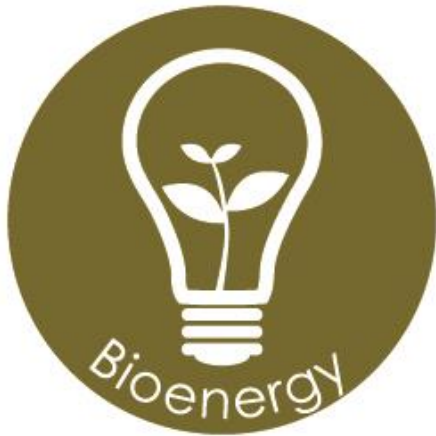


The Bioeconomy Consultants

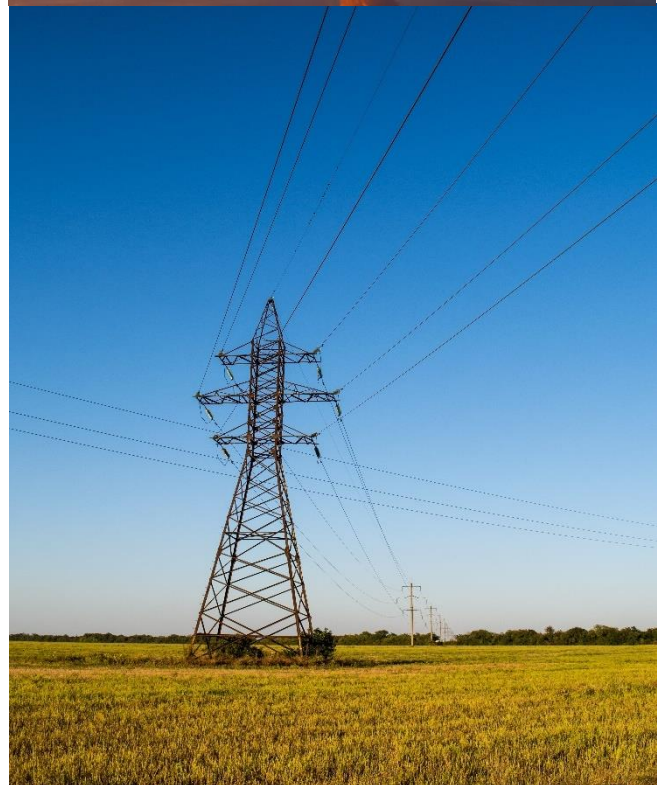


## News Review

Issue Seventy

Januar

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



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# Foreword

Welcome, subscribers, to a new year of Bioenergy News Reviews.

The big news in the energy sector this month has been the announcement from the UK's department for Business, Energy, and Industrial Strategy (BEIS), of its strategy to close all fully coal-fired power plants in the UK by 2025. This announcement has obviously been welcomed by the renewables sector, as it is another concrete commitment to greener energy in the UK. It is, however, not a hard and fast solution, as investment needs to be made elsewhere in renewables in order to account for the coal plant closures.

One option that is available to all coal-powered generators is to convert to biomass power, or to co-firing (as co-fired plants will still be allowed). Of course, converting to biomass does not come without cost, and so many coal-burners will have to make significant financial outlays in order to comply. There are fears that this will have a knock-on effect on consumer energy prices, and so BEIS has also announced that there will be a cap on Renewable Obligation Certificates (ROCs), which form the primary financial incentive for biomass conversions in the UK. The mechanism is will limit the number of ROCs that can be rewarded to existing installations, since the coal phase-out is a long-term goal, and BEIS do not wish for any immediate ramifications for the consumer.

This has been welcomed by UK biomass giants Drax, as there is an element to the ruling that protects "grandfathered" ROCs that were guaranteed before the ruling came in. This nuance allows Drax to continue with their conversions by adding a 4<sup>th</sup> biomass unit to their plant in Yorkshire.

The conversion of coal plants to biomass has also been in the news across the North Sea, over in the Netherlands. There, a similar policy has been put into place to cease coal-fired generation. Currently, five major coal plants in the Netherlands are slated for outright closure, but RWE is pushing for them to be converted to biomass instead. They argue that it would be an inefficient use of infrastructure to build new plants when existing plants are available for conversion, not to mention the environmental cost of building new plants.

Read on for the latest news.

