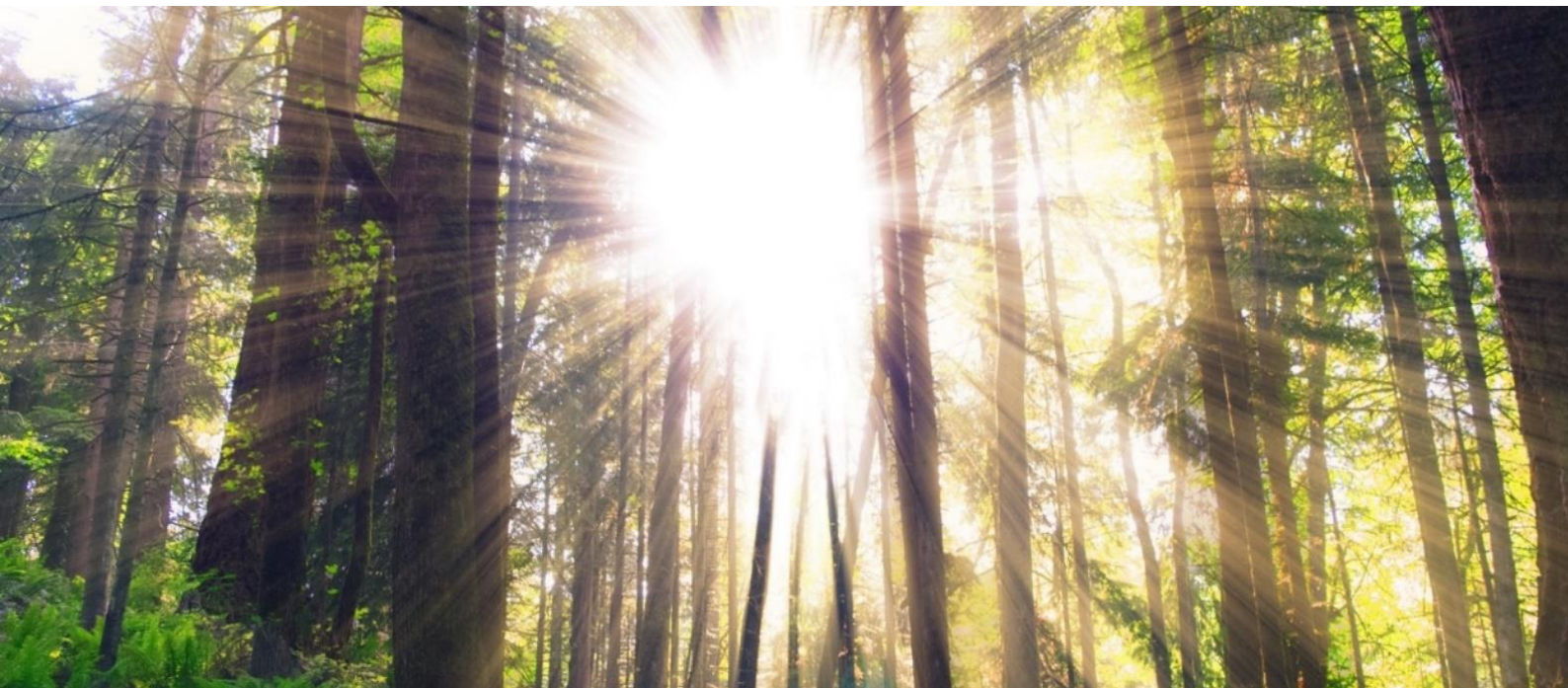


## News Review



**Issue Seventy-Five**

**June 2018**

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 to June's issue of our Feedstocks News Review.

Any technological sector involving work with biomass will be highly nuanced, particularly when it comes to sustainability. It is dangerous to paint all biomass technologies as simply being sustainable, as the supply chains are intricate with many factors at play. It is this nuance that has resulted in controversy over the USA's Environmental Protection Agency's decision to classify all forest biomass as carbon neutral when used for energy. While this is broadly correct in theory: any carbon dioxide emitted by the biomass when it is burned has previously been absorbed by the harvested tree and emissions will be recaptured through subsequent forest growth. However, there are more factors at play, with most arguments raging around how the source forest has been managed and how this impacts on overall carbon sequestration compared to alternative ways in which the forest might have been managed or its products utilised. It's also about how the forest as a whole is managed rather than individual stands. As we said, its complicated! How forest resources are managed can also have knock-on environmental effects beyond carbon emissions. The EPA's decision will fuel the already heated debate over the issues and highlights that anyone looking to step into the bioeconomy area needs to have a good understanding of the issues involved.

