

AMFI Newsletter



Lidköping Biogas: one of the world's first plants for liquefied biogas, as to fuel cars and trucks [more](#)

The AMFI Newsletter is prepared for the members of the Implementing Agreement for Advanced Motor Fuels of the International Energy Agency (IEA/AMF). The AMFI releases four electronic newsletters each year. A group of authors prepares contributions to this newsletter:

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GENERAL INTEREST

EU 2030 climate and energy goals

A reduction in greenhouse gas (GHG) emissions by 40% below the 1990 level, an EU-wide binding target for renewable energy of at least 27%, renewed ambitions for energy efficiency policies, a new governance system and a set of new indicators to ensure a competitive and secure energy system. These are the pillars of the new EU framework on climate and energy for 2030 presented today by the European Commission.

The key elements of the 2030 policy framework set out by the Commission are as follows:

A binding greenhouse gas reduction target: A centre piece of the EU's energy and climate policy for 2030, the target of a 40% emissions reduction below the 1990 level would be met through domestic measures alone.

An EU-wide binding renewable energy target: Driven by a more market-oriented approach with enabling conditions for emerging technologies, an EU-wide binding target for renewable energy of at least 27% in 2030 comes with significant benefits in terms of energy trade balances, reliance on indigenous energy sources, jobs and growth.

Energy efficiency: The role of energy efficiency in the 2030 framework will be further considered in a review of the Energy Efficiency Directive due to be concluded later this year.

Reform of EU ETS: The Commission proposes to establish a market stability reserve at the beginning of the next ETS trading period in 2021.

Source: http://europa.eu/rapid/press-release_IP-14-54_en.htm

Global biofuels demand rising

In the last 10 years, biofuels have become a promising solution to solving the energy security, environmental, and economic challenges associated with petroleum dependency. The global biofuels industry is now on the verge of entering a new phase of development focused on advanced and drop-in biofuels. According to a new report from Navigant Research, global demand for biofuels for road transportation will grow from 32.4 billion gallons in 2013 to 51.1 billion by 2022.

Petroleum consumption by the road transportation sector in the United States is expected to peak in 2016, as biofuels grow to account for 8.7 % of demand. Major stakeholders, including the airline industry and the U.S. Department of Defense, stand to benefit from advances in drop-in biofuels.

Source: www.navigantresearch.com/newsroom/biofuels-demand-for-road-transportation-will-surpass-51-billion-gallons-annually-by-2022

US EPA Announces 2014 RVO Numbers for RFS

The U.S. Environmental Protection Agency (EPA) has released its proposal for the 2014 Renewable Volume Obligations (RVOs) as part of the Renewable Fuel Standard (RFS) for the amount of renewable fuels to be blended into gasoline and diesel. The EPA has proposed to set the cellulosic biofuel category at 17 million gallons, biomass-based diesel at 1.28 billion gallons, advanced biofuel at 2.20 billion gallons and renewable fuel at 15.21 billion. According to the EPA, the proposal seeks to put the RFS program on a steady path forward – ensuring the continued

long-term growth of the renewable fuel industry – while seeking input on different approaches to address the “E10 blend wall.”

Source: <http://domesticfuel.com/2013/11/15/epa-announces-2014-rvo-numbers-for-rfs/>

GASEOUS FUELS

Sweden: The world’s first biogas plant for LBG

Lidköping Biogas is one of the world’s first plants for Liquefied Biogas (LBG). The new plant is a joint effort of the companies Swedish Biogas International Lidköping AB, Göteborg Energi AB and the Municipality of Lidköping. The plant will supply cars and trucks with renewable fuel.

A majority of the biogas is liquefied in the condensation plant. The technology is supplied by Air Liquide. In order to liquefy the biogas, the majority of remaining CO₂ (< 10 ppm) is purged by Pressure Swing Absorption (PSA) before the gas temperature is lowered using the Brayton cycle. The technology allows for liquefaction in the span of -140°C (at 4 barg) to -161°C (at atmospheric pressure), depending on the developing requirements of the vehicle market. The design capacity is 12 ton LBG/day, but will initially be run at around 70%. The energy cost of liquefaction is around 1 kWh/Nm³ upgraded biogas, which equals approximately 10% of the energy content of the biogas.

