The Bioeconomy Consultants

NNFCC

Feedstocks

News Review

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

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Foreword

Welcome, subscribers, to our final Feedstocks News Review of 2017.

Vivergo are one of the largest bioeconomy companies in the UK, and a huge contributor to the UK biofuels market. Since their primary feedstock to produce bioethanol is wheat, they also provide a significant market for UK wheat. Understandably, the news that Vivergo are closing their plant in East Yorkshire for maintenance - both earlier and for longer than anticipated citing policy uncertainty and current bioethanol price as contributing factors – has created uncertainty in the UK wheat market, particularly in the North-East region. Fortunately, no immediate effects have been felt, but this will remain a subject of interest for some time, as Vivergo may wait for a more favourable bioethanol price before fully resuming operations.

In more positive news, researchers in New York believe they have solved a significant health and safety problem in the wood pellets industry, one that will be welcomed both by producers and consumers. When wood or wood pellets are stored in ambient conditions, they tend to produce carbon monoxide gas, which can make pellet stores potentially hazardous to operators. However, the researchers have discovered the chemical pathway by which the carbon monoxide is produced, and have found that by exposing the pellets to ozone gas, the production of carbon monoxide is inhibited, and gas levels in store drop to safe levels. Furthermore, by exposing wood fibres to ozone *before* they are compressed into pellets, the carbon monoxide production can also be inhibited during the production phase. The researchers have a patent pending for their process.

Another new piece of research was released this month, that we had a lot of fun with in the NNFCC office: an interactive map showing global cropland at the finest resolution ever achieved. Not only is the map interesting to browse, it has also provided a valuable insight that there is more cropland in the world than previously estimated: as much as 20% more. While this is encouraging, improvements still need to be made to improve crop productivity and management to optimise land utilisation for both human and industrial consumption.

Read on for the latest news.

Policy

£40m set aside for UK farming grants

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Farmers will get a £40 million productivity boost as the UK's Environment Secretary Michael Gove announced the opening of a new grants scheme for investment in cutting edge technology and new equipment.

Under the scheme, grants are available to invest in new technology, to reduce cost or improve product quality. The funding can be used on diverse investments including green technology.

The Countryside Productivity Scheme is part of the Rural Development Programme for England (RDPE) and this latest announcement is the second phase of the Large Grants scheme announced in July 2017.

The first phase of the scheme included a £6 million fund for Improving Forestry Productivity.

Under the RDPE Countryside Productivity Scheme, there are grants for water resource management and reservoirs, improving forestry productivity, adding value to Agri-food, and improving farm productivity.

Eligible areas for support in scheme literature include increasing the use of renewable energy produced on farm by improving energy storage and distribution and to encourage more efficient use of livestock slurries, manures and digestate.

The grants are funded by the European Agricultural Fund for Rural Development (EAFRD). Grants are for a minimum of £35K and can cover up to 40% of eligible costs.

The government has guaranteed funding for RDPE Countryside Productivity Scheme grants if these are agreed and signed before the UK's departure from the EU, even if the grant agreements continue after we have left the EU. This is subject to projects good value for money and in line with domestic strategic priorities when the application is assessed.

Click here for more information.

Environment Agency announces consultation on charges

The Environment Agency has launched a public consultation on the cost of its permits and business charges. The proposed changes will mean that businesses pay for the full services they use rather than the public – which the Environment Agency sees as a more financially-sustainable model that will lead to long-term environmental improvements.

The changes affect the waste and resources sector including Anaerobic Digestion and land spreading of waste materials which will face increases in application fees and ongoing annual renewal fees.

The consultation will run until 12 January 2018, with the proposed charges being introduced in April 2018 – the start of the financial year.

Click here for more information.

BEIS announces investment in low-carbon industry

BEIS announced that they expect to invest around £162 million in industrial research and innovation, including Carbon Capture, Use and Storage (CCUS).

As part of this commitment, within the BEIS Energy Innovation Programme, BEIS expects to invest around £100 million in low carbon industrial innovation to reduce the risks and costs of accelerating the roll out of low carbon technologies which will enable UK industry to remain competitive.

