The Bioeconomy Consultants
NNFCC

YOUR PARTNERS FOR BUSINESS INSIGHT AND MARKET INTELLIGENCE

Providing clients with a strategic view of feedstock, technology, policy, and market opportunity across the bioeconomy

News Review

Bio-based Products

Issue Eighty

November 2018

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

Contents

Foreword

Welcome to November's edition of our Biobased Products News Review.

The bioeconomy provides us with a myriad of novel materials: as developments continue to be made in the field of biobased materials, new properties are being discovered that sometimes allow biobased products to perform better than their fossil-based counterparts. One of the materials which has had some of the most impressive developments is spider silk. It has long been known that spider silk has incredible material properties: it is lightweight but retains incredible strength (the oft-touted trivium being that spider silk has the same strength as steel of the same thickness). However, harnessing these remarkable properties has proven a development challenge for the bioeconomy: spiders aren't exactly easy animals to farm and harvest silk from, and so other organisms must be genetically modified to produce the silk. One approach taken by Kraig Biocraft has been to genetically modify silk worms to produce the fibres. This process is now starting to bear fruit, as Kraig has been able to announce novel applications for their fibres. Perhaps most impressive of all, from a materials perspective, has been the announcement that Kraig has developed bulletproof panels from their spider silk. The panels are said to be lighter and more flexible than traditional bulletproofing, increasing the comfort and mobility of the wearer. Kraig has already signed a deal with the US military to develop these materials, and now the delivered product will be tested for its bulletproofing properties. Regardless of one's stance on the development of products specifically for combat purposes, this must be regarded as a great achievement in materials development, and a classic demonstration of the potential that biobased products offer.

Elsewhere, Braskem has received a significant endorsement, as the Carbon Trust, through an independent review, confirmed that Braskem's biobased plastic is, in fact, carbon negative. One of the less-talked-about properties of biobased plastics is their function as a carbon sink: since they are produced from plant biomass, which has, during its life, absorbed CO_2 from the atmosphere in photosynthesis, producing plastic from biomass "locks away" this atmospheric carbon. To have this now confirmed by an organisation such as the Carbon Trust is significant, as it will help to further raise awareness of the benefits of biobased plastics to the wider public.

Read on for the latest news.

Policy

European Commission announces bioeconomy measures for 2019

PxHere

Delivering a sustainable circular bioeconomy requires a concerted effort by public authorities and industry. To drive this collective effort, and based on three key objectives, the European Commission will launch 14 concrete measures in 2019.

To unleash the potential of the bioeconomy to modernise the European economy and industries for long-term sustainable prosperity, the Commission will establish a €100 million Circular Bioeconomy Thematic Investment Platform. The aim of this is to bring bio-based innovations closer to the market and de-risk private investments in sustainable solutions, including facilitating the development of new sustainable bio-refineries across Europe.

Member States and regions, particularly in Central and Eastern Europe, have a large underused biomass and waste potential. To address this, the Commission will develop a strategic deployment agenda for sustainable food and farming systems, forestry and bio-based products; set up an EU Bioeconomy Policy Support Facility under Horizon 2020 to develop national and regional bioeconomy agendas; launch pilot actions for the development of bioeconomies in rural, coastal and urban areas.

The EU's ecosystem is faced with severe threats and challenges, including a growing population, climate change and land degradation. In order to tackle these challenges, the Commission will implement an EU-wide monitoring system with the aims of tracking progress towards a sustainable and circular bioeconomy; enhance its knowledge base and understanding of specific bioeconomy areas (by gathering data and ensuring better access to it through the Knowledge Centre for the Bioeconomy); and provide guidance and promote good practices on how to operate in the bioeconomy within safe ecological limits.

Click here for more information.

Markets

Kraig Biocraft begins expansion into Vietnam

Kraig Biocraft Laboratories, Inc., the leading developer of spider silk-based fibres, has announced that it is finalizing the details of its first shipment of the Company's proprietary recombinant spider silk silkworm eggs to Vietnam. The Company is coordinating the details of this shipment with senior officials within key central Vietnamese government ministries, as well as senior leadership within Quang Nam province.

Kraig Labs will be working, in cooperation with leading sericulture experts in Vietnam, to demonstrate the performance and capabilities of the Company's uniquely developed silkworms, as it moves to expand the production of its recombinant spider silk from pilot to full scale production.

