The Bioeconomy Consultants
NNFCC

YOUR PARTNERS FOR BUSINESS INSIGHT AND MARKET INTELLIGENCE

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

News Review

Feedstocks

Issue Eighty-Five

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

Contents

Foreword

Welcome all to April's issue of NNFCC's Feedstocks News Review.

Making a product or process biobased should never be considered as the sole end-goal. Even if a product can successfully be produced from biomass feedstock, there are a number of sustainability factors to consider, including land-use change impacts, processing energy costs, and (in the case of agricultural feedstocks) water usage. More on the latter later, but it is considerations like these that have led to bioeconomy processes diversifying their feedstocks from the "traditional" bioeconomy pantheon, such as palm oil, wood pellets, and wheat. Recent shifts towards waste biomass as feedstock have been championed by industry and government alike, owing to their effects of increasing resource efficiency, contributing to a circular economy, while diminishing the need to deal with the difficult and contentious issues around sourcing of virgin biomass.

One such area where use of wastes has become of interest has been biofuels: with increasing scrutiny of crop-based biofuels (culminating in the EU all but removing support for palm oil-derived biofuels in the Revised Renewable Energy Directive), and with waste-derived "development fuels" receiving additional incentives through the UK's Renewable Transport Fuel Obligation. However, one fuel sector that has struggled in this regard has been renewable jet fuel, relying to date primarily on vegetable oils as feedstock. This could all change in the wake of a new Horizon2020-funded project: flexJET is seeking to introduce biocrude oil as a source of jet fuel. This oil is produced from organic waste, and the project claims that this results in a more sustainable and economically viable jet fuel, and also produces green hydrogen, which is utilised as a fuel for the process downstream. The project is set to run for 4 years, and we look forward to any progress made.

In other news this month related to changing feedstocks, Finnish company Spinnova have completed production of a pilot plant that produces fabric fibres from wood pulp and wheat straw. The critical advantage this has over cotton fibres, is that cotton requires enormous amounts of irrigation to grow, and thus could be an important technology for water conservation – with the fashion industry having a massive water footprint and a growing chorus of concern rising over the impacts of 'fast fashion' trends that could exacerbate the problem.. The company are also investigating the possibility of recycling cotton clothes – a process that normally has difficulty producing higher-quality fibres, but Spinnova's technology may be able to allow fashion companies to completely recycle the cotton clothes they produce into high-quality fabrics, allowing the fashion industry to become more circular in its approach to use of materials and to start to address its environmental footprint more seriously.

Read on for the latest news.

Policy

Lawsuit aims to remove biomass support from RED II

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A coalition of environmental campaigners have launched a court bid to stop the European Commission treating forest grown wood as a renewable source of energy.

Plaintiffs from six countries have filed a lawsuit with the European General Court in Luxembourg, which seeks to annul the forest biomass provisions of the EU's 2018 Renewable Energy Directive (RED) II.

The case is designed to disqualify forest wood from contributing to the directive's target that 32 per cent of all electricity generated across the EU should be generated from renewable sources.

The plaintiffs challenge the directive's criteria for assessing greenhouse gas emissions, which they say fails to count the CO2 coming out the smokestack when wood is burned.

They say that if this is taken into account, biomass plants emit more CO2 per megawatt hour than fossil-fuelled power plants, including coal. While equivalent CO2 can be sequestered by regrowth of woodland, replacing the trees that have been harvested can take over a century and will not happen if the land is converted to agricultural uses, according to the suit.

The plaintiffs are composed of groups representing communities in virgin forest areas of the EU and the USA who are concerned about the upsurge in demand for wood fuel as a result of the directive.

The case contends that increased forest cutting will exacerbate greenhouse gas emissions by reducing the capacity of this woodland to absorb and sequester carbon.

Click here for more information.

London introduces ultra-low emissions zone

The Mayor of London has launched the Ultra-Low Emission Zone (ULEZ) in central London.

The ULEZ is central to the Mayor's plans to improve the health of Londoners by cleaning up the city's air, which leads to the early deaths of thousands of Londoners every year.

Most vehicles driving in the ULEZ will need to meet new, tighter emission standards or pay a daily charge to travel within the area. The ULEZ will operate in the same area as the current Congestion Charge Zone and will be in effect 24 hours a day, 7 days a week, all year round.

