

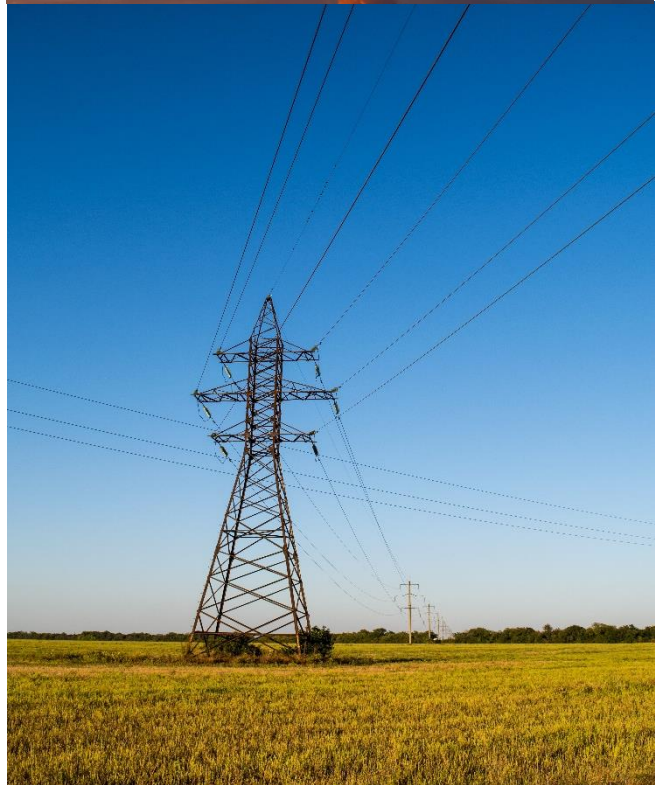


News Review

Issue Sixty-Five

August 2017

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



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Foreword

Welcome to August's Bioenergy News Review from NNFCC.

Last month we reported on UK energy giants (and our fellow Yorkshire dwellers) Drax, and how they were considering deviating from their current path of converting their coal burners into pellets by opting for gas instead. Converting a coal burner into a gas burner would make Drax eligible for a 15-year Capacity Contract, and by allowing them to provide the "backup" energy to fill the gap left by renewables, would provide a steady income. However, this month's news suggests that other options are on the table. As the summer draws to an end, Drax is nearing the end of its full pellet trial for its fourth biomass unit, in which wood pellets are being burned at the power station entirely in place of coal, as opposed to the cofiring the station has utilised up to now. Once the trial is finished the unit will switch back to burning solely coal through the winter, and Drax will decide if they want to take the trial further. Currently the results have been promising, but further work will be needed to improve the reliability and cost-effectiveness to a point where Drax would be happy to adopt it as standard practice – but they believe that this is still achievable.

Elsewhere, we have seen several exciting developments in AD technology. Perhaps most notable is Australian inventor David Thompson, who claims to have developed an AD system that can use waste plastic as its feedstock. Other systems have already been developed elsewhere that are not hindered by food waste feedstock being stored in plastic bags, but this is the first time AD has been used to actively deal with plastic. If the system proves to work, then this could be an invaluable step in the establishment of circular economy, and of plastic treatment in general, by allowing us to generate energy from non-recyclable plastic without the traditional hazards associated with incineration.

It is also well known that another benefit of using AD is that the digestate by-product can be used as fertiliser, but waste management company Viridor are looking to find fertiliser elsewhere in the AD process. The biogas produced by AD does not just consist of methane that is injected into the grid, but also contains carbon dioxide. Viridor are engaging in research to see if captured CO₂ can be used for fertiliser synthesis, essentially allowing CO₂ to be literally "ploughed back into the soil". This research will be interesting to follow, as much focus has been put on carbon capture technologies, but less so on what to actually do with said carbon after it has been captured and stored, and this is just one available option.

Read on for the latest market news.

Policy

Annual REA report covers biorenewables turnover and employment



Flickr

The REA's Annual review for 2017, provides comment and review of the development of the renewables sector in 2015/16. As part of this it analyses turnover and employment in the renewable energy sector. The UK bio-based and energy from waste sectors cumulatively had a turnover of 4.6 billion in 2015/16 and employed 34,000 people.

