



**Issue Thirty-seven**

**April 2015**

## **NNFCC Market Review | Biobased Products**

**Welcome to the April 2015 issue of our biobased products market review. Each month we review the latest news from across the biobased chemicals and materials sector. This service is exclusively for NNFCC members.**

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# Foreword

Welcome to the April edition of the NNFCC Bio based Products Market Review.

This month we would like to highlight a report compiled by NNFCC in collaboration with Inspire Biotech that looks at whether there is a specific need for investment in pilot scale equipment in the UK and to develop the outline case for any investment. The study, commissioned by BBSRC, EPSRC, Innovate UK, and IBLF, documents major investment opportunities to build UK excellence and leadership in translating industrial biotechnology and bioenergy research into industrial products and processes.

Since the publication of the Government initiated Innovation and Growth Team report on Industrial Biotechnology (IB), UK stakeholders have been working to realise the commercial benefits of IB, building on the acknowledged strength of the UK research base.

The study used a phased approach, including

- Identify the existing UK IB equipment asset landscape (pre-processing, processing, refining and extraction) the location, scale, typical use and means of access.
- Identify stakeholder views on equipment needs to address any identified gaps in provision
- Develop outline cases for investment in UK scale-up equipment by presenting the rationale for such targeted investment, taking account of existing UK and other accessible scale-up facilities.

In the asset landscaping exercise information was gathered on 340 relevant individual pilot-scale assets. This included 69 assets involved in biomass pre-processing, 105 assets involved in processing (e.g. fermentation) 42 assets involved in algal cultivation and 124 assets involved in product separation.

To build the case for prioritised public investment in specific IB sectors, information was drawn from the asset register, interviews with key asset 'owners' the stakeholder workshop and from follow-up discussions with key stakeholders.

The study found that overall the UK is currently well served with respect to accessible pilot equipment and competence and is competitive with other European member states. However, a number of emerging technologies were identified as areas worthy of investment and that further more limited investment, focused on specific established sectors, would strengthen UK capability.

C1 gas fermentation and high value products from microalgae were highlighted as two strategic areas where investment could have a major impact at a national and international level, delivering large benefits for the UK bioeconomy.

Read on for the latest market news

# Policy

## **Government lays down the foundations for a UK Bioeconomy**

The UK Government has published a report detailing the enormous opportunities resulting from growing the bioeconomy. The report 'Building a high value bioeconomy: Opportunities from Waste' presents the basis for the growth of the bioeconomy in the UK and the enabling actions required to realise the opportunity. The publication builds on an earlier House of Lords study which concluded that the opportunity from the bioeconomy could amount to around £100 billion per year with waste and residues providing valuable raw materials. The UK generates 100 million tonnes of carbon containing waste and 14 million tonnes of bio-based residues from crops and forestry sources. The advanced management of wastes and residues would yield considerable economic benefits and could help to reduce the use of petrochemicals, virgin materials and finite resources worldwide, in turn contributing to reducing global carbon emissions and to increased sustainability and energy security.

Click [here](#) for more information.

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## **US Executive Order - Planning for Federal Sustainability in the Next Decade**

The United States Government have released an executive order related to sustainability planning in the next decade. Amongst the various topics included in the document, the President mentions

the necessity to promote sustainable acquisition and procurement by ensuring that a series of performance and sustainability factors are taken into account. Amongst those there are statutory mandates that require purchase preference for biopreferred and biobased designated products. An annual target for the number of contracts to be awarded with biopreferred and biobased criteria must be established.

Click [here](#) for more information.

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# Market

## **Synthetic Biology Market - Global Industry Analysis, Size, Share, Growth, Trends and Forecast, 2013 - 2019**

According to a market report by Transparency Market Research, Synthetic biology is on the path to becoming a US\$13.4 billion market by 2019, exhibiting a sharp CAGR of 32.6% between 2013 and 2019. The report, titled "Synthetic Biology Market - Global Industry Analysis, Size, Share, Growth, Trends and Forecast, 2013 - 2019, puts the value of the market at US\$1.8 billion in 2012. Synthetic biology is a process that utilizes biology and genetic engineering to produce artificial biological systems and devices. The process is proving to be especially pivotal in producing affordable medicines and improved nutritional products. The report zeroes in the following key factors that have shaped the growth curve of the global synthetic biology market: Increased government participation and investments being routed into scientific research as well as active initiatives taken by private players in R&D.

Besides pharmaceutical and nutrition-related applications, synthetic biology has been used for mitigating the damaging effects of marine pollution. The process has been extensively applied for developing engineered microorganisms to limit oil spill damages. Additionally, researchers have successfully used synthetic biology to convert regular plastics into microplastics that can be re-used. With DNA sequencing prices taking a plunge, the synthetic biology market will gain momentum. However, the global synthetic biology market is still impeded by ethical issues relating to synthetic biology products.

