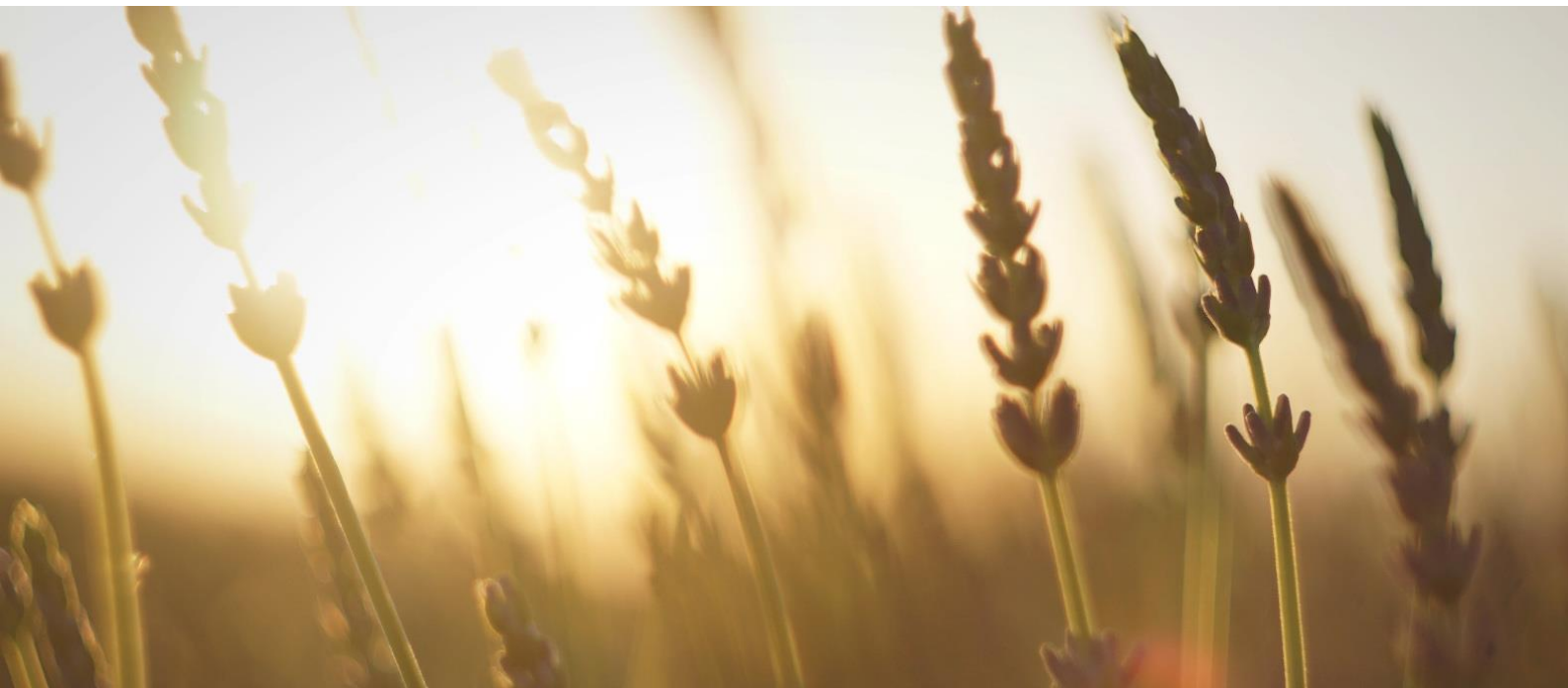


News Review



Issue Seventy-Seven

August 2018

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

Contents

Contents.....	2
Foreword.....	3
Policy	4
Markets.....	5
Research & Development	6
Polymers	6
Chemicals	8
Consumer Products	13
Patents.....	16
Events.....	17
Price Information	19

Foreword

Welcome to August's Biobased Products News Review.

This month we have a veritable glut of stories in the Chemicals section, with several biorefineries opening around the world, including Avantium in the Netherlands, Attis in the US and Leaf Resources in Malaysia. Biorefining technology continues to develop at an unprecedented rate, as new technologies are developed for the extraction of useful chemicals from biomass, and new value chains are established for those chemicals. As we look to reduce our dependence on fossil fuels in future, expect biorefining to become much more prevalent, and the presence of new plants worldwide is a testament to the potential of this sector.

It has also been a busy month for Brazilian company Braskem, with the announcement of two new products utilising the company's signature biobased plastic. Fellow Brazilians Tramontina have manufactured two chairs from Braskem's 100% biobased polyethylene, while US-based company Allbirds have become the first company to use Braskem's biobased ethylene vinyl acetate in a product. The latter product is a pair of flip flop sandals, claiming to be the "world's most comfortable shoes", a bold claim, but what is undeniable is the fact that the shoes are 100% biobased, and, in a relative first for such products, relatively affordable.

One of the biggest opportunities for the biobased products sector has always been plastic packaging, and among the most significant of the challenges therein has been to create a fully biobased plastic bottle, since hundreds of billions of such bottles are produced each year. This month Anellotech have announced a new milestone at their Texas plant, which produces the required biobased chemicals to manufacture 100% biobased paraxylene for plastic bottle production. The pilot plant trial for the process was a success, and now prototype bottles are in the pipeline. Major beverage companies will no doubt be keeping a keen eye on developments.