Related to biomass power, there has been further development of torrefied biomass in Europe through the EU-funded SteamBIO project. Torrefied wood – generated by heating in a steam atmosphere devoid of oxygen reduces the wood to a state that is much more efficient to transport, as it is lighter, and it becomes hydrophobic, meaning it can be transported in open-topped vehicles without being affected by weather conditions. The treated biomass also burns much more efficiently, and can be easily compressed into pellets or ground into a powder. A pilot plant for this process has been established in Spain, performing torrefaction on multiple kinds of wood and follows similar development of a pilot plant in the UK and other early commercial developments in the US

In slightly grimmer news, there has been a stark reminder as to why the bioeconomy and sustainability are so important: readings from the Mauna Loa observatory in Hawaii have recorded the highest ever atmospheric carbon levels since recordings began. Scientists have hypothesised that this is now the highest atmospheric carbon level for at least 800,000 years. The problem continues to accelerate, and more work still needs to be done to mitigate its advance.

Read on for the latest news.

# Policy

## US EPA classes forest biomass as carbon neutral

The debate about how to view energy from forest biomass sources has raged for more than a decade. Pro industry groups contend it will improve forestry management and ecology while having a neutral long-term impact on carbon levels. Preservationists and green groups suggest that it could lead to short-term emission gains as well as encourage timber harvesting in areas that need to be protected. Under the Trump administration, a new tone is being struck. EPA administrator Scott Pruitt indicted in April that the Environmental Protection Agency (EPA) when addressing future regulatory actions on biomass from managed forests will treat forest biomass as carbon neutral when used for energy production at stationary sources. The EPA will also be assessing options for incorporating non-forest biomass as carbon neutral into future actions.

EPA Administrator Pruitt explained that this announcement grants America's foresters much-needed certainty and clarity with respect to the carbon neutrality of forest biomass.

The EPA's Science Advisory Board has yet to issue a policy statement on woody biomass and carbon neutrality. However, the board has made it clear in the past that it was not scientifically valid to assume all feedstocks are carbon neutral.

Click [here](#) for more information.

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## OECD report into meeting bioeconomy policy goals

A new report by the OECD sets out components of a policy framework for a bioeconomy that countries can use to help identify their relative strengths and weaknesses, fill policy gaps and understand the bigger picture for the international bioeconomy.

The report identifies barriers and opportunities for achieving biomass sustainability. These are linchpins for solving a central quandary in the bioeconomy: how to reconcile the food and industrial demands of biomass.

The report also identifies and analyses recent policies to achieve the elusive goal of fully integrated biorefineries that can use multiple feedstocks and generate multiple products (fuels, chemicals, materials, electricity).

Finally, the report argues that realising the potential of biorefining to replace fossil-derived manufacturing will require producing materials at a scale appropriate to society. Policy implications run the gamut from R&D funding to commercialisation.

Click [here](#) for more information.

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# Markets

## **Yorkshire feed wheat trading at a premium**

Based on AHDB cereals market intelligence, as we approach the end of last years stored crop, Yorkshire feed wheat currently enjoys a £12/tonne premium on UK price of delivered feed wheat by trading at £172/tonne, which is thanks to the impacts of biofuel production in the North East.

Click [here](#) for more information.

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## **Investors urge G7 to phase-out coal**

The REA reports that a powerful group of investors has urged leaders of the richest countries in the world to phase out coal, reports Business Green.

Ahead of the G7 summit in Canada big investment spenders including Allianz Global Investors, Aviva Investors, DWS, HSBC Global Asset Management, Nomura Asset Management, Australian Super and HESTA wrote a letter to world leaders asking them to table a deadline for phasing out coal, and draw up a "meaningful" price on carbon.

The UK, USA, Canada, Japan, Germany, Italy and France currently spend £70bn (\$100bn) a year on subsidies to the coal industry. The Trump administration has since begun direct government intervention to rescue coal plants from closure.

