

The Bioeconomy Consultants



News Review

Issue Fifty-Five

October 2016

Each month we review the latest news and select key announcements and commentary on feedstocks used in the bioeconomy.



Contents

Policy.....	4
Market.....	6
Research & Development.....	7
Wood & Crop.....	10
Other Feedstocks.....	11
Events	15
Feedstock Prices.....	16

Foreword

Welcome to this month's edition of the NNFCC Feedstock's market review.

November 2016 is set to go down in climate change history as the month the world's first ever universal and legally binding global climate deal enters force. Drafted late 2015, the Paris Agreement set out a global action plan for climate change mitigation from 2020 including limiting the increase in global average temperature to well below 2°C. However, in order for the agreement to *actually commit* countries to take action, it was necessary for at least 55 countries of the 195 in the original agreement which together represent at least 55% of total global GHG emissions to ratify. These minimum thresholds were superseded earlier this month following ratification by the European Parliament (of which EU countries represent 12% of global emissions).

This event is unique not only as it represents the first legally binding global agreement but also due to the speed in which ratification will take place: just shy of one year. After all, it took 8 years for its predecessor protocol (remember Kyoto 1997?) to attain ratification with its 2012 Doha Amendment still not given the green light. While the swiftness and increased global cooperation is commendable, some are calling for action right now, pointing out that climate change isn't a future problem, it's a problem right now.

Its good news that this month's review contains a plethora of articles covering developments in the use of biomass for a wide range of applications then. For example, a new report from DEFRA has indicated the potential for seaweed to become an important feedstock for biofuels production. We also report on the scientists looking to nature to emulate the action of bacteria in unlocking the potential in carbon-rich lignin for the production of platform chemicals. Whether its energy or chemicals, biomass, in its abundant forms, clearly has a key role to play in fulfilling the Paris Agreement.

Read on for the latest market news.

Policy

UK to ratify Paris treaty



Flickr

The UK will back its commitment to tackling climate change by ratifying the Paris Agreement before the end of the year, the Prime Minister has announced. China and the United States - jointly responsible for 38% of the world's greenhouse gas emissions - have also recently announced that they will ratify the agreement. In her maiden speech to the United Nations General Assembly, Theresa May said: "We will continue to play our part in the international effort against climate change." The Paris Agreement committed the world to trying to limit global warming to as close to 1.5 degrees Celsius above pre-industrial levels as possible.

This year has broken previous temperature records with the first half of 2016 being 1.3C warmer than the pre-industrial era of the late 19th century, according to Nasa, although this figure was inflated by the el Nino effect. Every month for the last 14 in a row has broken the record average global temperature for that month. Currently around 30 countries have indicated that they will ratify the Paris deal, with several more, like the UK,

indicating that they will do so at the UN's General Assembly

Click [here](#) for more information.

Latest UK FIT deployment statistics published

Provisionally, overall Feed-in Tariff (FIT) - scale deployment in the UK at the end of July 2016 was 5,344 MW (880,491 installations). This represented a 28% increase in total FIT installed capacity compared to the same period in 2015, and a 20% increase in the number of installations. Photovoltaics (PV) were responsible for 99.5% of the increase in installations and 85% of growth in capacity, with wind contributing 8% to capacity growth. The highest growth rate (on July 2015) was seen in Hydro (up 40% to 131 MW) and PV (up 29% to 4,397 MW).

PV installations increased rapidly at the start of the FIT tariff scheme. The rate of increase slowed after August 2012 following tariff reductions. As at the end of July 2016, PV installations represented 82% of total installed capacity (4,397 MW) and 99% of the total number of installations (870,990). Sub-50 kW PV installations represented 73% (3,225 MW) of total PV installed capacity and 99% (865,375) of the total number of PV installations. Wind was the second largest technology representing 11% of total installed capacity (602 MW) and 1% of installations (7,604). Little reference is made to AD, also supported under the Scheme, where deployment at all scales has been relatively static since December 2015, with only 1 plant (large scale) commissioned in the period following repeated reductions in levels of tariff support on offer for new plants.

Click [here](#) for more information.

RSB certification scheme re-accredited by EC

The Roundtable on Sustainable Biomaterials announced in September that the European Commission re-accredited RSB's EU Renewable Energy Directive sustainability program for demonstrating compliance with sustainability criteria under Directives 98/70/EC and 2009/28/EC of the European Parliament and of the Council. The EC's decision was published Aug. 9 and is valid for five years. The reaccreditation process was necessary as RSB's previous recognition was expiring.