Click [here](#) for more information.

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### **Technavio Publishes Global Bio-Based Platform Chemicals Market 2015-2019 Report**



Technavio has published a new report on the Global Bio-Based Platform Chemicals Market, which is expected to grow at a CAGR of 13.82 percent from 2015-2019. The European Union and industry leaders have launched a new European Joint Undertaking on Bio-based Industries, which will contribute hugely to the European market for the production of bio-based products. • According to the latest report by Technavio, the push towards sustainability and a greener

environment have forced the governments of many countries to shift to the production of bio-based platform chemicals. According to Technavio, The European Union and industry leaders have launched a new European Joint Undertaking on Bio-based Industries, which will contribute hugely to the European market for the production of bio-based products. The latest report by Technavio also emphasizes economic growth in emerging areas like South America and Africa, which is expected to help boost market projections.

Click [here](#) for more information.

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### **Oleochemicals Market Review**

Oleochemicals are used primarily in the personal care industry for manufacturing of various lotions, creams, and so on. Oleochemicals are replacing many petroleum based products as their properties help build a product which is better for the environment and which can be manufactured from renewable raw materials. Major types for oleochemicals include fatty acids, fatty alcohols, glycerin, and others. The market for glycerin is projected to grow at the fastest rate. Fatty acids were observed to dominate the global market by type, for oleochemicals, and were estimated to control around 56.34% of the total oleochemicals consumption by type. The oleochemicals market in terms of size is projected to reach \$25.91 billion by 2019, growing at a CAGR of 4.2% between 2014 and 2019. With the environmental regulations constantly becoming more stringent and the non renewable resources getting depleted, it has paved way to the opportunity for the oleochemicals to enter the market and substitute the conventional petroleum based products being used currently.

Click [here](#) for more information.

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## **Global Bio-based Biodegradable Plastics Market to Witness 18% CAGR Between 2014 and 2020**

Future Market Insights (FMI) released its latest report titled, Global Bio-based Biodegradable Plastics Market Analysis and Opportunity Assessment, 2014 - 2020. According to the report, the global bio-based biodegradable plastics market is estimated to display a significant growth rate of 18% during forecast period 2014 - 2020.

Consumption of biodegradable plastics and bio-based biodegradable plastics was 300 Mn metric and 591,000 metric tonnes in 2013, accounting for 0.21% and 0.1% respectively of the total global plastics consumed. Demand for bio-based biodegradable plastics was considerably lower in comparison to traditional fossil fuel-based plastics; however, it is anticipated to increase significantly in the near future.

By product type, Polyester and PLA collectively accounted for over 60% of the total market value in 2014 and are expected to dominate the market during the forecast period. Other product types collectively accounted for 20% of the total market value in 2014. Starch-blend is also estimated to increase at a marginally slow CAGR compared to PLA and polyester in the near future.

Europe leads the global bio-based biodegradable plastics market, followed by North America. Both the regions cumulatively accounted for 70% of the total global revenue in 2014.

Click [here](#) for more information.

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# Research and Development

## **The most significant bioeconomy research ecosystem in Finland will begin operation in Espoo**



VTT

VTT has built a pilot plant (Bioruukki) aimed at refining biomass at Kivenlahti, Espoo. Bioruukki offers companies world-class platform for new technology development and realisation of bioeconomy concepts. It operates in an area of technology that is important to Finland: bioenergy, utilisation of biomass to make valuable products such as biochemicals and recycling. This is one of VTT Technical Research Centre of Finland Ltd's most significant investments this decade, and the largest bioeconomy research facility in Nordic countries. It serves the needs of process and product development operations of companies and projects implemented by VTT and its research partners. Bioruukki combines VTT expertise in chemistry, energy and biomass processing. It provides the opportunity to study which biorefinery concepts and ideas are both technically and economically feasible. This applies particularly to the development of production methods for biofuels and valuable chemicals.

Click [here](#) for more information.

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## **Amyris & Genome Compiler Partner to Commercialize DNA Construction Software Services for the Pharma and Biotech Industries**

Amyris, Inc., an industrial bioscience company, and Genome Compiler Corp., a synthetic biology platform company, have entered into a collaboration agreement to integrate Amyris's automated lab services with Genome Compilers online design tools and e-commerce platform to enable users to design and order DNA or other biological products seamlessly. This integration will provide a comprehensive solution from design to delivery of first-of-its-kind integrated DNA design and construction service, which promises to be more automated, less expensive, and more sophisticated than current offerings. Customers will benefit from Genome Compilers software tools and Amyris's rich libraries of verified genetic parts, DNA construction and editing methods. This joint project is funded in part by a grant from the Binational Industrial Research and Development Foundation (BIRD Foundation), a U.S.-Israeli partnership between private sectors to expand private high-tech industries. Amyris is committed to expanding the reach and access of our world leading biofab for advanced DNA construction.