Vans, lorries, coaches, buses, cars, motorbikes and all other vehicles will need to meet the new, stricter emission standards, or pay the daily ULEZ charge. This is in addition to the weekday

Congestion Charge. It will replace the T-Charge (officially known as the Emissions Surcharge) which was introduced in October 2017.

The charge for non-compliant cars is £12.50 a day (in addition to the Congestion Charge). Non-compliant larger vehicles have higher charges.

The Mayor is bringing forward the start date of the central London Ultra Low Emission Zone (ULEZ) from 2020 to 2019 and has confirmed that ULEZ will expand up to the North and South Circular roads from 25 October 2021.

Diesel cars over 4 years old will typically be affected. liability for the charge can be checked on the ULEZ site.

Click here for more information.

Ugandan law to hold scientists responsible for GM crop safety

The Genetic Literacy Project highlights that Ugandan researchers who have been working since 2005 to breed more nutritious bananas say their progress won't be hindered by a strict liability clause in the nation's latest biosafety bill.

The scientists are using genetic engineering to develop bananas rich in nutrients such as vitamin A, iron, zinc and folic acid. The Ugandan Parliament recently passed a bill that regulates the process for commercializing such crops. Though it has yet to be signed into law by the president, it includes a controversial clause that holds scientists accountable in case of any complaint associated to their research, regardless of whether the particular anomaly was directly caused by the scientist.

Click here for more information.

Markets

17% increase for US pellet exports

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Biomass magazine reports The U.S. exported 6.04 million metric tons of wood pellets in 2018, up approximately 17 percent when compared to the 5.14 million metric tons exported in 2017, according to data released by the USDA Foreign Agricultural Service.

The U.K. was the top destination for U.S. wood pellet exports in 2018, at 4.71 million metric tons. Exports to Belgium-Luxembourg reached 580,394.9 tons, with exports to Denmark at 472,564.8 metric tons. Exports ranging in volume from 20,000 metric tons to 90,000 metric tons were also reported for Italy, Canada, the French West Indies, France, and the Netherlands. The FAS data shows the U.S. exported 1,733.7 metric tons of wood pellets to Japan last year, with 6,559 metric tons exported to South Korea.

Data released by the FAS estimates the total value for 2018 wood pellet exports at $812 million, with the U.K. accounting for $646 million of that value.

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Research & Development

Diversifying biobased jet fuel feedstocks

Public Domain Pictures

flexJET is a four-year project part funded by the European Commission through the Horizon 2020 research initiative. 13 partners from five different European countries are coordinated by the University of Birmingham in the UK. As part of Horizon 2020's new research and innovation programme, it is assisting in the long-term goal of bringing innovative biofuels from sustainable raw materials to the market.

The innovative flexJET project is diversifying the feedstock for sustainable aviation fuel beyond vegetable oils and fats to biocrude oil produced from a wide range of organic waste, diverting it from landfilling or incineration. The process offers better economics and improved overall sustainability by processing waste feedstocks near the source and at a scale that matches the waste availability. This is also one of the first technologies to use green hydrogen from the processed waste feedstock for the downstream refining process thereby maximising greenhouse gas savings and further contributing towards the Paris Agreement GHG reduction goals.

Click here for more information.

Government-backed Carbon Capture advisory group

Leading players from across the UK's carbon intensive energy, oil, and steel industries have joined together to form a new government-backed advisory group, in a bid to accelerate the development of carbon capture usage and storage (CCUS) technology.

The CCUS Advisory Group, which is backed by up to £1m of government and industry support, includes representatives from major corporates such as BP, Shell, Tata Steel, National Grid, Cadent, and Drax, the Department for Business, Energy and Industrial Strategy (BEIS) announced.

The new industry-led CCUS group has been tasked with addressing cost concerns by providing expert advice to the government on the financial frameworks needed to underpin investment and growth in the sector.

It will also provide advice on the potential incentives and regulations needed for the development of a UK market in CCUS, in support of the government's ambition, announced in November, to have the UK's first full carbon capture project up and running from the mid-2020s, it added.