Click [here](#) for more information.

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# Research & Development

## **Torrefaction improves efficiency of biomass use**



Industrial facilities are generally located far away from extensive forest regions. Because wood requires efforts to transport, it sees only limited use as a raw material in industry. In the EU-funded SteamBio project, researchers from the Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB have teamed up with various partners to change all that, developing a special steam drying technique that could significantly cut transportation costs. Another bonus is that the technique yields valuable feedstock for the chemical industry.

As part of the EU-funded SteamBio project, researchers torrefied biomass by heating biomass in a steam atmosphere without oxygen. This process eliminates the hemicellulose completely. This significantly reduces the weight of the material, improves its specific calorific value and allows easy grinding into a highly reactive powder.

The torrefied biomass is water repellent and has significantly improved combustion properties, since it is composed purely of hydrogen and carbon. It can be transported in open bulk containers, since rain beads off the surface without penetrating the interior. What is more, the



torrefied biomass is significantly lighter than the untreated material, which significantly reduces transportation costs.

The torrefied wood chips can be compressed into pellets or ground into powder. Since it has a greater surface area, the biomass powder possesses greater reactivity in material uses than larger chunks. In energy applications, it can also be mixed with coal dust and fed into the firing system of coal-fired power plants. It is even possible to replace the coal entirely with biomass while keeping the same combustion system.

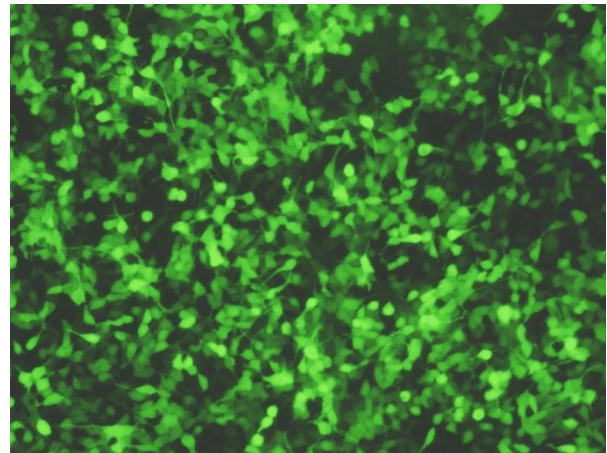
The volatile substances produced in the torrefaction process are valuable. They can be processed to obtain chemicals that serve as feedstock for a wide range of industry products. Until now, these platform chemicals have been obtained from crude oil or natural gas; now, torrefaction offers a sustainable way to produce them.

A pilot facility has been built up, installed and operated at project partner Heckmann Metall- und Maschinenbau GmbH, where it runs 24 hours a day, 7 days a week. Beech wood is used as the biomass. The facility has been then moved to Spain in January 2018 to continue the operation. Here, project partners torrefy pine, oak and beech wood, as well as vineyard prunings and waste from olive oil production.

Click [here](#) for more information.

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## Novel method to measure productivity in individual algal cells



*Wikimedia Commons*

In the search for new sources of consumables, scientists have come to realize that life itself could be the solution. Metabolic engineers have altered the metabolism of living organisms to make new drugs, biodegradables and biofuels.

A major challenge in this field is identifying which cells are the most productive. It is relatively easy to study bulk populations, which results in information about the metabolism of the overall cell population. However, it remains extremely difficult to identify which cells in the bulk population stand above the rest in terms of metabolite production and are therefore the best to copy and imitate. This identification requires observing inside individual cells in real time while the metabolite is made. Scientists at Nara Institute of Science and Technology (NAIST) report a new system that achieves this goal in microalgae cells. The system, which can be read about in Scientific Reports, combines fluorogenic aptamers with femtosecond laser photoporation.

Algae have a number of attractive qualities for metabolic engineering. First, they are extremely adaptive, as they have the ability to live in a broad range of environments.

Normally, scientists use fluorescence microscopy to look inside a cell. This strategy involves attaching a molecule that fluoresces to the metabolite of interest. However, because of cell wall protection, it has been difficult to introduce fluorescent molecules that detect specific metabolites in microalgae cells from outside.

The team of researchers has therefore been developing fluorescent aptamers that emit fluorescence upon binding to the metabolite paramylon and manufacturing methods that can introduce them into the cell by laser pulses.