Source: <http://www.lidkopingbiogas.se/eng/>

Sweden: GoBiGas gasification plant inaugurated

The gasification plant at GoBiGas (Gothenburg Biomass Gasification Project) was inaugurated on March 12, 2014 in Gothenburg. The plant was commissioned in late 2013 and will produce gas by gasifying forest residues and wood pellets. The produced gas is similar to natural gas and will primarily be used in the transport sector with the goal to switch from fossil fuel to biofuel. The new plant is first of its kind in the world.

The GoBiGas gasification process: The biomass is gasified in a process developed by the Austrian company Repotec. Valmet is handling the engineering work for the gasification plant in Gothenburg with a license from Repotec. Gasification takes place in a separate reactor and heat is transferred from a combustion chamber by circulation of hot bed material. Biomass is fed into the gasifier where it, on contact with the hot bed material, undergoes thermochemical decomposition. After the cleaning and methanation, the gas is imported to the natural gas supply and is used in Göteborg Energi's power plant. Because of the high quality, the biomethane can be fed to the existing distribution grid, where it is mixed with natural gas. Combining a gasification plant using biomass as fuel and a methanation plant is unique in the world.

Source: Valmet Corporation's press release on March 14, 2014 at 2:30 p.m. EET

www.valmet.com/en/infocenter/news.nsf/NewsItems/1768872?OpenDocument#.Uyyp2BChFbo

Hydrogen Fuel - Safety Concerns

Later this year, 1,000 of Hyundai’s hydrogen-fueled cars will go on sale in California; however hydrogen is highly flammable, and can ignite more easily than other fuels.

Just recently, a truck carrying compressed hydrogen caught fire about 20 miles outside downtown Los Angeles, and by the time the local fire department had arrived on the scene, two of the hydrogen tanks had begun venting gas, and flames had engulfed the truck’s cab. It took

almost seven hours for firefighters, working with a mix of chemicals and water, to end the threat. In the end, there were no casualties, and the worst-case scenario was avoided. But as California expands its use of hydrogen-fueled cars and builds out its infrastructure for servicing those cars, more hydrogen is going to be trucked around.

Hydrogen as a fuel source is an attractive proposition mainly because it doesn't emit toxic, heat-trapping pollutants the way gasoline does. An analysis conducted by the U.S. Department of Energy shows that for a mid-size SUV, the total greenhouse gas emissions from using hydrogen as a fuel is at worst half that for gasoline. However, hydrogen poses several other risks that gasoline does not. It is highly flammable, and can ignite more easily than other fuels. Hydrogen is also colorless and odorless, making it difficult to readily detect leaks.



Source: <http://www.propublica.org/article/a-new-road-rage>

Finland opened the world's largest biogas gasifier

The new plant is located in the region of Vaasa, on the Finnish West Coast. It uses biomass as fuel produced with waste from the timber industry, which is one of the major economic activities in Finland. With 140 megawatts of power, the plant of Vaasa will constitute the world's largest biomass gasification .

Installed in an existing coal plant, the new venture will increase the use of renewable energy and reduce the use of coal, while improve the trade balance of the country, said Minister of Labour Lauri Ihalainen, responsible for opening the plant, in a statement. The plant, which is operated by the Finnish company Vaskiluodon Voima, will decrease by 25 to 40% the coal needs and directly employ 100 people and indirectly thousands more in the region, while producing energy and heat for the inhabitants of Vaasa.

Source: http://www.gnvmagazine.com/eng/noticia-finland_opened_the_largest_biogas_plant_in_the_world-3001

ALCOHOLS AND (BIO)GASOLINE

US: POET-DSM's Project LIBERTY on schedule

POET-DSM Advanced Biofuel's first commercial cellulosic bio-ethanol plant remains on schedule for startup in the first part of 2014. The plant, dubbed "Project LIBERTY," will produce 20 million gallons of cellulosic biofuel per year – later ramping up to 25 million gallons – from corn cobs, leaves, husk and some stalk. Construction progress to date includes:

- The Biomass receiving and grinding building is mechanically complete, and biomass processing equipment is nearly ready for commissioning.
- Saccharification, fermentation tanks and processing areas are nearing mechanical



completion and commissioning.

