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Providing clients with a strategic view of feedstock, technology, policy, and market opportunity across the bioeconomy

News Review

Biofuel

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Each month we review the latest news and select key announcements and commentary from across the biofuels sector.

Contents

Foreword

Welcome, both subscribers and non-subscribers, to October's Biofuels News Review.

Carbon capture, utilisation and storage (CCUS) has been described as one of the key technologies that need to be adopted in order to shift towards net-zero carbon emissions. The principle is simple – carbon emissions are captured, usually at the source of production, and prevented from entering the atmosphere either by carefully depositing it below the Earth's surface or by valorising it into useful products. When CCUS is combined with the generation of fuels derived from biomass, as is the case with a new project from Velocys and Oxy Low Carbon Ventures, these fuels can be described as carbon-negative due to the carbon dioxide which was removed from the atmosphere by the biomass during its growth. This new project will see transport fuels produced by Velocys at their Bayou Fuels facility, and the carbon dioxide produced in the process transported and stored by Oxy Low Carbon Ventures.

Advanced biofuels are those produced from feedstocks that don't compete with food crops. For example, biodiesel made from used cooking oil is perhaps one of the most documented lately in the news. A recent Dutch invention will soon see an advanced biofuel powering Swedish cars made from wood residues such as sawdust. These residues will be pyrolyzed into a bio-oil for further processing, ultimately fuelling the equivalent of 15,000 cars every year.

Air travel has lately come under scrutiny for being a heavily polluting form of travel. As a result, carbon offsetting has become a popular way of mitigating the effects of air travel. Carbon offsetting is compensating for carbon emissions by making a reduction elsewhere, for example by planting trees which take up carbon dioxide from the atmosphere. British Airways are due to take the step of carbon offsetting all of their flights within the UK, by investing in global carbon reduction projects. In addition, Gulfstream Aerospace has launched a scheme, whereby its customers can pay a regular fee based on their flights which is reinvested in carbon offsetting projects. However, despite the benefits of this scheme, this does pass the financial burden onto the consumer and therefore is not necessarily an effective or 'sustainable' way of tackling climate change. Luckily, the company's sustainability programme also invests in eco-friendly buildings and the use of SAF (sustainable aviation fuel) which helps tackle carbon emissions at the root of the problem.

Read on for the latest news.

Policy

EPA exemption challenged

A coalition of renewable fuel and agricultural trade organisations in the US has filed a petition with the Court of Appeals for the District of Columbia Circuit, challenging the process by which the US Environmental Protection Agency (EPA) exempted certain small refineries from Renewable Fuel Standard exemptions for 2018.

In contrast to previous years, the EPA's entire decision document on the RFS exemptions was just two pages long, in which the agency claimed to resolve 36 pending petitions for disproportionate economic hardship exemptions.

This decision exempted small refineries from having to blend almost 1.5 billion gallons of renewable fuel, the coalition noted in the petition. Moreover, the document did not reveal any details and contained a too-brief reasoning for the EPA's decision. The coalition also noted that the decision did not transparently address whether any of the small refineries were eligible to receive extensions of their exemptions and did not include an analysis of 'disproportionate economic hardship', as the statute envisions.

Click here for more information.

Markets

Velocys moves to BIoCCS

Velocys has announced a project to produce negative emission fuels after signing a carbon capture, usage and storage (CCUS) agreement with Oxy Low Carbon Ventures (OLCV). The partnership is to capture carbon dioxide (CO_2) from its planned Bayou Fuels biomass-to-fuels project in Natchez, Mississippi, and securely store it underground. OLCV, a wholly-owned subsidiary of Occidental, will take, transport and store the CO_2 captured from the Bayou Fuels facility, enabling the production of transportation fuels that have net negative carbon intensity. It will be the first facility of its kind in the world.

According to a statement by Velocys, the Bayou Fuels project will take waste woody biomass and convert it into transportation fuels, such as diesel for trucks and sustainable aviation fuel, using the company's Fischer-Tropsch process.

Click here for more information.

August US corn market

Pixabay

The USDA recently released its Grain Crushings and Co-Products Production report with data from August, reporting that corn use for ethanol production was up slightly from July, but down 6% when compared to August 2018.

Total corn consumed for alcohol and other uses was 508 million bushels in August, up slightly from July, but down 6% from August 2018. August 2019 usage included 91.4% for alcohol and 8.6% for other purposes.

Corn use for fuel alcohol was at 455 million bushels, up 1% from July, but down 6% from August 2018. Corn consumed for dry milling fuel production and wet milling fuel production was 90.3% and 9.7%, respectively.