To get the aptamer inside the cell, the scientists shot the cells with laser pulses only femtoseconds long. These pulses created temporary pores big enough for the aptamers to enter. Once inside, the cells turned green only in places where the aptamers bound to paramylon. Using this technique, the researchers could measure the accumulation of paramylon with time, thus discriminating efficient cells from their unproductive neighbours.

While the system was only tested on paramylon, the team states that other metabolites will be detectable with appropriate aptamers.

Click [here](#) for more information.

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## Algae to produce salmon feed from distillery waste



*Geograph*

An Edinburgh company has developed a process that turns whisky by-products into fish food.

MiAlgae, a student start-up, uses by-products from the distilling process to grow Omega 3-rich algae for feeding farmed salmon.

Founder Douglas Martin said he wanted to "revolutionise" the animal and fish feed industries with microalgae that come from whisky.

He has just received a £500,000 investment in his business.

The investment will help the company expand its team and increase its production. It also plans to build a new plant for its technology at a whisky distillery.

Aquaculture is worth about £1.8bn a year to the Scottish economy.

MiAlgae, which was founded by Mr Martin while he was a masters student at the University of Edinburgh in 2015/16, said the fish feed was "economical and environmentally-friendly".

The microalgae can also be used as a raw material for agricultural food products.

Click [here](#) for more information.

## GM camelina may produce engine lubricants



*Geograph*

The Telegraph reports that Rothamsted Research, which is based in Harpenden, Hertfordshire, wants to plant GM camelina with altered DNA so that it produces 'wax esters', a natural lubricant which can be used instead of petrochemicals to keep machinery running smoothly. It is currently seeking government permission to start field trials.

Until now Rothamsted has only planted GM crops which could be used for human consumption, such as camelina with extra Omega-3 fish oil to boost health, or wheat altered to produce higher yields.

But said it now planned to use camelina as a 'chassis' to make useful lipids, or fatty acids, which can provide alternatives for chemicals in a range of industrial applications.

Rothamsted said it hoped to begin planting this year, and complete their trial by 2020.

As well as the wax esters and Omega-3 alterations the plants will also be genetically altered to increase the thickness of their stems and improve photosynthesis, to boost crop yields.

Rothamsted said if the trials go ahead they would be closely monitored by Defra and its

independent advisory committee and the Advisory Committee on Releases to the Environment (ACRE).

There will also be regular inspections, carried out by the Genetic Modification Inspectorate, which is part of the UK's Animal and Plant Health Agency.

However, campaigners said there was a significant amount of information that is missing from the company's application to Defra, including technical details of the genetic modifications themselves and any assessment of the potential impact on farms already growing non-GM camelina in the UK.

Twenty-six organisations including farmers, scientists, retailers and environmentalists have lodged a formal objection to Defra, asking them to refuse permission for trial, warning that pollen or seeds could escape and lead to other plants growing wax esters, which are harmful to humans.

Click [here](#) for more information.

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## AHDB publishes crop rotation guidance



*Wikimedia Commons*

In a bid to help farmers assess and develop more sustainable rotations AHDB has released a new publication to help farmers take stock of one of the farm's most valuable assets – the rotation.

It was published in advance of an AHDB-hosted debate at Cereals 2018, which will see monitor farmers and others discuss whether UK rotations are fit for the future.

The activity forms part of AHDB's strategic efforts to help farmers identify opportunities to make their rotations more resilient.

The 'How resilient is your rotation?' publication outlines a simple approach that can be used to identify the current strength of a rotation, as well as what limits its potential. It can also be used to list the factors that could put rotations at risk, as well as the opportunities available to improve them.

Click [here](#) for more information.

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## New Vibers bioplastic from potato waste and miscanthus

Bioplastics Magazine reports that a start-up company is now making bioplastic called Vibers from miscanthus and potato processing waste.

NNRGY developed the biodegradable, compostable bioplastic from elephant grass and residual product from the potato processing industry produced by Dutch bioplastics producer Rodenburg, from which a range of kitchenware products, are produced.