The government has also confirmed £170m will go towards developing what it hopes to be the world's first net zero cluster of heavy industrial plants by 2040, with CCUS expected to play a key role. Nevertheless, the funding figure pales in comparison to the £1bn CCS competition which was scrapped by the government in 2015 by then Chancellor George Osborne.

Click here for more information.

Identifying risks from water scarcity

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As climate change brings more frequent droughts and floods, understanding water usage and risks arguably never has been more critical. By most measures, the world is falling short of meeting United Nations Sustainable Development Goal No. 6: to achieve "sustainable water management and sanitation" by 2030.

Businesses have been using more water than ever in the past few years, even as they report more about water risks, according to the CDP's Treading Water report. Corporations reported $38 billion in losses related to water last year, the report found, after examining data from nearly 800 companies. And physical risks relating to scarcity and poor quality of water make up three-quarters of reported risks, which can upset production, damage reputations and even cause a company to lose its license to operate. Yet 44 percent of companies surveyed by GreenBiz and Ecolab survey lack a plan to achieve water goals.

However, tools are emerging to help identify the risks. The Water Footprint Network, based in the Netherlands, released in 2017 online maps that display water footprints per crop, industry, country or river basin. It even offers views of the sustainability of water footprints, filtered by certain criteria. Choose from green (related to rainwater), blue (groundwater and surface water), grey (related to wastewater) or total water data, and the map colours in accordingly.

Other options include bar-chart geographic assessments or pie charts per crop or sector. There's even a production assessment of commodities per crop, sector or facility.

Click here for more information.

US agencies to collaborate on bioeconomy advancement

The US federal Biomass Research and Development (BR&D) Board has unveiled a multi-agency strategy to accelerate innovative technologies that harness the nation's biomass resources for affordable biofuels, bioproducts, and biopower. The Bioeconomy Initiative: Implementation Framework was developed by the B&RD Board—an interagency collaborative which is co-chaired by the U.S. Department of Agriculture and the U.S. Department of Energy.

The Bioeconomy Initiative: Implementation Framework outlines an approach for implementing the Initiative. The Framework will serve as a guiding document for the BR&D Board member agencies to increase government accountability and accelerate innovative and sustainable technologies that contribute to a secure, reliable, affordable, and enduring supply of U.S. energy and products.

The Implementation Framework lays out activities to address technology uncertainty; leverage government, academic, and industrial resources and capabilities; stimulate public-private partnerships; and generate technical information that can inform decision-makers and policymakers.

Click here for more information.

Europe's largest dairy cooperative targets zero emissions

Geograph

Europe's largest dairy cooperative, Arla Foods, has announced its ambition that by 2050 its operations from cow to consumer will be carbon net zero, with any unavoidable emissions (for example, from farms) entirely offset by improvements elsewhere in the supply chain, balance nitrogen and phosphorus cycles to support clean water systems, and be even more closely aligned with nature to further increase biodiversity across Britain's countryside.

These new targets come after the cooperative, owned by 10,300 farmers across the UK, Germany, Denmark, Sweden, Finland, the Netherlands, and Belgium shows business growth can be achieved without environmental impact. While Arla has managed more than 40% more milk since 2005, its CO2 emissions have reduced by 22% across production and packaging; on farms CO2 emissions per kilo of milk have reduced by 24% since 1990.

Click here for more information.

UK emissions report published

BEIS released a publication providing the latest estimates of 1990-2018 UK greenhouse gas emissions which are presented in carbon dioxide equivalent units.

The provisional estimates suggest that in 2018, total UK greenhouse gas emissions were 43.5 per cent lower than in 1990 and 2.5 per cent lower than 2017.

The provisional emissions figures rely on provisional estimates of carbon dioxide emissions based on UK energy statistics. In 2018, UK net emissions of carbon dioxide were provisionally estimated to be 364.1 million tonnes (Mt), 2.4 per cent lower than the 2017 figure of 373.2 Mt. Carbon dioxide (CO2) is the main greenhouse gas, accounting for 81 per cent of total UK greenhouse gas emissions.