The re-recognition in August came just weeks after the European Court of Auditors issued a special report in which it concluded that "because of weaknesses in the Commission's recognition procedure and in the subsequent supervision of voluntary schemes, the EU certification system for the sustainability of biofuels is not fully reliable."

Speaking to Biomass Magazine Helena Tavares Kennedy, RSB's director of marketing and communications said; "We are aware of the European Court of Auditors report that stated there are weaknesses in the EU certification system for biofuels. There are some EU-approved certification systems that require bare minimum criteria and therefore do not guarantee truly sustainable practices, so we can see why they say there are weaknesses."

Click [here](#) for more information.

Policy Exchange report criticises UK support for heat pumps

Policy Exchange's new report highlights that the previous Government's plan to decarbonise heating by fitting electric heat pumps in most homes by 2050 would cost about £300 billion. This takes into account the installation cost of more than £8,500 per heat pump, the cost of upgrading the grid, and the additional 100 Gigawatts of power generation capacity that would be required to meet the demand for electricity. All in all it would cost as much as £12,000 per household to deliver the previous government's plans to reduce carbon emissions from domestic heating. The paper says that the newly created Department for Business, Energy and Industrial Strategy (DBEIS) needs to completely re-think its approach and look at alternatives, and highlighted the positive benefits of biomethane which can be injected into the existing gas grid network after 'upgrading'.

Although the renewables industry welcomed the role given to biomethane in the report, there were concerns raised, including the report's general dismissal of the contribution from biomass boilers, amongst other renewable heating technologies, in playing a large role in decarbonizing domestic heating. The REA stated, "Biomass heating is often the natural, low-carbon choice in off-grid properties, which are less well insulated and therefore require the higher heat that biomass can deliver. About 4 million homes in the U.K. are off the gas grid, so it would be wrong to dismiss biomass as a 'small-scale renewable'".

Click [here](#) for more information.

Seaweed for biofuels

Large-scale seaweed farms could become an important source for biofuels production in the UK, a new report by the Department for

Environment, Food and Rural Affairs (Defra) suggest. The government department recently unveiled a report entitled, Seaweed in the UK and abroad – status, products, limitations, gaps and Cefas role.

In the report, Defra stated that seaweed could be important because aquaculture does not compete for land and freshwater with either food or non-food crops. Furthermore, seaweeds have high productivity, fast growth rates and high polysaccharide content; all important qualities for biomass for biofuels and as a feedstock for bio-based materials and chemicals. Defra also said that macroalgae could also represent a significant sink for anthropogenic CO₂ (“Blue Carbon”), and cultivation and harvesting of seaweeds could play an important role in carbon sequestration and reduction of greenhouse gas emissions.

Global seaweed production has more than doubled between 2000 and 2014, from 10.5 to 28.4 million tonnes. The 2012 world production of seaweeds was estimated to be about \$6 billion (FAO, Food and Agriculture Organization, 2014); 95% of this production was from Asian aquaculture. In the UK, harvesting of wild seaweeds for food, feed and fertilisers has been carried out for centuries, however seaweed farming does not have a long history.

Click [here](#) for more information.

Market

Global pellet market marches on



The global biomass pellets market was valued at \$4.52 billion (€4.05bn) in 2014 and is forecast to reach \$8.34 billion in 2020, a new market study says. According to research carried out by Zion Research, the biomass pellet market is expected to grow at a compound annual growth rate (CAGR) of 10.9% between 2015 and 2020. The global biomass pellets market can be classified into two application segments, namely residential applications and industrial applications. The industrial sector is leading the market, accounting for more than 55% in 2014, but the residential segment is expected to witness rapid growth rate compared through forecast period. The global biomass pellets market is dominated by the Europe, Middle East, and Africa (EMEA) region with a share of more than 42% of total market in 2014.

Biomass pellet demand in the EMEA region is expected to grow at a rapid pace during the forecast period. The region is followed by the Americas and Asia-Pacific respectively, with Brazil and the US as the major biomass pellet producing countries,

with huge installed capacity of biomass power plants. Asia-Pacific, however is expected to be the fastest growing market for biomass pellets during the forecast period.

Click [here](#) for more information.

