipping company is currently building five more vessels which can be fuelled by LBG if and when the fuel is available. The vessels will operate in the seas of Northern Europe and have access to Skangas' LNG supply network in the region.

Link: https://www.bioenergy-news.com/news/swedish-shipping-company-takes-on-liquefied-biogas/

Cruise firm to invest into biogas fueled ships

Norway-based cruise operator Hurtigruten announced that it will be the 'first' cruise company to power its ships with liquefied biogas (LBG) from 2021. Fish parts cast aside by the food industry and mixed with organic waste would be used to generate biogas. The company plans to implement LBG into six of its 17 ships between 2019 and 2021 together with large battery packs filled by renewable energy, reducing Sulphur oxide and nitrogen oxide emissions. Hurtigruten is expected to invest over $850 million (€742 million) in building the world's greenest cruise liners in the aim of becoming completely emission-free.

Link: https://www.energy-reporters.com/storage/norway-cruise-giant-eyes-biogas-power/

Adoption of gas and low flashpoint fuels

Classification service provider the American Bureau of Shipping (ABS) has published its 'Advisory on Gas and Other Low Flashpoint Fuels', to offer guidance on current technologies, regulatory requirements and operational considerations for adopting gas and low flashpoint fuels. The majority of the deep-sea shipping fleet will be using conventional and emerging lower sulfur residual and distillate fuels to meet the 1 January 2020 IMO global fuel sulfur limit of 0.5%. The Advisory focuses on gas and other low flashpoint fuels that can provide solutions to the fuel sulfur regulations in the short and mid-term. It is designed to help ship owners and operators understand the available technologies and technical considerations to make the right decisions for their fleet as they navigate this challenging environment.

Link: https://ww2.eagle.org/en/news/press-room/advisory-to-help-solve-fuel-technology-challenges.html

Environmentally friendly on-board power for ships

The routes and ports for cargo and cruise ships are often close to city centres. Today, they are supplied with electricity and heat, even when lying down, by diesel engines, gas turbines and boiler systems. Diesel fuel and gas oils have been used so far. The resulting pollutant emissions, such as soot and nitrogen oxides, additionally pollute the air quality of inner cities, especially in the environmental zones.

In order to solve this problem, "MultiSchIBZ" will develop two prototypes of fuel cell systems suitable for practical use to technical maturity. The system is based on SOFC fuel cells which can be operated with low-sulphur diesel fuel or liquefied natural gas (LNG) as an energy source. A fuel gas generator converts the fossil fuel into a hydrogen-rich gas for operating the fuel cells. Compared with conventional propulsion systems using marine diesel as fuel, this is expected to reduce emissions by 99 % for nitrogen oxides and particulate matter and by more than 25 % for carbon dioxide. For the development of the technical components, the results and plants from two predecessor projects can be used. The aim is to optimize the existing components, which have already been tested in the laboratory, to further develop them for operation with LNG and to scale them up for the construction and operation of pilot plants with higher outputs.

After the development phase, a demonstration phase is planned in the project, in which several fuel cell APU´s will be tested on ships in real operation.

Source: TEC4FUELS
Link: https://www.tec4fuels.com/umweltschonender-bordstrom-fuer-schiffe/?lang=en

AMF ExCo 57

The 57th Meeting of the AMF Executive Committee was held 14 – 17 May 2019 in Stockholm, Sweden. There were 31 participants, including Estonia as Observer. At the meeting, the AMF Vision and Mission Statement were refined.

AMF Vision

Advanced motor fuels, applicable to all modes of transport, significantly contribute to a sustainable society around the globe.

AMF Mission

The mission of AMF is to advance the understanding and appreciation of the potential of advanced motor fuels towards transport sustainability. We provide sound scientific information and technology assessments facilitating informed and science-based decisions regarding advanced motor fuels on all levels of decision-making.

A new **annex proposal on "Advanced Maritime Fuels"** was presented and is likely to be kicked-off at the next ExCo meeting. The shipping sector – being a huge consumer of motor fuel and having ambitious targets for CO2 emission reduction and requirements for sulfur and NOx reduction – is in need of new, clean-burning and low carbon fuels. Some new fuel options have recently come into the picture, such as ammonia, ammonia/hydrogen/DME blends, advanced bio-methanol, and sulfur-free paraffinic marine bunker fuel.

