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

News Review





Issue Eighty-One December 2018

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

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Foreword

Welcome to December's Biofuels News Review, the final NNFCC News Review of the year.

There is big news across the Atlantic in the US: recently the US Environmental Protection Agency (EPA) has come under fire due to its deployment of its biofuel waivers. Under the Renewable Fuel Standard (RFS) in the US, all oil refiners are mandated to produce increasing volumes of biofuels. Small refiners that believe they will suffer undue financial hardship as a result of this may apply for a waiver of their biofuel mandate. However, these waivers have been granted in increasing numbers under the current administration, and to refiners many would consider to not be "small". However, this month there has been a break in the clouds over the US biofuels industry: the EPA has announced that 2019's advanced biofuel target will be raised by 15% on what was originally planned. This is a boon for the US biofuels industry, and for fuel decarbonisation in US, but this has not completely taken the heat off the EPA. The biofuels sector, and the agriculture sector responsible for production of biofuel feedstocks - have been demanding that the EPA reallocate the volumes of biofuel that have been waivered, as these are still counted against the biofuel target despite that biofuel not actually being produced. This issue has yet to be addressed by the EPA, despite it actively working against the purpose of the RFS.

Elsewhere, Finnish airline Finnair have taken a novel approach to decarbonisation of their flights. It is no secret that decarbonisation will be very expensive for the aviation sector, but nonetheless will be necessary, due to the high levels of emissions from the sector. Finnair have put the responsibility for this cost into the hands of their passengers, offering those who buy tickets the opportunity to pay extra in order to fund future biofuel blending or carbon capture. This is not without basis, as according to a survey, the majority of Finns said they would be willing to pay extra in order to decarbonise air travel. The scheme is set to launch in early 2019, and it remains to be seen how successful it will be.

Finally, we have news of a potential emissions-related redemption for Volkswagen. The car manufacturers were infamously caught in a scandal in 2015, where it was found the company had programmed its engines to falsely report emissions during testing. Though not directly resulting from this scandal, Volkswagen have now announced that they will be scaling-up distribution of their own biofuel, following successful tests among the manufacturer's employees. The biofuel is now available at Volkswagen's filling stations in parts of Germany, with further expansion planned.

Read on for the latest news.

Policy

US raises advanced biofuel mandate

The U.S. Environmental Protection agency has raised its annual blending mandate for advanced biofuels, drawing praise from the U.S. biofuels industry, but disappointment that the government had not done more to protect the agricultural market.

Under the U.S. Renewable Fuel Standard, oil refiners must blend increasing amounts of biofuels into their fuel each year or purchase blending credits from those that do.

The EPA raised its requirement for advanced biofuels by 15 percent for 2019, while keeping the volume for conventional biofuels like corn-based ethanol steady.

The 2019 mandate includes 4.92 billion gallons for advanced biofuels, up from the EPA's initial proposal in June of 4.88 billion and above the 4.29 billion that had been set for 2018. The requirement for conventional biofuels remains at 15 billion gallons for 2019, on par with 2018, and the same as proposed by the agency in June.

Click here for more information.

Norway to ban palm oil biofuel



Pixabay

The Norwegian Parliament has voted to ban its biofuel industry from buying palm oil linked to deforestation.

Campaigners have praised the move, which will come into force in 2020, believing it can help save rainforests, as well as fight against climate change.

The new policy says the Government should 'formulate a comprehensive proposal for policies and taxes in the biofuels policy in order to exclude biofuels with high deforestation risk'.

It follows Norway's use of palm oil in fuel reaching an all-time high in 2017.

On a wider level, the EU says it will phase out biofuels linked with deforestation - but not until 2030.

UK publishes bioeconomy strategy

The UK Department for Business, Energy and Industrial Strategy has published the UK's bioeconomy strategy, which outlines the approach that government, industry and the research community will take to harness the power of bioscience and biotechnology.

The bioeconomy represents the economic potential of harnessing the power of bioscience, using renewable biological resources to replace fossil resources in products, processes and services. This will also reduce our dependence on the finite fossil resource. The UK bioeconomy is today worth £220 billion and supports 5.2 million jobs.

Click <u>here</u> for more information.

Markets

Car oil demand may peak, but other vehicles will still increase demand



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LowCVP carries a short review of the findings of the IEA's World Energy Outlook 2018. The outlook forecasts that oil demand for use in cars will peak as a result of growing use of electric vehicles. However, overall demand for oil is projected to continue increasing. The IEA report says that demand for oil used for transport is already falling in some markets and segments, notably buses.