Our final story has a certain level of irony to it: the obvious effect of biobased products is to displace fossil-based counterparts, but in the meantime the fossil industry persists. The oil and gas industries require powerful industrial cleaning chemicals for equipment maintenance and oil recovery, and the Nanoterra Group has produced some cleaning agents that outperform their fossil-derived – and potentially hazardous – counterparts, and are 100% biobased to boot. There is something poetic about the fossil industry using biobased products – is it a sign of things to come? We certainly hope so.

Read on for the latest news.

Policy

BBIA refutes report into biobased plastic waste



Wikimedia Commons

BBIA has criticised Resourcing the Future's (RTF) report on plastics, 'Eliminating avoidable plastic waste by 2042: a use-based approach to decision and policy-making', for the misinformation on bioplastics contained in the report.

BBIA feels that the report contains a number of inaccuracies that mislead the public and are damaging to the bioplastics sector at a time of unprecedented interest in plastics waste. BBIA asks that the report be withdrawn, and a public correction issued.

BBIA has released a document responding to what it feels to be serious inaccuracies and inadequacies in the report.

Click [here](#) for more information.

US defines product categories for BioPreferred program

The U.S. Department of Agriculture (USDA) is amending the Guidelines for Designating Biobased Products for Federal Procurement to add 12 sections that designate product categories within which biobased products will be afforded Federal procurement preference by Federal agencies and their contractors.

The 2008 and 2014 Farm Bills directed USDA to expand the scope of the Guidelines to include the designation of product categories composed of intermediate ingredients and feedstock materials. Specifically, the 2008 Farm Bill stated that USDA shall "designate those intermediate ingredients and feedstocks that are or can be used to produce items that will be subject" to the Federal preferred procurement program. The term "intermediate ingredient and feedstock" is defined in the Farm Bill as "a material or compound made in whole or in significant part from biological products, including renewable agricultural materials (including plant, animal, and marine materials) or forestry materials, that are subsequently used to make a more complex compound or product." The term "intermediates" is used in the titles of the product categories being designated today to distinguish these categories from the finished, consumer products previously designated by USDA. Although the Federal government does not typically purchase large quantities of intermediate ingredients and feedstock materials, designating such materials represents a means to identify and include finished products made from such designated materials in the Federal preferred procurement program.

Click [here](#) for more information.

Markets

Avantium makes progress in first half of 2018



Avantium

Avantium N.V., a leading technology development company and forerunner in renewable chemistry, reports 12% growth in revenues in the first half of 2018, as strong demand for its Catalysis offerings continues. Milestones were achieved in Avantium's key Renewable Chemistries programs, Dawn Technology™ (Zambezi) and Mekong.

The Zambezi program was rebranded to Dawn Technology™, and the pilot biorefinery was opened on schedule with a subsidy of €1.8 million from the Province of Groningen. A consortium agreement was signed, bringing together partners committed to developing a commercial scale Dawn Technology™ biorefinery in Delfzijl, the Netherlands. Construction started on a Mekong bio-monoethylene glycol demonstration plant, which was awarded a €2.5 million grant by the European Innovation Council under the Horizon 2020 SME instrument. Net results improved to € - 6.5 million in the first half of 2018 (H1 2017: € -9.1 million).

Click [here](#) for more information.

BioAmber fails to find buyer

BioAmber Inc. has announced that the current stage of the Sales and Investor Solicitation Process (SISP) has concluded without an acceptable offer having been received from a Qualified Bidder as of the due date of July 27, 2018. The company will now seek to obtain court approval to pursue liquidation as well as alternative offers in order to realize the greatest value on behalf of its creditors.

Moving forward, subject to the approval of the court and with support from its monitor or receiver appointed by the court, the company intends to solicit liquidators to bid on the acquisition and disposal of the company's assets, including the Sarnia plant; continue to actively engage with Qualified Bidders and other interested parties to determine if, and under what terms, a transaction that would result in the continuation of the company's operations is still possible.

They estimate this process will be conducted over an approximate two-week period with a target conclusion date of August 14. The company will engage with Maynbridge Capital, its interim lender, and all other secured lenders to determine the best going-forward strategy.

Note that there can be no guarantee that the company will be successful in securing further financing or achieving its restructuring objectives. Failure by the company to achieve its financing and restructuring goals will likely result in the company and its subsidiaries being liquidated. Liquidation will almost certainly result in no residual value for non-secured creditors and equity investors.

Click [here](#) for more information.

Research & Development

How to identify promising biobased chemicals

Recent progress in metabolic engineering and synthetic biology enables the use of microorganisms for the production of chemicals ("bio-based chemicals"). However, it is still unclear which chemicals have the highest economic prospect. To this end, the authors develop a framework for the identification of such promising ones. Specifically, they first develop a genome-scale constraint-based metabolic modelling approach, which is used to identify a candidate pool of 209 chemicals (together with the estimated yield, productivity and residence time for each) from the intersection of the High-Production-Volume (HPV) chemicals and the KEGG and MetaCyc databases. Second, they design three screening criteria based on a chemical's profit margin, market volume and market size. The total process cost, including the downstream separation cost, is systematically incorporated into the evaluation. Third, given the three aforementioned criteria, they identify 32 products as economically promising if the maximum yields can be achieved, and 22 products if the maximum productivities can be achieved. The breakeven titre that renders zero profit margin for each product is also presented. Comparisons between extracellular and intracellular production, as well as *E. coli* and *S. cerevisiae* systems are also discussed. The proposed framework provides important guidance for future studies in the production of bio-based chemicals. It is also flexible in that the databases, yield estimations, and criteria can be modified to customize the screening.