In 2017, a new film was successfully developed for the packaging industry, and the three subsidiaries NNRGY Biopolymers, Vibers Consumer Goods and Vibers Packaging were established. The new film is thermoformable on existing machinery and at low temperatures, which saves energy. It can be processed as biodegradable waste. The seedling logo for certified compostable material has been applied for, however, the testing process is still ongoing.

Click [here](#) for more information.

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## Atmospheric carbon hits 800,000-year high

An article in the Independent reported that the concentration of carbon dioxide in the atmosphere has reached its highest level in at least 800,000 years. In April, CO<sub>2</sub> concentration in the atmosphere exceeded an average of 410 parts per million (ppm) across the entire month, according to readings from the Mauna Loa Observatory in Hawaii.

This is the first time in the history of the observatory's readings that a monthly average has exceeded that level.

The Scripps Institution of Oceanography said that before the Industrial Revolution, carbon dioxide levels did not exceed 300ppm in the last 800,000 years. The latest reading shows a 30 per cent increase in carbon dioxide concentration in the global atmosphere since recording began in 1958. The first measurement was recorded as 315ppm. Carbon dioxide concentration exceeded 400ppm for the first time in 2013.

Click [here](#) for more information.

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# Wood & Crop

## Assessment of EU forestry biomass production

The European Commission's Knowledge Centre for Bioeconomy has published a report into EU forestry biomass.

The land area covered by forests in the EU2 has been expanding at an average rate of 0.26% or 0.4 million hectares (Mha) per year from 2000 to 2015 (slowing down in 2010-2015). It reached 161 Mha (38% of the EU territory) in 2015. Of this area, 84% is potentially available for wood supply. The total above ground biomass stocked in EU forests reached 18 600 Mt in 2013. It has been increasing since 2000 at a rate of approximately 1.3% per year, although the forest growth has been slowing down slightly, mostly due to ageing of forests. The average annual harvest level – 281 Mt (of which 224 Mt are removed from the forest) – amounts to 63% of the growth rate (measured as net annual increment) of EU forests – 444 Mt per year. Since fellings are underreported, the actual harvest rate is likely to be higher, but still not exceeding the growth rate. Detailed and harmonised quantitative data on forest management, and especially wood removals, present severe gaps and uncertainties at EU level, with marked differences between Member States. While significant progress has been made, efforts to improve the current assessments should be pursued. Sustainable wood production implies reconciling the full range of ecosystem services which the forests provide.

Click [here](#) for more information.

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## **Palm Oil ruling for Total prompts protest from French Farmers**

France's largest farmers' union has called for French oil refineries to be blocked in protest at a decision allowing Total to use imported palm oil at a new biofuel production site.

The French authorities gave oil and gas major Total permission to use palm oil as a feedstock at its La Mede biofuel refinery, a move that prompted outcry from farmers and environmentalists.

French farmers who grow local oilseed crops like rapeseed that are also used to make biodiesel see cheaper palm oil imports as unfair competition and contrary to the environmental goals of biofuels.

Palm oil has been widely criticized in Europe for causing deforestation in southeast Asia and some lawmakers are pushing for a ban in its use in biofuel as part of new European Union energy targets currently under discussion.

The FNSEA farmers' union was calling for refineries to be blocked from June 10 as part of nationwide protests.

Farmers are also worried that ongoing trade talks between the EU and the Mercosur group of South American nations will lead to an influx of cheaper agricultural imports.

Total has said it will use less than 300,000 tonnes of crude palm oil per year at La Mede, out of a total processing capacity of 650,000 tonnes, and use oils from other plants such as rapeseed, sunflower seed and maize (corn).

Click [here](#) for more information.

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## **Japanese project to generate bioenergy from Cambodian rice husks**



*Flickr*

A Japanese-led project for the local agricultural sector in Cambodia, which is now under discussion, aims to recycle rice husks to generate power in a bid to reduce the environmental footprint of the rice processing industry and provide additional revenue streams for agricultural communities. The Japanese government would finance 50 percent of the project (\$2.5 million) through grants. The balance would come from the local rice miller or via a joint venture between a Japanese and local firm.

Click [here](#) for more information.

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## Growing interest in industrial hemp



*Pixabay*

Industrial hemp is attracting interest globally as numerous countries look to take decisions on legalising cannabis, which also opens doors to industrial low THC fibre variants that have typically been caught under legislation designed to criminalise high THC cannabis production.