Click [here](#) for more information.

EU energy and emissions data released up to 2015

Updated energy statistical datasheets for all EU countries have been published by the European Commission. These datasheets cover the period 1990-2015 and make it possible to track how each country's energy usage and greenhouse gas emissions patterns have changed over time. They contain an overview of the EU as a whole as well as individual country profiles, based on data from Eurostat and from the EU greenhouse gas monitoring mechanism.

Click [here](#) for more information.

\$40m to fund bioenergy development centres in the US

U.S. Secretary of Energy Rick Perry recently announced \$40 million in Department of Energy awards for the establishment of four DOE Bioenergy Research Centres, which will provide the scientific breakthroughs for a new generation of sustainable, cost-effective bioproducts and bioenergy.

The centres—each led by a DOE National Laboratory or a top university—are designed to lay the scientific groundwork for a new biobased economy. Initial funding for the four centres will total \$40 million for FY 2018, with plans for a total of five years of funding.

The following centres were selected based on an open competition using outside peer review: the Great Lakes Bioenergy Research Centre, led by the University of Wisconsin-Madison in partnership with Michigan State University; the Centre for Bioenergy Innovation, led by DOE's Oak Ridge National Laboratory; the Joint BioEnergy Institute, led by DOE's Lawrence Berkeley National

Laboratory; and the Centre for Advanced Bioenergy and Bioproducts Innovation, led by the University of Illinois at Urbana-Champaign.

The current awards represent a follow-on phase to the original DOE Bioenergy Research Centres program, established by the Office of Biological and Environmental Research within DOE's Office of Science in 2007.

Over 10 years, these three BRCs produced multiple breakthroughs in the form of deepened understanding of sustainable agricultural practices, major reengineering of plant feedstocks, development of new methods of deconstructing feedstocks, and reengineering of microbes for more effective fuel production.

Click [here](#) for more information.

DUKES report shows continued increase in UK renewables

In 2016, 8.9 per cent of total energy consumption in 2016 came from renewable sources; up from 8.2 per cent in 2015. Renewable electricity represented 24.6 per cent of total generation; renewable heat 6.2 per cent of overall heat; and renewables in transport, 4.5 per cent. The UK has now exceeded its third interim target; averaged over 2015 and 2016, renewables achieved 8.5 per cent against its target of 7.5 per cent.

Click [here](#) for more information.

Report aims to improve UK's energy crops growth



PxHere

Planting 1.4m hectares of non-food crops dedicated to the production of bioenergy can deliver "genuine" emissions savings and provide a degree of income security for UK farmers, according to new research from ETI.

The paper recommends a "learn-by-doing" approach to increasing UK-grown biomass. By planting around 30-35 kha annually through to 2050, the UK could develop best practices that account for impacts on wider markets, such as land set aside for food production. Eventually, the UK should have around 7.5% of total available agricultural area dedicated to bioenergy crops, the report notes.

ETI argues that delivery of energy crops must be balanced with the demand for land use from other agricultural sectors. Specifically, the report claims that increases in land productivity and a reduction in food waste are necessities to create space for bioenergy crops.

Bioenergy from biomass and waste is already delivering low-carbon heat, power and transport fuels in the UK, accounting for 9% of the UK's energy mix in 2015. ETI argues that further increases in supply should be generated within the UK, rather than on imports.

The UK is the biggest importer of wood pellets used for bioenergy in the EU, shipping in more

than seven million tonnes from the US and Canada in 2015. The UK has spent around £450m subsidising power stations to burn these pellets.

But with the EU attempting to source more biomass in order to hit EU renewable energy targets, critics are wary that nations will develop a harvest and planting cycle detrimental to the long-term prospects of horticulture practices.

Click [here](#) for more information.