As part of the Government's Clean Growth Strategy BEIS will be allocating up to £20 million to design and construct carbon capture and utilisation (CCU) demonstration projects. This programme will encourage industrial sites to capture carbon dioxide which could then be used in industrial applications. This would help to enable a pathway for learning and development of capture technologies at an intermediate scale, reducing the costs and risks. The programme will be run in three phases:

Phase 1 will be an initial scoping study for an engineering supplier to work on BEIS' behalf with potential host sites, carbon dioxide users and technology suppliers to produce site-specific cost estimates for deploying CCU at UK industrial sites. The Phase 1 ITT is now open for interested suppliers.

Click here for more information.

Markets

UK wheat prices hold despite Vivergo shutdown

AHDB reports that the slump in European ethanol prices over the past couple of months has been cited as one of the factors behind the timing of the shutdown announced by one of the UK's two bioethanol plants.

Vivergo Fuels announced that its Northeast bioethanol plant will be shutting down from the end of November for maintenance. However, the shutdown will be both longer and earlier than planned. This was partly attributed to the uncertain political environment, particularly timescales for the roll out of the higher E-10 blend, plus declines in the profitability of production after ethanol price falls.

This is supported by data from F.O. Licht, which shows European ethanol margins following a similar trend to European ethanol prices and declining markedly over the past couple of months. Ethanol prices have declined due to expectations of increased supply. Meanwhile, ex-farm UK wheat prices have crept higher.

Last month, AHDB forecast that Human and Industrial (H&I) wheat usage in the UK in 2017/18 at 8.191Mt, up 1% on the year. This increase was due to expectations that overall demand from the bioethanol & starch sectors would be higher than in 2016/17.

Stronger bioethanol demand is forecast to be one of the contributing factors to a tighter UK wheat balance in 2017/18, though the sharply lower stocks and reduced imports are also factors. Given the role that elevated bioethanol demand is currently playing in the UK wheat market, the length of the shutdown by Vivergo will be closely watched.

The Yorkshire/Humber region has on average contributed to around 13% of English wheat production and any annual increase here has a large contribution to the total UK increase. Any impacts from Vivergo's extended shutdown will be keenly felt in this region.

Click here for more information.

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Canada sees surge in pellet exports

Following on recent reports in the upsurge in US pellet markets, Canada's National Energy Board has announced that Canadian wood pellet exports increased by 46 percent between 2015 and 2016, due to growing global demand for biomass-fired electricity generation

Over the past five years, Canadian wood pellet exports have increased by 73 percent, growing from 1.4 million metric tons in 2012 to 2.4 million tonnes in 2016. By weight, Canada is now the second largest wood pellet exporter, following the U.S.

The U.K. is the primary destination for Canadian wood pellets, followed by Japan and the U.S. Approximately 70 percent of Canadian exports are destined for the U.K. (accounting for 0.7 million tonnes in 2012 and 1.7 million tonnes in 2016), with 11 percent shipped to Japan and 7 percent supplied to the U.S. The remaining 12 percent of exports are split between 11 other countries. Higher wood pellet exports to the U.S. were partially a response to growing biomass electricity generation in the United States.

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Research & Development

Preventing Carbon Monoxide in pellet storage

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Research at Clarkson University, New York, Queenaire and Curran renewable Energy has been examining means of reducing the risk of CO emissions during pellet storage, which pose a significant health and safety risk to operators.

Clarkson University confirmed that carbon monoxide was being produced by both bagged pellets and pellets in bulk storage. The team discovered the chemical pathway by which the carbon monoxide was being produced. It had been shown that exposure to ozone eliminated the unsaturated hydrocarbons that autoxidize to produce hydroxyl radicals, which, in turn, react with the hemicellulose to produce CO. To develop a practical process to eliminate the CO formation, a kinetic study of the continuous ozonolysis of wood fibre was conducted using a small materials auger. The reduction in CO emissions was linearly proportional to the ozone exposure (concentration × time). The exposure needed to reduce or eliminate the formation of CO from the exposed fibre was around 42 000 ppm min at a flow rate of 0.57 kg/min of fibre or approximately 0.032 g of O3/kg of fibre to be passivated.