New AMF Projects

Annex 58: The role of advanced renewable transport fuels in decarbonising the transport sector by 2030 and beyond

The aim of the project is to draw the big picture of how advanced renewable transport fuels can contribute to the decarbonisation of the transport sector. It is a joint project with IEA Bioenergy with participants from China, EC, Finland, Germany, Japan/LEVO, Sweden, and USA.

The project will conclude with a workshop for policy makers and analysts on 18 November 2019 in Brussels, Belgium.

For more information please contact Dina Bacovsky of BIOENERGY 2020+, Austria: dina.bacovsky@bioenergy2020.eu

Annex 59: Lessons Learned

The objective of the project is to investigate which factors determine whether the market launch of alternative fuels and vehicles is successful or not. The participating countries will describe several alternative motor fuels implementation efforts undertaken in their countries. From these descriptions, lessons learned will be derived. The results will feed into Annex 58 on Transport Decarbonisation.

For more information please contact Andrea Sonnleitner of BIOENERGY 2020+, Austria:
andrea.sonnleitner@bioenergy2020.eu

New AMF Publications

Danish contribution to Annex 56: Methanol as Motor Fuel

Methanol as motor fuel has regained interest in recent years due to its low price, easy handling and high octane number. Methanol can nowadays be produced from biogas which yields an extremely low Greenhouse Gas emission – easily comparable to those of electric vehicles.

The Danish participants in the project "AMF Annex 56 Methanol as Motor Fuel" have tested a 105 Octane M85 fuel consisting of 85% methanol and 15% petrol. The pilot car, a Peugeot 107, got a € 100 flex fuel kit installed and its engine performance on 105 Octane M85 went up by 5-7%with all emissions kept in place. The report finds that methanol can be introduced into the current gasoline infrastructure with very little investment and with no loss of tax revenues. A complete distribution setup is described in the report. Technical or legislative barriers that need attention are also described in the report.

Link: http://danskbiomethanol.dk/Papers/Report%20DK.pdf

AMF Annual Report 2018 released

The AMF Annual Report provides information on the Advanced Motor Fuels Technology Collaboration Programme on the status of advanced motor fuels in AMF member countries and worldwide, and on the work carried out by AMF in individual projects (Annexes). In addition, the AMF Chairman provides an outlook on advanced motor fuels.

Link: https://iea-amf.org/content/publications/annual_reports

Next AMF ExCo meetings

ExCo 58: 4-8 November 2019, Montreux, Switzerland, in parallel with IEA Combustion TCP Task Leaders Meeting; joint workshop of both TCPs on 6 November 2019

ExCo 59: 17-20 May 2019 in Xi´an, China; followed by an international forum on advanced motor fuels in Beijing on 21-22 May 2019

ExCo 60: planned for October 2020 in Denmark

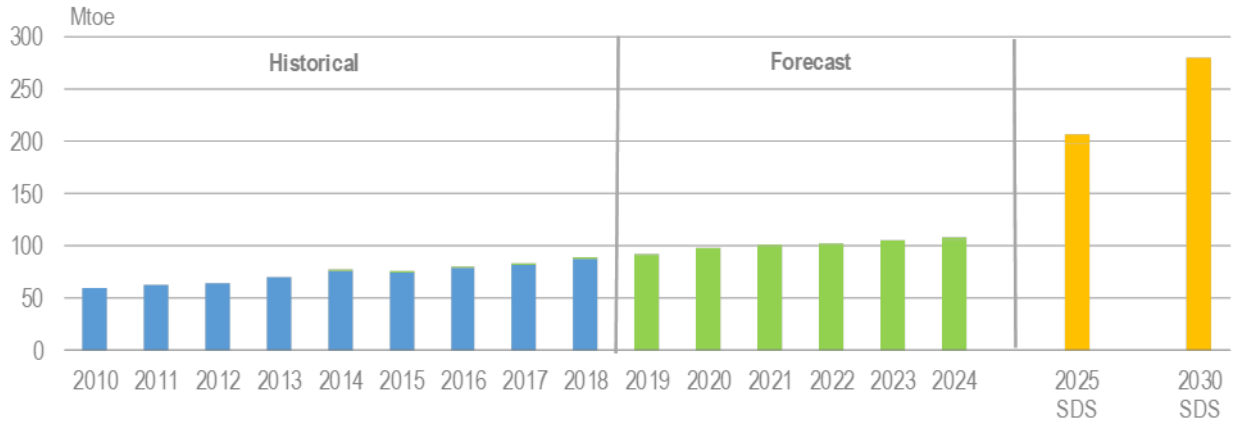
Please get in touch with the AMF Secretary if you wish to attend one of these meetings or workshops: dina.bacovsky@bioenergy2020.eu.