- Other processing areas are nearing mechanical completion as construction continues.
- Cooling tower construction is complete.
- Underground utilities and electrical power infrastructure are mechanically complete.

Farmers primarily in a 40-mile radius to the plant harvested approximately 100,000 tons of biomass this fall to be used to start the plant and operate it through next fall. Farmers are already signing contracts for the 2014 harvest. POET-DSM continues to hire positions for Project LIBERTY.

Source: www.poet.com/pr/construction-remains-on-schedule-for-project-liberty

U.S. ethanol exports in November 2013

U.S. ethanol exports surged to 82.4 million gallons in November, with large volumes finding their way into new or emerging markets such as China and India, as well as the Philippines, Tunisia, Panama, and Mexico, according to US government data.

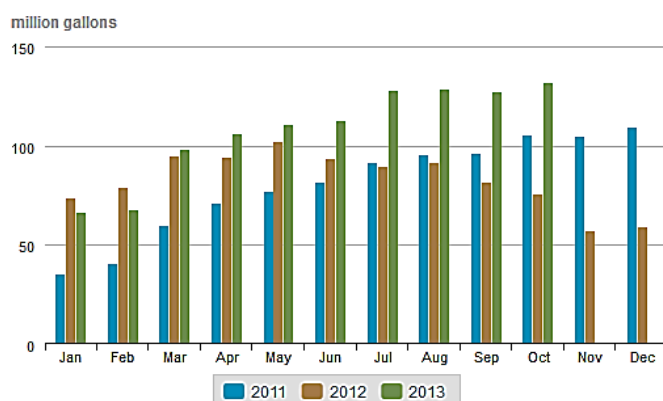
Total exports were up 54 % from October, reaching the highest monthly level since March 2012. Canada was the leading importer of U.S. product, receiving 28.5 million gallons in November. The Philippines followed with an annual high of 14.0 million gallons, while India (8.1 million gallons), Brazil (4.3 million gallons), and Norway (4.3 million gallons) were other top destinations. For the first time since 2002, a sizable volume of fuel ethanol was exported to China (3.5 million gallons). Similarly, Panama imported 2.0 million gallons. Tunisia (2.3 million gallons) and Mexico (1.7 million gallons) are other relatively new markets that imported U.S. product in November.

Source: <http://ethanolproducer.com/articles/10617/rfa-u-s-ethanol-export-opportunities-abound>

BIODIESEL ESTERS

US Biodiesel Production

U.S. production of biodiesel was 132 million gallons in October 2013. Biodiesel production during October 2013 was about 5 million gallons higher than production in September 2013. Biodiesel production from the Midwest region (Petroleum Administration for Defense District 2) was 67% of the U.S. total. Production came from 112 biodiesel plants with capacity of 2.2 billion gallons per year.



Producer sales of biodiesel during October 2013 included 92 million gallons sold as B100 (100% biodiesel) and an additional 41 million gallons of B100 sold in biodiesel blends with diesel fuel derived from petroleum.

There were a total of 1,009 million pounds of feedstocks used to produce biodiesel in October 2013. Soybean oil remained the largest biodiesel feedstock during October 2013 with 551 million pounds consumed.

Source: www.eia.gov/biofuels/biodiesel/production/

SYNTHETIC AND RENEWABLE DIESEL / JET

GTL plants face challenges in the U.S. market

There are currently five GTL plants operating globally, with capacities ranging from 2,700 barrels per day (bbl/d) to 140,000 bbl/d. Shell operates two in Malaysia and one in Qatar, Sasol operates one in South Africa, and the fifth is a joint venture between Sasol and Chevron in Qatar. One plant in Nigeria is currently under construction. Three plants in the United States—in St. Charles, Louisiana; Karns City, Pennsylvania; and Ashtabula, Ohio—are proposed. Of these, only the St. Charles facility is a large-scale GTL plant. In December 2013, Shell cancelled plans to build a large-scale GTL facility in Louisiana because of high estimated capital costs and market uncertainty regarding natural gas and petroleum product prices. The Annual Energy Outlook 2014 (AEO2014) Reference case projection does not include any large-scale GTL facilities in the United States through 2040. Other uses for available natural gas in industry, electric power generation, and exports of pipeline and liquefied natural gas are more economically attractive than GTL under AEO2014 Reference case facility cost assumptions and energy prices.