Click [here](#) for more information.

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## **Successful opening of the Bioprocess Pilot Facility on March 19th 2015**



*BPF*

Successful opening of the Bioprocess Pilot Facility on March 19th 2015 The director of the Bioprocess Pilot Facility (BPF), Hans van Leeuwen, together with shareholders and governmental institutions, started the first pre-treatment of woodchips in the newly build pre-treatment pilot plant, by officially pushing the button of the biomass pretreatment equipment. This extension of the BPF makes it a unique open access facility for scale up of sustainable production processes. It can be used to improve client process for converting biobased residues into useful chemicals, fuels and ingredients for the Food and Pharma industry.

The BPF is now accommodated with two new pilot scale-up facilities, next to the existing fermentation and downstream processing facilities of the BPF. One pilot section is designated to use biobased ingredients like wood, grass, straw, corn stover and other lignocellulosic feedstocks. The other pilot section is specifically meant for foodgrade ingredients, using our ample experience in fermentation and downstream processing.

Click [here](#) for more information.

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# Platform Chemicals

## Gevo Signs Strategic Alliance Memorandum of Understanding with Praj



Gevo, Inc announced that Praj Industries Limited ("Praj") has signed a memorandum of understanding (MOU) to become a Gevo licensee for producing renewable isobutanol at sugar-based ethanol plants. Under the MOU, Praj will undertake to license up to 250 million gallons of isobutanol capacity for sugar-based ethanol plants over the next ten years. Gevo will market the isobutanol produced by Praj's sub-licensees. Praj will also contribute process engineering and equipment services to expand isobutanol capacity at Gevo's plant in Luverne, Minn, as well as to improve yields and optimize energy consumption at the facility. Praj is a global leader in the ethanol and brewery industries, in addition to the industrial wastewater treatment, pharma, biotech and cosmetic sectors.

Click [here](#) for more information.

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## GLOBAL BIOENERGIES: Completion of the basic engineering phase of the Leuna Demo Plant

Global Bioenergies and The Linde Group announced the completion of the basic engineering phase of Global Bioenergies demo

plant. In February 2014, Global Bioenergies entrusted the Engineering Division of technology company The Linde Group with the mission to deliver the basic engineering study upstream of the construction of its demonstration plant. The two companies announced that this phase has now been completed successfully. Global Bioenergies offer processes to convert sugars into isobutene, a gaseous hydrocarbon.

Click [here](#) for more information.

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## 1,3 Propanediol (PDO) Market Analysis, Market Size, Application Analysis, Regional Outlook, Competitive Strategies And Forecasts, 2014 to 2020

According to GrandView Research, growing demand for bio-based chemicals in various application segments and surge in population globally are expected to drive the overall 1,3-propanediol (PDO) market. 1,3-PDO derived from bio-based feedstock is supported by the environment relations for their chemical properties and also to maintain sustainability in the market. Growing in demand for 1,3-PDO in polytrimethylene terephthalate (PTT) production, used for industrial and household textile applications is expected to have a positive impact on the overall market over the next six years. Other applications include personal care, house cleaning products, cosmetic, heat transfer fluid, engine coolant, de-icing fluids process and polyurethane manufacturing. 1, 3 PDO can used as an alternative for 1,4-BDO in polyurethane applications and it is also expected to replace propylene glycol in personal care and cosmetics giving a competitive edge to the market.

Asia Pacific is expected to be the fastest growing regional segment over the forecast period owing to growth in textile industry and growing

preference of PPT over polyethylene terephthalate (PET). Americas emerged as the leading regional segment in 2013 owing to the growth in demand for bio-based materials and advanced technologies incorporated in U.S. market. Europe is the dominant market for end-use applications such as personal care, cosmetics, and house cleaning products and is expected to attract the demand for 1,3 PDO and eventually be beneficial to the overall market. Demand of natural (bio-based) ingredients and favourable regulatory bodies are expected to have positive influence on the regional market. 1,3 PDO market is monopolistic in nature and does not have much of economic competition in the market. So the industry participants are expected to witness significant opportunity to improve their products over the forecast period. Major industry participants include DuPont, Tate & Lyle and Metabolic Explorer.

Click [here](#) for more information.