Click here for more information.

Research and Development

Civil Aviation agrees programme for emissions reduction

At the 40th International Civil Aviation Organization (ICAO) Assembly, airlines have welcomed support for the aviation industry's sustainability programmes.

The issue of the environment was top of the agenda during the week-long meeting of governments and industry stakeholders in Montreal, Canada. During the event, ICAO member states agreed to address the possibility of a long-term goal for governments to reduce carbon emissions from aviation.

Discussions between states resulted in two key outcomes, which the International Air Transport Association (IATA) has said will help airlines "take the next step" in cutting carbon emissions even further.

At the next assembly, the ICAO Council will report back on options for the adoption of a long-term goal for reducing carbon emissions from international aviation. Moreover, the assembly passed a resolution that reaffirmed support for the implementation of CORSIA, the Carbon Offsetting and Reduction Scheme for International Aviation.

This marks the first time in history that ICAO's 193 member states have agreed to look at a long-term goal for governments to cut emission from air travel. The move has been welcomed by IATA and its member airlines, who are aiming to cut total emissions to 50% of 2005 levels by 2050.

Click here for more information.

Biobased fuel using seawater bacteria

Wikimedia Commons

Researchers from The University of Manchester are exploring a more efficient way to produce the next generation of bio-based jet fuels – partly made from a type of bacteria that grows in seawater. The research group, led by Professor Nigel Scrutton, Director of the Manchester Institute of Biotechnology (MIB) and supported by the prestigious US-based international maritime research agency Office of Naval Research Global (ONR), is using synthetic biology to help identify a more efficient and sustainable method to make biofuel than the one currently used.

Scientists have discovered that the bacteria species called Halomonas, which grows in seawater, provides a viable "microbial chassis" that can be engineered to make high value compounds. This in turn means products like bio-based jet fuel could be made economically using production methods similar to those in the brewery industry and using renewable resources such as seawater and sugar.

The breakthrough behind this approach is the ability to re-engineer the microbe's genome so to change its metabolism and create different types of high value chemical compounds which could be renewable alternatives to crude oil. Dr Benjamin Harvey and his team of researchers at the world-leading Naval research facilities in China Lake, California, USA, have pioneered this work on converting biological precursors to jet fuels.

Click here for more information.

Biofuel precursors using MSW and biomass

Wikimedia Commons

Researchers at Lawrence Berkeley National Laboratory – Berkeley Lab – have successfully created six blends by combining municipal solid waste (MSW) with biomass.

MSW is rubbish that is produced every day around the world in significant volumes. Using an ionic liquid-based process, the scientists have converted the blends into methyl ketones, which are chemical compounds that can be used as diesel fuel precursors.

The study, which was published in the journal ChemSusChem, is reportedly the first to prove the conversion of MSW to methyl ketones using an ionic liquid process, an efficient biomass pre-treatment process.

The research was part of a collaboration between the Joint BioEnergy Institute and the Advanced Biofuels and Bioproducts Process Development Unit, both of which were established by the US Department of Energy and based at Berkeley Lab.

The scientists have scaled up one of the six blends 30-fold and are now attempting to scale up the process ever further.

Click here for more information.

Bioethanol

E85 from Pearson Fuels

Pearson Fuels, the largest distributor of E85 flex fuel in California, today announced a partnership to purchase renewable naphtha (RN) from World Energy, one of the largest and longest-serving low-carbon fuel suppliers in North America. Pearson Fuels will blend its ethanol fuel with World Energy's RN, a co-product from the production of renewable diesel (RD) and sustainable aviation fuel (SAF). The E85 flex fuel blend using RN creates an almost completely renewable fuel, which is the first of its kind in the world.

Click here for more information.

Biodiesel

Biorefinery opens in Gela

Eni has opened the most innovative bio-refinery in Europe at Gela. Launched in August 2019, the plant has a processing capacity of up to 750,000 tonnes a year and will be able to treat increasing quantities of used vegetable oil, animal fat, algae and by-products to produce high-quality biofuels.

All the petrochemical plants built in Gela since 1962 have closed down. In addition to the €294 million that has been spent so far on reconverting the refineries, Eni plans to invest another €73 million for further preliminary activities and pre-treating biomass, which will be finished by the third quarter of 2020 and will supply the bio-refinery with second-generation raw material, from waste, raw vegetable oil and advanced material.