Impact of Drax biomass conversion on wider regional economy quantified

Researchers at Oxford Economics studied the impact of Drax Group on the UK's economy as the company nears completion of a major high-tech engineering and infrastructure scheme to upgrade half the generating units at Drax power station, near Selby, to use sustainable biomass. The report estimates that the group's UK activities and that of companies in its supply chain last year contributed £1.2bn to the economy and supported 14,150 jobs. Employment covered a wide range of sectors including high-skilled manufacturing of industrial components, engineering and technical machinery, construction, IT, professional business services and transport.

Click [here](#) for more information.

Chinese urban population prepared to pay for green power



Wikimedia Commons

A number of China's urban consumers are willing to pay higher bills to buy "green electricity" from renewable sources like wind, solar or biomass, a recent survey commissioned by the China Renewable Energy Industries Association (CREIA) has found. According to a news report on the Chinadialogue, the survey, by the market research firm Ipsos, found that 97.6% of respondents favoured using green electricity to tackle air pollution, and that 44% of those surveyed were willing to accept a 10 yuan (US\$1.50) increase in their monthly bills for a greater share of green energy.

However, energy sector experts warn that consumer power in China's utilities sector is too weak to produce a decisive shift in China's energy mix, despite plentiful sources of clean power.

Click [here](#) for more information.

Research & Development

Ionic liquids for biomass pre-treatment

Ionic liquids are being investigated as a way to break down cellulosic plant material in biofuels-production processes. A significant hurdle to their use is the fact that ionic liquids are toxic to the microbes used in biofuel production. Researchers from Lawrence Berkeley and Sandia National Laboratories, working at the Joint Bioenergy Institute (JBEI; Emeryville, Calif.; www.jbei.org), have found that adding CO₂ during the pre-treatment step can neutralize the toxicity of the ionic liquids by adjusting the alkaline pH. Because the use of CO₂ as a reversible method to adjust

pH could eliminate the need to separate and purify the biomass after pre-treatment, the researchers say the CO₂-enhanced process could reduce costs by 50% or more compared to traditional biomass pre-treatment techniques.

Click [here](#) for more information.

Researchers support biomass gasification

Conventional and advanced biomass gasification is a promising and economically beneficial technology, according to a new study by a global team of researchers. A new review paper published in journal Energy & Environmental Science presents a case for biomass gasification as a promising, viable and economically beneficial technology for fuel and energy. Until recently, very few biomass gasification processes have proven economically viable but this paper shows how new advancements and refinement processes have pushed the technology to the forefront of potential sources of sustainable renewable fuel.

In the paper, titled "An overview of advances in biomass gasification", the authors provide a holistic view of the current research, development, deployment and provide insights into the future of biomass gasification. The study was led by researchers from London-based Imperial College and China-based Tsinghua University, together with researchers from The University of Sydney and Cranfield University.

"Biomass gasification has great potential to be a major player in the future as an alternative, renewable power source," said Paul Fennell, reader in the Department of Chemical Engineering and one of the lead authors on the research. Fennell said: "What we've shown is that biomass gasification is a very promising technology for the production of renewable energy. With the right

tools, approaches and advancements we can make sure that it is utilised in a cost-effective manner, with minimal social and environment impacts. It has great potential to be a major player in the future as an alternative, renewable power source."

Click [here](#) for more information.

Guayule rubber for tyres

The public-private consortium behind the Biomass Research and Development Initiative grant, "Securing the Future of Natural Rubber—an American Tire and Bioenergy Platform from Guayule," reported several key advancements emerging from the group's work over the past year. Cooper Tire & Rubber Co., working as the lead agency in the grant, announced that its scientists have reached a key milestone toward the goal of producing, by mid-2017, a concept tire in which all of the natural and synthetic rubber is replaced by guayule-based polymers. Guayule is a shrub that is grown primarily in the southwestern United States and contains rubber that can be processed for use in tires. The 100 percent guayule-based concept tire will undergo extensive technical evaluation following its production. Concurrently, Cooper will continue studies on potential commercialization of guayule-based tires for the future. To date, Cooper has completed a number of tire builds, iterative work that includes the replacement of both Hevea and synthetic rubber with guayule in various components, and then testing each build for overall performance. At the BRDI annual meeting, Cooper announced that it has completed this process on nearly all tire components, and has tested these tires with promising results

Click [here](#) for more information.