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### **Surging Popularity of Green Chemicals Drives Demand for Succinic Acid**

Succinic acid is a key building block for a wide range of secondary chemicals used in the chemical, pharmaceutical, food, and agricultural industries. Increasing need for green chemicals, as substitutes for conventional chemicals, for producing polymers and other complex derivatives is driving demand for bio-succinic acid. Efforts to expand production capacity of bio-succinic acid will help foster market growth in the coming years. Increasing use of succinic acid as a building block in 1, 4 Butanediol (BDO) and various other high-value and high-volume chemicals is also helping drive growth in the market. Adoption of stringent energy policies and continuous advancements in technology are driving focus on bio-succinic acid, derived from renewable feedstocks. Demand for bio-based

succinic acid is supported by benefits such as lower carbon footprint, cost efficiency, reduced price volatility compared to fossil fuel-based alternatives, and ability to reduce dependency on crude oil. The increasing use of bio-succinic acid as a replacement for butane-based maleic anhydride that is extensively used in production of succinic anhydride, diethylmaleate, glyoxylic acid, fumaric acid, and other plastics bodes well for succinic acid market growth. The growth in the coming years will be driven largely by increased use of succinic acid in perfumes and dyes, detergents, surfactants, additives, and as a flavouring agent in the food & beverage industry. As stated by the new market research report on Succinic Acid, Asia-Pacific represents the largest market worldwide.

Click [here](#) for more information.

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## Fine & Specialty Chemicals

**Muconic Acid Market is anticipated to reach USD 86.54 million by 2020, expanding at a CAGR of 7.0% from 2014 to 2020**

Transparency Market Research has released a new market report titled "Muconic Acid Market - Global Industry Analysis, Size, Share, Growth, Trends and Forecast 2014 - 2020." According to the report, the global muconic acid market was valued at USD 54.21 million in 2013 and is anticipated to reach USD 86.54 million by 2020, expanding at a CAGR of 7.0% from 2014 to 2020. Rising demand for muconic acid derivatives, especially adipic acid and caprolactam, is

estimated to drive the global muconic acid market. Additionally, increasing consumer awareness about bio-based products is likely to augment market growth. However, presence of synthetic and bio-based substitutes, such as cyclohexane, bio-succinic acid and butadiene, is projected to inhibit market growth during the forecast period. Growth in environmental concerns related to the usage of petrochemical-derived products is likely to provide large opportunities for the bio-based muconic acid market. Bio-based muconic acid has high potential to replace petrochemicals such as cyclohexane, a benzene derivative, if the price is competent enough to compete with these petrochemicals.

Adipic acid dominated the global muconic acid market in terms of volume in 2013. In terms of volume, it accounted for over 85% share of global muconic acid demand in 2013. Adipic acid is widely used in the production of nylon 6, 6 fiber and resins. It finds major applications in carpets, textiles and automotives. Caprolactam followed adipic acid and is expected to grow at a substantial rate during the forecast period. Growth in the carpet industry in developed countries and textile industry in developing countries is anticipated to drive the caprolactam market. This, in turn, is projected to drive the muconic acid market.

Click [here](#) for more information.

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## **Bio-on S.p.A and Eridania Sadam S.p.A. will work together on defining and optimising the production of levulinic acid**



A new collaboration is announced between two Italian companies operating in the sustainable chemical and agricultural industry, Bio-on S.p.A and Eridania Sadam S.p.A. The two companies will work together on defining and optimising the production of levulinic acid, a key molecule for the sustainable and low-impact future of the chemical industry. Already available on the international market, but in insufficient quantities, levulinic acid is currently obtained from industrial processes with an environmental impact that fails to meet European standards. The new project aims to convert the by-products of the sugar industry into levulinic acid, optimising innovative processes that team environmental sustainability and the reduction of production costs. The integration between agriculture and advanced biochemistry will enable levulinic acid production solely from agricultural waste not intended for human food, with carbon atoms generated from carbon dioxide captured in the atmosphere with chlorophyllian photosynthesis. The collaboration between Bio-on S.p.A. and Eridania Italia S.p.A. adds a further building block in the construction of the Italian green chemical industry. This natural molecule, which has immediate application in the biodegradable plastics sector, extending its field of application, also contributes towards the creation of new eco fuels, fertilisers and antiparasitics; it is also an intermediate element in the creation of high-performing plastics, medications and many other new "green" products.

Click [here](#) for more information.