The Company expects to have all of the required documentation for this shipment completed within the next two to three weeks and expects to be raising its silkworms in Vietnam in the fourth quarter.

Click here for more information.

Genomatica announces new investors

Genomatica

Genomatica has announced it has issued $90 million in its latest equity offering, strengthening its balance sheet to fully execute on its business plan and fuel new growth opportunities. Participants include new lead investor Casdin Capital, returning investor Viking Global Investors, which continues as Genomatica's largest shareholder, and organism engineering partner Ginkgo Bioworks. Genomatica also announced it is expanding its relationship with Ginkgo to accelerate biotechnology innovations for widely-used chemicals.

Genomatica's commercial technologies impact everyday plastics and personal care products, and new technologies under development target textiles and fibres.

The company has delivered two commercial processes. The first, for biobased 1,4-butanediol (BDO) is an ingredient in the production of millions of biodegradable, compostable plastic bags, coffee capsules and food packaging. Genomatica's GENO BDO™ process has made tens of thousands of tons of biobased BDO at Novamont's $110M production plant since late 2016. The second process, for biobased Brontide™ butylene glycol, is being used to make a range of more natural cosmetic and personal care products.

Genomatica is advancing a new process to make 100% biobased nylon-6 for clothing and carpets, to help move toward a more sustainable and circular textile economy. Genomatica's partners include Aquafil and the EFFECTIVE consortium, a dozen firms including brands such as H&M, Carvico, Vaude, and Balsan.

Click here for more information.

Research & Development

LCA confirms 70% carbon reduction through Anellotech process

Sustainable technology company Anellotech has announced that its pioneering Bio-TCat process, which produces bio-based aromatics from pine wood, has a CO_2 emission reduction potential of 70% or more when compared to petroleum-derived equivalents. Jacobs' analysis confirms that Bio-TCat is ideal for chemical producers and brand owners looking to meet sustainability goals for producing renewable polymers for consumer products or biofuels blended into transportation fuels.

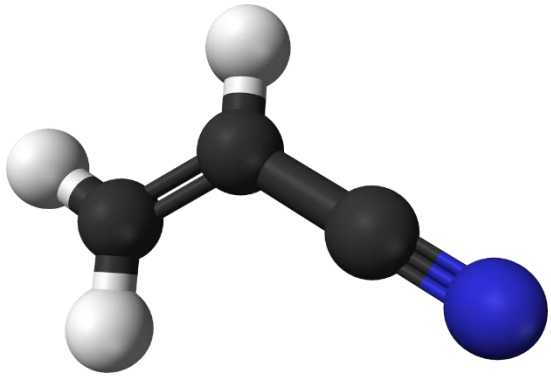
Jacobs, a globally respected engineering firm, conducted an in-depth review of Anellotech's Greenhouse Gas Emissions (GHG) Lifecycle Analysis (LCA), using its own industry-accepted refinery and petrochemical models. Jacobs verified that renewably-sourced Bio-TCat products enable significant GHG reductions when compared to identical chemicals currently made from crude oil.

The LCA compared Bio-TCat aromatics, produced using sustainably-sourced loblolly pine feedstock from the southern United States, to petro-aromatics produced in the US Gulf Coast from three crude oils which represented a range of carbon intensities. Jacobs employed their proprietary, detailed models for oil production, transportation and refining to estimate the carbon intensity of producing high-purity paraxylene and benzene products.

The results found that CO_2 emissions for producing paraxylene and benzene from pulpwood using Anellotech's process are estimated to be 70-80% lower than emissions for identical petro-based chemicals made from crude oils. If Bio-TCat is configured to make renewable gasoline and distillate fuel blendstocks, the reduction potential exceeds 90% as fuels are burned to make energy. In the coming months, Anellotech will be revisiting its process design and performing additional energy integration and optimization work to identify further ways to lower CO_2 emissions.

Click here for more information.