Research & Development

UK Government report on farm GHG mitigation



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The UK Government's annual Farm Practices Survey reviews practices adopted on-farm, including GHG mitigation strategies. Survey responses in 2017 from 2323 farms (equal to 3.8% of eligible holdings) was achieved across a sample of farms representative of the UK as a whole. Across those surveyed, 5.5% process wastes by AD (the figure was 1.3% back in 2013), crops were the most popular feedstock (3.9%) followed by slurries

(2.9%). 56% reported that they were taking actions to reduce GHG emissions by waste recycling (86%), improving energy efficiency (75%) and improving accuracy in nitrogen fertiliser use (72%). For those not taking action, the main reasons cited were: "don't believe that they produce many emissions" (47%), "lack of information" (35%), "unsure what to do due to conflicting views" (29%), "lack of incentive" (25%). For those taking action, the main incentives were: "good business practice" (80%), concern for the environment (62%) and "improve profitability" (55%). More than half of respondents who spread manures or slurry do not regularly calibrate their spreaders (at least annually).

Two thirds of farmers store solid manures in a temporary heap, while slurry is stored in tanks (24% of farms) or lagoons (16% of farms), with the latter most likely to be covered. 78% have at least 6-month storage capacity for slurries.

The results highlight that there are widespread areas of good practice, but some areas for improvement. Developments such as AD offers an incentive to better exploit manures and reduce emissions from livestock farms while delivering revenue and energy for on-farm use.

Click [here](#) for more information.

Viridor to trial use of CO₂ from AD as fertiliser

Recycling, waste management and renewable energy company Viridor has embarked on a Government-backed trial to use existing waste resources, including the carbon dioxide emissions (CO₂) it harvests from landfill, to literally plough back into the land as a fertiliser.

The project, with Oxfordshire-based CCM Research, is being undertaken at Viridor's Anaerobic Digestion (AD) plant at Walpole and aims to add value and create new markets for the

waste resources available at the facility. CCm Research's technology activates value in waste and energy resources by reducing carbon intensity and utilising waste streams in the manufacture of compound fertiliser.

This follows a successful initial project conducted over two years at Viridor's Ardley landfill site.

Viridor Development Manager and coordinator of Technology and Innovation, Marcus Du Pree Thomas explained that household food waste, which had been sent to an AD facility and was digested, produced a natural gas which could be combusted to create electricity which was sent to the National Grid.

A by-product of this process is carbon dioxide and Viridor and CCm Research have been working together to find an innovative use for this and effectively treat carbon dioxide as a waste material which can be recycled.

Viridor and CCm believe the process makes the best use of existing resources, significantly reducing the cost and carbon footprint of fertiliser simply by drawing most of the ingredients from current waste sources.

This next stage in the project is being supported by the Department for Business, Energy and Industrial Strategy (BEIS) and Innovate UK to demonstrate the commercial potential for this technology by developing a commercial scale unit, partially integrated into the facility at Walpole to deliver a minimum of 6,000 tonnes of high quality fertiliser to farmers for the 2018 growing season, enough for approximately 12,500 hectares that could grow 125,000 tonnes of wheat (estimates).

Click [here](#) for more information.

Identifying barriers to SMEs entering the bioeconomy

There is increasing interest in the development of a bio-based economy in Europe with decreased profitability and sustainability of materials as driving forces. This research is a study of SMEs in South-East Finland. The objective of the paper is to analyse the main factors challenging new SME companies to find or develop new business opportunities in the bio-based economy.

As Finland has a well-established forest industry in the midst of structural change, the results of this study are likely to be implemented in other countries and innovation environments as well.

The study consisted of a Webropol-based enquiry sent to South-East Finland SMEs active in the bio-economy and of the analysis of their answers obtained from 66 companies. The important role of SMEs as creating new sustainable businesses and jobs has been identified. The results show that key factors influencing the successfulness of SME companies are: Customer value-added, collaboration in R&D and supply chain. Knowledge of markets, products and processes are very important for SMEs entering into the new bio-based market, either as actors within the value chain, or as suppliers of raw materials or intermediary products to larger companies.

Click [here](#) for more information.