## Honeywell Partners With Metabolix to Develop Marine Biodegradable Ingredients for Personal Care Products

Metabolix, Inc., an advanced biomaterials company, announced that it has entered into a global, exclusive commercial and technology alliance with Honeywell to offer new marine biodegradable biopolymers for use in cosmetics and personal care products. Through the alliance, Metabolix's Mirel polyhydroxyalkanoate (PHA) biopolymers will be developed as part of Honeywell's Asensa line of personal care additives to help address pending legislation in the U.S. focused on replacing synthetic, non-biodegradable microbeads, as well as global demand for biobased and biodegradable alternatives. This technology is intended to meet increasing regulatory and other requirements around the world for personal care microbeads that biodegrade in marine and fresh water environments. Using applicable ASTM test methods, the marine biodegradability of Mirel PHA biopolymers has been shown to be similar to that of cellulose and paper, and is faster than other commercially available biodegradable polymers.

Click [here](#) for more information.

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## ADM and Clariant Announce Successful Introduction Of Biobased Propylene Glycol Deicing Products



Archer Daniels Midland Company and Clariant announced the introduction of ADM Evolution Chemicals line of biobased propylene glycol into Clariant's market leading Safewing and Octaflo brands of aircraft de-icing fluids in North America. ADM's propylene glycol meets existing industry standards and can be used interchangeably with petroleum-derived propylene glycol traditionally used in aircraft de-icing fluids. Safewing and Octaflo products made with ADM's biobased propylene glycol fulfill all performance expectations and reduce carbon footprint. Use of biobased propylene glycol, along with the innovative closed-loop aircraft de-icing fluid recycling technology, exemplifies Clariant's EcoTain concept which embraces the design of sustainable products and processes. ADM was the first company worldwide to make a biobased propylene glycol that complies with both industrial and USP requirements.

Click [here](#) for more information.

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# Polymers

## Italian Companies to Generate Bioplastic from Potatoes

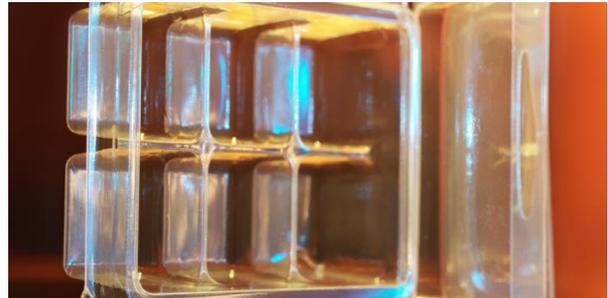


Two Italian companies recently announced plans to process potato by-products into plastic materials. The agreement between biotech firm Bio-on and potato product company Pizzoli aims to produce 2,000 tons of bioplastics annually with the hope of doubling that capacity in the future. The companies said they hope their new industrial facility will serve the country's food sector "with zero environmental impact." The bioplastics, called polyhydroxyalkanoates or PHAs, could replace traditional plastic in a number of processes, the companies said. The resulting materials maintain the same properties as those generated from petrochemicals but are biodegradable.

Click [here](#) for more information.

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## Solegear Teams with Ex-Tech Plastics to Increase Market Reach in the US



*Solegear*

Solegear Bioplastics and Ex-Tech Plastics, Inc., an Illinois-based plastics extruder, have entered into a commercial partnership to manufacture and distribute Solegear's next-generation Traverse bioplastic. Traverse is best known for its high bio-content in rigid packaging that can resist high heat shipping conditions. Through this agreement, Solegear and Ex-Tech will benefit from shared access to new market intelligence, technology and contacts to capitalize on business opportunities to grow the penetration of Traverse, in the North American market.

Solegear's Traverse Bioplastic is designed to replace Polyethylene terephthalate (PET) packaging applications that require both high heat resistance and high optical clarity. Traverse is composed of up to 45% bio-content and meets international shipping requirements. At the end of its life, the material can be recycled, as with conventional petroleum-based plastics.

Click [here](#) for more information.

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## **BASF brings polyamide solutions based on renewable feedstock to the world of fashion**



*BASF*

Ultramid polyamide derived from renewable feedstock helps save fossil resources and reduce greenhouse gas emissions. BASF offers a high performance Ultramid polyamide, which is derived from renewable raw materials, to the textile industry. Italon, a Taiwan based textile manufacturer, is the first company to use this new solution to produce yarns. With an innovative method, called the mass balance approach, BASF replaces 100% of the fossil feedstock required to manufacture Ultramid polyamide with certified renewable material, while maintaining the same high performance properties. The use of bio-feedstock helps to save fossil resources and reduces greenhouse gas emissions. The formulation remains the same and the quality is identical to the product made from fossil-based resources.

Click [here](#) for more information.