To improve the long-term profitability of GTL plants, developers have reconfigured their designs to include the production of waxes and lubricating products, which are another primary product of the FT process. Because of the smaller size of the chemical market, smaller-scale GTL plants similar to those proposed in the Midwest are economically viable. U.S. imports of waxes similar to those produced out of the FT process have experienced steady growth over the past decade because of increased demand in the chemicals market. FT waxes are used in industries producing candles, paints and coatings, resins, plastic, synthetic rubber, tires, and other products.

Source: <http://www.eia.gov/todayinenergy/detail.cfm?id=15071>

China: Biobased Aviation Fuel approved

The Chinese government has approved a biobased aviation fuel for commercial use. On Feb. 12, the Civil Aviation Administration of China published a notice announcing it has granted Sinopec the first certificate of airworthiness for biobased jet fuel. According to information published by the aviation administration Sinopec filed the application for the certificate in February 2012.

A statement released by the CAAC indicates the “biojet” complies with the CTSO-2C701. Information published by the CAAC in mid-2012 indicates the standard applies to civil aviation jet fuel containing synthesized hydrocarbons. According to information published on the standard, it requires alternative fuel and its synthetic paraffinic kerosene (SPK) component to conform to ASTM D7566-11a, which is a specification for aviation fuel containing synthesized hydrocarbons, and the supplement in CTSO-2C701.

In April 2013, Sinopec announced the success of the first test flight powered by its aviation biofuel. According to the company an Airbus A320 owned by China Eastern Airlines completed an 85-minute flight on biojet made from palm oil and recycled cooking oil feedstocks.

Source: <http://biomassmagazine.com/articles/10031/china-approves-biobased-aviation-fuel-for-commercial-use>

CORE-JetFuel

The CORE-JetFuel project supports the European Commission in its dynamic and informed implementation of research and innovation projects in the field of sustainable alternative fuels for aviation. It links initiatives and projects at the EU and Member State level, serving as a focal

point in this area to all public and private stakeholders. The project addresses competent authorities, research institutions, feedstock and fuel producers, distributors, aircraft and engine manufacturers, airlines and NGOs. It aims to set up a European network of excellence for alternative fuels in aviation that brings together technical expertise from all across this complex thematic field and helps to coordinate R&D as well as implementation efforts.

Source: <http://international.fnr.de/eu-activities/european-projects/core-jetfuel/>

BIOjet Abu Dhabi: Flight Path to Sustainability

Etihad Airways, Boeing, Takreer, Total and the Masdar Institute of Science and Technology announced they will collaborate on a new initiative – BIOjet Abu Dhabi: Flight Path to Sustainability – to support a sustainable aviation biofuel industry in the United Arab Emirates (UAE).

BIOjet Abu Dhabi will engage a broad range of stakeholders to develop a comprehensive framework for a UAE biofuel supply chain, including research and development and expanded investment in feedstock production and refining capability in the UAE and globally.

BIOjet Abu Dhabi was announced one day after Etihad Airways conducted a demonstration flight with a Boeing 777 powered in part by the first UAE-produced biokerosene from an innovative plant biomass-processing technology. The biofuel was partially converted from biomass by Total and its partner Amyris. Takreer, a wholly owned subsidiary of Abu Dhabi National Oil Co. (ADNOC), did the final aviation biofuel distillation, adding the UAE to a handful of countries that have produced and flown on their own biokerosene.

Source: <http://www.etihad.com/en-ae/about-us/news/archive/2014/new-biojet-abu-dhabi-initiative/>

OTHER FUELS AND VEHICLES

Iogen announces new drop - in cellulosic biofuel

Iogen Corporation announced it has developed a new method to make drop-in cellulosic biofuels from biogas using existing refinery assets. The company estimates there is refining capacity in place to incorporate 5 -6 billion gallons per year of renewable hydrogen content into gasoline and diesel fuel. Iogen will initially commercialize the approach using landfill biogas, and then expand production using biogas made in the cellulosic ethanol facilities it is currently developing. The production method involves processing biogas to make renewable hydrogen and incorporating this into finished fuels in selected refinery hydrogenating units. The overall greenhouse gas emissions are reduced by more than 60%, meeting the threshold for cellulosic biofuel in the USA.