US Sandia lab targets soil bacteria to access lignin feedstocks

Abundant, chock full of energy and bound so tightly that the only way to release its energy is through combustion—lignin has frustrated scientists for years. With the help of an unusual soil bacteria, researchers at Sandia National Laboratories believe they now know how to crack open lignin, a breakthrough that could transform the economics of biofuel production.

By following the metabolic pathway of an unusual soil bacteria that lives off lignin, Sandia research team members believe they can develop technologies to break down lignin and extract valuable platform chemicals. High-value chemicals like muconic acid and adipic acid can be derived from the platform chemicals. For inspiration on how to break down lignin, the researchers looked to nature.

“We know that over a long period of time fungus and bacteria do eventually break down lignin,” explained project lead Seema Singh. “If we can understand this process, we can use what nature already knows for biofuel and chemical production from lignin.” Since bacteria are easier to engineer for industrial production of desired chemicals, the researchers focused on bacteria.

Click [here](#) for more information.

Chevron and Iowa State University develop biomass liquefaction biorefinery

In the US, Iowa State University and Chevron U.S.A have developed the BioCentury Research Farm, a biofuels pilot plant, as a joint project. The project’s aim is to develop and demonstrate an advanced biorenewables technology called solvent

liquefaction. The process converts biomass such as wood chips into a bio-oil that can be processed into fuels or chemicals and a biochar. The BioCentury project is supported by a four-year, \$3.5 million (€3.1m) grant from the US Department of Energy’s Biomass Research and Development Initiative, obtained by Iowa State.

The solvent liquefaction process used in the pilot plant, initially developed by Chevron, begins with a proprietary solvent that is mixed with wood chips or other solid biomass. The mixture is processed under moderate temperatures and pressures and the resulting slurry is extruded into a reactor. After heating in the reactor, production is split into two processing streams, the upper stream handling gases and vapours while the lower handles liquids and small amounts of solids. A series of filters and separators along both streams recovers bio-oil, small amounts of biochar, and solvent for recycling. The process produces a bio-oil that is low in oxygen and therefore more stable than other bio-oils.

Click [here](#) for more information.

New moves in US to reduce lignin content of poplar

GreenWood Resources, a global timberland investment and asset management company based in Oregon, has licensed an Oak Ridge National Laboratory technology based on the discovery of a gene in poplar (*Populus trichocarpa*) that makes it easier to convert poplar trees into biofuels. GreenWood plans to commercialise the technology to select and breed better varieties of poplar with a lower lignin content. Led by Wellington Muchero, a team from the Department of Energy’s ORNL, the University of Tennessee and West Virginia University identified a gene linked to the synthesis of lignin, a key component of plant cell walls that provides

sturdiness but hinders the production of biofuels. Growing poplar trees with less lignin would provide easier access to the plant sugars that are converted into renewable fuels. The team's research showed the gene could reduce lignin content by up to 50% and increase ethanol yield by up to 250% on biomass that was not chemically or mechanically pre-treated.

Click [here](#) for more information.

Clariant produces isobutene from straw

Global Bioenergies and Clariant announced the first isobutene production from a wheat straw hydrolysate, in the industrial pilot of Pomacle Bazancourt. This success is the result of a collaboration initiated more than 18 months ago, and has been made possible by combining Clariant's proprietary process, allowing for the conversion of agricultural residues into sugar-rich hydrolysates, with Global Bioenergies' proprietary process for the production of isobutene from various industrial-grade sugars.

Clariant produced the wheat straw hydrolysate in its Straubing facility in Germany. This hydrolysate was converted into renewable isobutene in Global Bioenergies' industrial pilot operated by ARD in its Pomacle-Bazancourt facility. This result demonstrates the maturity, the complementarity, and the versatility of the two proprietary processes.

Clariant's pre-commercial plant of Straubing, Germany, transforms cellulosic sugars into ethanol using the sunliquid process, with a capacity of 1000 tons ethanol output per year. The production of isobutene opens the door for a more general use of 2G sugars, beyond the ethanol market

Click [here](#) for more information.

Wood & Crop

California to support biomass power



CALIFORNIA REPUBLIC

Wikimedia Commons

The California legislature has passed legislation that aims, in part, to support biomass plants within the state. The bill calls on electricity retailers to enter into five-year contracts for 125 MW of biomass power from facilities that generate energy from wood harvested from high fire hazard zones. The support relates to projects that began operations prior to June 1, 2013 and that produce electricity using specified minimum percentages of certain types of forest feedstock. The bill, SB 859, features an expenditure plan for 'cap-and-trade' proceeds, one of the strategies that California has employed to reduce greenhouse gas emissions by capping emissions in specific sectors.