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## **BASF now offers bio-based PolyTHF**

BASF has made bio-based Polytetrahydrofuran 1000 (PolyTHF 1000) available for the first time. PolyTHF is derived from 1,4 butanediol (BDO), which BASF has produced under license from

Genomatica. It is primarily used to make elastic spandex fibers for a large variety of textiles, including underwear, outerwear, sportswear and swimsuits. PolyTHF 1000 is mainly applied as a chemical building block for thermoplastic polyurethane (TPU), which is used to make for example parts of ski boots and skates, shoe soles and instrument panel skin for automotive applications as well as hoses, films and cable sheathing. It is also used as a component of thermoplastic polyetheresters and polyetheramides. Other applications include cast elastomers, which are used, for example, for the production of wheels for skateboards and inline skates.

Click [here](#) for more information.

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## **Toray Plastics (America) Introduces new Lumilid bio-based solvent-free lidding films**



*Toray*

Toray Plastics Inc. announces the introduction of new bio-based lidding films. LumiLid bio-based, dual-ovenable lidding films are manufactured with Toray's proprietary sustainable resin blends, which are made with more than 50 percent renewable feedstocks. Bio-based LumiLid films were created to lessen the impact on the environment, as they use fewer petroleum resources while they are being manufactured, and to meet the needs of

environment-conscious end users and consumers. In addition, like all LumiLid films, these are solvent-free and may alleviate end-users' concerns about solvent retention, as well as enhance the films' sustainability profile. The new LumiLid films are designed for frozen, wet and dry food, and dairy applications. They are FDA-compliant for use with oven temperatures of up to 400°F for 30 minutes.

Click [here](#) for more information.

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# Consumer Applications

## **Elevance Clean 1200 Now Commercially Available in Europe**

Elevance Renewable Sciences, Inc., a high-growth specialty chemicals company that creates novel specialty chemicals from natural oils, announced during The Cleaning Show 2015 in London that its superior-performing, bio-based and safe-to-use ingredient, Elevance Clean 1200, is now commercially available in Europe. Elevance Clean 1200 is highly compatible across a range of aqueous and organic solutions while being used at neutral pH in cleaning products for a wide range of applications such as metal cleaning, industrial and institutional degreasing, transportation, oil field, textiles, and food processing.

Its specific product attributes include: 1) Strong solvency characteristics surpassing that of d-limonene, dibasic esters, vegetable esters and isoparaffins as measured on the Kauri butanol (Kb) scale. 2) Formulating compatibility across a range

of organic and aqueous cleaners. 3) Excellent performance across a broad range of cleaning applications, including metal cleaning, industrial and institutional degreasing, transportation, oil field, textiles, and food processing. 4) Eliminating the need for highly caustic cleaning products, demanding and time-consuming personal protective equipment (PPE) requirements, and 5) the need to preserve sensitive metal substrates. Produced from natural oils, Elevance Clean 1200 meets increasingly restrictive environmental requirements, a key benefit as industries continue to come under pressure to reduce greenhouse gas (GHG) emissions globally.

Click [here](#) for more information.

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## **Novamont and Lavazza present the first compostable Italian espresso capsule**



*Novamont*

Novamont and Lavazza launched yesterday the first 100% Italian espresso compostable coffee capsule. The capsule is made of Mater-Bi 3G, a material belonging to the third generation of Novamont bioplastics. It contains a significant percentage of renewable resources, a reduced dependence on materials of fossil origin. It entails a significant reduction of greenhouse gas emissions and it is a 100% biodegradable product, ready for biological recycling. This means that the

compostable capsule can instead be disposed of along with the other organic waste and processed industrially to become compost. The partnership between Lavazza and the Mater-Bi third generation confirms the importance and the success of Novamont's biorefinery model: a biorefinery integrated into the local area, with positive effects in terms of environmental, economic and social impacts.

Click [here](#) for more information.

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### **Tea Company Chooses NatureFlex Packaging**

Innovia Films has announced that Carrington Tea is using bio-based NatureFlex packaging films for their Carrington Organics Tea line. This flexible packaging material is derived from wood pulp sourced from managed plantations and is certified to be over 90% bio-based and home and industrial compostable. High barriers to oxygen and moisture ensure product freshness. The teas are packaged in a 20-bag retail-ready soft pack • , developed in conjunction with Fastik Label and Supply. This packaging format is commonly used in Europe for economy-sized packaging; however this is rarely seen in North America. Flexible material also offered us a unique packaging approach and a chance for differentiation, as tea bags are predominantly packed in a box or can.

Click [here](#) for more information.

