The Bioeconomy Consultants

NNFCC

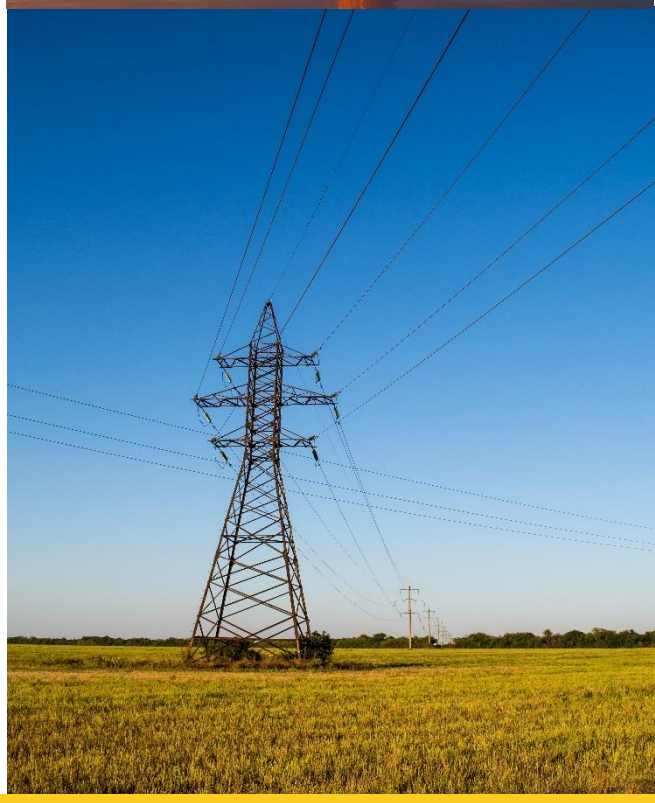
Bioenergy

News Review

Issue Sixty-Seven

October 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, readers, to October's free edition of NNFCC's Bioenergy News Review.

We begin on the other side of the Irish Sea: The Republic of Ireland was the last remaining European country that did not have some kind of incentive scheme for renewable heat generation, but the Irish government has now announced a Renewable Energy Support Scheme (RESS). The scheme is still in its final consultation phase, which does not end until the 3rd of November, but afterwards we can expect legislation, although we cannot yet know what form it will take. Ireland already has the REFIT scheme for renewable electricity generation, but this has not taken any new applications in nearly two years. This new scheme has been created in order to try and increase Ireland's levels of renewable heat and power in order to meet its EU target of 16% renewables by 2020. It is believed at this stage that the RESS will operate as a Feed in Tariff, paying generators proportionally to how much they generate, although the rates have yet to be determined.

Meanwhile, back in the UK, bioenergy was regrettably thin-on-the-ground in the UK's recently published Clean Growth Strategy. However, there were still some promising announcements including another round of Contract for Difference auctions, in which large-scale biomass plants have been successful in the past, along with the ongoing reforms of the Renewable Heat Incentive. One other announcement included the setting-aside of over half a billion pounds to invest in "less established" renewable energy projects, something that the biogas sector could potentially benefit from as it seeks to become competitive on the energy market.

Meanwhile, in Denmark, a small but significant change to the energy landscape has occurred. For years, DONG energy has been one of the poster boys for bioenergy in Europe, as Denmark's biggest energy company has sought to convert its coal plants to burn biomass on a large scale. However, the name DONG will no longer be seen in this sector, as the company is changing its name to Ørsted Energy, reflecting this new renewable ethos (as DONG stood for Danish Oil and Natural Gas). The name is a fitting one, being in honour of Christian Ørsted, one of Denmark's most famous scientists, who discovered electromagnetism, which is still fundamental to electricity generation today.

Read on for the latest market news.