The process of converting the traditional refinery into a bio-refinery began in April 2016 and took more than 3 million hours of work by Eni's employees and third parties to finish. To create

the Ecofining™ plant, the two existing desulphurisation units were modified, and a steam reforming unit was built to produce hydrogen. Hydrogen is a basic ingredient in hydrogenated vegetable oil (HVO), the biodiesel that, when added to fossil diesel at 15%, makes the premium fuel Enidiesel+.

Click here for more information.

Biodiesel snowploughs

Flickr

In Missouri, the National Biodiesel Foundation was awarded U.S. Environmental Protection Agency funding for its 2020 National Clean Diesel Project. In partnership with Iowa Department of Transportation, Optimus Technologies, and Renewable Energy Group, the project supports the purchase of three new replacement snowploughs that will operate on B100 and retire older more polluting vehicles. Renewable Energy Group will provide the B100 refuelling infrastructure for the fleet.

These new vehicles will facilitate goods movement seasonally by providing snow removal service and have access to rail yards, terminals, and key distribution centres. All replacement vehicles will use Optimus Technologies' Vector technology, allowing the vehicles to operate exclusively on 100% biodiesel – other than start-up and shutdown – to optimize fuel savings and emissions performance.

Click here for more information.

Belgium biodiesel storage and blending

Canada-headquartered multinational materials distributor Targray has opened its biodiesel terminal in Antwerp, Belgium. The biofuels storage and blending facility operates 24/7, and will serve fuel producers, distributors, traders and retailers in European markets.

The facility is strategically located in Europe's largest petrochemical centre, while Antwerp has good connections to customer bases throughout Europe via rail, sea, inland waterway and road transportation networks.

The terminal, which took its first order in the third quarter of 2019, supplies quantities of biodiesel from a wide range of feedstocks.

The opening of the terminal comes as fuel suppliers in the European Union (EU) seek to meet sustainability targets for two key European Commission directives entering their final year: the Fuel Quality Directive (FQD) and the Renewable Energy Directive (RED).

The FQD requires a reduction of the greenhouse gas intensity of transport fuels in the EU by a minimum of 6%, while the RED sets a 20% target for renewable energy and a 10% target for renewable energy in transport. Both directives state that targets must be met by the end of 2020.

Click here for more information.

Aviation Biofuel

Delta airlines look to forest residuals for fuel

US airline Delta Air Lines has announced it will invest $2 million (€1.8 million) to carry out a feasibility study for a biofuel production facility, in partnership with Northwest Advanced Biofuels (NWABF).

The potential biofuel production facility will produce sustainable aviation fuel (SAF) – as well as other biofuel products – and is expected to be located in Washington State. The SAF could be used in the airline's operations at stations in Seattle, Portland, San Francisco and Los Angeles.

Led by NWABF, the project would use wood residue deposits and wood slash from forest floors as the feedstock for the biofuel, which would quality under and approved carbon-reducing pathway recognised by the American Society of Testing and Materials (ASTM).

Delta expects the feasibility study to be complete by the middle of 2020, with first biofuel delivered by NWABF by the end of 2023.

Click here for more information.

BA to invest in carbon offsets

Wikipedia

UK airline British Airways will become the first in the country to offset carbon emissions on all flights within the UK.

From January 2020, all customers travelling within the UK on flights operated by British Airways will have carbon emissions offset by the airline and invested in carbon reduction projects around the world. These projects include renewable energy, protection of rainforests and reforestation initiatives.

British Airways operates up to 75 flights every day between London and 10 cities around the UK, including Edinburgh, Manchester and Newcastle. Its domestic emissions equate to around 400,000 tonnes of carbon dioxide (CO_2) annually.

The airline's parent company, International Airlines Group (IAG), has also become the first airline group in the world to commit to achieving net zero carbon emissions by 2050. This goal will be achieved through several environmental plans, including investing over $400 million (€363.3 million) in sustainable aviation fuels over the next two decades.

Click here for more information.

$40 million pledge from US airline

United Airlines have further strengthened their reputation as an aviation industry leader in environmental sustainability by committing $40 million toward a new investment vehicle focused on accelerating the development of sustainable aviation fuels and other decarbonization technologies. The carrier, which earlier this year agreed to purchase up to 10 million gallons of sustainable aviation fuel over the next two years, will look to collaborate with other environmentally conscious partners on this extraordinary initiative. Among all airlines around the world, United holds more than 50% of all publicly announced purchase commitments to using sustainable aviation fuels and is the only U.S. carrier to currently use this fuel on a continuous basis.

Click here for more information.