Biomass Heat & Power

US study demonstrates scale of emissions reduction from biomass



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In May the US Biomass Power Association completed and released a study of the carbon emissions of biomass power, developed in association with academics. The study focussed on a 50MW facility v natural gas. In one year, the biomass-fuelled power plant (working on a 25-year harvest rotation and utilising harvest residues for energy) saved 115 percent of the carbon emissions of natural gas. Comparing the two fuel sources for 100 years, the carbon savings held steady at 98 percent, after taking into account the fuel needed to cut, chip and transport the fuel to a biomass facility (even after taking account of soil carbon stock change).

Click [here](#) for more information.

July degression prompts RHI biomass surge

BEIS released non-domestic RHI deployment statistics in July. Q2 2017 shows a significant rise in medium scale (0.2-1MW) biomass applications – 716 applications totalling 435MW, representing a surge ahead of the tariff reduction (degression) in July (the first announced for medium-scale biomass). Medium-scale biomass accounted for 44% of all new applications. Biomass at all scales currently accounts for 89% of all accredited non-domestic RHI installations.

Click [here](#) for more information.

Full pellet trial continues at Drax



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Drax runs a coal and biomass plant in North Yorkshire, supplying 17% of the UK's renewable power. Three of the company's six generating units are currently powered by wood pellets and receive support from Renewable Obligation Certificates (for two units) and a Contract for Difference (CfD) (for one unit).

Drax have been running a trial on one of its coal units to examine the feasibility of a low-cost solution for fuelling it with 100% compressed wood pellets using existing co-firing infrastructure. The unit has performed well but there is further work to do to ensure that it delivers high output reliably and safely on a

sustained basis, which is believed to be achievable. The trial will continue through the summer, but the unit will return to coal fuelling this winter to ensure high availability through the colder months.

Drax's Research and Innovation team is currently developing a proposal to look into the feasibility of converting one or more of its coal units to gas. Early indications are that this could be an attractive option for delivering critical flexible and reliable generation capacity for the UK and Drax expect to continue to develop this as an option over the coming years. Any such investment would be eligible for a fifteen-year capacity contract through the UK Government's capacity auctions.

In terms of its Biomass supply business, operational performance improved. First half-year production increased from 251k tonnes in 2016 to 366k tonnes in 2017. In April Drax progressed its strategy to self-supply at least 30% of wood pellets by acquiring a 450k tonne compressed wood pellet plant out of receivership. This plant (LaSalle Bioenergy) is in the same South-East US region as its two existing pellet plants. With some refurbishment, Drax expect the plant to start ramping up operations in Q1 2018 and to reach full capacity output in 2019.

Click [here](#) for more information.

University of Northampton adds biomass burner to provide campus energy

Northampton has had a recent addition to its skyline in the shape of a 26-metre flue shaft, complete with LED screen, which is part of the University of Northampton's new energy centre located on its Waterside Campus.

The University has worked closely with sustainable energy specialists, Vital Energi to construct the energy centre and marked the completion in a special ceremony on 1 August where the screen was officially switched on by Professor Nick Petford, Vice Chancellor of the University of Northampton.

The energy centre has been designed to produce less emissions than traditional systems and will save over 1,000 tons of CO₂ in the short term by using woodchip biomass and gas to provide hot water and low carbon heating to buildings around the campus.

This will rise to 2,200 tons annually once the Combined Heat and Power Engine is added to the centre. This is the equivalent of taking 431 cars off the road each year.

The flue shaft is approximately the height of three London buses and its unique 12-metre-high LED screen, fitted by screen experts digiLED, will be showcasing the University at the gateway to the town on the Bedford Road.

Click [here](#) for more information.

Biogas

Australian inventor developing AD system for plastic waste



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The first systems to use anaerobic digestion technology to turn waste plastics into energy and fertiliser are being developed in South Australia. POET Systems expects to have its first two machines – each capable of processing 20 tonnes of plastic a week – operating commercially in about 12 months.

More than one million tonnes of contaminated plastic deemed unfit for recycling is sent to landfill in Australia each year. In the United States, the figure is almost 10 million tonnes.

Inventor David Thompson said his plastic to energy technology had so far successfully been applied to polyethylene, polypropylene, polystyrene and expanded polystyrene.

He said the anaerobic digestion process varied upon disposal feedstock and depended also upon temperature and system set up.

Click [here](#) for more information.