Policy

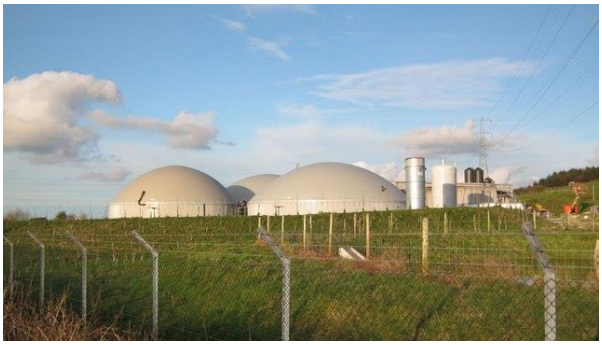
Ireland adopts Renewable Energy Support Scheme

In early September, the Irish Department of Communications, Climate Action & Environment (DCCAE) announced the adoption of a new subsidy regime to promote renewable energies, to be known as the Renewable Energy Support Scheme (RESS). So far, Ireland has been the only European country without an incentive scheme for heat from renewable sources. However, the green island has to meet EU requirements by 2020. This means that 16 percent of Ireland's total energy needs for power, heat and traffic must be provided from renewable energies. This is to be achieved by making use of all green energy sources available in the country. Biogas is to play a key role especially in meeting the individual goals for the heat and transport sector.

The conditions for expanding the network of biogas plants in Irelands are very good: Firstly, the agriculture and waste sector boasts an enormous biomass potential. Secondly, with a growth rate of 4.9 percent in 2016, Ireland is the fastest-growing national economy in the EU and offers a favourable investment climate. Moreover, the country wants to gain independence from energy imports. However, in order to successfully initiate the energy reform, there is a special need for biogas plant manufacturers who have long-standing plant engineering experience in the region.

Click here for more information.

Half-a-billion-pound investment from UK Government to less-established renewables



Geograph

UK Energy Minister Richard Harrington confirmed on 11 October 2017 that up to £557 million will be made available for less established renewable electricity projects as part of the government's Clean Growth Strategy, to drive economic growth and clean up the energy system.

Since 1990 the UK's GHG emissions are down by more than a third while the economy has grown by two-thirds. Low carbon generation provided more than half (52%) our electricity this summer, according to National Grid, while PwC analysis shows the UK decarbonising faster than any other G20 nation.

It is the government's intention that the Clean Growth Strategy will build on this success and ensure Britain remains a global leader in the move towards a low carbon economy.

The latest renewable power CfD auction saw the cost of new offshore wind fall by 50% compared to the first auction held in 2015 and resulted in over 3GW of new generation which could power 3.6 million homes. The next Contracts for Difference auction is planned for spring 2019.

Click here for more information.

Imminent phase-out of Dutch coal?

Pixabay

Institute for Energy Economics and Financial Analysis (IEEFA) reports that in announcing plans to shut all coal-fired power plants by 2030, the new government of the Netherlands sent a dramatic signal to electricity markets today that no investment in coal-fired power in Europe is safe.

The Dutch statement is especially significant given that the Netherlands itself has only recently commissioned three of Europe's newest coal-fired power plants, all completed in 2015.

The coalition-pact policy directive also states, importantly, that the government will introduce a binding target to cut carbon emissions by 2030 to put a floor under carbon prices.

The Netherlands already presents a stark case to investors in new coal-fired generation in Europe —and further afield—in the massive write-downs Dutch utilities have made on the country's three new coal plants. Those write-downs, to around half the original value of the plants, indicate that the utilities affected, Engie, RWE and Uniper, will not make money on the investments in question. The impairments reflect the impact of massive growth in renewable power in neighbouring Germany, which has depressed wholesale power prices, and the utilities having failed to foresee flat or falling electricity demand.

The Institute for Energy Economics and Financial Analysis (IEEFA) published a report last year documenting how the three utilities had logged underpublicized impairments collectively worth billions of euros on the new power plants. The report ("The Dutch Coal Mistake: How Three Brand-New Power Plants in the Netherlands Are at Risk Already of Becoming Stranded Assets") concluded that political and market trends would drive valuations even lower.

Today's announcement highlights the risk of investing in either new or existing coal-fired power, and the lesson is clear: National coal phase-out plans such as this, combined with the rise of renewables and the impact on demand of improved efficiency, put old electricity-production models at risk.

Click here for more information.

Markets

Transparency Market Research overview of the Bioenergy market

The competition in the bioenergy market is being driven by the domination of big players who are adopting innovative strategies to increase their geographical research, finds a new report by Transparency Market Research.

Currently, large companies, such as E. I. du Pont de Numerous and Company, are focusing on establishing its presence in various regions and on strengthening their vertical integration activities by offering a wide range of products that are used for making advanced biofuels, thereby winning business from other operating players. Additionally, companies are also spending a significant amount of their budget on creating brand awareness, which can be seen in the

business strategy of companies such as Amyris Inc's, notes TMR.