Carbon offsets as new service with Gulfstream

General Dynamics' subsidiary Gulfstream Aerospace has launched a new service underlining its commitment to sustainability, which provides operators with the option to offset carbon emissions from their flights. Participants in the scheme will pay an annual fee based on aircraft utilisation to fund projects and actions that

generate an equivalent reduction in carbon emissions.

The company does not charge operators for administering its carbon offset service and there is no contractual commitment. Customers inform Gulfstream of their projected annual flight hours and are invoiced monthly; the fee received is then invested in environmentally friendly activities through a third-party provider.

Gulfstream added that one carbon offset represents the reduction of one metric ton of greenhouse gas emissions. The company's sustainability programme includes optimising aircraft, eco-friendly buildings, as well as the use of sustainable aviation fuel (SAF). Gulfstream's maintenance and completions facility in Long Beach, California in the US sells SAF to customers, which it uses for completions and delivery flights.

Click here for more information.

Other Biofuels

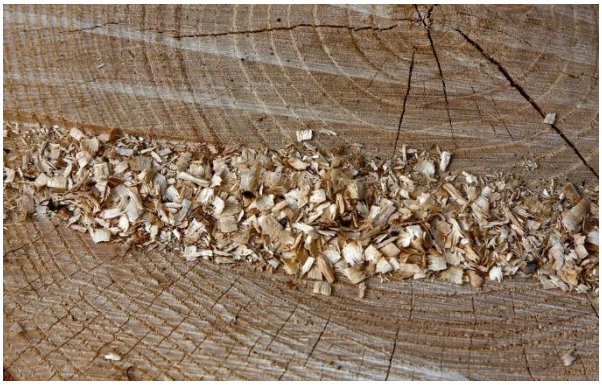
Biomethane needed to reach net zero

Biomethane has been named as one of the best-positioned fuels to reach net zero emissions by a recent study. The joint study by Lloyd's Register and A.P. Moller – Maersk found that the best opportunities for decarbonising shipping lie in finding new sustainable energy sources. Based on market projections, the study found that biomethane, alcohol and ammonia are the best options.

Energy efficiency is an important tool for integrated logistics company Maersk to reduce carbon emissions. Efficiency measures have positioned the firm 10% ahead of the industry average. However, achieving net zero requires a change in the way deep-sea vessels are fuelled.

Click here for more information.

Swedish bio-oil to power cars



Flickr

Thanks to a Dutch invention, cars in Sweden will soon be powered by a fuel made from wood residues such as sawdust. TechnipFMC and the Dutch company BTG-BTL based in Twente will design and build a production facility in Sweden where wood residues will be converted into bio-oil. It will be the first plant in the world where 'green fuel' will be produced and further processed in a refinery for motor vehicles.

The plant will convert roughly 35,000 – 40,000 tons of dry wood residues into oil each year using a special technology called pyrolysis. This oil is then processed in a refinery to produce advanced biofuels. With this produced pyrolysis petrol an equivalent of 15,000 family cars can be powered per year.

The biofuel is mixed with other types of fuel – biofuels as well as fossil fuels – resulting in a petrol and diesel that is partly composed of sustainable oil. This ensures that it will comply with the European RED II directive under which, starting in 2020, petrol must contain a certain fraction of renewable energy from sustainable sources such as wind, sun, and biomass.

Click here for more information.

Events

Energy & Clean Growth in the Northern Powerhouse
Hull, 5th-6th November 2019

The first week of November will see the NP11 convening a major, two-day event to showcase the innovation, leadership and opportunities across the North of England in energy, decarbonisation, transition and clean growth.

Click here for more information.

Future of Biogas Europe 2019
Amsterdam, 13th-14th November 2019

This 5th annual two-day conference will once again provide a senior level platform and bring together senior executives & experts from the entire value chain including power producers, technology providers, agricultural sector, food and beverage industry, waste industry and leading technology and solution providers.

Click here for more information.

RSB Annual Meeting 2019
Berlin, 5th-6th December 2019

Join us at the 2019 RSB Annual Meeting, sponsored by Agrisoma, Airbus and UPM Biofuels, where we will be unlocking the tools and strategies being employed by leaders across the advanced bioeconomy as they embed real sustainability in every layer of their operations.

Click here for more information.