Click [here](#) for more information.

Mersey Gateway gets biomass power plant

Testing will soon begin at a 20.2MW Northwest England biomass power plant, which is expected

to start commercial operation in April 2017, developers say. The 147,000 tonnes-per-year capacity waste wood biomass facility is being developed within the 180-acre Mersey Multimodal Gateway project – a logistics hub to the west of Liverpool – by Danish firm Burmeister & Wain Scandinavian Contractor (BWSC) and logistics company Stobart Group. The combined heat and power (CHP) facility will burn low-grade recovered wood, 500 tonnes of which will be supplied for the initial testing period scheduled to begin in October. Commissioning is scheduled for December, and commercial operations should begin in early 2017. Stobart has also begun building a wood processing facility at a nearby site which will be the main site for sorting and chipping waste wood.

Click [here](#) for more information.

CropEnergies UK Ensus bioethanol plant to move back to full capacity

Germany-head quartered bioethanol producer CropEnergies has announced that it is ready to operate its bioethanol plant in Wilton, UK, at full capacity. The facility named Ensus, based in the north east of England, has been mothballed since February 2015. Work was halted after bioethanol prices dropped amid sluggish European markets and low oil prices. After carrying out a number of successful trial runs over the summer to improve reliability, the company said that the plant can play a pivotal role in future operations. The announcement came in the firm's second quarter (Q2) results.

Click [here](#) for more information.

Iona Capital invests in Welsh wood-fuelled CHP

UK energy and environmental investment company Newbridge Energy will install three wood chip-fuelled combined heat and power (CHP) units in northern Wales. The move comes after the company reported receiving a "multi-million pound" investment from Iona Capital. The three units, to be situated in the town of Ruthin, will have a combined capacity of 3MWe and 12MWth, and they are expected to come online by the end of 2016. They will qualify for the UK government's Renewables Obligation Certificates (ROCs) and the Renewable Heat Incentive (RHI) support schemes.

Iona Capital has financed over 20 renewable energy projects in Wales, Scotland, and England over the past five years.

Click [here](#) for more information.

Other Feedstocks

Fibre from waste

UK-based autoclave waste specialist Wilson Bio-Chemical has opened its micro autoclave fibre production plant for turning municipal solid waste (MSW) into biomass fibre that can be converted into chemicals or fuels. The facility has been developed with the help of the University of York subsidiary, the Biorenewables Development Centre (BDC) and is based at the BDC's site just outside York. This new technology aims to divert substantial amounts of mixed waste from landfill

and produce a range of chemicals and fuels to replace the use of fossil-resource-based products.

Wilson Bio-Chemical has developed and installed a specialised, rotating autoclave which can treat the biological portion of MSW (mainly food waste, garden waste, paper and cardboard) with steam and high pressure and convert it into a sterile fibre (Wilson Fibre). Biorefinery specialists, the BDC, have provided support and expertise in the development of the new production plant, which at full commercial scale can process 150,000 tonnes of waste per year. Wilson is now working with the BDC and with the Centre for Novel Agricultural Products (CNAP) at the University of York on a variety of projects to test the feasibility for use in fermentation processes as well as for use in bioenergy.

Click [here](#) for more information.

Lanzatech produces test volumes of jet fuel from waste gas feedstocks

Low-carbon fuel specialist LanzaTech has produced jet fuel from waste gases for Virgin Atlantic. LanzaTech said that it had produced 1,500 of its jet fuel called 'Lanzanol'. Since 2011, LanzaTech has been working with Virgin to commit to producing the world's first jet fuel derived from waste industrial gases from steel mills via a fermentation process.

The Lanzanol was produced in China at the RSB (Roundtable of Sustainable Biomaterials) certified Shougang demonstration facility. The alcohol-to-jet (AtJ) process was developed in collaboration with Pacific Northwest National Lab (PNNL) with support from the US Department of Energy (DOE) and with the help of funding from HSBC.