The upsurge in energy demand due to increasing industrialization and urbanization have led to a perplexing energy deficit for several countries. Developing countries are especially feeling the pinch as they remain on the pivot of balancing economic development and watching their carbon footprint as the world face the monumental crisis of global warming. This dilemma has become the major driving force for the progress of bioenergy market in the recent years, as more and more consumers realize its potential to be a reliable, efficient, and renewable source of energy.

As bioenergy emits lesser greenhouse gas in comparison to burning of conventional fuel resources, it is being taken seriously while planning the energy mixes in several countries. A TMR analyst says, "Bioenergy constitutes 10% of total energy supply in the world and is estimated to be about 80% of the overall renewable energy supply across the globe." The report also predicts that the range of advantages surrounding the adoption of bioenergy will also propel the overall market.

Click here for more information.

2017 trumps 2016 in US biomass deployment

Biomass magazine report that The US Federal Energy Regulatory Commission has released its Energy Infrastructure Update for July, reporting that 206 MW of biomass power capacity were installed during the first seven months of 2017, up from 50 MW during the same period in 2016.

During the first seven months of this year, the U.S. placed into service 17 biomass units with a combined 206 MW of capacity. During the same period of last year, 21 biomass units with a combined 50 MW of capacity were brought into service.

As of the close of July, the U.S. has 16.83 GW of installed biomass capacity, accounting for 1.41 percent of total U.S. capacity.

Click here for more information.

China leads world in biomass deployment

World Bioenergy reports on a recent visit to China Expo that identified that China has ambitious renewable energy targets with biomass expected to play an important role in the future energy mix. The country is already leading in the installation of renewable power plants globally. For biomass, the country plans to have 30 GW of installed biomass capacity by the year 2020. Regions are already making good progress in converting fossil fuels to biomass and it was an important time for World Bioenergy Association to be present in Jilin Province, China for a bioenergy mission trip.

Click here for more information.

Japan champions biomass power

The ministry of economy, trade and industry in Japan has set targets of increasing renewable energy's share of the power generation mix to 24% by 2030. Japan is currently the world's fifth biggest polluter, by country, and the 15th biggest polluter, in terms of emissions per capita. After the Fukushima nuclear accident in 2011, the country increased its imports of fossil fuels, in place of nuclear energy which has spurred recent drives to support alternatives. In an effort to diversify its energy mix, the Japanese government has been promoting renewable energy through generous feed-in tariffs for the past five years. Wind and solar tariffs, however, have been cut in half over

the past 12 months, with biomass seen as a lucrative alternative. The government is hoping to triple Japan's biomass power generation capacity by 2030. It views biomass as a less volatile sector than wind or solar energy, since it does not depend on favourable weather conditions.

The ministry of economy, trade and industry in Japan has set targets of increasing renewable energy's share of the power generation mix to 24% by 2030.

In response, a group of Japanese banks have funded a biomass project financing in the north-west of the country. 1.7bn Yen (around US$105mn) was extended by banks led by Shinsei Bank, which acted as the mandated lead arranger. The borrower is Japan Renewable Energy Corporation (JRE), a company backed by investment bank Goldman Sachs.

Construction on the plant in Kamisu started in June and is due to complete in May 2019. The finished wood biomass power facility will have a capacity of 24MW. JRE is intending to build more than 10 new biomass facilities by the end of the decades, with an expected investment of some 40bn Yen.

Click here for more information.

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Research & Development

ETI research demonstrates bioenergy's potential

During 2017, the UK-based Energy Technologies Institute is releasing technical data and reports from projects delivered across its technology programmes over the last 10 years.

The Institute reports that bioenergy is one of the most scalable, cost-effective and flexible sources of renewable energy. ETI research, focussed on accelerating the use of bioenergy in the UK, shows that bioenergy has the potential to help secure UK energy supplies, mitigate climate change, and create significant green growth opportunities without constricting food production.

Bioenergy has the capability to meet around 10 per cent of future UK energy needs and deliver net negative CO2 emissions of around 55 million tonnes per year in the 2050s, if used in combination with Carbon Capture and Storage (CCS). This could offset the need for more expensive interventions in sectors like aviation, transport and shipping.