Click [here](#) for more information.

Overview of lignocellulosic biorefinery sector

Lignocellulosic biorefining processes plant-derived biomass into a range of bio-based products. Currently, more than 40 lignocellulosic biorefineries are operating across Europe. Here, the authors address the challenges and future opportunities of this nascent industry by elucidating key elements of the biorefining sector, including feedstock sourcing, processing methods, and the bioproducts market.

Click [here](#) for more information.

Polymers

Anellotech closer to 100% biobased bottle

Sustainable technology company Anellotech recently achieved new milestones at its TCat-8® pilot plant in Texas, thereby progressing its 100% bio-based bottle collaboration with global consumer beverage company Suntory.

Anellotech's TCat-8® pilot plant is using Bio-TCat™ technology, an efficient thermal catalytic process which converts non-food biomass feedstock material into BTX aromatics, a group of renewable chemicals identical to their petro-based counterparts. The first shipment of BTX has now been sent to joint development partners IFPEN and Axens for purification studies to make bio-paraxylene – the key aromatic chemical needed to make 100% renewable beverage bottles a reality. Bio-paraxylene from TCat-8® will be used to make renewable PET resin for prototype bottle manufacture and product testing.

Since the announcement of a successful two-week continuous pilot plant trial in March 2018, over

1,200 hours of cumulative on-stream time have been achieved at TCat-8®, while BTX has been generated for product testing and evaluation and process development data collected for future commercial plant design. Anellotech also continues to produce other aromatic products through its Bio-TCat™ process, including benzene and toluene. These can be used to make a range of bio-based polymers such as nylon, polycarbonates, acrylonitrile butadiene styrene (ABS) and industrial chemicals such as LAB (linear alkyl benzene), which is used in laundry detergents.

Click [here](#) for more information.



Public Domain Pictures

Fully biobased thermoformable biocomposite developed

VTT has developed a thermally formable, biodegradable material, which is 100% bio-based. Its suitability for applications such as furniture makes it an attractive alternative to wood and biocomposite materials available in the market, not only because of its biodegradability but also due to its formability and colouring properties.

Biocomposites made from entirely bio-based raw materials can be used to replace fossil raw material derived plastics, which have traditionally been used in industrial applications. Being

thermoformable, the material is well suited for various manufacturing processes and products.

At the end of their life-cycle, products made from this material can either be re-used, composted, or burned to generate energy without any fossil-based carbon dioxide emissions. Because the material degrades into carbon dioxide and water due to microbial actions, it will not exacerbate the global microplastic problem.

The first model product is a designer chair manufactured as a joint effort between VTT, Plastec Finland and KO-HO Industrial design. The chair, manufactured using traditional compounding and injection moulding technologies, is made from wood-based cellulose fibres, renewable and industrially compostable, thermoformable polylactide, and bio-based additives.

VTT developed the material in the ACEL research programme funded by Clic Innovations Ltd., and the proof of concept stage was carried out with Plastec Finland, an injection moulding company.

Click [here](#) for more information.

ARLANXEO releases new TPVs

ARLANXEO, a global leader in performance elastomers, introduces its new thermoplastic vulcanisates (TPVs) that combine Keltan Eco ethylene propylene diene monomer rubber (EPDM) with green fillers, plasticizers and thermoplastics, resulting in EPDM products with up to 90% sustainable ingredients.

Keltan Eco is the world's first EPDM rubber manufactured using bio-based ethylene extracted from sugarcane. Depending on the ethylene content of each rubber grade, the proportion of bio-based material ranges between 50% and 70%.

After evaluating the potential of creating sustainable alternatives for traditional polyolefin

thermoplastics, plasticizer oils and (reinforcing) fillers, ARLANXEO now developed thermoset rubber compounds and thermoplastic vulcanisates based on Keltan Eco EPDM with the specific aim of maximizing sustainable content without compromising technical performance.

By combining Keltan Eco EPDM with green compounding ingredients the new EPDM compounds can also be used for dynamic and static automotive sealing applications with 85 to 90 weight percent of its composition having sustainable origin and a technical performance comparable to standard EPDM compounds.

Studies have shown that both the characteristics and technical performance of these Keltan Eco EPDM grades are identical to those of conventional EPDMs produced via Ziegler Natta catalysis and/or those from monomers based on crude oil.

Today, these new bio-based EPDM grades are commercially tested and used in applications, such as window profiles for busses and buildings, automotive extrusion profiles, O-rings, TPV over-mouldings for automotive interior, pharma applications, sport surfaces, and, most recently, in the sponge rubber layer directly underneath the outer cover of the official soccer ball of the Soccer World Cup 2018.