The decrease in carbon dioxide emissions was driven by the continuing downward trend in emissions from power stations, with a 9.9 per cent decrease between 2017 and 2018. This is mainly as a result changes in the fuel mix used for electricity generation, away from coal and towards renewables. In 2018, carbon dioxide emissions from power stations, at 65.2 Mt, accounted for 18 per cent of all carbon dioxide emissions.

Only the energy supply and transport sector showed ongoing declines, while business sectors, residential and public sectors either showed no change or an increase in emissions year on year.

Driven by continual growth in vehicle kilometres travelled on roads, transport carbon dioxide grew to a peak in 2007, 8.5 per cent higher than in 1990. Since then emissions from this sector have fallen back to around 1990 levels, driven mainly by improvements in new car fuel efficiency, as well lower traffic growth than in previous years as a result of a dip following the 2008/2009 recession.

These estimates do not include emissions from international aviation and shipping, but domestic aviation and shipping emissions are included.

These provisional estimates are not used for any formal reporting of how the UK is performing against its emissions reduction targets, as this requires final estimates based on the UK's greenhouse gas inventory. However, these statistics give policy makers and other users an initial steer as to the trend in emissions between 2017 and 2018, which helps form an initial assessment of the extent to which the UK is on track to meet its GHG reduction targets.

Click here for more information.

Wood & Crop

Study identifies potential cold-tolerant miscanthus strains

Chilling temperatures (0–15°C) inhibit photosynthesis in most C4 grasses, yet photosynthesis is chilling tolerant in the 'Illinois' clone of the C4 grass Miscanthus x giganteus, a candidate cellulosic bioenergy crop. M. x giganteus is a hybrid between Miscanthus sacchariflorus and Miscanthus sinensis; therefore chilling-tolerant parent lines might produce hybrids superior to the current clone. Recently a collection of M. sacchariflorus from Siberia, the apparent low temperature limit of natural distribution, became available, which may be a source for chilling tolerance. The collection was screened for chilling tolerance of photosynthesis by measuring dark-adapted maximum quantum yield of PSII photochemistry on plants in the field in cool weather. Superior accessions were selected for further phenotyping: plants were grown at 25°C, transferred to 10°C (chilling) for 15 days, and returned to 25°C for 7 days (recovery). Two experiments assessed light-saturated net photosynthetic rate and operating quantum yield of PSII photochemistry (ΦPSII), and response of net leaf CO2 uptake to intercellular CO2. Three accessions showed superior chilling tolerance: RU2012-069 and RU2012-114 achieved photosynthetic rate up to double that of M. x giganteus prior to and during chilling, due to increased CO2-saturated photosynthesis (Vmax). RU2012-069 and RU2012-114 also maintained greater levels of ΦPSII during chilling, indicating reduced photodamage. Additionally, accession RU2012-112 maintained a stable photosynthetic rate throughout the 15-day chilling period, while photosynthetic rate continuously declined in other accessions; this suggests RU2012-112 could outperform others in lengthy chilling periods. Plants were returned to 25°C after the chilling period; M. x giganteus showed the weakest recovery after 1 day, but a strong recovery after 1 week. This study has therefore identified important genetic resources for the synthesis of improved lines of M. x giganteus, which could facilitate the displacement of fossil fuels by cellulosic bioenergy.

Click here for more information.

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UK's largest wood gasifier opens

The Environment Journal reports that the largest wood gasifier plant in the UK is now fully operational.

The site in Ince, Cheshire, is owned by Bioenergy Infrastructure Group (BIG), and used uses advanced gasification thermal treatment (ATT) technology.

Each year, the site will process up to 170,000 tonnes of waste wood, converting this fuel into 21.5MW of electricity, enough to power over 40,000 homes. BIG claim the plant will deliver a net reduction in greenhouse gas emissions worth around 65,000 tonnes of CO2 per annum, the equivalent of taking more than 40,000 cars off the road.

Around 150 jobs were created during the construction of the new plant, which will be operated and managed by about 25 full-time employees.

In addition to Ince, BIG also owns and operates waste wood biomass plants in Birmingham, Northern Ireland and Widnes. They are also in the late stages of construction and development of new plants in Hull, Lanark in Scotland and Hoddesdon in Hertfordshire.

Click here for more information.