News from IEA

Tracking clean energy progress

The IEA's Sustainable Development Scenario (SDS) offers a pathway for the global energy system to reach three strategic goals: the Paris Agreement's well below 2°C climate goal, universal energy access and substantially reducing air pollution.

But based on existing and announced policies we are far from on track. One of the energy technologies not on track (out of 45 analysed) is transport biofuels, see figure below. Transport biofuel production expanded 7% year-on-year in 2018, and 3% annual production growth is expected over the next five years. This falls short of the sustained 10% output growth per year needed until 2030 to align with the SDS.



Global biofuel production 2010-2024 (historical and forecast) versus SDS biofuel consumption in 2025 and 2030; provided by IEA

More details on transport biofuels and all other energy sectors are available online.

Link: https://www.iea.org/tcep/ *and* https://www.iea.org/tcep/transport/biofuels/

PUBLICATIONS

IEA Hydrogen Report

The report "The Future of Hydrogen" analyses the current state of play for hydrogen and offers guidance on its future development. The report finds that clean hydrogen is currently enjoying unprecedented political and business momentum, with the number of policies and projects around the world expanding rapidly. It concludes that now is the time to scale up technologies and bring down costs to allow hydrogen to become widely used. The pragmatic and actionable recommendations to governments and industry that are provided will make it possible to take full advantage of this increasing momentum.

Link: https://webstore.iea.org/the-future-of-hydrogen

Are aviation biofuels ready for take off?

Air travel is booming, with the number of air passengers set to double over the next twenty years. Aviation demand is particularly evident in in the Asia Pacific region, where growing economic wealth is opening new travel opportunities.

This commentary by IEA Energy Analyst Pharoah LeFeuvre summarizes the current state of sustainable aviation fuels.

Link: https://www.iea.org/newsroom/news/2019/march/are-aviation-biofuels-ready-for-take-off.html

Life-cycle GHG emissions of ethanol

IEA Bioenergy Task 39 has analyzed the commonalities and differences between four well-recognized biofuels life cycle analysis tools when applied to ethanol production in different regions. The assessed LCA models are used globally by industry, policy makers and regulators to evaluate and quantify the carbon intensity of biofuels. The findings of the analysis are published in the article "Comparison of biofuel life-cycle GHG emissions assessment tools: The case studies of ethanol produced from sugarcane, corn, and wheat" in the journal "Renewable and Sustainable Energy Reviews".

Link: https://www.sciencedirect.com/science/article/pii/S1364032119302552

Corn ethanol greenhouse gas study

The U.S. Department of Agriculture finds that the greenhouse gas emissions from corn-based ethanol are about 39% lower than gasoline, while ethanol from natural gas-powered refineries is 43% lower. Using new data, this analysis updates the U.S. Environmental Protection Agency study for the Renewable Fuel Standard that found in 2022 ethanol GHGs would be 21% lower than gasoline. The researchers found that the ethanol industry could take a range of actions that could have ethanol reducing GHGs by between 47% and 70% by 2022.
Link: https://www.tandfonline.com/doi/full/10.1080/17597269.2018.1546488

Cellulose conversion to high-density aviation fuel

Scientists in China have developed a process for converting cellulose from plant waste from agriculture and timber harvesting into high-density aviation fuel: a polycycloalkane mixture. Tuning the reaction conditions also permits the selective production of methyl cyclopentane, which can be used as high-octane-number gasoline additive.
Source: Green Car Congress, https://www.greencarcongress.com/2019/03/20190322-hdaf.html
Download: https://www.cell.com/action/showPdf?pii=S2542-4351%2819%2930085-6