Once this was identified, the team found a way to prevent carbon monoxide production by exposing the wood fibres to ozone prior to pressing them into pellets. The university has a patent pending on the process.

Click here for more information.

Analysis of plastic contaminants in Scottish digestate

The Scottish Environment Protection Agency (SEPA) proposes to align physical contaminant limits for PAS110 digestate in Scotland with Quality Meat Scotland (QMS) and Scottish Quality Crops (SQC) standards. The limits will be adjusted in increments with 50 % of PAS110 limit in April 2017 followed by 25% and 8 % in April 2018 and 2019 respectively.

In an examination of a few field sites to examine the impacts of the proposed standard, a weight based analysis showed that three of the four sites assessed were producing digestate of suitable quality (in plastic contamination terms) to meet SEPA's 2017 and 2018 limits through high selectivity of feedstocks and post digestion screening. However, the more stringent 2019 limit could cause periodic failures with current feedstock selection and screening practices.

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BIOFOREVER project to demonstrate feasibility of wood-to-chemicals conversion

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BIOFOREVER (BIO-based products from FORestry via Economically Viable European Routes) is a new European project to demonstrate the feasibility of conversion of lignocellulosic feedstocks like wood into chemical building blocks and high added value products. The project will run under the umbrella of the Bio Based Industries Joint Undertaking (BBI JU) which is a public private partnership between the European Union and the Biobased Industry Consortium. The BIOFOREVER project consortium consists of 14 European companies. The project will run 3 years from September 2016- September 2019 with a total investment of 16 million euro.

The BIOFOREVER project objective is the technical and economical demonstration of 5 different value chains from feedstock to final product. Within this framework, several conversion technologies will be demonstrated up to pre-industrial scale for several types of feedstock while commercialization routes for the most promising value chains will be delivered.

Click here for more information.

Yorkshire businessman develops closed-loop recycling system

An environmental entrepreneur has launched one of the country's most advanced recycling businesses, which uses the latest technology to turn organic waste including food waste into energy, as part of a £2.5m investment that will initially create 15 new jobs in North Yorkshire. The new venture is the brainchild of Thirsk businessman Richard Todd founder of the former Todd Waste Management group, recently sold to Yorwaste.

Richard's new company Allium Organics, will be one of the UK's first closed loop recycling businesses to turn organic waste, such as food and other biodegradable waste, into energy, via a three-stage process. It will use 'In Vessel Composting' technology to treat waste making it into a nutrient-rich compost. Around 100,000 tonnes of compost will be produced each year that will be used to restore non-agricultural land, such as former landfill sites and quarries. Initially, Allium Organics will use the compost to grow Willow Coppice on a former landfill site, between York and Scarborough, at East Knapton. Once it is planted, it will take approximately three years before the first wood can be harvested.

The wood will then be turned into a biomass fuel at the company's Alne site and used to produce heat, which will be sold to the neighbouring site and electricity that will be sold back to the National Grid. When it is fully operational, it will export sufficient energy to power approximately 12,000 houses.

Click here for more information.

Conversion of biomass into "coal" for energy

The University of Nottingham is partnering with the Energy Research Accelerator (ERA) and CPL Industries to produce a commercial scale facility capable of converting biomass into next-generation solid fuels with coal-like properties.

The new facility is being supported by the Energy Research Accelerator (ERA) - an Innovate UK funded initiative involving the Midlands Innovation consortium of universities, together with the British Geological Survey and industrial partners, who are working together to support research and innovation in energy.

The technology being used to develop the biocoal is known as Hydrothermal Carbonisation (HTC). This converts high-moisture biomass into solid fuels using moderate temperatures and high pressures.

Once completed, the HTC facility will be operated by CPL Industries, a manufacturer and distributor of solid fuels which already has products on the market containing biomass materials. This will be a fist of its kind in the UK.