Production of biobased acrylonitrile



Wikimedia Commons

Acrylonitrile (ACN) is a petroleum-derived compound used in resins, polymers, acrylics, and carbon fibre. This paper presents a process for renewable ACN production using 3-hydroxypropionic acid (3-HP), which can be produced microbially from sugars. The process achieves ACN molar yields exceeding 90% from ethyl 3-hydroxypropanoate (ethyl 3-HP) via dehydration and nitrilation with ammonia over an inexpensive titanium dioxide solid acid catalyst. The paper further describes an integrated process modelled at scale that is based on this chemistry and achieves near-quantitative ACN yields (98 ± 2%) from ethyl acrylate. This endothermic approach eliminates runaway reaction hazards and achieves higher yields than the standard propylene ammoxidation process. Avoidance of hydrogen cyanide as a by-product also improves process safety and mitigates product handling requirements.

Click here for more information.

Bioplastics as a niche within bioeconomy

This paper focuses on the development of a bioplastics innovation niche as an important sector of the biobased economy and a viable solution to promote sustainable long-term growth. Relying on the Strategic Niche Management framework, the following niche mechanisms are analysed: convergence of expectations, learning processes, and networking with powerful actors in the sector. The authors conducted a comparative analysis, looking at Italy and Germany, two frontrunner countries in bioplastic production who have enacted divergent policies in support of this sector. The comparative perspective has brought some interesting insights into the maturity level of the two respective niches, as well as into the emerging architectural properties of the underling social networks. Core findings show a general high level of expectations in the bioplastics sector in both countries, whereas key elements undermining the niche development refer either to the lack of policy support or to the changing and unstable institutional and regulatory framework. Regarding the architectural structure, the Italian network of actors was largely characterized by an active exchange of knowledge among firms, whereas the German network was characterized by the presence of several institutional actors actively participating in knowledge flows. This last result relates, in the authors' view, to the different policy strategies followed by national governments in the two countries: the German case being characterized by large public investment in R&D, whereas the Italian case is mostly characterized by demand side policies that effectively created a market for bioplastic shoppers.

Click here for more information.

Polymers

Kraig Biocraft announces bulletproof spider silk panels

Kraig Biocraft Laboratories, Inc., the leading developer of spider silk based fibres, has announced that it has delivered ballistic shootpack panels to the U.S. Army made from the Company's proprietary Dragon Silk™ material. These panels will be evaluated for effectiveness in stopping bullets, in an effort to provide our Warfighters with a lighter and more comfortable alternative to conventional protective apparel.

Dragon Silk is a genetically engineered spider silk which mimics the strength and toughness found in native spider silk, but which can be produced at large quantities through the Company's specially developed silkworms. These specially engineered silkworms were developed to be a direct drop-in replacement into the traditional silk production infrastructure which produces more than 150,000 metric tons of silk per year. This approach of adapting the existing production infrastructure is the key differentiator between the Company and others working to produce spider silk materials.

Unlike traditional synthetic materials such as Ultra High Molecular Weight (UHMW) polymers or aramids, which are very stiff, spider silk is extremely flexible, making it more comfortable and providing higher mobility and movement for the wearer. Spider silk is also biocompatible, making it ideal for skin contact applications, and biodegradable, reducing the environmental burden of the current synthetic materials.

Click here for more information.

MCC releases paper cup made from biobased biodegradable plastic

Mitsubishi Chemical Corporation has announced that Japan Pulp and Paper Co., Ltd. will launch sales of paper cups made with MCC's BioPBS™ plant-derived and biodegradable plastic in October.

MCC developed BioPBS™and holds its basic patent. BioPBS™ is manufactured by PTT MCC Biochem Company Limited, a 50-50 joint venture between MCC and PTT Global Chemical Public Company Limited. This environmentally friendly material is broken down by living microorganisms in soil and decomposes into water and carbon dioxide. Based on the material's high heat resistance, high flexibility, and high heat seal strength as well as its biodegradability, Japan Paper and Pulp decided to use it as the laminate on the inner surface of paper cups in place of conventional polyethylene.

MCC has developed applications for BioPBS™ not only in conventional items such as compost bags and agricultural mulch films, but also developed a broader range of new applications in coffee capsules, paper cups, straws, and other food-related products. The company is already in discussions with several major overseas fast-food chains.

Click here for more information.

Braskem's plastic to be used in coffee packaging

Pixabay

Braskem is to become a Green Plastic supplier for the traditional Rio de Janeiro-based brand Café Favorito. The first polyethylene of renewable origin to be produced in the world, the resin will be applied in the 500 g coffee pillow packs.