Click [here](#) for more information.

Chemicals

Biobased cleaning products for oil and gas industry



Wikimedia Commons

Nanotera Group has introduced higher quality, plant-based solutions to replace chemical and hazardous products in the oil & gas industry. Dedicated to protecting the environment, Nanotera now supplies powerful cleaning agents that perform at record times, hence reducing processing costs for oil companies. Their scientists focus on producing 100 percent plant-based, environmentally friendly cleaning products that are readily biodegradable. The range of products match or exceed the efficacy of traditional products which have a high impact on the companies' green footprint and the planet.

The products can be successfully applied in enhanced oil recovery, tank cleaning, equipment maintenance, oil herding, oil/water separation and rig maintenance. They clean by reducing the surface tension of the oil. By weakening the polar attraction of oil to the surface, they allow it to be rinsed from the surface and captured. The surfactants safely break down organic contaminants, oil and water emulsions and remediate hydrocarbons without polluting the treated product. Tests show powerful results in minimal time scales.

The new range of products are environmentally friendly and safe to use, economical and formulated to ensure employee health is protected whilst meeting all relevant government health specifications. It is a concentrated, non-toxic, non-flammable, fully biodegradable product designed for today's industrial environments.

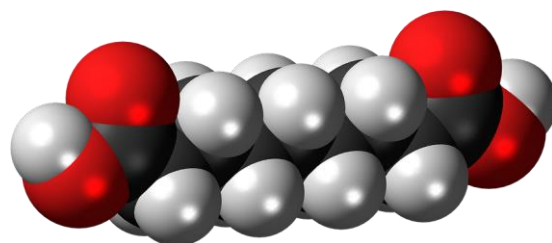
Click [here](#) for more information.

Identifying greener hydrocarbon solvents

A "top down" approach to the development of sustainable, greener, low-polarity solvents is presented. Methyl butyrate, ethyl isobutyrate, methyl pivalate and pinacolone were identified as potential target solvents from trends in Hansen solubility parameters and known physical properties. Solubility, flammability and physical properties were determined which showed their potential to replace traditional, hazardous, volatile, non-polar solvents such as toluene. Each new candidate then demonstrated their suitability to replace these traditional solvents in solubility tests, despite being esters and ketones, each candidate demonstrated their similarity to traditional volatile non-polar solvents in terms of their solubility properties by their ability to dissolve natural rubber, a particularly low-polarity solute. This was reinforced by their performance in a model Menschutkin reaction and a radical-initiated polymerisation for the production of pressure-sensitive adhesives, where their performance was found to be similar to that of toluene. Importantly, a preliminary toxicity test (Ames test) suggested non-mutagenicity in all candidates. Each of the four candidates can be synthesised via a catalytic route from potentially renewable resources, thus enhancing their green credentials.

Click [here](#) for more information.

Advances in biobased dicarboxylic acid production



Pixabay

Growing concerns of environmental pollution and fossil resource shortage are major driving forces for bio-based production of chemicals traditionally from petrochemical industry. Dicarboxylic acids (DCAs) are important platform chemicals with large market and wide applications, and here the recent advances in bio-based production of straight-chain DCAs longer than C4 from biological approaches, especially by synthetic biology, are reviewed. A couple of pathways were recently designed and demonstrated for producing DCAs, even those ranging from C5 to C15, by employing respective starting units, extending units, and appropriate enzymes. Furthermore, in order to achieve higher production of DCAs, enormous efforts were made in engineering microbial hosts that harboured the biosynthetic pathways and in improving properties of biocatalytic elements to enhance metabolic fluxes toward target DCAs. Here we summarize and discuss the current advantages and limitations of related pathways, and also provide perspectives on synthetic pathway design and optimization for hyper-production of DCAs.

Click [here](#) for more information.

First plant-based cannabinoid medicine licensed



Pixabay

GW Pharmaceuticals plc, a biopharmaceutical company focused on discovering, developing and commercializing novel therapeutics from its proprietary cannabinoid product platform, along with its U.S. subsidiary Greenwich Biosciences, has announced that the U.S. Food and Drug Administration (FDA) has approved EPIDIOLEX® (cannabidiol) oral solution for the treatment of seizures associated with Lennox-Gastaut syndrome (LGS) or Dravet syndrome in patients two years of age or older. EPIDIOLEX is the first prescription pharmaceutical formulation of highly-purified, plant-derived cannabidiol (CBD), a cannabinoid lacking the high associated with marijuana, and the first in a new category of anti-epileptic drugs (AEDs).

LGS and Dravet syndrome, which develop in childhood, are rare, severe forms of epilepsy that are notoriously treatment-resistant.^{1,2} Most patients with LGS and Dravet syndrome require multiple seizure medications and the majority are resistant to currently approved AEDs.^{2,3,4} The day-to-day impact of these conditions is significant with high rates of early mortality.^{5,6}

The EPIDIOLEX clinical development program included three randomized, controlled Phase 3 clinical trials and an open-label extension study. In the Phase 3 studies, published in *The New England Journal of Medicine*^{7,8} and *Lancet*⁹,

EPIDIOLEX added to other antiepileptic therapies significantly reduced the frequency of seizures in patients with LGS and Dravet syndrome. The most common adverse reactions that occurred in EPIDIOLEX-treated patients were somnolence; decreased appetite; diarrhoea; transaminase elevations; fatigue, malaise, and asthenia; rash; insomnia, sleep disorder and poor quality sleep; and infections. The company's development program represents the only well-controlled clinical evaluation of a cannabinoid medication for patients with LGS and Dravet syndrome.