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# Patents

## **Bio-based synthetic fluids US 8969259 B2**

A method is provided involving altering the viscosity of bio-derived paraffins to produce a paraffinic fluid, where the altering step includes oligomerizing bio-derived paraffins, unsaturating bio-derived paraffins, chlorinating bio-derived paraffins, or a combination of any two or more thereof; the bio-derived paraffins are produced by hydrodeoxygenating a bio-based feed; the bio-based feed comprises bio-derived fatty acids, fatty acid esters, or a combination thereof; the bio-derived paraffins comprise n-paraffins; and the n-paraffins have a biodegradability of at least 40% after about 23 days of exposure to microorganisms. Also provided are methods of protecting a substance by applying a paraffinic fluid and a method of producing an orifice in a substrate by at least injecting a paraffinic fluid into the substrate.

Click [here](#) for more information.

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## **Methods of preparing para-xylene from biomass US 8969057 B2**

Methods of preparing para-xylene from biomass by carrying out a Diels-Alder cycloaddition at controlled temperatures and activity ratios. Methods of preparing bio-terephthalic acid and bio-poly(ethylene terephthalate (bio-PET) are also disclosed, as well as products formed from bio-PET.

Click [here](#) for more information.

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# Events

## Plant Based Summit, April 8-10 in Lille Grand Palais, France



The leading international event 100% dedicated to plant-based, green and sustainable chemistry!

## Sustainability Live 2015 on 21-23 Apr in Birmingham, the UK



Organised by Faversham House, Sustainability Live incorporating NEMEX and ENERGY RECOVERY has been the hub of energy and sustainability solutions for the UK business community since its inception in 2007.



## SynBioBeta London 2015, 22-24 April, Imperial College, London, UK



SynBioBeta invites you to submit a speaking proposal for SynBioBeta London 2015.

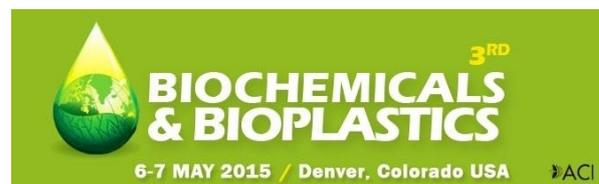
## Life Cycle Assessment Workshops, 22-23 April in York, UK



The domestic biodiesel industry has been mired in uncertainty since the US Environmental Protection Agency delayed the release of the 2014 and 2015 mandates for blending renewable fuels into US fuel stocks under the Renewable Fuel Standard. With no guidance on the demand for biodiesel, producers have shut plants or severely reduced production.



## Biochemicals & Bioplastics summit 2015, 6-7 May, Denver, Colorado



ACI's 3rd Biochemical & Bioplastics 2015 conference will make its debut in the US examining the critical elements involved in developing the industry. With insights from both biochemical & bioplastic producers and key players, we will consider what policies and incentive strategies can be put in play to ensure the critical elements are in the correct balance to implement successful business value.

## All-Energy 2015, 6-7 May in Glasgow, UK



Registration is now open for the largest renewables event in the UK - taking place at the SECC in the renewables hub of Glasgow for the first time on Wednesday 6 and Thursday 7 May 2015.

## Building a Biobased Economy for Europe (BBEE) early-career workshop, 2 June 2015, in York, UK



BBEE is an early-career interdisciplinary workshop discussing the big issues related to building a bio-based economy.

This highly dynamic and participatory event includes talks by high level experts, interactive workshops and small-group discussions.

This is an  
NNFCC  
event

## BioRenew Tech Match: Matchmaking event at the 11th International Conference on Renewable Resources & Biorefineries, 3-4 June 2015, in York, UK



Enterprise Europe Network in Yorkshire is organising a matchmaking event during the 11th International Conference on Renewable Resources & Refineries. This event aims to bring together innovative organisations from countries around the globe seeking to collaborate for mutual commercial benefit.

Meet  
NNFCC  
Here

## 11th International Conference on Renewable Resources & Biorefineries on 3-4 June in York, UK



The conference aims at provide 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.

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**Biobased World at ACHEMA 2015 on  
15-19 Jun in Frankfurt am Main,  
Germany**



BiobasedWorld and ACHEMA are pleased to announce the BiobasedWorld 2015 exhibition. Discover new ideas, products, technologies and strategies. Learn about projects on biomass, biobased chemicals, biofuels and biorefineries and meet key players from the biobased value chain.



**Global Bioeconomy Summit 2015:  
Innovation, Growth & Sustainable  
Development in 25-26 November in  
Berlin, Germany**



Organised by the Bioeconomy Council of the German Federal Government, the first Global Bioeconomy Summit is a platform for leaders in the international bioeconomy to discuss ideas on strategy, governance and policy design.