# Policy

## UK sets out coal phase-out strategy

Britain will set an emission limit on coal-fired power generators from Oct. 1, 2025, forcing them to close unless they are fitted with carbon capture technology.

As part of its efforts to meet the country's climate targets, Britain in 2015 announced it would end "unabated" coal-fired power generation - plants without technology to capture and store carbon emissions - by 2025.

The Department for Business, Energy and Industrial Strategy (BEIS) fleshed out the plan by saying it would set an emission limit of up to 450 grams of CO<sub>2</sub> for each kilowatt hour of electricity produced to make sure polluting plants close.

Since Britain introduced a tax on CO<sub>2</sub> emissions from power plants in 2013, coal power generation has plummeted, with the country last year seeing its first day of coal-free power generation since the industrial revolution in the 19th century.

Around 6 gigawatts (GW) of coal-fired power capacity is currently in use, capable of powering around 6 million homes, but BEIS said that by the 2025 date it expects this to fall to just 1.5 GW and that other forms of generation will make up the shortfall.

With many of the country's nuclear power plants also set for closure in the late 2020s, and few new plants being built, the government in 2017 first started payments under a capacity market, which pays plants to make available back-up electricity at short notice.

Britain has a legally binding target to cut carbon dioxide emissions by 2050 to 80 percent below 1990 levels as part of a drive to counter global warming.

Click [here](#) for more information.

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## Biomass ROCs to be capped



*Wikimedia Commons*

The Department for Business, Energy and Industrial strategy has outlined its plans for its renewable energy credit system following public consultation. Following unanticipated levels of participation, the department is limiting the amount of credits that co-firing and biomass plants are eligible to produce.

The decision was made to reduce the possibility of increased rates for energy consumers and government liability stemming from expenses relating to coal to biomass conversions. These conversions are a long-term must for coal plants, after a 5 January BEIS policy statement reiterating plans to close all unabated coal-fired plants by 2025.

Two options were given by the consultation gave to control the costs of the programme: 1) cap the amount of renewables obligation certificates (ROCs) biomass can generate, 2) redraw the bands

for ROC allocation. According to the government response, there was not a definite favourite among the 22 respondents.

BEIS supported the cap due to its belief that it will give energy producers the most operating flexibility.

The new cap will limit biomass conversions and co-fired plants to 250,000 ROCs annually, up from the initial proposal of 105,000. The cap does not affect what BEIS calls 'grandfathered' energy production, a label that guarantees the level of support that relevant facilities acquired when they entered the scheme. The department will allow flexibility for operators responsible for a mix of grandfathered and non-grandfathered units: if a grandfathered unit generates fewer ROCs than forecast, the left over can be taken up by non-grandfathered units.

Click [here](#) for more information.

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### **Scotland announces funding for low-carbon energy**

The Scottish Government has announced £80m in funding for low carbon projects as part of efforts for 50 per cent of Scotland's heat, transport and electricity consumption to be supplied from renewable sources by 2030.

The energy strategy includes a £20m Energy Investment Fund and a £60m Low Carbon Innovation Fund to boost renewable and low carbon infrastructure.

As well as aiming for half of Scotland's energy consumption to come from renewables, the strategy targets a 30 per cent increase in the productivity of energy use across the Scottish economy by 2030.

Speaking in the Scottish Parliament, energy minister Paul Wheelhouse announced ministers

would consult on plans for a publicly owned energy company by the end of 2018.

The company, operating on a not-for-profit basis, will aim to support economic development and help tackle fuel poverty.

Click [here](#) for more information.

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### **China plans for widespread CHP installations**

China plans to install over 12 GW biomass CHP capacity by 2020 according to new reports. The biomass power plants will combine heat and electricity generation (CHP) in a bid to curb pollutant emissions by reducing coal consumption during winter. This will replace an equivalent of 30 million tonnes standard coal every year, the National Energy Administration (NEA) said in a statement. The aim is to further increase this to 25GW by 2035.

Click [here](#) for more information.

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## **Markets**

### **UK renewables generation continues rise**

The U.K. Department for Business, Energy & Industrial Strategy released updated energy statistics in late December, reporting that the share of low carbon electricity accounted for a record high of 54.4 percent during the third quarter of 2017, up from 50.2 percent during the same period of 2016. The increase is primarily attributed to increased renewables generation.

The report notes that energy production from bioenergy and waste reached 2.2 million metric tons of oil equivalent during the third quarter, up 24.4 percent when compared to the same three-month period of 2016.