ETI research suggests that to increase the supply of UK-grown biomass, there is a need to make more productive use of arable land in the UK. By planting around 1.4 Mha (about 7.5% of the total agricultural area of the UK) of second generation non-food bioenergy crops by the 2050s, bioenergy would make a significant contribution to delivering a cost-effective low carbon energy system for the country and create new jobs in the UK farming and forestry sectors.

Click here for more information.

Report assesses future contributions of renewable gas heating

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Renewable gases could provide heat for up to 15 million homes in Britain by 2050, according a new report commissioned by Cadent.

The figure comes from the high scenario in the study, which concludes there is the potential to produce between 68TWh and 183TWh of renewable gases each year in the UK by the middle of the century.

Between 47TWh and 56TWh of renewable gases could be produced from waste feedstocks, the report states, with slightly more than four-fifths consisting of bio-synthetic natural gas (bioSNG) and the rest made up of biomethane produced from anaerobic digestion.

Non-waste feedstocks could be used to produce a further 21TWh to 127TWh of renewable gases. Most (97 per cent) would be bioSNG, but the remaining 3 per cent would be biomethane from anaerobic digestion.

In the central scenario, around 108TWh of renewables gases would be produced annually - enough to heat around 9 million homes.

Click here for more information.

Increased efficiencies to reduce UK household energy costs

The UK Energy Research Centre and University of Sussex Centre on Innovation and Energy Demand have published a report which states that energy efficient improvements to home heating, insulation, lighting and appliances could reduce the energy consumed in UK households each year by a quarter and knock £270 off the average household energy bill of £1,100.

The full economic benefits of reducing energy demand by a quarter could be up to £47 billion. This includes further economic benefits of improved health from warmer homes, stimulus to the economy of installing the energy efficiency improvements required, and capacity saved in the electricity system. Some of these benefits would also arise from other types of low carbon investment.

Click here for more information.

Biomass Heat & Power

Ukraine responds to Russia with biomass investment

Ukraine has been subject to cuts in gas supplies from Russia, so in the last three years, Ukraine has invested 400 million euros in bioenergy and biofuel deployment.

Over the past 3 years almost 1.7 GW of thermal generating capacity using biomass and other renewable energy sources instead of gas and other fossil fuels have been introduced in the country. A significant further development of bioenergy is envisaged in the new Energy Strategy of Ukraine until 2035.

Click here for more information.

Shift to renewables prompts DONG to change name

DONG

Following the profound strategic transformation from black to green energy and the recent divestment of upstream oil and gas production, the name DONG Energy does not fit the company anymore. Consequently, DONG Energy called an Extraordinary General Meeting which will be held on 31st October to ask the shareholders of the company to approve a change of the company name to Ørsted.

Over the past decade, DONG Energy has transformed itself from an energy company based on coal and oil to a global leader in renewable energy. The company has increased earnings considerably, while reducing the use of coal in its power stations and building out new offshore wind farms. Since 2006, carbon emissions have been reduced by 52%, and by 2023, they will have been reduced by 96% compared to 2006.

In addition, the company has established a new storage team to explore new business opportunities in energy storage. DONG Energy has also established a new corporate ventures unit in Silicon Valley, California, to explore emerging energy technologies and potential long-term business opportunities. As battery storage and new energy technologies mature and as a more flexible demand side is developed, natural gas will, in the coming years, continue to support the transition to an entirely green energy system. DONG Energy will continue to trade in and sell natural gas to its customers.

The new name – Ørsted – references the innovative Danish scientist Hans Christian Ørsted (1777-1851). Ørsted spearheaded several scientific discoveries, including the discovery of electromagnetism in 1820, which helped lay the scientific foundation for how today's societies are powered. As part of becoming Ørsted, a new logo and brand identity will be introduced.

Click here for more information.

Drax hits back at report critical of biomass

Drax Power has hit back at a report which questioned the economic case for biomass, insisting the technology was the "only reliable, flexible" renewable that can be deployed at scale in the UK.

The US-based Natural Resources Defence Council (NRDC) published a new report, compiled alongside economic consultancy Vivid Economics, claiming that solar and wind would quickly outpace biomass in terms of cost reductions.

The report was particularly damning of biomass' future prospects, claiming any subsidy support for the technology would be a "poor strategic investment" and amount to "hundreds of millions of pounds" being "funnelled into a dying sector".