Severn Trent begins work on food waste AD plant near Derby

Work is underway on Severn Trent's new food waste and green gas plant at the company's site in Spondon, Derby.

Severn Trent is investing around £20million in the plant that will turn 50,000 tonnes of food waste a year into renewable gas that will be pumped into the distribution network.

Engineering firm Jones Celtic BioEnergy has been awarded the contract to build the new anaerobic digestion plant, that will be similar in design to the company's existing food waste plant in Coleshill and another which is nearing completion in Roundhill near Stourbridge.

The company, which serves eight million people across the Midlands and mid-Wales, has invested heavily in renewable energy in recent years and is now developing this expertise to generate clean power.

The food waste plant will use innovative technology that replicates the process of a human body, by digesting food to turn it into gas that can be used in homes and businesses in the Derby area. The gas is made suitable for domestic use with a process which involves some complex engineering techniques where it is washed, squashed, tested and injected. The gas is 'washed' at high pressure, it is then 'squashed', or compressed, so it is at the same pressure as natural gas and is then 'tested' for quality.

Finally, an odour is added so it smells like normal gas. Testing also includes a review of the energy composition of the gas. Once that has been done, it is finally 'injected' into the gas supply network.

Click [here](#) for more information.

AD Digestate as Biofertiliser



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Bioenergy Insight reports on farming family Steve and Sarah Suggitt of Suggitt Farm Services in Norfolk who are using digestate, a liquid by-product from their AD plant, to produce PlantGrow, a solid biofertiliser and liquid plant food developed by them specifically for the horticultural market. The solid version is a soil conditioner, while the liquid plant food nourishes growing plants.

The biofertiliser is available to both commercial growers and hobby gardeners and is on-shelf in 200 Homebase stores, all Blue Diamond stores, and independent garden centres in Norfolk, as well as online.

Due to its organic content, digestate from AD has a very high nutritional value. Despite this, operators of AD plants have traditionally found it difficult to find a market for digestate as farmers and gardeners have been wary of alternatives to artificial fossil-fuel-based fertilisers, which dominate the market.

Click [here](#) for more information.

Record seaweed harvest to be trialled as AD feedstock



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The UK's technology innovation provider for process manufacturing, the Centre for Process Innovation (CPI), has announced that the SeaGas collaboration has successfully harvested a 20-tonne batch of seaweed, the largest ever harvest of farmed seaweed in the UK.

SeaGas is jointly funded by Innovate UK and the Biotechnology and Biological Sciences Research Council (BBSRC), and is assessing the viability – both technical and financial – of farming sugar kelp seaweed for bioenergy production through anaerobic digestion. The world population is growing rapidly and as a result there is a global increase in per capita energy demands. In order to cater for this demand, sustainable feedstocks are needed for the production of bioenergy. The SeaGas project will deliver a strategy to meet this growing need, using farmed seaweed as a feedstock, helping to achieve a sustainable future.

Anaerobic digestion processes traditionally use crops such as maize and beet as well as agricultural and food wastes. However, over the coming years these resources will become increasingly scarce and better used to produce food for human consumption. Seaweed could be a suitable feedstock replacement as it is a sustainable source of biomass that does not require fertiliser, fresh water or agricultural land

for production. Furthermore, seaweeds have high productivity, fast growth rates and high polysaccharide content, all of which are important qualities for biofuel biomass. Despite these benefits, only one per cent of the world's seaweed is farmed in Europe, with Asia responsible for 96.6% of the global seaweed production. The partners of the SeaGas project are collaborating to build a viable supply chain for farming and storage of seaweed in the UK, initially for the production of biomethane from seaweed through anaerobic digestion, but ultimately to stimulate the market and for higher value products from this sustainable feedstock.

Click [here](#) for more information.

Energy from Waste

Slight decrease in median EfW gates fees

WRAP's recently published tenth gate fees report analyses the gate fees charged for a range of waste treatment, recovery and disposal options as reported by local authorities. In addition, gate fees are supplied by organic and wood waste facility operators for both local authority, and commercial and industrial waste sources.

