

# BIOBASED PRODUCTS

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

*October 2021*



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## Foreword

Welcome readers, to this month's Biobased Products News Review.

The UK's Competition and Markets Authority (CMA) is introducing its new "Green Claims Code", which outlines six requirements a business should follow when making claims on their products' sustainability. According to the Code, businesses should ensure that their claims are truthful and accurate; that they are clear and unambiguous; that they do not omit or hide any information; that they make fair and meaningful comparisons; that the claims are substantiated; and that they consider the whole lifecycle of a product. This new guidance intends to ensure that businesses' green claims are not misleading to consumers in any way, therefore protection consumers and businesses' reputation, and encouraging businesses to invest in "green" practices.

Such new legislations may very well have a significant positive impact on consumers' willingness to buy green products, as demonstrated by a research study in Italy published in the International Journal of Production Economics. The study showed that as demand for biobased products rises, the presence of clear product certifications leads to consumers increasingly buying such products instead of their conventional alternatives. The study concludes that "the diffusion of certified biobased products may therefore prove effective for overcoming economic challenges related to the implementation of the circular bioeconomy", and points out that "social involvement" will be instrumental in making a certification scheme work.

There is also increasing evidence that educating consumers and providing them with a better ability to see "the bigger picture" in terms of sustainability, carbon emissions and fossil resources for example, leads to them being more likely to purchase biobased products. A recent study published in the Journal of Behavioral and Experimental Economics showed that inducing a process of systems thinking in consumers (by making them list as many consequences of their consumption behaviour as possible) resulted in a shift towards them having a stronger intention to buy biobased products. This provides further evidence that integrating a social aspect to the development of the bioeconomy is crucial for its success.

Read on for the latest news.

## Policy

### Guidance Environmental claims on goods and services



*Pixabay*

Consumers are increasingly demanding products and services which minimise harm to, or have a positive effect on, the environment. As a result, there has been a proliferation of products, services and businesses which claim to meet that demand.

Consumer protection law does not prevent businesses from making environmental claims about their products and services, provided they do not mislead consumers. It provides a framework for businesses to make environmental claims that help consumers make informed choices. Consumer protection law therefore gives consumers important protection in relation to environmental claims.

In protecting consumers from misleading environmental claims, consumer protection law also protects businesses from unfair competition. It creates a level playing field for those businesses whose products genuinely represent a better choice for the environment and who can make truthful environmental claims. In addition, there is separate legislation which directly protects businesses from misleading marketing.

The law also therefore has the effect of encouraging businesses to invest in the environmental performance of their products. It enables businesses to communicate these genuine efforts to consumers transparently and to reap the commercial benefits.

Click [here](#) for more information.

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## Markets

### INCA Renewtech partners with Genesis Products to produce bio-panels for RVs and trucks

INCA Renewable Technologies announced the company has secured the land to build a large-scale manufacturing facility in Elkhart County, Indiana that will process thousands of tonnes of hemp fibre into high performance bio-composite panels and pellets for the transportation, consumer plastics and building materials industries.

INCA also announced an exclusive sales agreement with Genesis Products, which provides design and engineering, advanced materials expertise and manufacturing facilities to Fortune 200 companies in the RV, building materials, transportation and furniture industries.

INCA BioPanels will have application in the furniture and flooring industries, as well as Hollywood movie sets. The company is also developing proprietary formulations for the automotive and consumer plastics industries.

Click [here](#) for more information.

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## NatureWorks to build PLA plant in Thailand



*Pixabay*

Continuing its global manufacturing expansion plan, NatureWorks, the world's leading manufacturer of low-carbon polylactic acid (PLA) biopolymers made from renewable resources, has obtained final authorization from parent companies, GC International Corporation Company Limited, a subsidiary of PTT Global Chemical Public Company Limited (GC) and Cargill Incorporated (Cargill), to build a new Ingeo™ PLA manufacturing complex in Thailand.

NatureWorks plans to invest in excess of \$600 million to construct the complex, which will include production sites for lactic acid, lactide, and polymer, making it the world's first PLA facility designed to be fully integrated.

Click [here](#) for more information.

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## ADM and LG Chem expand relationship

LG Chem, a leading global diversified chemical company, and ADM, a global leader in nutrition and biosolutions, announced that they have signed a memorandum of understanding (MoU) to explore US-based production of lactic acid to meet growing demand for a wide variety of plant-based products, including bioplastics.

Under the terms of the agreement, which was signed by ADM Chairman and CEO Juan Luciano and LG Chem Vice Chairman and CEO Hak Cheol Shin at ADM's global headquarters in Chicago, the two companies plan to take steps toward launching a joint venture in early 2022 that would build, own and operate a US-based facility to produce high-purity corn-based lactic acid on a commercial scale.