But Drax Power, the owner of the UK's largest coal-to-biomass conversion plant, has come out swinging in response.

Andy Koss, chief executive at Drax Power, noted that Drax's biomass-powered generating units produced 16% of the UK's renewable power in 2016 and received just 10% of the total amount of support paid to renewables.

"Biomass is the only reliable, flexible renewable power available at scale. At Drax we're looking at ways to reduce the costs of this technology.

"The falling costs of renewables is great news, but we need a mix of energy technologies to ensure security of supply.

"Biomass is the only renewable technology which can be flexed up and down to meet demand and provide the balancing services which National Grid expects to become increasingly important as more and more intermittent renewables come on line and demand for power increases," Koss said.

Click here for more information.

E.ON adds "UK first" battery system to biomass plant

E.ON has completed the installation and grid connection of its 10MW battery at the Blackburn Meadows biomass plant near Sheffield – a new energy storage project that will help keep power supplies stable and support the range of power generation sources feeding into the UK's national grid.

The 10-megawatt (MW) lithium-ion battery is housed in four 40ft long shipping containers. It has the same power as roughly 100 family cars and holds the same amount of energy as 500,000 mobile phone batteries.

The Blackburn Meadows battery was successful in National Grid's Enhanced Frequency Response (EFR) tender to deliver technologies capable of responding in less than one second at times of either an over- or under-supply of energy to the grid.

Click here for more information.

Wallonia government pulls plug on Biomass plant

The Walloon government has decided to cancel its call for tenders for a biomass power plant in Wallonia, Belgium.

The Walloon government is the executive branch of Wallonia, and it is part of one of the six main governments of Belgium.

In May 2016, the Walloon government announced plans to support a 200MW biomass plant and launched a call for tenders.

However, on 12 October 2017, L'Echo announced that the new MR cdH executive decided to stop the procedure.

According to L'Echo, the government saw the project as a risk in terms of biomass supply because it was "unaccompanied by cogeneration".

The government also expressed concern over the ability of suppliers to meet long-term sustainability certification rules. In Belgium, subsides are made conditional in relation to sustainability certification.

However, the abandoned project will not stop the biomass industry in Belgium. The government will revive a new call for projects and focus on smaller, local developments.

Click here for more information.

Biogas

ABP opens 15MW AD plant in Buckinghamshire

Pixabay

A £22 million investment by ABP Food Group's renewable division in a green energy plant will produce enough sustainable energy to power the equivalent of 12,000 homes. ABP's renewables division, Olleco, has just opened the new 15 MW Anaerobic Digestion facility in Aylesbury, Buckinghamshire.

The ABP Food Group facility is located adjacent to the Arla dairy, allowing the dairy to become a zero-carbon milk processing facility.

ABP Food Group is recognised as an industry leader when it comes to sustainable practices and environmental initiatives. In 2015 the company opened the world's first certified carbon neutral abattoir in Ellesmere where waste material from the food processing operation is used in conjunction with used cooking oil to provide the energy requirements on site. Earlier this year, ABP achieved triple accreditation from The Carbon Trust for the third consecutive year and is one of only a handful of companies to have achieved such accreditation.

Olleco, the renewables division of ABP Food Group, collects waste food and cooking oil from the retail and food service sector and converts this waste into bio diesel, bio gas and bio fertiliser. The company employs over 600 people across the UK.

Click here for more information.

Veolia wins contract for French Wastewater AD

Veolia, through its subsidiary CFSP, has been selected by Le Mans Métropole for the contract for its La Chauvinière wastewater treatment plant.

The contract is worth a total of approximately 60 million euros, which amounts to 16.38 million for the construction of the new facilities by OTV-Veolia and 43.5 million euros for nine years operation. The aim is to build a truly circular economy around wastewater with the installation of the anaerobic digester, along with various innovative processes.

Work on the anaerobic digester will begin in 2018 for commissioning scheduled at the end of 2020, allowing the La Chauvinière plant to produce energy in the form of biomethane from wastewater. The amount of gas the plant will inject into the local reticulated network will the equivalent to the gas consumed by one of the city's buses.