Draft legislation to legalise the growing of industrial hemp is before Cabinet of Australia's Northern Territory, with a decision expected in the coming months. Last year the Federal Government approved hemp products to be sold as food, which reportedly made a big difference to the demand for industrial hemp. Hot on its heels though, and grabbing most of the headlines, is the prospects of a commercial medicinal marijuana industry. Reports stated there was room for both industries to be profitable in Australia. More research was also needed to develop varieties suited to the various growing regions of Australia.

Meanwhile in the US, Michigan is also eyeing up prospects for the crop. In November, Michigan voters will have the chance to allow industrial hemp for commercial purposes. Not only could it accelerate researchers' understanding of how the crop grows in Michigan, but agricultural leaders also see opportunity for the state's farmers amid depressed commodity prices.

Industrial hemp could provide farmers an alternative to commodities like corn, soy or wheat

— a chance for farmers to “diversify their portfolio”. It also would come as Michigan follows national trends of declining farm income, which has dropped 52 percent nationally since 2013, according to the U.S. Department of Agriculture.

The 2014 Federal Agricultural Act, known as the Farm Bill, legalized industrial hemp growing for research purposes in states that allowed it. In January 2015, Michigan's Industrial Hemp Research Act was signed into law, allowing the state's colleges and universities to pursue industrial hemp research.

Click [here](#) for more information.

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## US pellet production report

The US Energy Information Administration released its latest monthly report on US biomass production, covering February 2018.

There is currently capability to produce 11.8 million ton of densified biomass pellets in the US, with 8.7 million tons of this capacity located in the southern US. There are plans for a further 38.7 thousand ton of capacity which are currently either planned or under construction.

The current operational capacity represents 87 plants across the US, In February these plants purchased 1.09 million tonnes of biomass feedstock, produced 0.57 million ton of pellets and sold 0.64 million ton of pellets. Domestic sales accounted for 0.13 million ton at an average price of \$148.82/ton. Exports were 0.51 million tonnes, averaging \$166.77/ton.

This brings sales for the year to date to 1.2 million tonnes, 71% of which have been exported from the US.

Click [here](#) for more information.

# Other Feedstocks

## EU plastics waste production and consumption statistics

In a recent Eunomia briefing report commissioned by WWF, plastic consumption and waste management in the UK is examined.

Data on the total production of plastics and demand by consumers is available only for the 28 EU member states ('EU28') collectively. The total demand for plastic waste increased from 47.5 million tonnes in 2005 to 52.5 million tonnes in 2007.<sup>3</sup> Over the next two years, the impacts of the financial crisis led to a reduction in demand down to 45 million tonnes in 2009. Since this time, demand levels have fluctuated but are on a general uptrend, and the most recent data (2015) reports demand of 49 million tonnes. Total plastics production was 58 million tonnes in 2015, suggesting that 16% (9 million tonnes) of plastics produced in the EU28 is exported outside the EU. Around half of all the plastics consumed in the EU in 2014, the latest year for which waste data is available, became waste or went into stocks (for example into vehicles or buildings).

Of the total plastic waste generated in the EU in 2014, 4.9 million tonnes was generated in the UK. Based on forward projections, current (2018) waste arisings are estimated at 5.2 million tonnes, and are forecast to increase to around 6.3 million tonnes by 2030 – a 20% increase over this 12 year period. This is a significant increase in the quantity of plastic waste. Packaging accounts for the majority (67%) of the UK plastics waste stream. Higher than the proportion across the EU, which is most likely due to a much stronger market for

convenience food in the UK compared to many other European countries.

The generation of packaging waste indicated is considered higher than reported in official statistics, due to likely under-reporting of waste through EPR schemes

According to the latest available data (2014), 26% of UK plastic waste was recycled. A small fraction (< 1%) was littered and the remaining waste was sent to residual disposal. 55% of generated waste was disposed of at landfill sites, and a further 18% sent to energy recovery (incineration). Higher recycling rates, of 38% and 40% respectively are achieved for packaging and construction waste – 85% of all plastic recycling is packaging material. However, as other recent work by Eunomia has indicated the UK's packaging recycling rate is very likely to be overstated.