According to Grand View Research, global demand for lactic acid – which is used broadly in food, feed and cosmetics in addition to industrials like bioplastics – was valued at approximately USD 2.7 billion in 2020, with an expected annual growth rate of 8 percent.

In addition, the companies will collaborate on a second joint venture that would use lactic acid produced by the first joint venture to produce and commercialize polylactic acid (PLA), a plant-based, biodegradable plastic that can be used in a wide array of products, from food packaging to clothing to upholstery.

Click [here](#) for more information.

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## Total Corbion PLA marks 100kT Luminy PLA production milestone

Total Corbion PLA's plant in Rayong Thailand has, since its grand opening in 2019, earlier this summer reached a cumulative production volume of 100kT of Luminy® PLA. The plant is now running at name plate capacity of 75kT annually in order to meet the ever-growing demand for PLA bioplastics.

Luminy® PLA resins are biobased and made from annually renewable resources, offering a reduced carbon footprint versus many traditional plastics. At the end of their useful life, PLA products can be mechanically or chemically recycled. The biodegradable and compostable functionalities of PLA make it the material of choice for a wide range of markets and applications, including fresh fruit packaging, food serviceware, durable consumer goods, toys and 3D printing.

Luminy® PLA can be a more sustainable alternative to established oil-based plastics that might not have as many end-of-life avenues available to them and many producers are making the switch to bioplastics for this reason.

Total Corbion PLA opened their first PLA plant, with 75kTpa capacity, in Rayong, Thailand in 2019. Since that time, they have also announced their intention to build a second PLA plant with 100kTpa capacity in Grandpuits, France which will be the first of its kind in Europe.

Click [here](#) for more information.

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## Novolex acquires Vegware



*Pixabay*

Novolex®, a leader in packaging choice, innovation and sustainability, has acquired Vegware, a rapidly growing international provider of compostable foodservice packaging headquartered in Edinburgh, U.K. Vegware's teams in both the U.K. and U.S. are expected to join the Novolex family.

Vegware was founded in Edinburgh in 2006 by Joe Frankel. Headquartered in Scotland, it has operations in the U.K., EU and the United States. The company sources renewable, plant-based materials to manufacture cups, cutlery, tableware and takeout packaging designed to be commercially composted with food waste. Sold in more than 70 countries, Vegware products are known for their quality, performance and design.

The addition of Vegware products will complement Eco-Products' own product line that is made of renewable materials that can often be recycled and/or composted. This partnership will broaden Eco-Products' presence in Europe and give Vegware additional access to the North American market.

Click [here](#) for more information.

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## EU-BAT compliance confirmed for all Sateri viscose fibre mills



*Pixabay*

All of Sateri's five viscose mills in China are now fully compliant with the emission limits set out in the European Union Best Available Techniques Reference Document (EU-BAT BREF) on Polymers, following recent verification of Sateri Jiangsu and Sateri China mills.

Verified by independent consultant Sustainable Textile Solutions (STS), a division of BluWin Limited (UK), the parameters assessed included resource utility efficiency, wastewater discharge and air emission.

Click [here](#) for more information.

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## Research & Development

### Consumer willingness to pay for bio-based products: Do certifications matter?

European Commission aims to promote a more efficient and harmonized policy regulation framework for the market-pull of bio-based products.

We conduct an artefactual field experiment in Italy, that demonstrates the existence of a "green premium", which refers to increased consumer willingness to pay (WTP) for bio-based over conventional products, and a "certified green premium", which refers to an additional increase in consumer WTP for certified bio-based products over and above other bio-based products.

This experiment measures consumer preference through an incentive compatible procedure using 1080 observations. Moreover, we show that, across different product typologies (i.e. hand soap, food bags, colored pens), demand for conventional products is generally more elastic than demand for bio-based and certified bio-based products.

Our evidence underlines that certification may play a key role in purchase decision making, especially for products in the food and nutrition and personal care categories. The diffusion of certified bio-based products may therefore prove effective for overcoming economic challenges related to the implementation of the circular bioeconomy.

Click [here](#) for more information.

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## Systems thinking and the adoption of bio-based consumer products



*Pixabay*

Systems thinking (ST) represents an important cognitive paradigm for the transition towards a circular bio-economy, as greater awareness of the environmental impact of fossil-based products may lead to a switch to sustainable alternatives produced from secondary biomass which is not used as feed or food. However, the relationship between ST and the adoption of bio-based products, as well as the general mechanism of how ST affects environmental behavior, is not yet well-understood.