Electricity generation from bioenergy, including cofiring, reached 7.6 terawatts during the third quarter, up 22.8 percent when compared to the third quarter of 2016. Within this, generation from plant biomass was up 35 percent. The increase is mainly attributed to increased availability at Drax following extensive outages a year earlier. The report notes that the increase from Drax was slightly offset by reduced generation from landfill gas.

As of the close of the third quarter, the DBEIS said that bioenergy accounted for approximately 15 percent of renewable capacity in the U.K.

Click [here](#) for more information.



*Geograph*

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## **Renewables to be as cost-effective as fossil by 2020**

According to a new report from the International Renewable Energy Agency (IRENA), all types of clean energy — which by definition includes bioenergy-for-power and hydropower — will fall within the cost range of fossil fuels within the next two years.

The report highlights other forms of renewables, such as bioenergy, geothermal and hydropower projects, that have successfully competed head-to-head on fossil fuel costs in the last 12 months.

The report further notes that by 2019, the best onshore wind and solar PV projects will be delivering electricity for \$0.03/kWh – significantly below the current cost of power from fossil fuels.

IRENA points out that onshore wind and solar PV costs now stands at USD 6 cents and USD 10 cents per kWh respectively, with recent auction results suggesting future projects will significantly undercut these averages. They cite recent onshore wind cost of 4 cents per kWh, while the current cost spectrum for fossil fuel power generation ranges from USD 5-17 cents per kWh.

IRENA also assessed the project-level cost data for about 15,000 utility-scale projects globally. The study found the levelized cost of energy (LCOE) fell over the period covering 2010-2017. In some solar PV utility-scale projects, the drop was "precipitous." IRENA actually used the word, "remarkable," the numbers were so astounding.

The data shows the average LCOE for utility-scale solar PV decreased to \$0.10 per kilowatt-hour, a drop of 73 percent between 2010 and 2017.

It should be noted that GTM Research's most recent Global Solar Demand Monitor report, published in December 2017, underscores the downward trend. The report cites Q4 2017 utility-scale solar prices ranging from \$30 per megawatt-hour in Mexico to a high of \$151 per megawatt-hour in Japan. That comes to \$0.03 per kilowatt-hour and \$0.15 per kilowatt-hour, respectively.

Click [here](#) for more information.

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## UK renewables spending lags behind

In spite of the UK setting renewable generation records last year, investment in new clean energy projects plunged further in Britain than in any other country because of government policy changes, new figures show.

The amount companies spent on green energy in the UK rose during the years of the coalition government (2010-2015) but has now fallen for two years in a row under the Conservatives, according to analysis by Bloomberg New Energy Finance (BNEF).

While investment in wind, solar and other renewable sources slumped by 56% to \$10.3bn (£7.5bn) in the UK, worldwide spending climbed 3% to \$333.5bn (£242.4bn), the second-highest level on record.

Click [here](#) for more information.

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# Research & Development

## E-Fuel releases ethanol-powered generator



*E-Fuel*

E-Fuel has launched its solution for people who want energy independence and to be green about it.

The Silicon Valley company introduced its 100% ethanol generator, the Personal Energy System (PES), 8 January. It is intended to give customers full independence from the public power grid.

With the smallest version starting at US\$96,000, the generators can be purchased with cash or bitcoin. Citing blackouts in New York and California, as well as the cost and inefficiency of public utilities, E-Fuel wants to appeal to people who want to achieve energy security environmentally.

According to E-Fuel, the generator can provide 1100 watts/foot compared to solar's 10 watts/foot. They also say that by cutting off the need for coal-fired power stations, using the technology can reduce carbon emissions by 99% when used with the right kind of ethanol. Customers are encouraged to distil their own fuel by the company, who say that PES can run on hydrous ethanol.

In addition to supplying electricity, PES uses a radiant heat exchanger at the engine exhaust header to distribute heat through buildings.

On 9 January the US Department for Agriculture released a report on domestic ethanol output, concluding that although plants are near capacity there is limited demand for new facilities. Increased focus on fuel efficiency has stemmed gasoline consumption and so the ethanol that is blended with it.

A technology like E-Fuel's could be a boon to ethanol producers if demand for 100% ethanol increases. But home-brewed ethanol is an obvious threat to commercial suppliers and is necessary for full energy independence.

Click [here](#) for more information.