Made from sugarcane, one of the main differentiators of Green Plastic is its contribution to reducing the greenhouse gas emissions into the atmosphere by capturing 3.09 metric tons of carbon dioxide during its production process. It should also be noted that, because it is 100% recyclable, the CO_2 that is captured in its production remains fixed throughout the life cycle of the final product.

Currently, over 150 brands worldwide have already adopted Green Plastic in packaging for the most diverse segments, such as food, personal hygiene, and durable goods. With the same properties, performance and versatility of polyethylene of fossil origin, renewable resin can be used in the same production chains of conventional plastic and recycling.

The Café Favorito packaging will use the I'm Green™ label so consumers can recognize the application of Green Plastic in its composition.

Braskem, the world's largest producer of biopolymers, has been producing polyethylene

from renewable sources since 2010, at the Petrochemical Complex of Triunfo (RS). With a production capacity of 200,000 metric tons per year, this is the largest industrial unit of ethylene derived from ethanol on the planet.

Click here for more information.

Carbon Trust endorses carbon-negative bioplastic claims

Carbon Trust

Brazilian chemicals company Braskem, producers of I'm green™ - a bio-based polyethylene made from sugarcane - has had its negative carbon footprint credentials strengthened thanks to an independent review by the Carbon Trust.

In a new report comparing I'm green™ with fossil-based equivalents, the Carbon Trust has endorsed the methodology used by Braskem to support claims that for every tonne of I'm green™ produced, the equivalent of around 3 tonnes of CO_2 are locked away by the sugarcane which provides the main raw material for its manufacture. This means Braskem's bio-based plastic is effectively carbon-negative.

Capturing CO_2 during its lifecycle, I'm green™ avoids emissions related to the production of fossil fuel feedstock, thereby providing a net saving of the equivalent of around 5 tonnes of CO_2 by the end of the plastic manufacturing process. I'm green™ is 100% recyclable plastic currently being used in a range of applications from food packaging to personal care products, as well as more durable goods such as chairs and vases.

Brand owners are increasingly responding to climate change by reducing their carbon footprint, which requires investment in more efficient processes and using innovative, renewable materials. Braskem's I'm green™ is made from a renewable feedstock and can make a significant contribution to reduce carbon emissions.

Click here for more information.

---

thyssenkrupp commissions PLA plant in China

To reduce reliance on petroleum-based plastics, thyssenkrupp has developed a manufacturing process for the bioplastic polylactide (PLA). The world's first commercial plant based on the patented PLAneo® technology recently started production in Changchun, China. It is operated by the Jilin COFCO Biomaterial Corporation, a subsidiary of COFCO, China's largest food and beverage group. The new plant produces all standard PLA types, among other things for the production of eco-friendly packaging, fibres, textiles and engineering plastics.

Polyactide (PLA) is a 100% bio-based and compostable plastic which thanks to its physical and mechanical properties can replace conventional oil-based polymers in many areas. The starting material for PLA production is lactic acid, which is recovered from renewable resources such as sugar, starch or cellulose.

PLAneo® technology converts lactic acid into PLA in a particularly efficient and resource-friendly way. Another advantage is its transferability to large-scale plants with capacities of up to 100,000 tons per year. In developing the technology, thyssenkrupp's subsidiary Uhde Inventa-Fischer profited from decades of expertise gained from the construction of more than 400 polymerization plants and extensive experience in the scale-up of new technologies. For the new plant in Changchun thyssenkrupp provided the engineering, key plant components and supervision of construction and commissioning.

Click here for more information.

Covestro to develop CO_2-incorporating polyurethanes

Covestro

Under the name cardyon™, Covestro is developing and marketing new polyether carbonate polyols that are produced with the aid of carbon dioxide (CO_2). With Desmopan® 37385A the company now offers the first representative of a new series of thermoplastic polyurethanes (TPU) containing polyether carbonate polyols based on CO_2 technology.

Compared to conventional TPU materials, the new TPU products leave a lower carbon footprint and help close the carbon cycle. They also conserve fossil resources and, unlike many bio-based materials, do not compete with food production.