Iogen said it is actively consulting with the EPA and CARB to gain pathway approval for being counted against national RFS goals. Biogas is produced today from landfills, wastewater treatment plants, waste digestion facilities, and farm digesters with well proven technology. The company says it is planning to use the technology in association with two large scale US cellulosic ethanol plants it is developing, resulting in increased overall cellulosic biofuel yields per unit of feedstock, lower unit capital costs, and lower water usage per unit of biofuel production.

Source: http://www.iogen.ca/media-resources/press_releases/2014_Iogen_pr_jan22.pdf

US: CNG Snow Plow

In the U.S. State of Wisconsin, the newest addition to Dane County's growing fleet of compressed natural gas (CNG) vehicles is a cutting-edge snow plow that runs exclusively on the cheaper, cleaner, fuel. Dane County is the first to pilot the new equipment in Wisconsin. The County Executive also detailed next steps the county will take to create a road map for conversion of its vehicle fleet to run on CNG by 2023.



The average county plow consumes 2,400 gallons of diesel fuel per year. The renewable CNG the county generates from decaying garbage at its Rodefild landfill costs the county the gasoline equivalent of \$1.25 a gallon. With diesel prices topping off at nearly \$4 a gallon locally that amounts to over \$6,000 in fuel savings per CNG plow per year.

Source: <http://www.ngvglobal.com/dane-county-clears-snow-with-cng-plow-0214#more-30295>

MISCELLANEOUS

Airbus and Malaysia sign MOU

Airbus and key Malaysian partners have signed a memorandum of understanding (MOU) to assess local solutions for sustainable biomass production in Malaysia. The aim is to determine the most suitable feedstocks to ensure that any future jet fuel production in the region is based only on sustainable solutions. The first assessment is expected to be completed by December 2014. Other partners include AMIC (Aerospace Malaysia Innovation Centre), MiGHT (Malaysian Industry-Government Group for High technology), UPM (Universiti Putra Malaysia), CIRAD (a French research centre working with developing countries to tackle international agricultural and development issues) and BioTech Corp (Malaysian Biotechnology Corporation).

Airbus supports the certification and development of commercial quantities of sustainable alternative fuels for aviation through promoting innovative regional projects world-wide. To date, Airbus has formed partnerships in Europe, America, Australia, Middle-East and China.

Source: <http://www.biomassmagazine.com/articles/9961/airbus-forms-a-sustainable-fuel-center-of-excellence-in-malaysia>

IEA & IEA-AMF NEWS

AMF IA

The Advanced Motor Fuels Implementing Agreement (AMF IA) is driving on a successful path towards cleaner and more efficient transport. Established in 1984, in its 30th year of existence the Implementing Agreement has grown to a number of 17 Contracting Parties which currently participate in 12 Annexes. Over the years, 35 Annexes have been successfully completed, and more than 50 reports have been published.

AMF Executive Committee

Three transport related IEA Implementing Agreements will hold their Executive Committee meetings in the week of 19 May 2014 in Copenhagen, Denmark: Advanced Motor Fuels (AMF),

Hybrid and Electric Vehicles (HEV), and Bioenergy. Joint activities include an AMF and Bioenergy workshop on "Infrastructure Compatible Transport Fuels"; site visits; and a discussion between AMF and HEV on their strategic plans for the next working period and topics for cooperation.

The 47th Meeting of the AMF Executive Committee will be held 20 – 23 May 2014 in Copenhagen, Denmark. This is an important ExCo meeting for AMF, as the documents for the extension of the Implementing Agreement for another five years (starting 2015) will be finalized.

AMF Annexes / Projects

Annex 28: Information Service & AMF Website

Annex 35 Subtask 2: Particulate Measurements: Ethanol and Butanol in DISI Engines

Annex 38 Phase 2: Environmental Impact of Biodiesel Vehicles

Annex 39 Phase 2: Enhanced Emission Performance of HD Methane Engines

Annex 42: Toxicity of Exhaust Gases and Particles from IC-Engines

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

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

Annex 45: Hydrotreated vegetable oil, by Germany and Denmark

Annex 46: Alcohol Application in CI Engines, by DTU

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

Check www.iea-amf.org for more details!