New council to push for plant-based products

Archer Daniels Midland Co., Cargill, Tate & Lyle, and Ingredion are among the founding members of the Plant Based Products Council, which will seek more sustainable consumer products and packaging through greater use of plant-based materials.

The council will promote the adoption and use of products derived from renewable biomass. It will advocate for private sector programs and government policies to encourage use of renewable materials and feedstocks, including policies to reduce carbon emissions, improve water quality and soil health, and curtail solid waste destined for landfills. The Plant Based Products Council launched a database featuring more than 480 plant-based and bio-based products already on the market.

The council released polling conducted in August 2018 showing strong interest from millennials in bioplastics. The polling found 48% of millennials said they feel most guilty about their own plastic use, which compared to other resources such as paper (33%), water (31%) or how much they drive (31%). Sixty-four per cent of millennials said they were willing to use plastic alternatives, and 60% said they were surprised by the lack of alternative options to plastic.

Click here for more information.

Enviva supply pellets to Tees Renewable Energy Plant

Recent financial announcements by Enviva regarding takeover of partner shares in its Hamlet pellet plant which is under construction in North Carolina, USA, indicate that MGT Power (the Tees Renewable Energy Plant) has a 15 year take or pay offtake contract with Enviva for 1 million tonnes per annum of wood pellets following a ramping up period.

The Hamlet plant is expected to begin commercial operations in June and reach full nameplate production in 2021. The MGT contract commences in 2019, ramps to full supply volumes in 2021 and continues to 2034.

Click here for more information.

Other Feedstocks

Flushed toilet paper as chemicals feedstock

Bioplastics magazine reports ISPT, the Netherlands-based Institute for Sustainable Processing Technology, has launched a new project to produce valuable chemicals from paper waste. The Cell-U-Value project will run until October 2022 in partnership with KNN Cellulose, the University of Groningen and Nouryon (former AkzoNobel Specialty Chemicals).

The tons of paper that are flushed down the toilet every year contain high volumes of cellulose, that currently simply go to waste. The Cell-U-Value project will kick off with a lab feasibility study to convert this cellulose to acetic acid, which can be used to make useful chemicals such as MCA (mono-chloro acetic acid).

Converting the cellulose into biobased, sustainable chemicals will be achieved through a process of hydrolysis and fermentation integrated with reactive extraction. The focus will be on scaling up to a full-scale value chain, both on an economical and an environmental level. This will be followed by a pilot to gain clear insight into what the functional process to produce 10 tons of bio-based fine chemicals made from cellulose will entail.

Click here for more information.

Pixabay

Making fibres from old cotton clothes

In the future, T-shirts might be made from potato peels, wheat straw, trees, or even former T-shirts instead of virgin cotton. In Finland, a startup has developed new technology that can transform cellulosic fibre into fibre for the textile industry–without the environmental challenges of older materials.

Spinnova, based in Jyväskylä, Finland, finished building a pilot factory in late 2018. Inside, patented machines grind up wood pulp and agricultural waste into tiny fibres that can be spun into wool and then made into fabric for clothing. The process has advantages over cotton, which requires large amounts of water to grow–often in water-stressed regions–and also uses large amounts of pesticides.

The company is beginning first with wood pulp as a raw material – perhaps unsurprisingly, since it's based in a region known for forestry and forest products – and with wheat straw, a form of agricultural waste. But over the last few years, it has experimented with multiple other sources of fibre, from carrot peels to cotton clothing. Clothing as a source of fibre is particularly interesting, because cotton is typically difficult to recycle; if you drop off a pair of old jeans for recycling at a store, they'll likely turn into a lower-quality material like insulation. The new process, which creates a gel-like material called microfibrillated cellulose, re-creates a high-quality fabric. In theory, brands could take back their old clothing to use as raw material in a fully closed loop. As Spinnova ramps up production at its new factory, it's now in talks with clothing companies that want to do exactly that.

Click here for more information.

UPM develops adhesive that doesn't interfere with paper recycling

Flickr

Sticker attachments have recently seen a rise in popularity. However, the glues used in stickers have caused problems in the paper recycling process. The problem is not a new one but has become more notable as the quantity of sticker material attached to printed products has increased.

Enhancing recyclability was a key target when UPM Raflatac, UPM Communication Papers and UPM's Central European Research Centre joined forces.