LanzaTech and Virgin Atlantic are now set to continue to work with Boeing and a host of

industry colleagues to complete the additional testing aircraft and engine manufacturers require before approving the fuel for first use in a commercial aircraft. Assuming all initial approvals are achieved, the innovative LanzaTech jet fuel could be used in a first of its kind proving flight in 2017.

Click [here](#) for more information.

Waste to Energy gasification plant approved for Corby, UK

A proposal for an energy-from-waste plant by developer Clean Power Properties has been granted planning permission by Northamptonshire County Council. The refuse-derived fuel (RDF)-fired facility in Corby has a design capacity of 8-12MWe through a pyrolysis gasification plant. A biogas unit with capacity of 2-3MWe is proposed to be installed in the same building.

The project has faced opposition, leading to a UK government decision on 27 January to call in the plan and hold a hearing. Clean Power Properties then withdrew its application on 2 June. According to council documents, the company then made revisions "to address the concerns raised" by government before resubmitting.

Despite the changes, Corby Borough Council objected to the scheme on the grounds that insufficient information had been provided on air quality, odour, noise and vibration impacts. The Environment Agency raised no objections to the application, despite concerns raised by local residents.

Click [here](#) for more information.

Greenpeace activist block palm oil refinery at Port of Rotterdam



Wikimedia Commons

Activists from Greenpeace blocked entry to a palm oil refinery at the Port of Rotterdam for seven hours due to claims of the plant being linked to Indonesian environmental concerns. A report by the environmental group links IOI, the owner of the Croklaan palm oil refinery, to deforestation, wildfires, and human rights violations including using child labour in Indonesia. The ten activists blocked the refinery's entrance with tree trunks and stopped docking at the port with kayaks and the Greenpeace ship Esperanza, which prevented unloading palm oil destined for the facility.

Greenpeace, in its report titled A Deadly Trade-Off, claims that up to two-thirds of the palm oil processed at Croklaan comes from third party suppliers such as Korindo, Eagle High, and the Indofood/Salim Group, which it claims have contributed to the destruction of a quarter of Indonesia's rainforests in the past two decades. Greenpeace bases its allegations on IOI supply data, concession maps, Nasa fire hotspot data, deforestation alerts, public reports, and official Roundtable on Sustainable Palm Oil complaints.

IOI said in a statement on Tuesday that it "acknowledges" the report from Greenpeace and "shares a similar top line analysis" of the industry

challenges related to ensuring compliance by third party suppliers.

Greenpeace has dismissed IOI's statement as an attempt to pass responsibility away from the company and not break contracts with the named suppliers.

Click [here](#) for more information.

CETA agreement - a threat to European ethanol industry?

The EU-Canada Comprehensive Economic Trade Agreement (CETA) is a major threat to the EU ethanol industry, the European renewable ethanol association ePure warns. The agreement, which is to be discussed by the EU's trade ministers during the informal European Council meeting could result in 1.2 billion litres of additional duty free imports from Canada to the EU. This, ePure states, is the equivalent of 20% of the EU's renewable fuel ethanol production, and would eliminate demand for well over 3 million tonnes of European cereals and sugar beet, undermining the income of thousands of European farmers.

The US exports duty-free ethanol to Canada under the North American Free Trade Agreement (NAFTA), already making Canada the number one destination of US ethanol exports. The production subsidies that have allowed the Canadian industry to survive the intense price pressure caused by cheap US ethanol imports are set to expire or be scaled back in 2017. According to ePure's assessment, Canadian producers will be looking towards export markets where they can still achieve sufficiently high margins for survival, while the domestic demand will be supplied with US ethanol, effectively by-passing current EU tariffs and anti-dumping duties on US ethanol.

ePure is urging the Council and the European Parliament to postpone the implementation of CETA until measures are put in place to adequately protect EU ethanol producers from US exports through the backdoor of CETA.

Click [here](#) for more information.

Fischer Tropsch plant for Oklahoma

Velocys plc has announced that construction of Envia Energy's gas-to-liquids (GTL) plant in Oklahoma City, Oklahoma, is now complete. Envia Energy is a joint venture of Velocys, Waste Management, NRG Energy and Ventech that will deploy several of Velocys' full-scale commercial Fischer-Tropsch reactors. According to Velocys, the project will act as the commercial reference plant for its technology. On-site loading of catalyst into the Fischer-Tropsch reactors has been completed by Velocys, with support from its partner Mourik, the company added. According to Velocys, pre-commissioning work, including hydro-testing of the lines and vessels, and a rigorous inspection process, is substantially complete.