PUBLICATIONS

- **Biofuels for Transportation Markets** - This report analyzes the emerging markets and future growth opportunities for biofuels, including ethanol, biodiesel, and drop-in biofuels. It provides an analysis of the major demand drivers and market challenges. Global market forecasts of vehicle sales and vehicles in use, along with liquid fuels consumption, station installations, and revenue extend through 2022. The report also examines the key technologies associated with biofuels, as well as the competitive landscape.

Link: <http://www.navigantresearch.com/research/biofuels-for-transportation-markets>

- **Biogas – an introduction** – This study gives a brief introduction in the subject of biogas production and utilization in Germany. The German Government has set itself the goal of ensuring a modern, environmentally friendly, sustainable and safe supply of energy by means of expanding renewable energies like biogas. Biogas produced from biomass takes on a special role among renewable energies: it is suitable for the simultaneous production of electricity and heat, as a fuel and as a natural gas substitute. In addition, it is flexible in use and relatively easy to store. Energy generation from biogas is not subject to fluctuations due to the time of year, the time of day or the weather. After all, biomass is a CO₂-neutral energy source to a large degree.

Link: <http://mediathek.fnr.de/biogas-an-introduction.html>

- **Global screening of 'Power-to-Gas' and BioSNG projects** – The report Global screening of projects and technologies for Power-to-Gas and Bio-SNG has been prepared by the Danish Gas Technology Centre. It describes more than 50 topical projects in 15 countries on projects (test, development, demonstration) that integrate electricity and gas. With actual descriptions of the individual projects the report gives a current overall view of the state-of-the-art of the two technology areas.

Link:

http://www.energinet.dk/SiteCollectionDocuments/Engelske%20dokumenter/Forskning/global_screening_08112013_final.pdf

- **Advanced biofuel feedstocks: an assessment of sustainability** – This study by the Arup URS Consortium in the UK provides, to the best of knowledge, a first holistic analysis of the list of feedstocks. In this study, information has been collected regarding the basic characteristics, supply potentials, technology compatibility, economics and sustainability for 28 feedstocks. The analysis is based on the best evidence publically available that could be gathered within the duration of the study, and it was highlighted where the available evidence is most uncertain and additional information is needed. Feedstock supply data for today and 2020 have been collected (in million tonnes/yr and PJ/yr of biofuel equivalent) for the UK, EU and globally.

Link: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/277436/feedstock-sustainability.pdf

- **Technology Roadmap: Wind Energy - 2013 edition** – The IEA Wind Power Technology Roadmap 2013 Edition recognizes the very significant progress made since the first edition was published in 2009. The technology continues to improve rapidly, and costs of generation from land-based wind installations continue to fall. Wind power is now being deployed in countries with good resources without any dedicated financial incentives. The 2013 Edition targets an increased share (15% to 18%) of global electricity to be provided by wind power in 2050, compared to 12% in the original roadmap of 2009. However, increasing levels of low-cost wind still require predictable, supportive regulatory environments and appropriate market designs.

Link: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/277436/feedstock-sustainability.pdf

- **Energy Technology Initiatives – 2013** – Ensuring energy security and addressing climate change cost-effectively are key global challenges. To find solutions, the public and private sectors must work together, sharing burdens and resources, while at the same time multiplying results and outcomes. This publication highlights the most significant recent achievements of the IEA Implementing Agreements. At the core of the IEA energy technology network, these initiatives are a fundamental building block for facilitating the entry of new and improved energy technologies into the marketplace.

Link: http://www.iea.org/publications/freepublications/publication/EnergyTechnologyInitiatives_2013.pdf

- **A closer look at urban transport – TERM 2013: transport indicators tracking progress towards environmental targets in Europe** – European Environment Agency's (EEA) annual Transport and Environment Reporting Mechanism (TERM) report aims to provide policymakers, as well as a broader audience, a clear overview of current transport demand, the pressures from the transport sector on the environment, and related impacts and responses. The report uses latest available data in order to assess key trends and overall progress towards policy targets. This TERM 2013 report includes an assessment of progress towards the transport-related environmental targets set out in the 2011 White Paper and other transport and environment regulations. It also includes a

focus on the environmental impacts of urban transport.