The installation will be located at CPL's production site in Immingham, North Lincolnshire, and is scheduled to begin production in mid-2018.

Click here for more information.

Wood & Crop

Interactive map shows world's available croplands

A new map has been released, detailing croplands worldwide in the highest resolution yet, helping to ensure global food and water security in a sustainable way.

The map establishes that there are 1.87 billion hectares of croplands in the world, which is 15 to 20 percent—or 250 to 350 million hectares (Mha)—higher than former assessments. The change is due to more detailed understanding of large areas that were never mapped before or were inaccurately mapped as non-croplands.

Earlier studies showed either China or the United States as having the highest net cropland area, but this study shows that India ranks first, with 179.8 Mha (9.6 percent of the global net cropland area). Second is the United States with 167.8 Mha (8.9 percent), China with 165.2 Mha (8.8 percent) and Russia with 155.8 Mha (8.3 percent). Statistics of every country in the world can be viewed in an interactive map.

South Asia and Europe can be considered agricultural capitals of the world due to the percentage of croplands of the total geographic area. Croplands make up more than 80 percent of Moldova, San Marino and Hungary; between 70 and 80 percent of Denmark, Ukraine, Ireland and Bangladesh; and 60 to 70 percent of the Netherlands, United Kingdom, Spain, Lithuania, Poland, Gaza Strip, Czech Republic, Italy and India. For comparison, the United States and China each have 18 percent croplands.

Click here for more information.

Yorkshire pellet delivery service sees success

A fast-growing Yorkshire company which has become one of the region's leading suppliers of biomass wood pellets has secured £200,000 to support its growth plans.

VerdEnergy supplies customers throughout the North of England from its headquarters in York, depots in Richmond and Goole and through its fleet of specialist delivery vehicles.

VerdEnergy was established in 2015 by the team behind Duncan Renewables, an installer of renewable energy systems.

Co-founder Mark Duncan said they had realised that there was a gap in the market for a good quality wood pellet supplier and decided to create a full-service solution for customers, which includes installation, service maintenance and fuel supply.

This approach has proven to be a success, with volumes more than trebling in the past two years.

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AHDB predicts decline in UK wheat area

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AHDB reporting on surveys of the GB wheat area are predicting a decline of 2% in 2018 to 1.752Mha, which represents the fourth consecutive year of decline. According to official estimates of the UK supply and demand, the balance of UK wheat availability and domestic consumption in 2017/18 is estimated at 2.648Mt, a fall of 18% on the year. Higher domestic demand has offset small rises. After taking into account the operating stocks requirement of 1.600Mt, the estimated surplus of wheat available for export or free stock in 2017/18 is 1.048Mt, down 35% year on year.

Click here for more information.

Other Feedstocks

Ørsted applies for second waste recovery plant

Ørsted has applied to change the environmental permit for its under-development REnescience plant in Northwich.

According to a consultation into altering the permit, Ørsted wants to install and operate an additional plant to produce solid-recovered fuel.

Ørsted, formerly DONG Energy, says the SRF plant's annual production capacity would be up to 50,760 tonnes a year. However, the permit consultation also says refuse-derived fuel could also be produced, but the combined capacity would not exceed 50,760t/yr.

According to the permit consultation, the site is allowed to produce RDF, so the variation mainly covers two additional stages (shredding and a wind sifter unit) to make the waste up to SRF standard.

Overall, the REnescience plant is planned to process up to 120,000t/yr of waste and the consultation says, "no increase" to this is proposed. As things stand, plant will have a total electrical capacity of up to 6MW, with its electricity derived from processing biogas.

Click here for more information.

Annual WRAP Food Waste report published

The UK Food Waste Recycling Action Plan released its annual report

The report highlights successes with this cross-industry initiative. The FWRAP initiative is designed to improve the capture, supply and the quality of household and commercial food waste. Supported by WRAP the group has worked hard to collaborate more effectively and to identify and reconcile the blockages in the supply chain that continue to suppress the potential for the collection and recycling of food waste. There is still estimated to be between six and seven million tonnes of food waste that is not captured within the supply chain and that could be put to much better use through either composting or AD.