Oil use for cars will peak in the mid-2020s, but demand for petrochemicals, trucks, planes and ships still keep overall oil demand on a rising trend. Meanwhile, improvements in fuel efficiency in the conventional car fleet reduce potential demand by three times more than the 3 million barrels per day (mb/d) displaced by 300 million electric cars projected to be on the road in 2040.

The IEA has cut its longer-term oil price projections compared with last year, partly because of the falling cost of both renewable and conventional sources of energy, the worldwide push to tackle climate change and improve air quality and the boom in US shale oil and gas output. The Agency says it expects the oil price should continue to rise towards \$83 a barrel by the mid-2020s.

Factors affecting biodiesel market



Geograph

It is often argued that the EU biofuels policy drives prices for agricultural feedstock, yet there is nothing to prove this.

When prices for agricultural commodities and staple foods exploded globally in 2007 and 2008 and prices became volatile as a result, the focus was on issues surrounding global nutrition. Continued famine and poverty since then have primarily been associated with changes in international prices for agricultural feedstock and the promotion of biofuels. Environmental associations in particular have frequently, and very effectively, made the case that the main cause is in the EU's biofuels policy.

However, they fail to take into account that according to the United Nations' Food and Agriculture Organization, suppliers respond by intensifying production and increasing yields. For several years now, bumper crops have led to global oversupply and, as a consequence, a buildup of stocks at high levels.

At the same time, the shares of biofuels in the top agricultural commodity exporting countries in Asia and North and South America reached new record highs. Governments have responded to the surpluses by raising the national biofuels mandates to stabilize producer prices.

The current biodiesel hype, which has little impact on selling prices of raw rapeseed oil, shows that fuel prices have little influence on agricultural commodity prices. Demand for rapeseed methyl ester over the past few weeks caused a decline in supply, but feedstock remained abundant at all times. Consequently, rapeseed oil prices only rose slightly. At the same time, the price gap between rapeseed oil and palm oil widened to approximately 300 euros per metric ton, according to information published by Agrarmarkt Informations-Gesellschaft mbH (AMI).

The key issue affecting the product chain of rapeseed processing and biodiesel production in Germany is the uncertain transport situation due to low water levels in Germany's rivers that have curtailed the flow of goods and led to rising prices.

Click here for more information.

Research and Development

Report outlines massive increases in biofuels necessary for climate mitigation scenarios

A new multi-landmark report has been released by government-led, multi-stakeholder initiative Biofuture Platform detailing how biofuels and bioproducts 'must play an integral role' in the future of the global energy transition.

Entitled Creating the Biofuture: A Report on the State of the Low Carbon Bioeconomy, the report uses models and scenarios outlined by the International Energy Agency (IEA), the International Renewable Energy Agency (IRENA) and the Intergovernmental Panel on Climate Change (IPCC).

Key barriers against the development of bioenergy and biofuels are outlined in the report as: high levels of perceived risk affecting the availability of financial resources; lack of competitiveness relative to fossil-fuel based alternatives in many markets; unfavourable policy frameworks that do not effectively meet the competing needs of the agricultural economy and food system; and an insufficient, unreliable or expensive supply of feedstock available.

Technological support alongside favourable policies and legislation will be essential to overcoming these barriers, according to the report.

According to the report, 130 billion litres of biofuel were produced annually in 2016. However, global biofuel output 'must' rise to more than 200 billion litres by 2025 and more than 1,100 billion litres by 2050 annually to be in line with climate change mitigation scenarios developed by IRENA and the IEA.

Click here for more information.

Reviewing advanced biofuel policies in European countries

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. Four of the member states have in place mandates based on energy content, while Sweden and Germany have recently switched to GHG reduction quotas. All countries except Denmark and Sweden have placed a cap on conventional or food-based biofuels for 2020, with caps ranging from 4% to 6.7%. All countries except for Sweden have defined mandates for advanced biofuels by 2020, although the ambition varies widely from 0.05% in Germany to 1% in the Netherlands. The prices for noncompliance range from €9 per gigajoule (GJ) for conventional biofuels in the UK up to €150 per GJ for advanced biofuels in Italy.