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## **AkzoNobel to build Hydrogen plant in bid to cut emissions**



# **AkzoNobel**

*AkzoNobel*

Dutch paints and chemicals maker Akzo Nobel and gas network operator Gasunie plan to build Europe's largest green hydrogen production plant in a bid to cut emissions, the companies have said.

The facility, to be built in the northern part of the Netherlands, would use a 20-megawatt (MW) water electrolysis unit to convert sustainable electricity into hydrogen. That would mark an important step in scaling up the technology, which

is seen as crucial for reducing carbon dioxide (CO<sub>2</sub>) emissions, the companies said.

Under pressure to meet strict CO<sub>2</sub> emission goals, industrial companies and utilities hope to use excess wind and solar power to create hydrogen, which can then be stored for reversion into power or for direct industrial use.

The planned installation would produce around 3,000 tonnes of green hydrogen each year, which can either be used by Akzo's specialty chemicals division or be sold to third parties, such as public transport companies using hydrogen buses.

Both companies will look for potential buyers in the coming months and will make a final decision on the project next year, with the building costs expected to run into the "tens of millions" of euros, Galjee said.

The eventual aim is to convert and store sustainable energy in the form of hydrogen on a much larger scale, with plants of at least 100 MW. So far, the largest planned unit in the Netherlands has a capacity of 1 MW.

Industrial factories in the Netherlands currently use more than 800,000 tons of hydrogen produced by natural gas each year.

Akzo Nobel is one of the most energy-intensive companies in Europe. It says it currently uses renewable sources for 40 percent of its total energy need and aims to be CO<sub>2</sub>-neutral by 2050.

Click [here](#) for more information.

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# Biomass Heat and Power

## Drax welcomes BEIS decision on ROC cap

Drax welcomes the UK Government response to the consultation on cost control for further biomass conversions under the Renewable Obligation scheme, which will enable Drax to convert a fourth unit to biomass.

The response would enable Drax to optimise its power generation from biomass across its three ROC units under the cap, whilst supporting the Government's objective of controlling costs under the Renewable Obligation scheme.

Drax will now continue its work to deliver the low-cost conversion of a fourth biomass unit, accelerating the removal of coal-fired generation from the UK electricity system, whilst supporting security of supply.

Drax plans to complete the work on this unit as part of a major planned outage in the second half of 2018, before returning to service in late 2018. The capital cost is significantly below the level of previous conversions, re-purposing the existing co-firing facility on site to deliver biomass to the unit.

The unit will likely operate with lower availability than the three existing converted units, but the intention is for it to run at periods of higher demand, which are often those of higher carbon intensity, allowing optimisation of ROC(1) generation across three ROC(1) accredited units. The CfD(2) unit remains unaffected.

Click [here](#) for more information.

## RWE requests biomass conversion for Dutch coal plants



*Wikimedia Commons*

The Netherland Times reports that Energy giant RWE is calling on the Dutch government to reconfigure the last five coal plants in the Netherlands to run on biomass, instead of closing them completely to make best use of existing infrastructure.

One of the Dutch's governments current goals is to shut down the last five coal-fired plants in the country by 2030 in order to reduce the production of CO<sub>2</sub>, as agreed at the climate convention in Paris.

Two of the five installations, on the Maasvlakte and the Groningse Eemshaven, opened only recently and together they cost around 6 billion euros. Instead of shutting down the coal-fired plants, they should be rebuilt in order to work on biomass. In this way more CO<sub>2</sub> can be saved, says Taco Douma, director of the German energy giant RWE. Douma's goal for 2030 is to get the two installations in Geertruidenberg and in the Eemshaven running on 100% biomass.

Click [here](#) for more information.

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## EPH group acquires 2 Italian biomass plants

Biomass Magazine reports that EPH (Energetický a průmyslový holding a.s.) recently completed the acquisition of the biomass power plants owned by Biomasse Italia and Biomasse Crotona (for a total capacity of 73 MW) from Bioenergie (50 percent) and Api Nòva Energia (50 percent), becoming the most important group in Italy in the renewable energy production from solid biomass.

The transaction is part of the Czech Group's strategy to develop the business of renewable energy in Europe. This is the second investment in biomass energy after the conversion project of the 400 MW carbon power plant of Lynemouth, as part of the coal "phase out" program promoted in the United Kingdom. Once completed, this will become one of the biggest biomass plant globally.

Click [here](#) for more information.