Eunomia estimates that 31% of plastic waste is currently (2018) recycled, and this is projected to increase to 42% by 2030 as a result of future policies taking effect. The proposed revisions to the Packaging and Packaging Waste Directive, which specify a 55% plastic packaging target by 2025, will have the greatest impact on the overall recycling rate. Energy recovery is predicted to become the second largest plastic waste destination. Rates are forecast to increase from a current (2018) estimated rate of 23% to 39% in 2030 – a 16% increase in use for energy recovery.

Click [here](#) for more information.

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# Events

## **Creating value from crop and food waste**

**Toulouse, 11th July 2018**

To ensure sustainable growth, Europe is encouraging the replacement of fossil fuel-based products with sustainable alternatives from renewable, biological sources. But how can we supply an increasing world population with food and other bio-based materials from a finite area of agricultural land? Part of the solution must lie in making more from waste. From across Europe, researchers and technologists are developing new ways to produce a wide range of innovative products from unavoidable agricultural, horticultural and food processing waste including functional foods, active packaging, biodegradable materials, fertilisers and biofuels.

Click [here](#) for more information.

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## **Biomass for Industrial Applications Amsterdam, 26th-27th September 2018**

The VDI conference Biomass for Industrial Applications focuses on the industrial utilization of biomass. The presentations consider both the energy-related as well as the material usage of biomass. Discuss the newest technical, economic and political developments in the industry with leading experts and find out what's in store for the biomass market in the future. This knowledge will help you to make the right strategic decisions for your company and to clear the way of implementation barriers.

Click [here](#) for more information.

## **International Biomass Congress & Expo Berlin, 10th-11th October 2018**

The International Biomass Congress & Expo aims to bring together leading producers, suppliers, regulators and other engaged organisations over a two-day period. High-level speakers, experts in their field, will address a range of topical issues relating to the biomass sector.

Brought to you by Bioenergy Insight, the leading international biomass magazine, this year's conference will be co-located with the International Biogas Congress & Expo as well as the renowned Biofuels International Conference and Expo, making this series of bio events our largest gathering yet of bio related companies, giving participants unrivalled coverage.

Click [here](#) for more information.

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## **EFIB Toulouse, 16th-18th October 2018**

Join over 650 bio-based leaders in 2018 for the 11th edition of EFIB in Toulouse, France, on the 16th, 17th and 18th of October.

Click [here](#) for more information.

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## **Agrocycle Mission to China Beiling, 22nd-26th October 2018**

The Agricultural waste and residue management for a circular bio-economy event will be held in China from the 22nd to the 26th of October 2018, and will bring together stakeholders from industries, research, public bodies, educators and policy-makers from China and Europe.

The programme of the event includes 2 days of plenary conferences in Beijing (22-23 October) and three days of workshops, brokerage meetings and on-the-field visits (24-25-26 October).

Click [here](#) for more information.

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# 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)
10 Feb	275-318 (–↑)	85-120(–↓)	75-100(––)

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)
Jul-18	152.0 (↓)			516.5 (↓)	376.0 (↓)	936.00 (↓)
Aug-18			349.0 (↓)			941.75 (↓)
Sep-18		178.7 (↓)		532.7 (↓)	385.5 (↓)	948.25 (↓)
Nov-18	159.2 (↑)		356.0 (↓)			958.75 (↓)
Dec-18		183.0 (–)		556.0 (↓)	397.0 (↓)	
Jan-19	162.6 (↑)					967.00 (↓)
Feb-19			359.7 (↓)			
Mar-19	164.8 (↑)	185.5 (↑)		575.0 (↓)	406.2 (↓)	968.50 (↓)
May-19	166.1 (↑)	186.7 (↑)	361.7 (↓)	586.2 (↓)	412.2 (↓)	
Jul-19	163.5 (↑)			590.0 (–)	418.0 (↓)	
Aug-19			354.7 (↓)			
Sep-19		183.0 (↓)				
Nov-19	158.4 (↑)		359.0 (↓)			
Dec-19		186.2 (↑)				
Jan-20	160.4 (↑)					
Mar-20	161.4 (↑)	189.0 (↑)				
May-20	161.9	189.5 (↑)				

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

**Other biomass feedstock prices are available upon request, simply contact [enquiries@nnfcc.co.uk](mailto:enquiries@nnfcc.co.uk)**

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