The six member states reviewed are actively implementing the EU ILUC directive provisions

and are increasing their support for advanced biofuels, either through mandates or significant financial incentives. All of the countries except Denmark have already defined short-term mandates to 2020, both for conventional and for advanced biofuels, but only the UK has a mandate through 2032. These short-term mandates are, or are expected to be, fulfilled by technologically ready and commercially available products, such as biomethane from waste and HVO from used cooking oil. However, these technologies have a limited potential to achieve the minimum share of advanced biofuels of 3.5% in 2030 mandated by the EU REDII. We conclude that the longer-term goals of the EU strategy will require member states to step up their ambition and to stimulate long-term investment in new capacity for advanced technologies. Given the long lead time needed for planning, constructing and ramping up production at cellulosic biofuel facilities, introducing robust support measures for advanced technologies should be an urgent priority for these Member States over the next few years.

Click here for more information.



Pixabay

Drax in partnership to reduce shipping emissions

Drax Group has joined forces with Smart Green Shipping Alliance (SSGA), Ultrabulk, and Humphreys Yacht Design for reducing carbon dioxide (CO2) emissions from the shipping industry.

Based in the UK, Drax Group is a power station operator and employs approximately 2,500 people.

The partnership has already begun with a 12month-long feasibility study by installing a new sail technology called Fastrig on-board Ultrabulk's ships.

InnovateUK and Institution of Mechanical Engineers (IMechE) have provided £100,000 for the study.

The first six months of the study will focus on assessing the technical feasibility of the project, followed by the development of a business case and cost calculation in the second half.

The partnership mainly aims to retrofit the ship with Fastrig technology and launch a commercial demonstrator by 2021.

Click here for more information.

Fulcrum BioEnergy to build plant in Indiana



Fulcrum

Biofuels producer Fulcrum BioEnergy has announced that it has selected the city of Gary, Indiana as the location of its Centerpoint biofuels plant.

The facility will convert municipal solid waste into low-carbon, renewable transportation fuel.

Centerpoint's construction will begin in 2020 and take an estimated 18-24 months to complete. Once the plant is operational, it will divert and process approximately 700,000 tons of waste from the Greater Chicago area.

The waste will then be converted into a feedstock offsite and will produce an estimated 33 million gallons of fuel annually. The process will reduce greenhouse gas emissions by upwards of 80% in comparison to conventional fossil fuels.

Centerpoint is set to create 160 full-time permanent jobs and 900 construction jobs.

Bioethanol

Ethanol could lead decarbonisation of road fuel - Global Markets for Growth Energy



Pixabay

More than 30,000 leaders from across the globe gathered in Katowice, Poland for COP24, the 24th Conference of the Parties to the United Nations Framework Convention on Climate Change.

Among those are representatives from the bioenergy sector, including Climate Ethanol Alliance, working to tackle one of the most stubborn sources of global emissions, namely liquid fuels.

That's because internal combustion engines will dominate global transportation networks for decades to come, especially in developing nations where wired infrastructure is less reliable or cannot keep pace with new opportunities for trade and commerce.

In the United States, as in much of the Organisation for Economic Co-operation and Development (OECD), emissions from electricity generation are no longer the top contributor to climate change. The distinction now belongs to cars and trucks.

According to the US Energy Information Administration, transportation represents the country's only major sector that experienced an increase in greenhouse gas emissions in 2017. In all other categories, advancements in efficiency and reductions in the country's reliance on coal helped push emissions down.

The only immediate solutions to reduce the climate impact of the transportation sector at scale come from biofuel, like ethanol. That conclusion is reflected in findings from the UN Intergovernmental Panel on Climate Change (IPCC).

The IPCC reports that the most probable scenario limiting global climate change to 1.5 degrees Celsius will require a dramatic increase in global biofuel consumption – up from 1.97% of the transportation mix in 2020 to 14.71% in 2050.

These energy sources have already been developed on a large scale in the US, which is now the world's top producer and exporter of biofuels. Today, 98% of all motor fuel sold in America contains at least 10% ethanol (both conventional and advanced).

Yet, despite the global climate imperative, some US ethanol plants are idling production or cutting back on investments in new capacity. That is because ethanol prices have declined even faster than the historically low prices for corn feedstocks.

At the same time, these trends indicate that ethanol's cost advantage over petroleum continues to rise, creating a valuable opportunity for other nations to immediately bring down emissions by blending higher levels of ethanol into their transportation fuel mix.

Ethanol also offers a range of human health benefits because it serves as a key octane booster, displacing toxic, cancer-causing chemicals. Research from the University of California Riverside demonstrates that ethanol blends reduce toxic emissions by up to 50%, including smog and ultra-fine particulates.