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# Biogas

## "Dry" biogas generation process developed

A scientist in Sweden has developed a process for the dry digestion of organic waste into biogas in two different types of reactors.

According to a statement from the University of Borås, doctoral research student Regina Jijoho Patinvoh's research results reveal that a simple reactor of textile materials works well in dry digestion of solid waste such as chicken feathers, citrus peels and manure. Apparently, the microorganisms that breakdown the waste eventually adapt to the dry material so the process speeds-up.

The reactor was developed by the textile company FOV Fabrics in collaboration with the University of Borås. It is suitable for the small-scale production of biogas, for example in developing countries.

Typically, water is an important component of the process to turn organic waste into biogas. This is an obstacle, meaning biogas production requires high energy and water consumption, and results in a lot of residues. This research could well address these issues.

Click [here](#) for more information.

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## Farm AD to contribute to Scotland's energy goals



*Geograph*

On-farm anaerobic energy plants can make a 'key contribution' to meeting the goals set out in Scotland's first ever Energy Strategy, according to the UK's trade body for anaerobic digestion.

The Scottish Government's Energy Strategy, the first of its kind in Scotland, sets a new target for at least 50% of all Scotland's heat, transport, and electricity consumption to be supplied from renewable sources by 2030.

The Strategy notes that biogas and biomethane produced through anaerobic digestion (AD) will have a role to play in helping to decarbonise Scotland's energy system.

It notes that existing biomethane sites in Scotland already produce enough gas to supply the equivalent of 85,000 homes.

AD is currently delivering 45 MWe of power and 11,000 m<sup>3</sup>/hr of heat in Scotland, with AD plants across the UK now having enough capacity to power over a million homes.

Click [here](#) for more information.

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## Mixed outlook in European Biogas report

The Statistical Report of the European Biogas Association is an extensive examination of the state of the biogas industry in Europe. The report covers the 28 EU countries, as well as Iceland, Norway, Serbia and Switzerland.

Although the number of biogas plants in Europe has been stabilising since 2015, the total Installed Electric Capacity (IEC) is on the rise. The IEC increased in Europe from 4,158 MW in 2010 (earliest EBA data), to 9,985 MW in 2016 (+5,827 MW). Growth since 2011 has been mainly due to the building of plants running on agricultural substrate.

Growth in the number of units has declined significantly across Europe in recent years, falling to 1% between 2015 and 2016. Over the longer term, the number of plants has increased from 6227 plants in 2009 to 17,662 in 2016. Most growth was achieved between 2010 and 2012. Most are on-farm AD units followed by sewage sludge units. Most of the recent growth has been in France and the UK.

Click [here](#) for more information.

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## Foresight Group acquires AD portfolio



*Wikimedia Commons*

Foresight Group LLP has announced the completion of the acquisition of an operational portfolio of two large scale Anaerobic Digestion (“AD”) plants and seven composting assets for an undisclosed sum.

The sites are located across East Anglia and the East Midlands. Between them, the AD plants provide 2.8MW of electrical power generation capacity (and related waste heat use), 450 Sm<sup>3</sup> (standard cubic metres) per hour of biomethane export capacity to grid (and related CO<sub>2</sub> sales) and capacity to process in excess of 95,000 tonnes per annum of energy crops, agricultural waste and industrial/commercial food waste whilst also benefiting from FIT and RHI revenue. The composting sites have a capacity to accept in excess of 155,000 tonnes per annum of primarily green waste to produce circa 100,000 tonnes per annum of high quality compost using open-windrow (green waste) and in-vessel (green mixed with ABPR food waste) methods. The additional processing capacity means Foresight’s portfolio of 40 waste projects boast a waste processing capacity of more than 2 million tonnes per annum.

Foresight has established a market leading position in AD having invested previously into 18 greenfield projects across the UK with a capacity of 16.7MWe and this secondary acquisition leverages off that experience to build upon Foresight’s existing footprint. The transaction

demonstrates Foresight's appetite to aggregate operational AD assets to enable it to consolidate its strong market position in the UK and to export its deep experience in the sector to Europe, Australia, North America and beyond.

The transaction has seen the formation of a partnership between Foresight and Material Change Ltd and its parent company Heathpatch Ltd. As part of the deal, Material Change has entered into long term feedstock supply, digestate offtake and management & maintenance services contracts.

Foresight continues to nurture a strong global AD project pipeline of both operational assets and greenfield opportunities.