Click here for more information.

Dutch invest in UK biocoal technology

Biomass magazine reports a subsidiary of Dutch private equity investment firm Momentum Capital has made a conditional investment of EUR 45 million ($53 million) in the development of a biocoal plant to be built in Vägari, Estonia.

Baltania OÜ's facility will utilize technology from Clean Electricity Generation BV (CEG), which, according to the company, has developed a "proprietary, turn-key, plug-and-play torrefaction system that generates up to 15,000 metric tons of bio coal product per module per year, and simultaneously generates up to 1.1 MWe of green electricity per module."

A full-scale demonstration plant that utilizes the technology is located in Derby, in central England's East Midlands, according to CEG.

Baltania OÜ indicated its focus will be on production of biocoal pellets, and that its main customer base will consist of utility companies in the Nordic countries and central Europe. The planned output capacity of the plant will be approximately 160,000 metric tons annually.

The project, to be carried out in cooperation with the Estonian Ministry of the Environment, will be funded by Momentum Capital and other investors and financial institutions, as well as a European Union NER300 grant of EUR 25 million.

In previous announcements, Scandinavian Biopower Oy, a 100% subsidiary of Momentum Capital, made an investment decision to commission a biocoal plant in Mikkeli, Finland (also using the CEG technology). The value of the investment is approximately EUR 70 – 80 million. Provided that all conditions of the investment decision are finally met, the biocoal plant will be built during 2018.

The main product of the biocoal plants will be biocoal pellets produced from sustainable woody biomass. Biocoal pellets can be used to partially or fully replace coal in electrical power generation or heat generation plants as a sustainable alternative without major additional investment in plant conversion.

Click here for more information.

China derives chitosan fibres from crustacean shells

Max Pixel

Hismer Bio-Tech Co. Ltd. based in Ningyang County, Tai'an City in east China's Shandong Province, is making biomass fibre from a very unusual source: shrimp and crab shells.

In the backyard of the company's workshop, piles of shrimp and crab shells permeate the air with their strong odour. But after going through the company's processing machine, the shells are turned from food waste to chitosan fibre, basically indistinguishable from other synthetic fibres.

Hismer collects 10,000 tonnes of the shell waste from seafood processing companies in China's ports of Qingdao, Yantai, Dalian and Ningbo a year for the production of some 6,000 tonnes of biomass fibre. It has become the world's largest marine renewable producer.

Hismer is not the only company introducing innovation to China's textile industry. BMSG, a bio seaweed substance processing firm, has been turning seaweed into biomass fibres for cloth that can be safely used for surgical dressings.

Click here for more information.

Events

ECO-BIO 2018
Dublin, 4th-7th March 2018

ECO-BIO 2018 will highlight the latest research and innovation towards developing industrially viable, safe and ecologically friendly biobased solutions to build a sustainable society.

A topical and comprehensive programme will include plenary and invited speakers, forum discussions, contributed oral presentations, a large poster session and exhibition.

The conference will bring together all concerned with the biobased economy to review industrial, academic, environment and societal approaches, discuss the latest research and progress, and encourage new research partnerships to enable new cascaded biobased value chains.

Click here for more information.

2nd International Conference on Marine Biomass as Renewable Energy
Glasgow, 5th-6th March 2018

One source of biofuels has been identified as marine biomass or marine algae. Many researchers are working on the feasibility of using algae as a feedstock for producing bio-fuels. One example of biofuel from marine algae would be the conversion of Marine biomass to methane via anaerobic digestion, which can generate electricity. Another potential for algae is its potential for biodiesel.

One great characteristic of micro-algae is that it doesn't rely on soil and land. They thrive in water which is salty or dirty. Therefore, they do not need fresh water resources. Algae also have high growth rates, good growth densities which also makes them a good source for biofuels. Algae can be grown in a variety of climates and in different types of production methods. These can be from photo bioreactors, ponds and fermenters.