The median gate fee for recycling/recovery of all types of wood waste from Household Waste Recycling Centres has remained the same as last year's at £35/tonne for the UK as a whole. The median in England has increased from £38/tonne last year to £45/tonne this year. However, there is great variety in gate fees within England itself at regional level with gate fees varying from £23/tonne in the north to £50/tonne in the south.

Increased biomass capacity, with a number of facilities currently in construction, is anticipated to impact on gate fees i.e. where there is new biomass capacity this will impact on the local market by lowering gate fees. This is already seen in the north east of England. Commercial contracted gate fees are the lowest at £20/tonne, compared with £25/tonne for commercial spot gate fees and all local authority sourced wood waste.

This year, reported median gate fee for incineration with energy recovery (EfW) is £83/tonne compared to £86/tonne last year. The median gate fee reported by local authorities for MBT from this year's survey is £88/tonne compared to £85/tonne last year, showing little change. For Residual Waste (post-sorted) MRFs a median gate fee of £94/tonne is reported.

Click [here](#) for more information.

Events

Value from Unavoidable Food Waste York, 21st September 2017

Join us to discuss the opportunities, barriers and latest technologies for extracting high-value products from unavoidable food waste. With the help of a panel of experts from industry, policy and academia, we will be exploring the issues over breakfast.

Click [here](#) for more information.

European Biomass to Power Aarhus, 8th-9th November 2017

Already on its 7th edition, this event will give latest updates on the European biomass market and its new developments, as well as focus on sustainability challenges. Over the two days, ACI's conference will give you in-depth look into case studies giving practical examples of planning, finance and technology strategies utilised for biomass co-generation projects.

Four Exclusive Site Visits: during the afternoon of 7th November a limited number of conference delegates will receive a unique opportunity to visit Dong Energy's Skaerbaek & Studstrup Power Stations and on 8th of November a delegation will be invited to visit Biomass fired CHP plant in Lisbjerg and Verdo's CHP Plant (KVR) in Randers. There is no extra charge to attend, but spaces are strictly limited and allocated to conference delegates on a first-come, first-served basis, so it is highly recommended to book early to guarantee availability.

Click [here](#) for more information.

Future of Biogas Europe London, 15th-16th November 2017

ACI's Future of Biogas Europe 2017 Summit will be taking place in London, UK, on 15th — 16th November 2017. The two-day event will bring together senior executives and experts from the full value chain to provide a forum for all parties active in the field of anaerobic degradation of organic matter and renewable energy production in the form of biogas.

Already on its 3rd edition, this two-day conference will bring together power producers, technology providers, agricultural sector, food and beverage industry, waste industry and leading technology and solution providers to join our forum

discussions and excellent networking, including key industry figures from leading companies in this field from across the globe.

Join us in London to exchange on your point of view and experience with your peers, and engage in excellent networking opportunities.

Click [here](#) for more information.

European Biosolids & Organic Resources Conference Leeds, 20th-21st November 2017

Now in its third decade this event provides practitioners with an annual update on legislative changes; new technologies; best practice and site-experiences with existing technologies and an insight into relevant research in the science and engineering of biosolids and organic resources. The conference is attended by recognised experts from around the world both, as speakers and delegates.

The programme covers the latest innovations and updates of existing technologies. Presentations from respected industry experts and newcomers follow the development of technologies and legislation from inception to full-scale installations.

Click [here](#) for more information.

Energy from Waste 2017

London, 6th-7th December 2017

A move towards greener energy makes Energy from Waste (EfW) a fundamental cog in energy provision. Supported by the Environmental Services Association (ESA) and European Suppliers of Waste to Energy Technology (ESWET), SMI's 10th annual conference on Energy from Waste will draw critical updates from those shaping the industry.

It will strengthen knowledge in key topics such as EfW feedstock, advanced waste gasification and new financing initiatives, whilst looking at the practicalities of community engagement schemes and keeping attendees at the forefront of technological breakthroughs to adapt to the growing need for sustainable energy.

Understanding current UK policy, potential changes after BREXIT and EU initiatives surrounding the circular economy will be a major focus, as will hearing a selection of case studies from international markets and local authorities currently implementing waste projects including the City of Westminster and the North London Waste Authority CHP Plant.