Pretreatment of lignocellulosic materials

In this paper, a review devoted to the processing of lignocellulosic materials as substrates for fermentation processes is presented. The review focuses on physical, chemical, physicochemical, enzymatic, and microbiologic methods of biomass pretreatment.
Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6278514/
Download: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6278514/pdf/molecules-23-02937.pdf

Fuel properties and spark ignition engine performance

The main goal of this thesis is modeling the impact of fuel properties on spark ignition (SI) engine performance and carbon dioxide emissions. The results include models (based on multi-linear regression) that represent the impact of octane number, heat of vaporization, net calorific value and auto-ignition temperature on fuel consumption and carbon dioxide emissions from the end-use point of view. Modeling work was performed based on results from the driving cycles such as New European Driving Cycle (NEDC) and Worldwide harmonized Light vehicles Test Cycle (WLTC). Using alcohol-gasoline blends yielded higher fuel consumption in all cases. The model's prediction accuracy is very high and the values are close to measured ones. Based on chosen sources, the highest fuel consumption was observed for E85 fuel blend. Supplementary, fuel blend property calculator was created in order to predict alcohol-gasoline fuel blend properties.
Link: https://aaltodoc.aalto.fi/handle/123456789/31596

Health impacts of transportation sector emissions

A new study provides the most detailed picture available to date of the global, regional, and local health impacts attributable to emissions from four transportation subsectors: on-road diesel vehicles, other on-road vehicles, shipping, and non-road mobile engines such as agricultural and construction equipment. The study links state-of-the-art vehicle emissions, air pollution, and epidemiological models to estimate health impacts at the global, regional, national, and local levels in 2010 and 2015.
Link: https://theicct.org/node/1976

Decarbonisation of transport

This report by the European Academies' Science Advisory Council (EASAC) reviews options for reducing greenhouse gas (GHG) emissions from European transport. It argues for stronger policies to bridge the gap between the GHG emission reductions that will be delivered by current policies and the levels needed to limit global warming to less than 2°C or even 1.5°C (Paris Agreement). The report focusses on road transport because, in the EU, this contributes 72% of transport GHG emissions.

Link: https://easac.eu/publications/details/decarbonisation-of-transport-options-and-challenges/

Biofuels sustainability

This report provides insights into the development of biofuels, biomass and biogas for renewable energy in the EU from 2010 to 2017 with a focus on the most recent years. Specifically, the production, consumption and trade of bioenergy are assessed, and the various sustainability impacts of EU consumption of biofuels are quantified. The analysis is based on Member State Renewable Energy Progress Reports.

Source: European Commission Energy Studies, https://ec.europa.eu/energy/en/studies/technical-assistance-realisation-2018-report-biofuels-sustainability

Download report:
https://ec.europa.eu/energy/sites/ener/files/documents/technical_assistance_in_realisation_of_the_2018_report_on_biomass_sustainability-final_report.pdf

Advanced biofuel policies in EU member states

This update provides details on the latest policy measures that six select European Union member states (Denmark, Germany, Italy, the Netherlands, Sweden, the United Kingdom) are taking to support the deployment of advanced alternative fuels. Across these countries, currently between 4.8% and 31% of their transportation fuels are derived from biomass.

Source: icct - the International Council on Clean Transportation, https://www.theicct.org/publications/advanced-biofuel-policies-select-eu-member-states-2018-update

Download: https://www.theicct.org/sites/default/files/publications/Advanced_biofuel_policy_eu_update_20181130.pdf

European vehicle market statistics, 2018/2019

Statistical portrait of passenger car, light-commercial, and heavy-duty vehicle fleets in the European Union from 2001 to 2017. The emphasis is on vehicle technologies and emissions of greenhouse gases and other air pollutants. Brief introductions to each chapter note important trends and provide selected comparisons to other large vehicle markets.

Source: icct - the International Council on Clean Transportation, https://www.theicct.org/publications/european-vehicle-market-statistics-20182019
Download: https://www.theicct.org/sites/default/files/publications/ICCT_Pocketbook_2018_Final_20190408.pdf

Monitoring CO2 emissions

This report presents data on new passenger vehicles registered in Europe in accordance with EU Regulation (EC) No 443/2009 and data on new light commercial vehicles registered in Europe in accordance with Regulation (EU) No 510/2011.