Click [here](#) for more information.

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### **Veolia assists Scottish Water in becoming energy self-sufficient**

Veolia is assisting Scottish Water in its quest to achieve energy self-sufficiency at its Seafield Wastewater Treatment Works. The plant is the largest treatment works in the east of Scotland. Since 2015, Veolia has extended the site's capability to generate its own energy from 55% in 2015 to around 85% in 2017.

Working in partnership with Scottish Water, Veolia has extended the site's capability to generate its own energy by boosting the renewable energy derived from a combination of anaerobic digestion of sludge and biogas fired combined heat and power plants.

Veolia has introduced a wide range of measures to derive renewable energy using sludge as a resource. Measures installed to date include a thermal hydrolysis process that has increased biogas production by around 10%, investment in an additional CHP unit to provide greater energy generation and to take advantage of the

additional biogas, and a further 3% increase in the yield of biogas.

Seafield WwTW treats waste for a population of approximately 850,000 people from Edinburgh and the surrounding area which equates to 300 million litres of wastewater every day. The target of energy self-sufficiency will go towards increasing sustainability and lowering carbon emissions. The advances to date mean that the Seafield site has reduced its energy costs by 50% which will help meet the value-for-money consumer criteria set for the industry.

More advanced technologies now mean that biogas from all the available sewage could deliver an estimated 1,697GWh - enough electricity to power over half a million homes, increasing the resilience of the National Grid and helping to control energy bills.

Click [here](#) for more information.

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### **Millerhill AD plants acquired by Ancala**

Ancala Partners LLP has acquired a 1.5MW operational anaerobic digestion facility located in Millerhill, Edinburgh, from Kelda Water Services for an undisclosed sum.

The facility will be integrated into Ancala's UK anaerobic digestion platform, Biogen, a leading owner and operator of anaerobic digestion plants in the UK.

According to Ancala the facility is an important long-term component of the Zero Waste Plan being delivered by The City of Edinburgh Council and Midlothian Council to meet the Scottish Government target of no more than 5 per cent of waste being sent to landfill by 2025.

Discarded food collected by the two partner councils plus additional waste from local businesses and industries are recycled at the

facility. Methane gas is then produced and converted through a CHP engine into electricity. The process generates enough electricity to power approximately 3,300 homes. In addition to producing renewable green electricity, the facility converts food waste into a nutrient-rich biofertiliser that is PAS110-certified.

Click [here](#) for more information.



*Geograph*

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## Energy from Waste

### **Key milestone for Energy Works power plant**

A key element of a new £200m energy-from-waste power plant has been completed, marking a milestone in the Humber's largest current building project.

Engineering firm Spencer Group has steered the Energy Works scheme in Hull from concept to delivery and the company is now playing a key part in the construction of the vast green energy facility.

Up to 150 Spencer Group staff and sub-contractors have been delivering the £35m package of civil and structural works for the green energy power plant and the Spencer team has now completed the Energy Academy, a learning, research and development facility created in partnership with the University of Hull.

The arched building incorporates the control room for Energy Works as well as education and research and development facilities.

The building has full viewing windows on both floors and is purpose-designed to offer operational staff, researchers and visitors wide-ranging views of operations on site.

The partnership with the university will support two full-time PhD students and offer schools, other educational institutions and the local community the opportunity to learn about the benefits of renewable energy technologies.

Specifically, the Energy Academy will support research related to the technologies within Energy Works and related processes.

The 25MW facility is due to begin generating electricity in 2018, using an energy recovery process called fluidised bed gasification to produce sufficient energy to power 43,000 homes by processing 240,000 tonnes of refuse-derived fuel (RDF) annually.

Click [here](#) for more information.

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## **Edinburgh EfW plant halfway to completion**

Environment leaders from the City of Edinburgh and Midlothian Councils have visited FCC Environment's £142 million waste to energy plant which is currently under construction in Millerhill, Midlothian.

It is 15 months since the ground was broken at the site in Millerhill, Midlothian and over this time construction of the new waste to energy plant, which will serve the City of Edinburgh and Midlothian, has reached the halfway stage.

The Millerhill Recycling and Energy Recovery Centre (RERC) is being developed by FCC Environment (UK), which signed a 25-year contract to deliver and operate the plant in October 2016.

Click [here](#) for more information.