The glue deposits from sticker material create holes in the produced paper and lead to breaks in the paper web, which is the paper running through the paper machine. For UPM and other paper producers who use recycled, deinked fibres, this leads to a loss of production and, of course, wastes valuable, sustainable, recycled fibre.

A new type of adhesive has now been developed and launched on the market, promising considerable improvements in the recyclability of UPM Raflatac paper labels.

The new glue behaves much better during the deinking process and the new label passes the

European Paper Recycling Council's scoring criteria for recyclability.

The paper recycling and production knowledge of UPM Communication Papers and R&D with the product development knowledge of UPM Raflatac were closely linked in the collaboration. UPM Raflatac also collaborated with their customers when testing the new adhesive. INGEDE, the International Association of the Deinking Industry, also took part in the development work.

Recycled fibre accounts for nearly one-third of all fibre used in UPM's paper production. A well-functioning recycling process ensures that all the recovered paper material is used as effectively as possible. Improving the recyclability of paper products is one of the best ways to develop the sustainable use of paper.

Click here for more information.

Events

World Waste to Energy and Resources Summit
London, 21st-22nd May 2019

Now in its 8th year, the World Waste to Energy and Resources Summit has gained global recognition as the summit where deals are made and new partnerships formed between leaders of international waste management CEOs, developers, bankers, private equity financiers, and technology pioneers.

Click here for more information.

Securing markets and maximising value from biosolids and other biofertilisers
Leeds, 21st-22nd May 2019

Sometimes it doesn't matter how strong the evidence is to support a particular practice – if the perception is sufficiently negative, that practice may never gain widespread support. Day 1 of this event will provide an opportunity for different sectors to share experiences and best practice – and explore how perceptions and evidence might better interact to secure long-term resilience in land-based markets. Day 2 of this conference focuses on strategies to reduce costs / improve value from land-based markets for biosolids and other bioresources.

Click here for more information.

Biomass PowerON 2019
Copenhagen, 22nd-23rd May 2019

The conference brings together biomass experts for 2 days of interactive presentations and networking sessions to share their knowledge of biomass to power conversions. The event will highlight the latest scientific achievements, economics and regulatory framework issues.

Click here for more information.

Plant Based Summit
Lyon, 22nd-24th May 2019

In May 2019, Plant Based Summit will launch its 5th edition in Lyon, with an even sharpened positioning on the innovation, the co-development and its operational implementation for the necessary deployment of bio-based products. It will be the opportunity for the participants to contribute to the evolution of plant-based, green and sustainable chemistry!

At Plant Based Summit, each stakeholder in the biobased economy is able to share, find the best solutions to fit its own specific place and development stage, enabling it to make the decisive leap forward, thus contributing to empower the biobased economy.

Click here 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 high-quality industry exhibition, attracting biomass professionals from around the globe.

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 (£/tonne, 5% VAT)	UK Ex-Farm Barley Straw (D1000) (£/tonne)	UK Ex-Farm Wheat Straw (D1000) (£/tonne)
10 Feb	292-333 (↓-–)	58-80 (↓-–)	48-58 (–-↓)

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)
May-19	166.0 (↑)	189.0 (↓)	360.7 (↑)	460.5 (↓)	360.0 (↓)	895.25 (↓)
Jul-19	165.5 (↑)			465.5 (↓)	368.7 (↓)	908.75 (↓)
Aug-19			363.0 (↑)			914.50 (↓)
Sep-19		177.0 (–)		473.0 (↓)	376.7 (↓)	919.00 (↓)
Nov-19	148.0 (↓)		367.0 (↑)			928.25 (↓)
Dec-19		180.0 (↓)		489.7 (↓)	388.5 (↓)	
Jan-20	149.1 (↓)					938.25 (↓)
Feb-20			370.0 (↑)			
Mar-20	151.1 (↓)	183.7 (↑)		504.5 (↑)	402.2 (↓)	
May-20	152.4 (↓)	186.0 (↑)	371.2 (↑)	512.5 (↑)	410.0 (↓)	
Jul-20	158.0 (↓)					
Sep-20		183.2 (↑)				
Nov-20	148.7 (↓)					
Jan-21	152.6 (↓)					

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

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

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