Link: http://www.iea.org/publications/freepublications/publication/EnergyTechnologyInitiatives_2013.pdf

- **Canadian guide to biomethane** – Ontario's Biogas Association published a Developers' Guide to Biomethane as a Vehicle Fuel to help farmers determine if producing biogas and upgrading it to biomethane to be used as a renewable vehicle fuel is a good fit for their farm operations.
Link: <http://biogasassociation.ca/bioExp/images/uploads/documents/membersOnly/DeveloperGuide-BiomethaneVehicleFuel.pdf>
- **Wasted: Europe's Untapped Resource** – According to a newly released study conducted by the International Council for Clean Transportation and the National Non-Food Crops Centre, if all sustainably available waste and residuals were converted to biofuels, it could supply up to 16 percent of the European Union's road fuel by 2030.
Link: <http://europeanclimate.org/wp-content/uploads/2014/02/WASTED-final.pdf>
- **EU study predicts clean energy, climate failure by 2050** – The EU's decarbonisation of its energy sector will only cut emissions by half the amount needed to limit global warming to 2° Celsius in 2050, according to a business-as-usual scenario quietly released by the European Commission. Scientists and EU leaders agree that by mid-century, Europe must ramp up energy savings and green its power generation to slash CO₂ emissions by 80-95% compared to 1990 levels, and so avoid catastrophic climate change. But according to a European Commission 'Trends to 2050' study, the continent is only on track to reduce its emissions by around a third in 2030, and 44% in 2050.
Link: http://ec.europa.eu/energy/observatory/trends_2030/doc/trends_to_2050_update_2013.pdf
- **Remap 2030 – A Renewable Energy Roadmap** – REmap 2030 is a roadmap to double the share of renewable energy by 2030. It is the first global study to provide renewable energy options based on a bottom-up analysis of official national sources. The roadmap encompasses 26 countries representing three-quarters of current energy demand. In determining the potential to scale up renewables, the study not only focuses on technologies, but also on the availability of financing, political will, skills, and the role of planning.
Link: <http://irena.org/remap/>

EVENTS

31st International Battery Seminar & Exhibit, 10-13 March 2014, Fort Lauderdale, Florida, USA

Conference website: <http://www.powersources.net/florida/31st.html>

European Hydrogen Energy Conference (EHEC 2014), 12-14 March 2014, Sevilla, Spain

Conference website: <http://www.ehec.info/>

Automotive World Megatrends USA 2014, 18 March 2014, Dearborn, Michigan, USA

Conference website: <http://megatrendssusa.automotiveworld.com/>

Bioenergy, Fuels and Products Conference and Expo, 18-19 March 2014, Atlanta, Georgia, USA

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

International Symposium "Automotive and Engine Technology", 18-19 March 2014, Stuttgart, Germany

Conference website: <http://www.fkfs.de/english/company/events/stuttgart-symposium-2014/>

F.O. Licht's Sugar and Ethanol Brazil 2014, 24-26 March 2014, Sao Paulo, Brazil

Conference website: <http://ethanolbrazil.agraevents.com/>

Transport Business Summit 2014 – Transport – Driving Europe's Economy, 27 March 2014,

Brussels, Belgium

Conference website: http://ec.europa.eu/transport/newsletters/2014/01-31/articles/save-the-date_tbs_en.htm

Energy Storage World Forum, 1 April 2014, London, UK

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

New Energy Vehicle Show, 2 April 2014, Hong Kong, China

Conference website: <http://www.nev-hk.com/>

Biomass Fuel and Power Congress, 8-9 April 2014, Moscow, Russia

Conference website: <http://www.biofuels.ru/>

5th Transport Research Arena (TRA) 2014 conference, 14-17 April 2014, Paris-la-Defense, France

Conference website: <http://www.traconference.eu/>

Energy Mobility 2014, 29 April 2014, San Diego, CA, USA

Conference website: http://www.knowledgefoundation.com/viewevents.php?event_id=312#oid

Small Fuel Cells 2014, 30 April 2014, San Diego, CA, USA

NGV Global 2014, 5-8 May 2014, Long Beach, California, USA

Conference website: <http://www.ngv2014.com/>

Alternative Clean Transportation Expo, 5-8 May 2014, Long Beach, California, USA

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

European Algae Biomass 2014, 6-7 May 2014, Seville, Spain

Conference website: <http://www.wplgroup.com/aci/conferences/eu-eal4.asp>

International Conference MECHATRONICS, 12-14 May 2014, Lodz, Poland

Conference website: <http://icm-iiia.eu/>

PYRO 2014 - 20th International Symposium on Analytical and Applied Pyrolysis, 19-23 May 2014, Birmingham, UK