Veolia will also introduce a number of innovations to help make the La Chauvinière plant a virtuous model committed to minimising the energy consumed by the plant and its facilities, while also developing new technology. For example, the Alcion process converts CO2 from the purification of biogas into sodium bicarbonate that can be used by the neighbouring household waste energy recovery facility. This is a first at such a scale for this type of plant.

Click here for more information.

Events

Focus on Feedstock
York, 1st November 2017

Join BioVale for a half-day workshop to discuss the issues around feedstock: how to get your feedstock right and what to do when you get it wrong. There will be a series of talks, followed by a question and answer session with the panel of speakers, networking and an 'ask the expert' session.

Click here for more information.

BioBase4SME Training: Communicating Sustainability
York, 8th November 2017

The bioeconomy is a concept many people are still confused by or unaware of. However, consumers are increasingly willing to spend money on products with strong environmental credentials. Bio-based alternatives with a strong sustainability narrative can help to meet growing demand for these solutions.

You are invited to join a training workshop tailored to bioeconomy SMEs on the benefits of sustainability communications and how to develop strategies to boost the marketability of your products.

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

This 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.

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 legislatory 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.

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

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

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

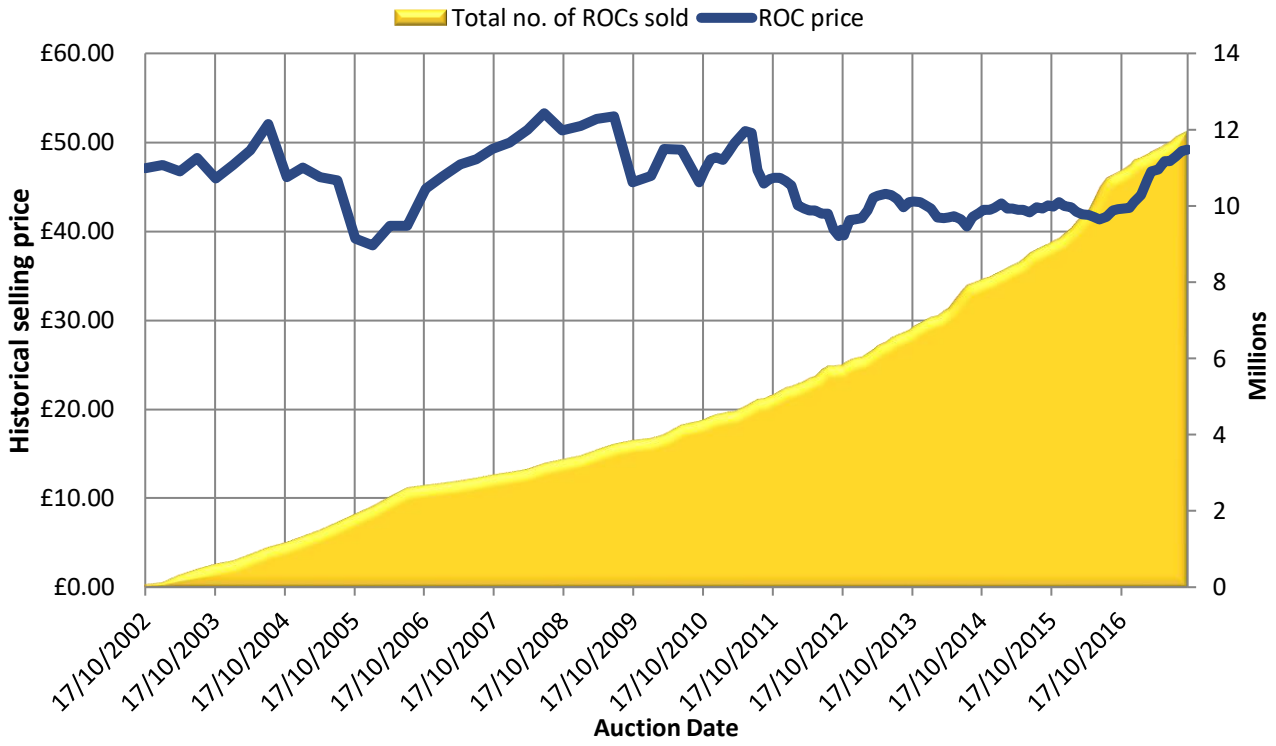
The conference will provide a forum for leading political, corporate, academic and financial people to discuss recent developments and set up collaborations.

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.

Prices

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



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