In addition to the Oklahoma City project, the company reported that preliminary engineering studies have been completed for a GTL project in Central Asia. In addition, an air permit has been granted for a third-party project in the U.S.

Click [here](#) for more information.

Ginkgo Bio-works and Genomatica alliance to develop biobased chemicals

Ginkgo Bioworks and Genomatica have announced an alliance to more rapidly deliver biology-based solutions for the world's highest-

volume intermediate and specialty chemicals. The alliance is structured as a deep collaboration, with two-way sharing of technology and intellectual property, along with joint technology development, to provide a single unified offering to the market. The alliance aims to accelerate the transition of the mainstream chemical industry to biological process technology. Biobased production of intermediate chemicals can deliver better overall economics and greater sustainability and performance by harnessing the power of biotechnology and microorganism engineering to grow products. Only a few dozen chemicals lie at the heart of the mainstream chemical products industry, with markets up to millions of tons and many billions of dollars each, are used to make the thousands of everyday products. Genomatica has proven the ability to develop and transfer to industry new process technologies that work at high-volume commercial plants. Novamont, a Genomatica-licensee, recently announced the opening of the world's first commercial plant for bio-production of 1,4-butanediol powered by Genomatica's process technology.

Click [here](#) for more information.

Events

***NEW* Life Cycle Assessment Workshops, 18-19 October in York, UK**



Following the success of our previous Life Cycle Assessment (LCA) workshops, NNFCC and North Energy are holding two new training workshops providing you with insight into how LCA's work and their applications.

Click [here](#) for more information.

Feedstock Prices

UK spot prices of bagged wood pellets, and wheat and barley straw. Arrows indicate rise ↑, unchanged – or fall ↓ from previous month.

Date	UK Wood Pellets Delivered	UK Ex-Farm Barley Straw	UK Ex-Farm Wheat Straw
	(£/tonne, 5% VAT)	(D1000) (£/tonne)	(D1000) (£/tonne)
5 October	215-229 (↓-↓)	40-60(--↑)	38-60(↑--)

For wood pellets prices we considered UK pellet traders selling prices.

For details on straw spot prices, see <http://www.farming.co.uk>

UK (LIFFE), French (MATIF) and US (CBOT) future prices for wheat, rapeseed, maize, and soybean. Arrows indicate rise ↑, unchanged – or fall ↓ from previous month's predictions.

Date	UK (LIFFE) Feed Wheat (£/tonne)	MATIF Wheat (€/tonne)	MATIF Rapeseed (€/tonne)	CBOT Wheat (cnts/bsh)	CBOT Maize (cnts/bsh)	CBOT Soyabean (cnts/bsh)
Nov 16	128.5(↑)		376.0(↓)			963.5(↑)
Dec 16		160.2(↑)		395.5(↑)	348.2(↑)	
Jan 17	129.9(↑)					969.2(↑)
Feb 17			378.0(↑)			
Mar 17	131.3(↑)	166.0(↑)		417.0(↑)	358.2(↑)	976.0(↑)
May 17	133.0(↑)	169.2(↑)	376.2(↑)	430.2(↑)	365.2(↑)	982.0(↑)
Aug 17			360.5(↑)			986.7
Sep 17		170.5(-)		456.0(↑)	378.5(↑)	
Nov 17	135.1(↑)		362.7(↑)			
Dec 17		173.2(-)		476.5	387.0	
Jan 18	137.2(↑)					
Feb 18			366.5(↑)			
Mar 18	138.9(↑)	179.7(↑)				
May 18	141.2(↑)	180.7(↑)				
Nov 18	139.8(↑)					

For details on future prices see <http://www.hgca.com>

Other biomass feedstock prices are available upon request, simply contact enquiries@nnfcc.co.uk.

Credits and Disclaimer

NNFCC Market Review is edited by Dr Paula McNamee for NNFCC members. Feedback is welcome. The Review has been compiled in good faith and NNFCC does not accept responsibility for any inaccuracies or the products or services shown.

The Bioeconomy Consultants



NNFCC
Biocentre, York Science Park
Innovation Way
Heslington, York
YO10 5DG

Phone: +44 (0)1904 435182
Fax: +44 (0)1904 435345
Email: enquiries@nnfcc.co.uk
Web: www.nnfcc.co.uk
Twitter: @NNFCC