Brazil's RenovaBio policy aims to attract new bioethanol investment



RenovaBio

Brazil's latest policy to boost biofuels use has improved the outlook for ethanol production and should attract new investment in plants.

Brazil is advancing with additional regulation for the policy, called RenovaBio and expected to be enacted in 2020.

RenovaBio will mandate fuel distributors to gradually increase the amount of biofuels they sell. The programme aims to double the use of ethanol by 2030 from around 26 billion litres currently. The programme also targets increases for other renewables such as biodiesel.

BP has three ethanol mills in Brazil, crushing 10 million tonnes of sugar cane per year. It formed a venture last year with Brazil's Copersucar, a leading global ethanol seller, to jointly operate one of the largest fuel terminals in the country located in Paulínia, in Sao Paulo state.

Click here for more information.

VERBIO acquires DuPont's Nevada bioethanol plant

It has been jointly announced that DuPont Industrial Biosciences (DuPont) and VERBIO North America Corporation (VNA), the U.S. subsidiary of leading German bioenergy producer VERBIO Vereinigte BioEnergie AG (VERBIO), have reached terms for VNA to acquire DuPont's Nevada, Iowabased cellulosic ethanol plant and a portion of its corn stover inventory. Completion of the transaction is subject to customary closing conditions and is expected to occur in November. VNA intends to install facilities to produce renewable natural gas (RNG) made from corn stover and other cellulosic crop residues at the site. This would be VERBIO's third production facility devoted to this cellulosic technology – in 2014, the company commissioned its first facility in Schwedt, Germany, and its second facility in Pinnow, Germany is currently being commissioned.

VERBIO is a leading manufacturer in the German biomethane and biofuels market running four production facilities producing around 27 million gallons of RNG, 140 million gallons of biodiesel and 87 million gallons of ethanol per year. The company focuses on developing and installing new technologies to produce first and secondgeneration biofuels from biomass and crop residues.

Following its merger with Dow in 2017, DuPont announced a strategic shift within the cellulosic biofuels market and began to seek a buyer for the biorefinery. DuPont continues to participate in the overall biofuels market through specialty offerings, including both first- and secondgeneration biofuel enzymes and engineered yeast solutions that improve yield and productivity for biofuel producers.

VNA is working on plans to start construction of the RNG plant in spring 2019 and begin commercial production of renewable transportation fuel by summer 2020.

Biodiesel

Volkswagen launches biodiesel



Volkswagen

Volkswagen has been testing the newly developed R33 BlueDiesel fuel at its in-house filling station in Wolfsburg, Germany, since January 2018. The innovative fuel enables CO2 savings of at least 20% compared with conventional diesel thanks to the use of biofuels. It will also enable major customers to achieve climate protection goals with their fleets.

Volkswagen employees tested the new fuel initially. Over a period of nine months, they filled up company vehicles with R33 BlueDiesel only. Up to one-third of the new fuel consists of renewable fuel components.

The R33 concept was jointly developed by Volkswagen, Coburg University and other project partners. Shell Global Solutions has been supplying the fuel since January in cooperation with Tecosol and Neste, which supply fuels certified according to European standards. R33 BlueDiesel complies with diesel standard DIN EN 590 and fulfils all criteria for use as a standard fuel without having to meet further requirements.

Chips play an important role in the production of raw materials for biofuels as cooking fat is used, which would then normally be disposed of after use. However, modern processes make it possible to sensibly utilize the waste. The fat is filtered, cleaned and processed into a paraffin mixture or biodiesel, which is then added to the basic diesel. R33 BlueDiesel, for example, has a bio content of up to 33% based exclusively on residual and waste materials. At least 20% CO2 can therefore be saved compared with conventional diesel fuel. The fuel can also be used in diesel vehicles without the engine needing to be converted – as it fully complies with the diesel fuel standard.

Following the successful test phase, R33 BlueDiesel is now being used permanently at Volkswagen's filling stations in Wolfsburg, and testing has also begun at the Volkswagen plant in Salzgitter. Introduction at further locations is planned.

Click here for more information.

Singapore expansion gives Neste more options

Neste Corporation has made the final investment decision on additional renewable products production capacity in Singapore. The decision is based on a growing global market demand for low-carbon solutions in transport and cities, aviation, polymers and chemicals.

The investment worth approximately EUR 1.4 billion will extend Neste's renewable product overall capacity in Singapore by up to 1.3 million tons per annum, bringing the total renewable product capacity close to 4.5 million tons annually in 2022. The company's target is to start up the new production line during the first half of 2022.