Click [here](#) for more information.

Evaluating waste-based volatile fatty acids

Bio-based volatile fatty acid (VFA) production from waste-stream is getting attention due to increasing market demand and wide range usage area as well as its cost-effective and environmentally friendly approach. The aim of this paper is to give a comprehensive review of bio-based VFA production and recovery methods and to give an opinion on future research outlook. Effects of operation conditions including pH, temperature, retention time, type of substrate and mixed microbial cultures on VFA production and composition were reviewed. The recovery methods in terms of gas stripping with absorption, adsorption, solvent extraction, electrodialysis, reverse osmosis, nanofiltration, and membrane contractor of VFA were evaluated. Furthermore, strategies to enhance bio-based VFA production and recovery from waste streams, specifically, in-line VFA recovery and bioaugmentation which are currently not used in common practice, are seen as some of the approaches to enhance bio-based VFA production.

Click [here](#) for more information.

Oleon opens plant for biobased cosmetic building blocks



Pixabay

The oleochemical company Oleon from Ertvelde has built a new plant to produce biobased building blocks from sunflower oil for the cosmetic industry, lubricants and coatings.

The Ghent port zone (Ertvelde-Rieme) is home to the headquarters and production plant for the base products glycerine and fatty acids. There are also production units in Oelegem, Emmerich (Germany), Compiègne (France) and Port Klang (Malaysia). Oleon buys raw materials from all over the world and its end products are exported to more than 100 countries.

Dimerised fatty acids, among other things, will be made in the new plant which has a yearly production capacity of 14,000 tonnes. These acids serve in turn as building blocks for polyamides and polyesters which are used in automotive coatings and seawater-resistant coatings. Another product from this plant comprises high-grade branched fatty acids (isostearic acid). These remain in a liquid state down to extremely low temperatures and are therefore highly suitable as lubricants. What is more, their good air permeability makes these building blocks ideal for application in cosmetic creams and films that will feel light and scarcely greasy at all.

Click [here](#) for more information.

Attis to open first commercial biorefinery

Attis Industries Inc., a diversified innovation and technology holding company, has announced that it has executed a letter of intent with the city of Barnesville, Georgia, to purchase a 32-acre property where the Company plans to build its first commercial-scale biorefinery.

The Company's Barnesville facility will generate roughly \$35 million in annual revenue and contribute 40 direct green collar jobs to the local economy, with plans to increase to over 100 jobs within two years. The facility will be designed to process and convert 200 dry tons per day of biomass into a portfolio of biobased products, including pulp for paper products, sugar for renewable fuel production, melt-flowable lignin for use in plastics applications, and biobased chemicals for use in everyday products.

The Company's Barnesville facility will bring major advances to the traditional pulping industry in the South-eastern U.S. It will have the capacity to produce over 30,000 tons per year of pulp for sale into conventional pulp and paper markets, and as a feedstock for renewable fuel production. In addition, the Company will manufacture 20,000 tons per year of a unique, melt flowable form of lignin that makes an ideal candidate for use in various plastics applications such as injection-moulded parts, composite decking, siding, sheet and films. The Company's lignin can also be used as a direct replacement for fossil fuel-derived raw materials in adhesive applications. The yield and quality of the lignin polymer extracted by Attis surpasses all known commercial biomass processing capabilities, and essentially allows Attis to generate about 50% more revenue per ton of biomass processed than the technologies that preceded it. The new plant will also include finished product manufacturing for selected products.

Click [here](#) for more information.

Avantium to open biorefinery in Netherlands



Flickr

Avantium N.V., a leading technology development company and forerunner in renewable chemistry, has announced that it will officially open a pilot biorefinery for its Zambezi technology in Delfzijl, Netherlands.

Avantium develops novel technologies that use renewable carbon sources instead of fossil resources. The Delfzijl plant will pilot Avantium's latest technology to convert plant-based non-food feedstock to high purity industrial sugars and lignin. The industrial sugars are used in chemistry and fermentation processes to produce a broad range of durable materials, while lignin is used in energy generation.

The province of Groningen is supporting the pilot biorefinery with a RIG ('Regionale Investeringssteun Groningen') subsidy of €1.8 million.

Avantium previously announced it had founded a consortium to develop an ecosystem for the biorefinery technology. The consortium consists of AkzoNobel, RWE, Staatsbosbeheer and Chemport Europe, each of which brings specific expertise for the planned commercial-scale biorefinery.

Click [here](#) for more information.

Sappi to build Xylex demonstration plant

Sappi has announced further progress in the development of its biorefinery capacity with the confirmation that it will construct a demonstration plant to further scale up its novel Xylex® technology for the production of Xylitol and Furfural. The plant will be located adjacent to the existing sugars and lignin extraction plant at Ngodwana Mill. It should be operational early in 2019.