Click [here](#) for more information.

Bioeconomy Investment Summit

Helsinki, 14th-15th December 2017

Join us on 14-15 December 2017 in Helsinki, Finland for the 2017 Bioeconomy Investment Summit.

Over 30 speakers from across the globe will share their views on how we can bring together the economy and the environment.

New advances in technology mean that everything that can be made out of oil can be made from renewable, biological resources. There are huge environmental and business opportunities for a wide range of industries: construction, chemicals, textiles, energy, plastics.

The bioeconomy gives us a unique opportunity for building a sustainable future. Our speakers will focus on what investment steps we need to take to make it happen.

Click [here](#) for more information.

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.

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.

EUBCE 2018

Copenhagen, 14th-18th May 2018

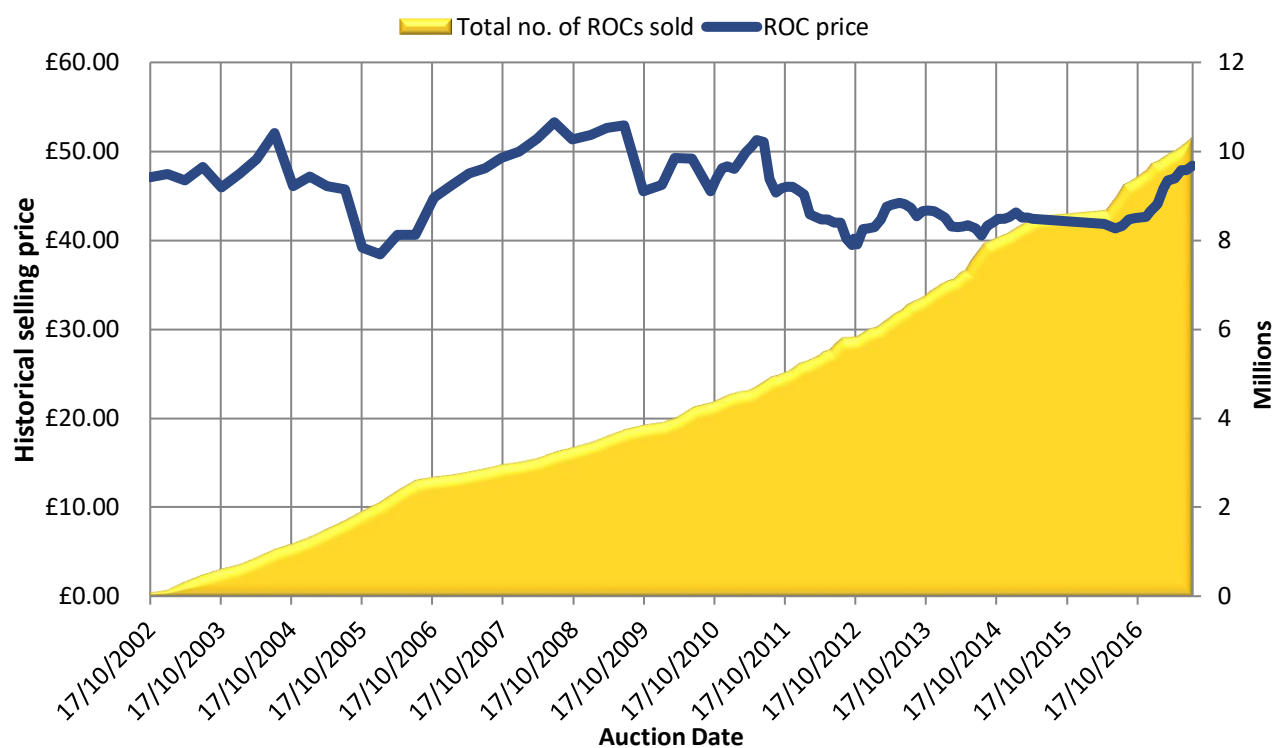
We look forward to the 26th EUBCE in 2018 in Denmark and to the many vibrant topics that will be included in the agenda. The core of the traditional EUBCE conference will be held over 4 days.

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.

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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The Bioeconomy Consultants



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

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