As a result of the investment, Neste will have more options to choose between different product solutions in the whole production system. In addition to producing renewable diesel, all Neste's renewable product refineries are able to produce renewable aviation fuel and raw materials for various polymers and chemicals materials. The investment in Singapore will include additional logistics capabilities and enhanced raw material pre-treatment for the use of increasingly lowquality waste and residue raw materials also for the existing refinery.

Neste currently has a renewable products production capacity of 2.7 million tons annually. Of this total, over one million is produced in Singapore, the same amount in Rotterdam in the Netherlands and the rest in Porvoo, Finland. Before the new production line in Singapore, we will continue eliminating bottlenecks in our existing production, bringing the existing capacity to 3 million tons by 2020.

Click here for more information.

Aviation Biofuel

Finnair puts decarbonisation in the hands of its customers



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After announcing the project in the summer of 2017, network airline Finnair has begun the first phase of its CO2 and biofuel offset service, selecting the partners that will collaborate on the initiative.

The service will allow customers to offset the carbon emissions of their flight by funding emissions reduction projects or by supporting the use of biofuels.

For sustainable biofuels, Finnair has partnered with Dutch jet fuel company SkyNRG. The emissions reduction projects will feature a collaboration with the Nordic Environment Finance Corporation (NEFCO), an international finance institution backed by the Nordic states.

Flights flown by Finnair using the biofuel will be determined by the uptake of the service by customers. According to the release, biofuel has a reduction potential of 60-80% compared to conventional aviation fuels. However, the airline admits that the price of the biofuel is three to five times more expensive than regular fuel.

The service follows Finnair's commitment to the aviation industry's goal to achieve carbon neutral growth by 2020 and to halve carbon emissions by 2050.

The offsetting service will be available to customers in early 2019 and can be purchased through the airline's website.

Click here for more information.

Other Biofuels

Project successfully trials drop-in shipping biofuel

Positive results from a three-year collaborative research project focused on marine biofuels suggest shipping can be set on a sustainable course.

GoodFuels Marine, and tanker operator NORDEN A/S, have worked closely together on trailing the 'world's first zero emission, 'drop in' Heavy Fuel Oil (HFO)-equivalent marine biofuel', which they say almost completely reduces 'all carbon and sulphur emissions'. Other partners involved in testing the GoodFuels' Bio-Fuel Oil (BFO) on vessels in the Amsterdam-Rotterdam-Antwerp region were Royal Dutch Boskalis and Wärtsilä.

Events

Lignofuels 2019 Oslo, 13th-14th February 2019

Now on its 11th edition, this two day conference will once again bring together key lignofuels stakeholders to join our forum discussions and networking, including leaders from advanced generation biofuels companies from across the globe represented by Technical, Strategic and Business Development Executives from First and Advanced Generation Biofuels Producers, Oil Refiners, Process Technology Providers, Enzyme Developers, Engineering Firms and Agribusiness as well as Financiers, Investors, Policy & Regulators, Automotive & Aviation Industries, Consultants, Traders & Brokers and Chemical Companies.

Click here for more information.

Gasification 2019 Brussels, 13th-14th March 2019

The conference will showcase the latest developments in the sector and provide key insights from senior executives in the industry to discuss the latest commercial and technical developments, challenges and research breakthroughs throughout the entire gasification market.

Click <u>here</u> for more information.

EUBCE 2019 Lisbon, 27th-30th May 2019

The EUBCE is the leading platform for the collection, exchange and dissemination of scientific and industrial know-how in the field of biomass.

The EUBCE combines one of the largest biomass science and technology conferences with a highquality industry exhibition, attracting biomass professionals from around the globe.

Click here for more information.

UK AD and World Biogas Expo Birmingham, 3rd-4th July 2019

As the largest international trade show dedicated solely to AD and biogas, UK AD and World Biogas Expo 2019 offers a unique combination of industry insight, innovation and investment opportunities for both the UK and international markets.UK AD and World Biogas Expo is unique in covering all sectors and regions where AD offers solutions – from UK farming to world mega cities, from local waste and water management to global energy generation and transport.

UK visitors will hear about the latest domestic market news, including policy and regulations, as well as discover international trends and developments. International visitors will be able to explore business prospects in the UK as well as showcase their success stories.

Price Information

Historical spot prices of liquid fossil fuels and liquid biofuels. Five years prices and up to November 2018 are given in \$ per barrel.



-FAME 0° FOB ARA

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

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