The combination of Sappi's operational excellence, the proposed co-location of the commercial plants at existing mill sites delivers strong integration synergies, and the cost advantages offered by Sappi's scale and the Xylex® technology mean that Sappi will have a globally competitive cost base for sugars and xylitol and furfural production.

Click [here](#) for more information.

Agreement between PETRONAS and Leaf for Malaysian biorefinery offtake

Leaf Resources Limited is pleased to announce that PETRONAS Chemicals Group Berhad and Leaf Malaysia have entered into a non-binding Memorandum of Understanding in relation to Leaf's proposed biorefinery project in Malaysia.

The MOU provides for, among other things, a study of chemical markets and commercially ready bio-technologies. Subject to satisfactory findings in the study and the approval of PCG, the parties may pursue an offtake agreement for the fermentable sugars produced at the proposed Leaf facility in Segamat Johor Malaysia on terms mutually agreed by the parties and consistent with global project finance standards.

Click [here](#) for more information.

Consumer Products

Biobased flip flop sandals



Pxhere

In line with its strategy to strengthen renewable chemicals, Braskem is launching a resin made from sugarcane. Designed for applications in industries such as footwear, automotive, transportation and others, the new product arrives to expand the company's I'm greenT portfolio, which already is known around the globe for its green polyethylene, the world's first biopolymer to be produced on an industrial scale.

Developed in partnership with San Francisco-based Allbirds, the brand is the first to use renewable bio-based EVA resin (ethylene vinyl acetate copolymer), which is a sustainable innovation from Braskem's I'm greenT brand that will be adopted in the new Sugar footwear line. Already on sale in the United States, New Zealand, Australia, and Canada, the new line combines comfort, design and sustainability.

Closely following the industry's competitiveness and needs to arrive at the new solution, Braskem made adaptations in its plant located in Triunfo, Brazil, to produce the renewable resin. With characteristics such as flexibility, lightness and

resistance, the resin helps to reduce greenhouse gases in the air by capturing and storing CO₂ during its production process.

Since it began to be produced, in 2010, Braskem's I'm greenT polyethylene made from sugarcane has captured the attention of companies around the world interested in adopting the solution. Today, the biobased polyethylene is used by over 150 brands in Europe, United States, Asia, Africa and South America.

Click [here](#) for more information.

Michelin targets 80% renewable tyres by 2048

Michelin has announced its ambitious plan to ensure that by 2048, all of its tyres will be manufactured using 80 percent sustainable materials and 100 percent of all tires will be recycled.

Today, the world-wide recovery rate for tires is 70 percent and the recycling rate is 50 percent. Michelin tires are currently made using 28 percent sustainable materials (26 percent bio-sourced materials like natural rubber, sunflower oil, limonene etc., and 2 percent recycled materials such as steel or recycled powdered tires). For a sustainable future, Michelin is investing in high technology recycling technologies to be able to increase this content to 80 percent sustainable materials

The route to this ambitious sustainable material target will be achieved by research programs into bio-sourced materials like Biobutterfly and working with Michelin's high-level partners, and the advanced technologies and materials that are being developed in these partnerships. The Biobutterfly program was launched in 2012 with Axens and IFP Energies Nouvelles to create synthetic elastomers from biomass such as wood, straw or beet.

Michelin is developing innovative solutions today in order to integrate more and more recycled and renewable materials in its tires, while continuing to improve performance, including 30 percent of recycled materials by 2048. This is demonstrated by the recent acquisition of Lehigh, a specialist in high technology micro powders which are derived from recycled tires.

In 2018, according to the World Business Council for Sustainable Development it is estimated that 1 billion of end of life tires are generated worldwide, representing around 25 million tons. Within this total, 70 percent of tires are recovered, and 50 percent are recycled every year on average. This 50 percent is the amount of recycled material, into products such as rubber used in sports surfaces, and the additional 20 percent is transformed into energy.

By comparison, 14 percent of plastic containers or packages are recovered each year, and the car industry has a target of 3.5 percent recycling rate.

Click [here](#) for more information.

Yorkshire Tea switching to biobased plastic



Pxhere

The plastic that Yorkshire Tea have been using to seal their tea bags is going to be replaced with a renewable plant-based material. The company are starting to switch over now, and the aim is that all their UK tea bags will have switched by the end of 2019.

The new tea bags will be renewable and biodegradable and will use a plant-based material for sealing. It doesn't have any effect on the tea's flavour or its shelf life and won't cost any more to buy.

The new tea bags will be compostable, too - though because the new material only biodegrades fully in industrial composting, the best way to dispose of them will be to pop them in your garden waste or food waste bin rather than home compost.

Customers might actually have already tried them, as Yorkshire Tea have had some on shop shelves since May as part of a first trial run.

Click [here](#) for more information.

Chairs from Braskem's biobased plastic released

Combining design sophistication with environmentally friendly practices is the proposal of the Jet and Paco chairs, a result of the partnership between Braskem and Tramontina. The products are made with the I'm GreenT Green Plastic, a sustainable innovation by the petrochemical company, being the first renewable polyethylene (PE) to be produced on an industrial scale in the world.