The conference aims to explore the challenges and opportunities in the area of marine algae as a source of biofuel. It will highlight the recent developments in research areas such as cultivation of marine algae and research & development of algal—biofuel production.

Click here for more information.

World Bio Markets
Amsterdam, 20th-22nd March 2018

With governments committed to reducing emissions and consumers becoming more educated about where their products come from, there are opportunities for the bio-based sector to become a true contender to fossil oil. Yet long development times, lack of investment, and challenges in attaining a secure and sustainable supply chain have made it difficult for the bio-economy to achieve commercial success.

This event provides a platform for the entire global value chain, from feedstock producers to consumer brands, to work together to overcome these challenges.

Click here for more information.

Global Bioeconomy Summit
Berlin, 19th-20th April 2018

The first Global Bioeconomy Summit was held in 2015 and brought together more than 700 bioeconomy stakeholders from over 80 countries. Since then, Bioeconomy has taken a steep and exciting way forward. Many notable initiatives and collaborative efforts have been initiated by the bioeconomy community in order to drive the development of sustainable bioeconomies in their countries and regions.

It is now time to come together again and to re-visit the strategies for future international cooperation in a next Global Bioeconomy Summit!

The 2nd GBS will focus on emerging concepts and future trends in bioeconomy, the latest on challenges and opportunities related to ecosystems, climate action and sustainable development along with the bioeconomy innovation agendas and global governance initiatives to manage them.

Click here for more information.

EUBCE 2018
Copenhagen, 14th-18th May 2018

We look forward to the 26th EUBCE in 2018 in Denmark and to the many vibrant topics that will be included in the agenda. The core of the traditional EUBCE conference will be held over 4 days.

There will however be an extension to the core conference and exhibition in order to showcase the many achievements in the field of full scale biomass utilisation in Denmark that are an integral and major part of the country becoming fossil-free by 2050. Members of the national organising committee will organise special technical visits to sites in the centre of the country where biomass is the key renewable feedstock into processes producing renewable energy, biofuels, biochemicals and biomaterials as well as integrating bioproducts into traditional established fossil-based systems.

Click here for more information.

RRB 14
Ghent, 30th May - 1st June 2018

The 14th edition of the International Conference on Renewable Resources & Biorefineries will take place in Ghent, Belgium from Wednesday 30 May until Friday 1 June 2018. Based on the previous RRB conferences, this conference is expected to welcome about 350 international participants from over 30 countries.

Delegates from university, industry, governmental and non-governmental organizations and venture capital providers will present their views on industrial biotechnology, sustainable (green) chemistry and agricultural policy related to the use of renewable raw materials for non-food applications and energy supply. The conference further aims at providing an overview of the scientific, technical, economic, environmental and social issues of renewable resources and biorefineries in order to give an impetus to the biobased economy and to present new developments in this area.

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	240-365 (↑-↑)	70-95(↑-↑)	68-85(↑-↑)

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)
Dec-17				392.2 (↓)	336.7 (↓)	
Jan-18	137.5 (↓)					979.25 (↓)
Feb-18			358.0 (↓)			
Mar-18	140.2 (↓)	160.2 (↓)		416.7 (↓)	349.0 (↓)	990.50 (↓)
May-18	141.6 (↓)	164.0 (↓)	362.0 (↓)	429.2 (↓)	357.2 (↓)	1001.5 (↓)
Jul-18	143.6 (↓)			442.5 (↓)	365.5 (↓)	1011.0 (↓)
Aug-18			355.5 (↓)			1012.5 (↓)
Sep-18		167.7 (↓)		455.7 (↓)	372.5 (↓)	1004.5
Nov-18	141.1 (↓)		360.2 (↓)			
Dec-18		170.7 (↓)		473.5 (↓)	381.2 (↓)	
Jan-19	142.9 (↓)					
Feb-19			362.5 (↓)			
Mar-19	145.0 (↓)	174.2 (↓)				
May-19	145.9 (↓)	176.0 (↓)	361.5 (↓)			
Jul-19	146.5					
Sep-19		178.0 (↑)				
Nov-19	143.7 (↓)					
Dec-19		179.5				

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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