Desmopan® 37385A has a hardness of 85 Shore A. Its mechanical properties are at least at the level of conventional TPU grades of similar hardness, and even exceed some of them. For example, it has a tensile strength of 36 megapascals. The elongation at break reaches 660 percent (DIN 53504). The plastic is designed for extrusion, but is also suitable for injection moulding.

Covestro plans to expand the new TPU series with variants of different hardness. A product with a hardness of 95 Shore A, for example, whose melt cures rapidly during processing, is well advanced in development.

Covestro cooperates closely with companies and research institutions to use CO_2 technology as a synthesis platform for other large-scale chemical raw materials. For example, work is underway on new CO_2-based polyols for rigid polyurethane foams that could be used, for example, in the thermal insulation of buildings, in automobiles and in sports equipment. At the Dormagen plant, Covestro already operates a production plant that produces CO_2-based polyols for flexible polyurethane foams. The latter are used in the commercial production of upholstered furniture and mattresses.

Click here for more information.

Novamont opens Mater-Biopolymer plant

The inauguration of MATER-BIOPOLYMER, the Novamont Group site dedicated to the production of ORIGO-BI, biodegradable polyesters with an increasing content of renewable raw materials entering the production process, was held in Patrica (FR) of the MATER-BI compostable bioplastic family.

MATER-BIOPOLYMER, in line with the NOVAMONT strategy, based on the use of the world's first technologies for the revitalization of sites no longer competitive, is a virtuous example of industrial development in a logic of territorial regeneration and enhancement of infrastructure and skills existing.

The plant, in fact, comes from the conversion of a plant dedicated to the production of PET. Thanks to NOVAMONT's innovative technologies and know-how, the various sections of the plant have been regenerated to allow the use of renewable raw materials and the application of a more sustainable and low-emission process.

MATER-BIOPOLYMER is a highly efficient plant, and is equipped with a complex system of utilities that allows to minimize costs and waste through the recovery and enhancement of waste. In 2016, construction of a waste water distillation section was initiated at the site, resulting in the process of recovering tetrahydrofuran (THF)which is generated during the polymerization reaction, which, once distilled, is destined for the chemical and pharmaceutical industry.

Click here for more information.

Chemicals

Demonstration plant for chemicals from CO_2 and light

A demonstration plant for a ground-breaking technology to produce chemicals from sunlight will be built at Delfzijl, the Netherlands by AkzoNobel Specialty Chemicals and partner firm Photanol BV.

The companies formed a partnership in 2014 to jointly work on a technology using cyanobacteria that mimics the way plants use photosynthesis to produce chemical building blocks such as organic acids from carbon dioxide (CO_2). These have applications in biodegradable plastics, personal care products and as intermediates for the chemical industry.

Photanol has closed a financing round with a group of Dutch investment firms that will allow the construction of the unit to go ahead; completion is expected in 2020.

Click here for more information.

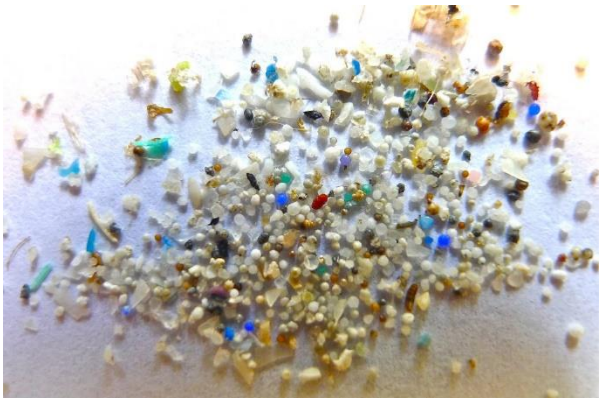
BASF could pull out of Synvina venture

Avantium and BASF are in a dispute about the future of their Synvina joint venture. The companies disagree on the timing for the fulfilment of the criteria to invest in the commercial-scale plant for FDCA (furandicarboxylic acid). After an internal strategic review, BASF has served a notice to Avantium that if the investment criteria are not fulfilled by 5 December 2018, it is entitled under the joint venture agreement to exit from Synvina. BASF asserts that fulfilment of the investment criteria for the reference plant must be assessed in the fourth quarter of 2018, as originally envisaged in the joint venture agreement. Avantium disagrees with this interpretation of the joint venture agreement. Avantium is convinced that the 2-3 year extension of the PEF pilot phase announced in January 2018 logically necessitates a postponed final assessment. Avantium and BASF are discussing possibilities for an amicable settlement to this difference of opinion. Should BASF exit the Synvina joint venture, the IP, people, assets and technology for the production of FDCA and PEF (polyethylenefuranoate) will return to Avantium, allowing it to investigate alternative routes for commercializing the technology.