The present study therefore aims to close these research gaps by conducting a survey-based experiment with a ST-motivated treatment, in which participants are asked to list as many consequences of their consumption behavior as possible (N=446 US consumers).

Our findings suggest that the treatment is able to slightly activate a ST perspective, along with indirectly affecting consumer intentions to buy bio-based products by means of ST.

Click [here](#) for more information.

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## Bio-based materials for nonwovens

The nonwoven industry is one of the most innovative and important branches of the global fiber products industry. However, the use of petrochemical-based materials in many nonwoven products leads to severe environmental issues such as generation of microplastics. Synthetic material use in nonwovens is currently around 66%.

This review covers potential technologies for the use of bio-based materials in nonwoven products. The current generation of nonwoven products relies heavily on the use of synthetic binders and fibers. These materials allow for products with high functional properties, such as permanence, strength, bulk, and haptic properties. The next generation of nonwoven products will have a higher fraction of natural and renewable materials as both binders and fiber elements.

There are a wide range of materials under investigation in various nonwoven product categories. Especially, lignocellulosic materials are of interest. This includes traditional pulp fibers, regenerated cellulose fibers, lignin binders and nanomaterials derived from wood. The development of water stable, strong interfiber bonding concepts is one of the main problems to be solved for advancing bio-based nonwoven products.

Click [here](#) for more information.

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## **Kenaf fibres reinforced unsaturated polyester composites: A review**

Recently development of high-performance polymer composites made from natural resources in the various sectors is increasing tremendously due to the environmental issues and health hazard possessed by the synthetic fibers during disposal and manufacturing.

Among the many different types of natural resources, kenaf fibers have been extensively investigated as an alternative reinforcement for polymer composites over the past few years due to their low cost, good mechanical properties, high specific strength, nonabrasive, eco-friendly, and biodegradability characteristics.

Kenaf is regarded as an industrial crop in Malaysia and grown commercially in other parts of the world for different applications. It is certainly one of the important plants cultivated for natural fibers globally which has great potential to use as automotive and construction materials.

In many research studies, kenaf fibers have been used as reinforcement in unsaturated polyester (UPE) which perfectly improved the features of the polyester resin. The tensile properties of kenaf fiber reinforced UPE are mainly influenced by the interfacial adhesion between the fibers and the polyester resin. Several chemical modifications are employed to improve the interfacial bonding between kenaf fibers and polyester, resulting in the enhancement of mechanical properties of the composites.

Click [here](#) for more information.

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## **Half-life of biodegradable plastics in the marine environment depends on material, habitat, and climate zone**



*Pixabay*

The performance of the biodegradable plastic materials polyhydroxybutyrate (PHB), polybutylene sebacate (PBSe) and polybutylene sebacate co-terephthalate (PBSeT), and of polyethylene (LDPE) was assessed under marine environmental conditions in a three-tier approach.

Biodegradation lab tests (20°C) were complemented by mesocosm tests (20°C) with natural sand and seawater and by field tests in the warm-temperate Mediterranean Sea (12–30°C) and in tropical Southeast Asia (29°C) in three typical coastal scenarios. Plastic film samples were exposed in the eulittoral beach, the pelagic open water and the benthic seafloor and their disintegration monitored over time. We used statistical modelling to predict the half-life for each of the materials under the different environmental conditions to render the experimental results numerically comparable across all experimental conditions applied.

The biodegradation performance of the materials differed by orders of magnitude depending on climate, habitat and material and revealed the impreciseness to generically term a material "marine biodegradable." The half-life  $t_{0.5}$  of a film of PHB with 85  $\mu\text{m}$

thickness ranged from 54 days on the seafloor in SE Asia to 1,247 days in mesocosm pelagic tests. t0.5 for PBSe (25  $\mu$  m) ranged from 99 days in benthic SE Asia to 2,614 days in mesocosm benthic tests, and for PBSeT t0.5 ranged from 147 days in the mesocosm eulittoral to 797 days in Mediterranean benthic field tests. For LDPE no biodegradation could be observed.

Click [here](#) for more information.

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## Polymers

### Danimer Scientific to acquire biodegradable polymer producer Novomer

Danimer Scientific, Inc., a leading next generation bioplastics company focused on the development and production of biodegradable materials, has announced that it has signed a definitive agreement to acquire Novomer, Inc., a leading developer of conversion technology providing transformable, functional, and low net carbon inputs into the production of PHA-based resins and other biodegradable materials, in a cash transaction valued at \$152 million. Each company's Board of Directors has approved the transaction.