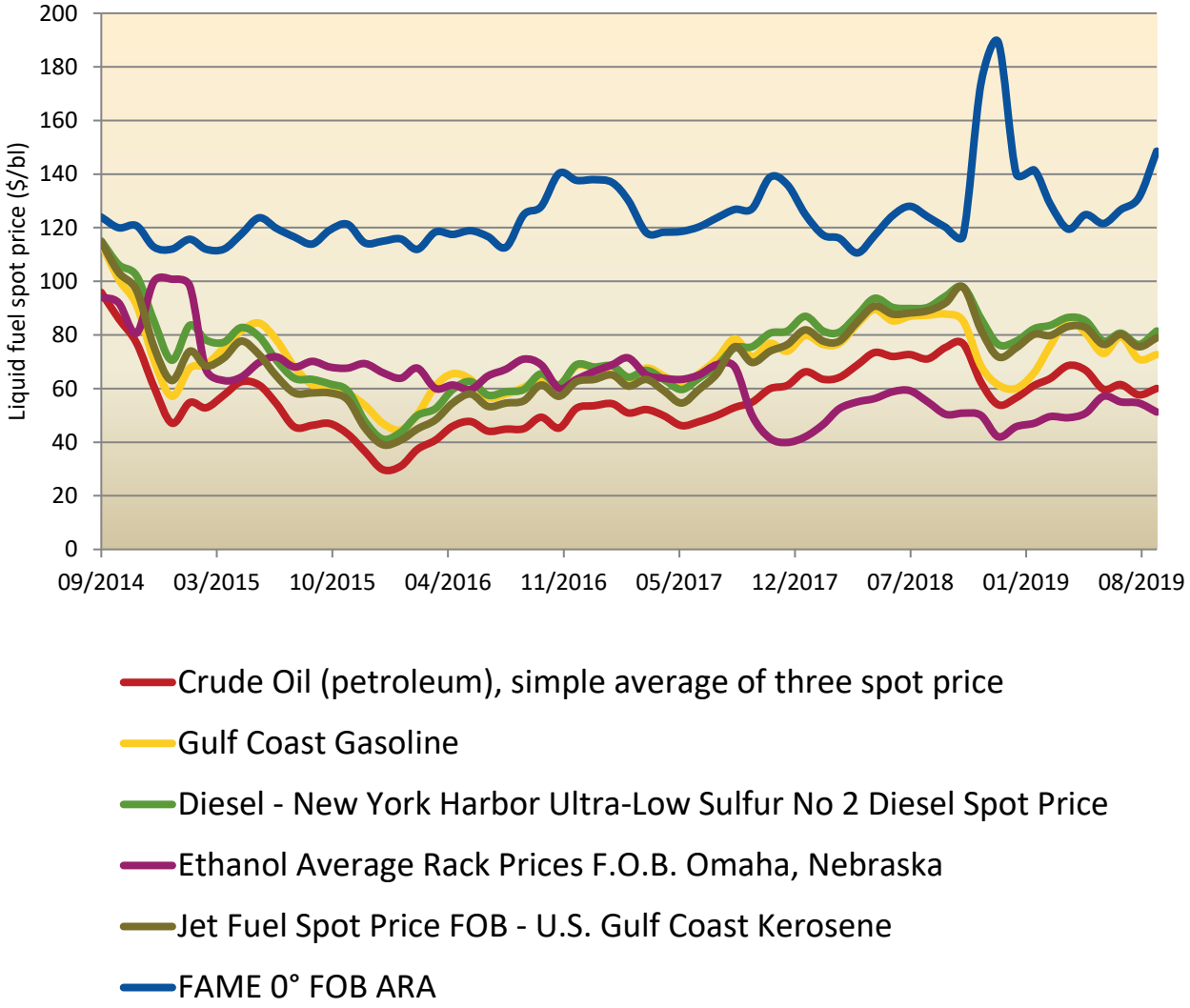
World Bio Markets
Amsterdam, 23rd-25th March 2020

We are facing rapidly evolving socio-economic and environmental challenges that have us on a collision course with some of humanity's most existential threats. We need to act fast to avert disaster. Fortunately, human ingenuity and technical innovation are keeping pace with change and offering hope for a future that will enable us to sustainably fuel, clothe, feed and heal a growing population on a rapidly evolving planet. World Bio Markets 2020 is at the nexus of this revolution, attracting the innovators that are driving tangible results from lab to market.

Click here for more information.

Price Information

Historical spot prices of liquid fossil fuels and liquid biofuels. Five years prices and up to September 2019 are given in $ per barrel.



Prices of Crude oil, diesel, gasoline, and jet fuel are recorded from www.indexmundi.com; Price of ethanol from www.neo.ne.gov, Biodiesel spot prices from http://www.kingsman.com

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