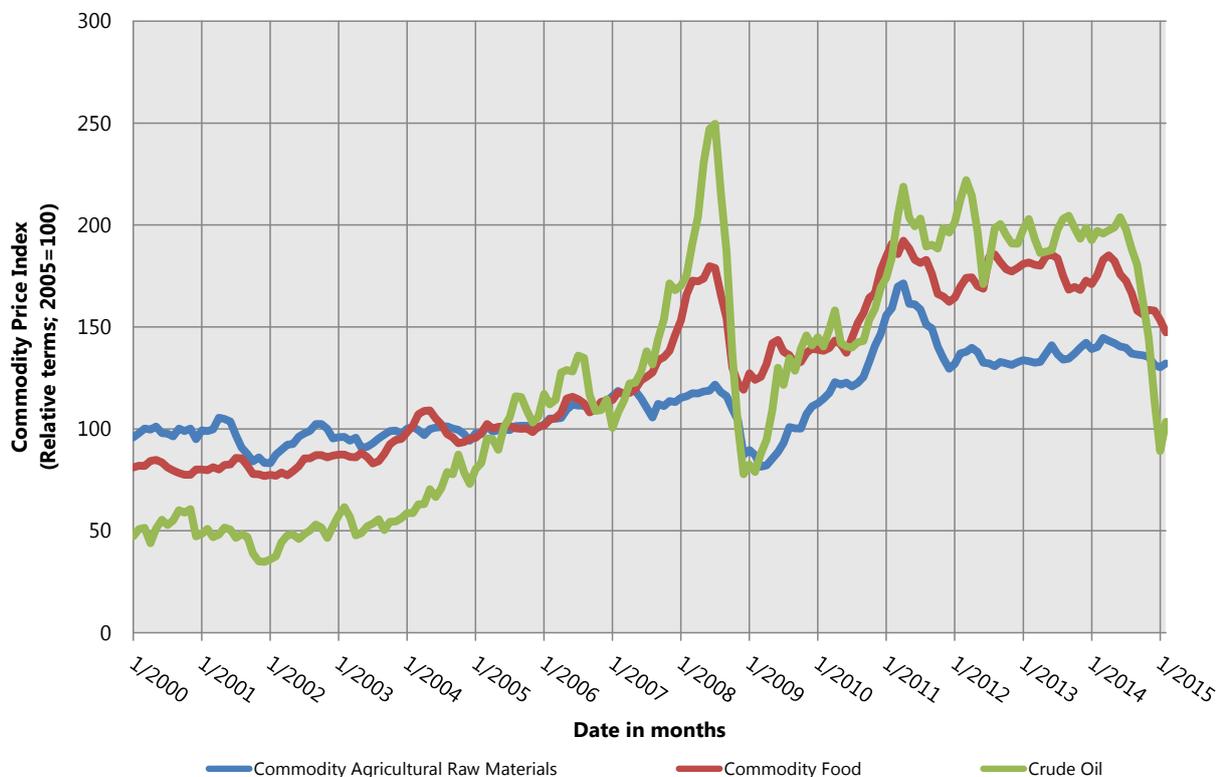
# Price Information

**Spot Prices of feedstocks as of today and five years ago, and percentile price change. Arrows indicate rise (↑), constant (→) or fall (↓) from previous month.**

| Item                          | Price, US\$<br>(Jan 10) | Price, US\$<br>(Feb-15) |     | %<br>Price Change |
|-------------------------------|-------------------------|-------------------------|-----|-------------------|
| Crude oil (petroleum, barrel) | 174.28                  | 54.93                   | (↓) | -68%              |
| Maize (corn, metric ton)      | 265.29                  | 173.70                  | (↓) | -35%              |
| Sugar (pound)                 | 0.2974                  | 0.1451                  | (↑) | -51%              |
| Rapeseed oil (metric ton)     | 1440                    | 747.45                  | (↓) | -48%              |
| Soybean oil (metric ton)      | 1260                    | 697.94                  | (↓) | -45%              |
| Ethanol (gallon)              | 2.39                    | 1.5                     | (↓) | -37%              |

For details on indexes please see [www.indexmundi.com/commodities](http://www.indexmundi.com/commodities); Ethanol prices from Govt of Nebraska at [www.neo.ne.gov/](http://www.neo.ne.gov/)

## Raw materials 15-year Price Indices



For details on the nature of these commodities please see [www.indexmundi.com/commodities](http://www.indexmundi.com/commodities)

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# Credits and Disclaimer

NNFCC Market Review is edited by Dr Davide Di Maio for NNFCC members. Feedback is welcome. The Review has been compiled in good faith and NNFCC does not accept responsibility for any inaccuracies or the products or services shown.



NNFCC are partners in Bio Base NWE, an INTERREG IVB project designed to accelerate the growth of the biobased economy in North West Europe.



For more information on the project click [here](#) and to learn about funding opportunities click [here](#).

## NNFCC

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