Click here for more information.

Consumer Products

Novamont releases products to eliminate microplastic pollution



Flickr

With the intention of preserving and regenerating natural resources through innovative development, and in close collaboration with ROELMI HPC, NOVAMONT has developed a line of readily biodegradable ingredients for cosmetic applications: CELUS-BI®, a new standard of innovation in the sector.

Novamont has presented the most advanced product in the range -- CELUS-BI® FEEL. With excellent technical performance, this product is an original and sustainable response to the need to eliminate microplastics from leave-on cosmetics. CELUS-BI® FEEL is a texturising agent that guarantees excellent use properties such as softness, velvet touch and film-forming capacities. The ingredient also has excellent sebum control and high compatibility with active substances, vegetable oils and fragrances.

CELUS-BI® FEEL is “readily biodegradable” in accordance with the guidelines of the Organisation for Economic Co-operation and Development (OECD) and biodegrades rapidly and

totally in the environment. It is fully biodegraded in just a few days in a purifying plant, ensuring that no residues end up in rivers and seas and with the enormous advantage that the resulting sludge has no microplastics. CELUS-BI® FEEL is therefore suitable for use in applications where dispersion in water is highly likely (solar), eliminating potential pollution and/or accumulation. CELUS-BI® FEEL also has an exceptional environmental profile, determined through the LCA (Life Cycle Assessment) method.

Production capacity available for CELUS-BI® FEEL would suffice to cover the entire European need for microplastics for the cosmetics industry.

Click here for more information.

Home-compostable coffee capsule released

In cooperation with Golden Compound, the internationally active packaging manufacturer ALPLA has brought a world first onto the market: a biodegradable coffee capsule that consumers can dispose of in their home compost.

Together with materials manufacturer Golden Compound, ALPLA has developed a market-ready coffee capsule that environmentally aware consumers can use with a clear conscience. The capsule is made from the material Golden Compound green. This comprises an organically based material and ground natural fibres from sunflower seed shells. The capsule and filter fleece are completely biodegradable in the garden compost within a maximum of six months, and are free from aluminium and genetically modified organisms. ALPLA provides its customers with the capsule and the garden-compostable lid.

Golden Compound uses sunflower seed shells as a reinforcing material. They are a by-product of the food industry and not in competition with food production. In this way, Golden Compound green protects fossil resources and reduces the carbon footprint. Composting the capsule generates humus, and the coffee grounds contain valuable plant nutrients such as potassium, phosphorus and nitrogen.

The material also has excellent characteristics, as confirmed by numerous certificates: the oxygen barrier is very much comparable with conventional plastics such as PP-EVOH-PP. The monolayer coffee capsule is thus aroma-proof without outer packaging. Furthermore, Golden Compound green is certified in line with the standards 'OK compost HOME' and 'OK biodegradable SOIL' from TÜV.

Click here for more information.

Pixabay

PepsiCo commits to recycled plastic use

Drinks giant PepsiCo, one of the world's largest users of food-grade recycled PET, is planning to use 25% of recycled content for its plastic packaging by 2025 as part of its sustainable plastics vision. The company will work collaboratively with suppliers and partners to increase consumer awareness, foster cross-industry and public-private partnerships, as well as advocate for improved recycling infrastructure and regulatory reform.

Plastic waste has been in the media spotlight in recent months and PepsiCo's pledge comes at a

time when businesses are under pressure to cut down on their use of the material.

As part of its commitments, the drinks giant has a specific goal to use 33% recycled polyethylene terephthalate (PET) content in beverage bottles by 2025.

The decision complements PepsiCo's commitment to its 2025 Agenda. In its agenda, the company aims to make 100% of its packaging recyclable, compostable or biodegradable, while increasing the use of recycled materials, reducing the carbon impact of its packaging, as well as increasing recycling rates by working in collaboration with the PepsiCo Foundation - the philanthropic arm of PepsiCo.