Conference website: <http://www.pyro2014.co.uk/>

E-Mobility-World, 23 May 2014, Friedrichshafen, Germany

Conference website: <http://www.e-mobility-world.de/emw-de/index.php>

7th Graz Symposium Virtuelles Fahrzeug, 27-28 May 2014, Graz, Austria

Conference website: <http://www.gsvf.at/cms/index.php/en>

World Bioenergy 2014, 3-5 June 2014, Jönköping, Sweden

Conference website: www.worldbioenergy.com

10th International Conference on Renewable Resources and Biorefineries, 4-6 June 2014, Valladolid, Spain

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

FEW Fuel Ethanol Workshop & Expo, 9-12 June 2014, Indianapolis, IN, USA

Conference website: www.fuelethanolworkshop.com

Oleofuels 2014, 11-12 June 2014, Düsseldorf, Germany

Conference website: <http://www.wplgroup.com/aci/conferences/eu-eaf7.asp>

2nd International Conference of the Cluster of Excellence Tailor-Made Fuels from Biomass, 16-18 June 2014, Aachen, Germany

Conference website: <http://www.fuelcenter.rwth-aachen.de/index.php?id=545>

18th Int. Forum on Advanced Microsystems for Automotive Applications (AMAA 2014), 23 June 2014, Berlin, Germany

Conference website: <http://www.amaa.de/>

EngineExpo2014, 24-26 June 2014, Stuttgart, Germany

Conference website: <http://www.engine-expo.com/english/index.php>

11th EUROPEAN SOFC & SOE FORUM, 1-4 July 2014, Lucerne, Switzerland

Conference website: <http://www.efcf.com/index.php?id=1195>

International VDI Conference - Biofuels 2014, 15-16 July 2014, Rotterdam, Netherlands

Conference website: <http://www.vdi-wissensforum.de/en/nc/events/detailseite/event/06K0966014/>

4th International Symposium on Gasification and its Applications, 2-4 September 2014, Vienna, Austria

Conference website: <http://www.i-sga.info/>

TCS2014 - Symposium on Thermal and Catalytic Sciences for Biofuels and Biobased Products, 2-5 September 2014, Denver, USA

Conference website: <http://www.tcs2014.org/>

Batteries 2014, 24 September 2014, Nice, France

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

Biofuels International 2014, 24-25 September 2014, Ghent, Belgium

Conference website: http://www.biofuels-news.com/conference/14_programme.php

H2Expo - e-mobility, fuel cells, hydrogen & storage solutions, 23-26 September 2014, Hamburg, Germany

Conference website: <http://www.h2expo.com/en/>

9th IAV Conference: Gas-Powered Vehicles, 29-30 September 2014, Potsdam, Germany

Conference website: <http://www.iav.com/en/events/iav-tagung/9th-iaav-conference-gas-powered-vehicles>

National Advanced Biofuels Conference and Expo, 13-15 October 2014, Minneapolis, Minnesota, USA

Conference website: <http://www.advancedbiofuelsconference.com/ema/DisplayPage.aspx?pageId=Home>

SGC International Seminar on Gasification, October 15-16, Malmö, Sweden

Conference website: www.gasification.se

Biogas Science 2014, 26-30 October 2014, Vienna, Austria

Conference website: <http://biogas2014.boku.ac.at/>

2014 IEEE Vehicle Power and Propulsion Conference (VPPC), 27-30 October 2014, Coimbra, Portugal

Conference website: <http://www.vppc2014.org/home.html>

European Electric Vehicle Congress, 2-5 December 2014, Brussels, Belgium

Conference website: <http://www.eevc.eu/>

21st International Symposium on Alcohol Fuels ISAF, 10-14 March 2015, Gwangju, Republic of Korea

Conference website: www.2015isaf.org

5th EUROPEAN PEFC & H2 FORUM, 30 June 2015, Lucerne, Switzerland

Conference website: <http://www.efcf.com/index.php?id=1237>

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