The green resin, made from ethylene obtained from sugarcane, has the same physical characteristics as those of conventional PE and can be fully utilized by the traditional recycling chain. Its main differentiator is the capture of 3.09 metric tons of CO₂ for each metric ton produced, thus contributing to reducing greenhouse gas emissions into the atmosphere. Additionally, the green polyethylene does not degrade, that is, what is captured remains fixed throughout the entire product life cycle.

With the same strength, durability and weight of chairs made from fossil plastic, the Jet and Paco lines feature Braskem's I'm GreenT seal, allowing consumers to recognize the products made with Green Plastic, produced in its plant located in Triunfo, Rio Grande do Sul (RS). The plant has a capacity to produce 200,000 metric tons of renewable resin per year.

To achieve this differentiator, the items produced must undergo a carbon-14 dating test, the same used to determine the age of fossil materials found across the world. This evaluation is carried out in New York, and to be approved, items are required to contain at least 51% of renewable material.

Click [here](#) for more information.

Elopak produces 1 billion 100% renewable cartons

Elopak is the first manufacturer to deliver over one billion 100% renewable cartons after launching beverage cartons featuring certified renewable polyethylene (PE) in 2014.

Elopak's cartons, offered with renewable PE, help ensuring resources for future generations. In addition, using a renewable feedstock instead of a fossil one, significantly reduces the carbon footprint of the cartons.

In 2017, the Elopak further improved its renewable offering by introducing new feedstocks for renewable PE. The company chose to change supplier base to widen its offering of renewable PE and now offers two different sources. One is derived from sugar cane, the other is based on tall oil, a residue from pulp and paper production.

Click [here](#) for more information.

Patents

Cellulose Platelet Compositions, Methods of Preparing Cellulose Platelet Compositions and Products Comprising Same

A composition and method of preparing a composition is presented wherein the composition comprises cellulose platelets and the cellulose platelets comprise at least 60% cellulose by dry weight, less than 10% pectin by dry weight and at least 5% hemicellulose by dry weight. The composition can be concentrated to at least 25% by weight solids content by pressing under low pressure, whilst retaining the ability to be re suspended within an aqueous medium. The resulting aqueous medium obtains the desired properties of the composition, such as increased viscosity or increased dispersion of pigment particles, for example, to the same extent as the composition before pressing.

Click [here](#) for more information.

Biodegradable polyols having higher biobased content

The present invention is directed to biodegradable polyester polyol polymers having high bio-based content and methods for producing biodegradable polyester polyol polymers having high bio-based content. In preferred embodiments, β -lactone monomers may be produced from epoxide and carbon monoxide having high bio-based content. In certain preferred embodiment, the β -lactone is β -propiolactone produced from ethylene oxide and carbon monoxide. In certain embodiments, β -lactones may be polymerized with diols, triols, and polyols to form the biodegradable polyester polyol polymers having high bio-based content. In

some embodiments, the biodegradable polyester polyol polymers having high bio-based content may be terpolymers formed from a first β -lactone, a diol, triol, or polyol, and a second β -lactone. In some other embodiments, the biodegradable polyester polyol polymers having high bio-based content may be copolymers formed from a polylactone oligomer and a diol, triol, or polyol.

Click [here](#) for more information.

Biodegradable sanitary articles with higher biobased content

The present invention is directed to sanitary articles such as disposable diapers, adult incontinent pads, feminine hygiene products, and sanitary napkins comprised of biodegradable polymers with higher biobased content. The sanitary articles include a topsheet, an absorbent core, and a backsheet. The topsheet is comprised of biodegradable polyester polyol polymer foam which may be configured to wick liquid away from a wearers body and may be impregnated with superabsorbent polymer. The absorbent core may be comprised of superabsorbent polymer including a cross-linked and/or partially neutralized polyacrylic acid polymer, cross-linked polyacrylic acids or cross-linked starch acrylic acid graft polymers. The backsheet may be comprised of poly-lactone polymers having generally hydrophobic characteristics. In preferred embodiments, the polymeric materials comprising the topsheet, absorbent core, and backsheet are formed from raw materials with high biobased content.

Click [here](#) for more information.

Events

1st PHA Platform World Congress Köln, 4th-5th September 2018

This PHA-platform is made up of a large variety of bioplastics raw materials made from many different renewable resources. Depending on the type of PHA, they can be used for applications in films and rigid packaging, biomedical applications, automotive, consumer electronics, appliances, toys, glues, adhesives, paints, coatings, fibres for woven and non-woven and inks. So PHAs cover a broad range of properties and applications.

This congress will address the progress, challenges and market opportunities for the formation of this new polymer platform in the world. Every step in the value chain will be addressed. Raw materials, polymer manufacturing, compounding, polymer processing, applications, opportunities and after-use or end-of-life options will be discussed by parties active in each of these areas. Progress in underlying technology challenges will also be addressed.

Click [here](#) for more information.

Biomass for Industrial Applications Amsterdam, 26th-27th September 2018

The VDI conference Biomass for Industrial Applications focuses on the industrial utilization of biomass. The presentations consider both the energy-related as well as the material usage of biomass. Discuss the newest technical, economic and political developments in the industry with leading experts and find out what's in store for the biomass market in the future. This knowledge will help you to make the right strategic decisions for your company and to clear the way of implementation barriers.