Click here for more information.

Asian fashion retailer adopts biobased plastic bags

Splash, a prominent fashion retailer in the Middle East and India, and a brand owned by the Landmark Group, has partnered with Natur-Tec, a business unit of Northern Technologies International Corporation, to pioneer a new sustainable biopolymer-based packaging solution in the Middle East and South Asian region.

The brand's 80 million polybags a year have been replaced with "bioplastics" - a biobased and compostable plastic alternative to conventional plastics. The biobased carbon is helping reduce 298 Tons of carbon dioxide emissions a year. At the end of useful life, these eco-friendly bags are safely and completely digested (biodegraded) by macro- and micro-organisms in natural composting and soil disposal. This approach reduces the carbon footprint of the company's packaging and provides for an environmentally responsible end-of-life through composting. The company's new approach is in line with the Circular Economy model and eliminates leakage into the ocean environment and landfills.

Use of conventional plastics such as polyethylene and polypropylene are facing harsh societal and political criticism due to environmental and waste-disposal concerns. As widely reported in print, electronic, and social media, these non-degradable plastics find their way into the oceans and negatively affect marine eco system and habitats. As a result, demand for certified biodegradable and compostable packaging is expected to become the norm.

Click here for more information.

Patents

Biobased hydroxy-urethanes as reactive diluents

Provided herein is a method of preparing a biobased hydroxy-urethane. The method includes reacting a cyclic carbonate with a diamine in the absence of an isocyanate. Also described provided herein are biobased hydroxy-urethane materials prepared by the method, coating compositions including the biobased hydroxy-urethane materials, and methods of coating a substrate using the biobased hydroxy-urethane materials.

Click here for more information.

Events

International Conference on Green Chemistry and Technology Edinburgh, 12th-13th November 2018

Green Chemistry and Technology 2018 is a global overview the Theme: "Endorsing the Importance of Sustainable World by Academic and Industrial Forum: Driving Waste towards Zero" is designed for professionals at all levels and career phases of the Chemical industry, Pharmaceutical industry, and Petroleum industry, who want to improve their understanding of what will drive and shape the future of the market. This will include senior executives, sales and marketing personnel, strategic planners, who will be benefit from a broad overview of the Chemical, Pharmaceutical and petroleum industry. The strength of the Conference is that the participants tend to include all phases of the value chain as well as individuals from a wide variety of sector and countries. This experience helps the conference to be an interactive forum and encourages a strong level of dialogue and discussion, thus maximising the benefits of attendance. This conference surely provides better information and insight into the development of the world Chemical industry, which in turn has enabled attendees to make better and more profitable decisions.

Click here for more information.

European Bioplastics Conference Berlin, 4th-5th December 2018

The European Bioplastics Conference is the leading business and discussion forum for the bioplastics sector in Europe and worldwide. As the major industry association in this field, the hosts at European Bioplastics are committed to representing the interests of stakeholders along the entire value chain. The diversity of the delegation – 330 strong in 2017 and expected to grow – reflects that, and the trend towards a pan-industry gathering is set to continue as the event embraces the inclusion of political and other non-private sector actors. With more and more brands and manufacturers waking up to the potential of bioplastics, and with policy makers increasingly streamlining their efforts to install frameworks that benefit the growth of sustainable bio-industries, this is the time to put bioplastics high up on the agenda of a bio-based circular economy in Europe and beyond.

Click here for more information.

IBioIC Annual Conference Glasgow, 30th-31st January 2019

IBioIC's Annual Conference is the leading general IB conference in the UK. The conference celebrates the success of the biotechnology industry in Scotland and provides delegates with the networking opportunities needed to drive new collaborations.

Click here for more information.

World Bio Markets
Amsterdam, 1st-3rd April 2019

We are seeing a fundamental shift in the global bio-based chemicals market as brands take action to steer their supply chains away from a traditional petro-chemical base, and those who have already made the change enjoy the benefits both in public perception and commercial performance.

With this in mind, for 2019, World Bio Markets is truly connecting our producer and brand audiences to unite to achieve success.

Our exciting agenda helps bio-based producers to learn from each other, create greater efficiencies, improve their technology, scale-up and grow. At the same time, it connects them with brands.

Click here for more information.

RRB-15
Toulouse, 3rd-5th June 2019

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 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.