Source: European Environment Agency (EEA) - Publications https://www.eea.europa.eu/publications/monitoring-co2-emissions-from-new-2#tab-data-references

Download: https://www.eea.europa.eu/publications/monitoring-co2-emissions-from-new-2/at_download/file

EVENTS

JSAE/SAE 2019 International Powertrains, Fuels and Lubricants Meeting (PFL2019), 26-29 August 2019, Kyoto, Japan
Conference website: https://www.pfl2019.jp/

Electric & Hybrid Vehicle Technology Expo, 10-12 September 2019, Novi, Michigan, USA
Conference website: https://evtechexpo.com/

Advanced Biofuels Conference 2019, 17-19 September 2019, Stockholm, Sweden
Conference website: https://www.svebio.se/en/evenemang/advanced-biofuels-conference-2/

US Biogas 2019, 1-2 October 2019, San Diego, California, USA
Conference website: https://events.newenergyupdate.com/biogas/

International Methanol Vehicle and Fuel Applications Conference and Exhibition, 11-13 October 2019, Chongqing, China
Conference website: https://www.methanol.org/international-methanol-vehicle-and-fuel-applications-conference-exposition/

Progress in Biomethane-Mobility, 15-17 October 2019, Neubausaal Schwäbisch Hall, Germany
Conference website: https://ibbk-biogas.com/schedule/biomethane-2019/

13th Conference on Gaseous-Fuel Powered Vehicles; 22- 23 October 2019, Stuttgart, Germany
Conference website: https://fkfs-veranstaltungen.de/3/conference-on-gaseous-fuel-powered-vehicles/program/22-23-october-2019/

Power2Gas Conference, 23-24 October 2019, Marseille, France
Conference website: https://p2gconference.com/

Sustainable Aviation Summit at ABLC NEXT, 30 October – 1 November 2019, San Francisco, USA
Conference website: http://biofuelsdigest.com/ablcnext/?source=BD

European E-Fuels Conference, 6-7 November 2019, Munich, Germany
Conference website: https://www.wplgroup.com/aci/event/european-e-fuels/

The Contribution of Advanced Renewable Transport Fuels to the Decarbonisation of Transport in 2030 and beyond, 18 November 2019, Brussels, Belgium
For more information please contact dina.bacovsky@bioenergy2020.eu

RNG 2019 Conference, 2-5 December 2019, Dana Point, California, USA
Conference website: http://www.rngcoalition.com/rng-conference/

Transportation Research Board 99th Annual Meeting, 12–16 January 2020, Washington, D.C., USA
Conference website: http://www.trb.org/AnnualMeeting/AnnualMeeting.aspx

Fuels of the Future 2020, 20-21 January 2020, Berlin, Germany
Conference website: https://www.fuels-of-the-future.com/

National Biodiesel Conference & Expo, 20-23 January 2020, Tampa, Florida, USA
Conference website: https://www.biodieselconference.org/

Renewable Fuels Association National Ethanol Conference, 10-12 February 2020, Houston, Texas, USA
Conference website: http://www.nationalethanolconference.com/

The Work Truck Show & GreenTruck Summit, 3-6 March 2020, Indianapolis, Indiana, USA
Conference website: http://www.worktruckshow.com/

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 Werner TOBER and Robert ROSENITSCH, TU Vienna, Shinichi GOTO, AIST, and Manfred WÖRGETTER, BIOENERGY 2020+. It is edited by Dina Bacovsky, 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.

AMF Secretary

Dina Bacovsky
Bioenergy 2020+
dina.bacovsky@bioenergy2020.eu
+43 7416 52238 35

AMF ExCo Chair

Magnus Lindgren
Swedish Transport Administration
magnus.lindgren@trafikverket.se

AMF Delegates

Austria
Austrian Federal Ministry for Transport, Andreas Dorda

Canada
NRCan/RNCan, Carol Burelle

Chile
Ministerio de Energia, Ignacio Santelices

People's Republic of China
CATARC, Donglian Tian

Denmark
DTU, Jesper Schramm

Finland
VTT, Nils-Olof Nylund

Germany
FNR, Birger Kerckow

India
Ministry of Petroleum & Natural Gas, Sunil Kumar

Israel
Ministry of Energy and Water Resources, Bracha Halaf

Japan
AIST, Shinichi Goto
LEVO,Yutaka Takada
NTSEL, Ichiro Sakamoto

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