Click [here](#) for more information.

International conference on bioinspired and biobased chemistry & materials Nice, 14th-17th October 2018

The scientific and international N.I.C.E (Nature Inspires Chemistry Engineers) Conferences are organized with the objective to share new developments in the growing field of bioinspired chemistry and materials and to understand new challenges that are being faced in this field of research.

The NICE conference encompasses chemistry, biology and physics and gives a multi-disciplinary overview of biomimetic approaches to engineering new materials and systems.

Click [here](#) for more information.

EFIB 2018

Toulouse, 16th-18th October 2018

Join over 650 bio-based leaders in 2018 for the 11th edition of EFIB in Toulouse, France, on the 16th, 17th and 18th of October.

Click [here](#) for more information.

International Conference on Green Chemistry and Technology

Edinburgh, 12th-13th November 2018

EuroSciCon invites all the participants from all over the world to attend "21st Edition of International Conference on Green Chemistry and Technology" during November 12-13, 2018 at Edinburgh, Scotland which includes prompt keynote presentations, Oral talks, Poster presentations, Workshops and Exhibitions.

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.

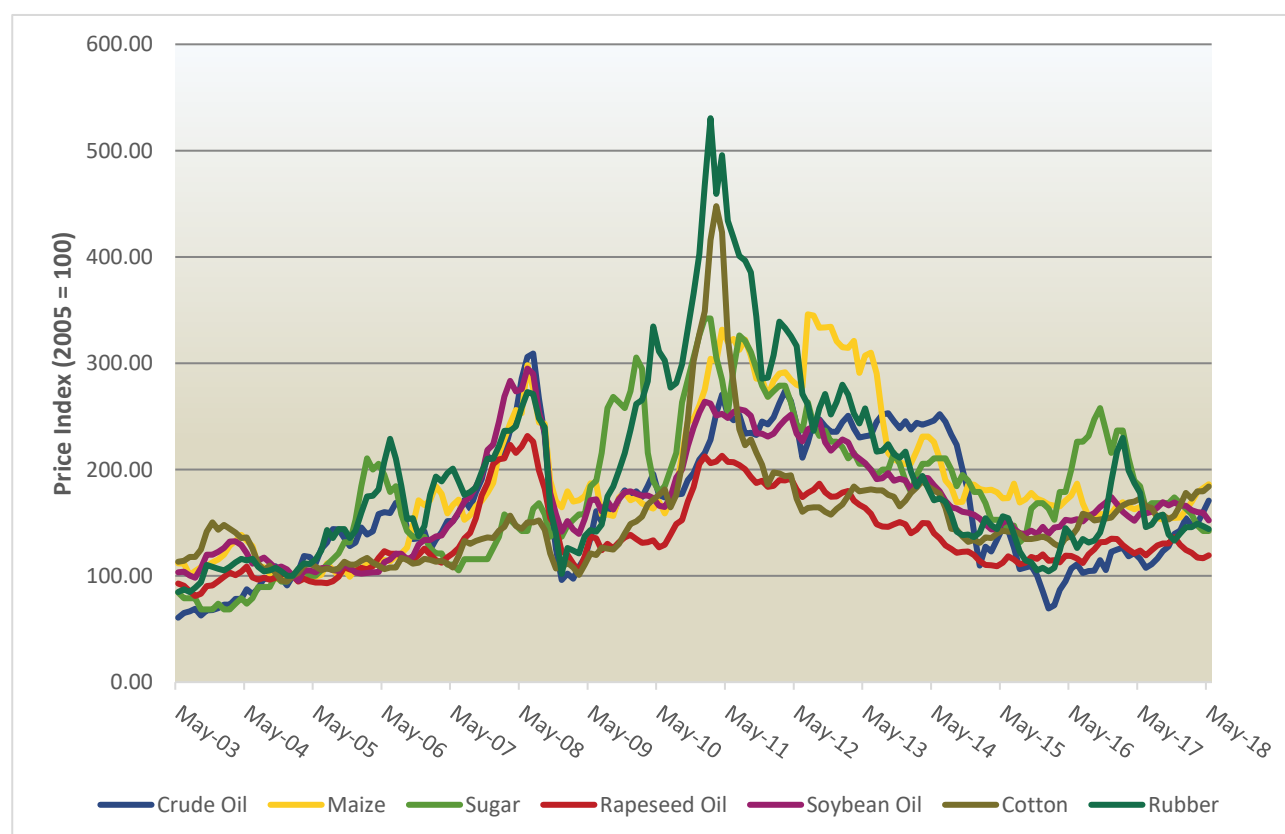
Price Information

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)	99.74 (↑)	73.43 (↑)	-26%
Maize (corn, metric ton)	298.41 (↑)	179.09 (↑)	-40%
Sugar (kilogram)	0.38 (↓)	0.27(→)	-29%
Rapeseed oil (metric ton)	1,078.00 (↓)	812.00 (↑)	-25%
Soybean oil (metric ton)	1,041.00 (↓)	793.00 (↓)	-24%
Cotton (kilogram)	2.05 (↑)	2.08 (↑)	+1%
Rubber (kilogram)	2.81 (↓)	1.70 (↓)	-40%

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 NNFFCC.

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