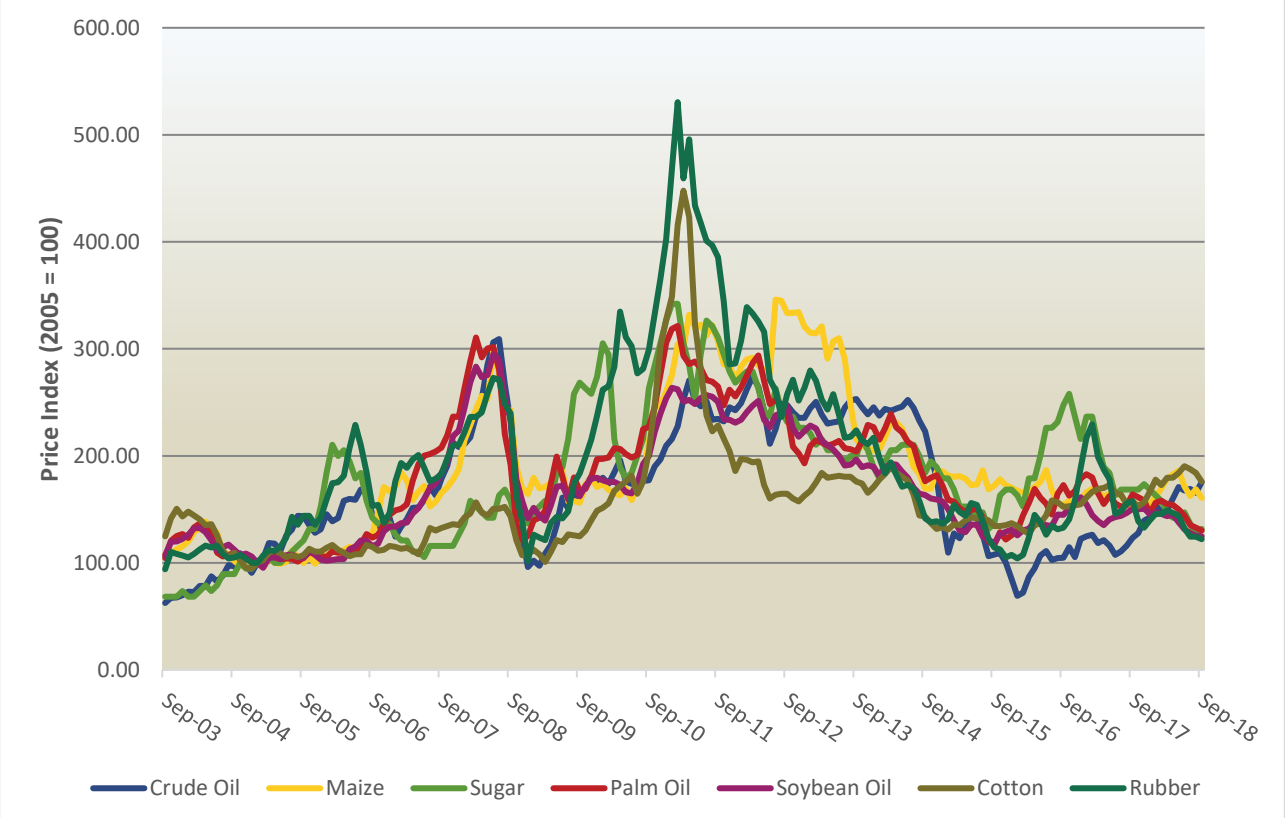
Price Information

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$ (May 13)	Price, US$ (Apr 18)	Price Change
Crude oil (petroleum, barrel)	105.43	75.36	-29%
Maize (corn, metric ton)	201.73	154.8	-23%
Sugar (pound)	0.41	0.25	-39%
Palm oil (metric ton)	859.00	523.62	-39%
Soybean oil (metric ton)	987.00	650.99	-34%
Cotton (kilogram)	1.97	1.99	+1%
Rubber (kilogram)	2.53	1.44	-43%

All prices from World Bank data.

Raw materials 15-year Price Indices



All prices from World Bank data, for details on index methodology, please contact NNFCC.

Credits and Disclaimer

NNFCC News Review is edited by Bob Horton for NNFCC subscribers. 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
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