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# Events

## **Energy Now Expo Telford, 7th - 8th February 2018**

Changes in government policy, subsidy support and Brexit have led many to question whether investment in renewable energy is still a practical, viable option. Taking place on 7th & 8th February 2018, once again at the Telford International Centre, Shropshire; the Energy Now Expo 2018 will focus on the best options available to farmers and landowners, both in the immediate and longer-term future.

Being held with the support of the NNFCC, the 2018 event will see the return of the exhibition of over 150 suppliers, together with the one-to-one advice clinic and the multi-streamed conference in which the latest sector news and plans will be

discussed and opportunities evaluated. Organisers are pleased to announce that the NNFCC's CEO Dr Jeremy Tomkinson will be taking part in the conference, chairing a session on energy crops and presenting on advanced biofuels and the new opportunities for bio based feedstocks in a biomass session, both on Thursday 8th February.

Click [here](#) for more information.

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## **Eco-Bio 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.

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## **MBRE 2018**

### **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.

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.

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## **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.

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.

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.

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## **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.

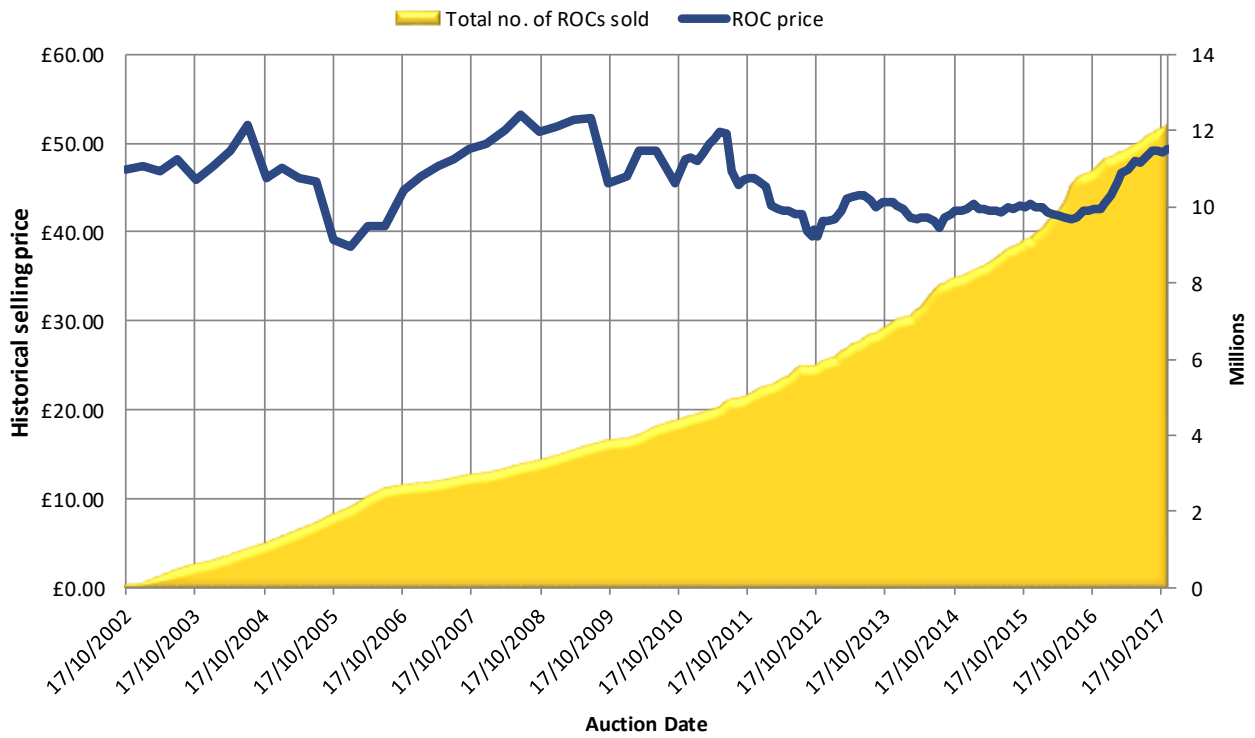
The three-day international conference will consist of plenary lectures, oral presentations, poster sessions and an exhibition. Companies and research organizations are offered the opportunity to organize a satellite symposium.

Click [here](#) for more information.

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# Prices

**Historical auctioned prices of ROCs in sterling pounds, and total amounts of ROCs historically sold.**



Click [here](#) for more information



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