Danimer believes that Novomer's p(3HP) is highly complementary with Danimer's inputs, and can be incorporated as a component in certain Danimer resins. Nodax®, Danimer's signature PHA, and Novomer's p(3HP) have different properties and attributes: Nodax® has strong performance and biodegradability properties, making it possible to be used across diverse end-use applications, while p(3HP) has improved barrier properties and is a lower cost non-fermented input. By incorporating Novomer's p(3HP) into

Danimer's customer solutions, Danimer expects to have greater flexibility to meet an even broader range of customer needs, and also expects to be able to produce its resins at a substantially lower cost.

Click [here](#) for more information.

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### WinCup's phade® straw biodegrades in a controlled marine environment in just 58 days



*Pixabay*

New WinCup Holdings, Inc. has released a time-lapse video and an accompanying report showing the rapid biodegradation of its phade® straw in a controlled marine environment. phade® is the world's first marine biodegradable drinking straw.

The video and report are the result of a project conducted by Keypoint Intelligence, a product testing firm, that involved placing phade® in two unique saltwater tank environments and monitoring the biodegradation process. While petroleum-based plastic straws are estimated to take at least 200 years to biodegrade, this project showed that phade® achieved complete biodegradation in just 58 days.

Click [here](#) for more information.

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## New generation of biobased polyesters for durable products

To enable the introduction of biobased polyesters into the high-performance applications sector, such as automotive and electronics, Wageningen Food & Biobased Research is developing a new generation of Biobased polymers using the Isoidide molecule.

Using Archer Daniels Midland's rigid starch-based molecule called ISOIDIDE, the company is developing a new generation of polymer materials that can be used not only in BPA(Bisphenol A)-free packaging but also in engineering applications such as automotive and electronics.

These biobased, yet strong and thermally resistant materials, show great versatility, which will be demonstrated by project partners of Wageningen Food & Biobased Research: Refresco is interested to explore the potential of HIPSTAR materials for bottles, Beckers will use them as metal coatings, while HollandColours will use them in their colorants formulations. Working together with important industrial partners is the best way to develop polymers that meet the requirements and standards of the market.

Click [here](#) for more information.

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## lululemon partners with leading sustainable materials innovator Genomatica



*Pixabay*

lululemon athletica inc. has announced a multi-year collaboration with sustainable materials leader Genomatica to bring renewably-sourced, bio-based materials into lululemon's products. This represents lululemon's first-ever equity investment in a sustainable materials company and Genomatica's largest partnership within the retail industry. Together, the two companies will create a lower-impact, plant-based nylon to replace conventional nylon, which is the largest volume of synthetic material currently used to make lululemon products.

Genomatica uses biotechnology and fermentation to convert plant-based ingredients into widely used chemical building blocks, like those used to make nylon. These building blocks are converted to pellets and yarns, and the companies will be working closely with lululemon's fabric supply chain to incorporate this material into future products.

Click [here](#) for more information.

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## Capacity expansion and new MD as Futamura celebrates five year anniversary

Futamura UK, Wigton, has announced investment plans for an additional casting machine to expand capacity in their thriving cellulose films business. The investment plans come as Futamura celebrates its five-year anniversary since acquiring the cellulose films business in July 2016.

Futamura has enjoyed year-on-year sales growth, due to rising demand for their renewable and compostable NatureFlex films. The machine build will commence in Q3.

Click [here](#) for more information.

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## Pangaia introduce PLNTFIBER™ & FRUTFIBER™



*Pixabay*

Pangaia is diversifying its range of bio-based materials to help address the problems linked to the world's over-reliance on cotton. The company has developed two fabrics that look and feel like cotton, with zero cotton used. FRUTFIBER™ repurposes food waste, turning banana leaf fiber, pineapple leaf fiber and bamboo into a new, innovative fabric. PLNTFIBER™ uses renewable, fast-growing

plants such as Himalayan nettle, bamboo, eucalyptus and seaweed.

While Cotton fibres have many useful properties and applications, the world's over-reliance on traditionally sourced cotton is problematic. Traditional methods of Cotton cultivation and processing are water-intensive and many cultivators rely on pesticides and fertilisers to improve their yields, which damages local biodiversity and soil health. Relying on one singular resource also encourages the practice of monocropping. Monoculture plantations (monocropping) weaken the soil, deplete soil nutrients and reduce local biodiversity..

Plant fibers are renewable and inherently biodegradable. By using production waste from the fruit industry that would otherwise be discarded (the leaves), as well as abundant and fast-growing plants, the company not only helps by offering alternative solutions to traditional cotton but also contributes to the restoration of the soils that sequester carbon.

Click [here](#) for more information.

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## AGM launches a range of eco-friendly graphene dispersions

AGM has launched a ground-breaking new range of eco-friendly graphene nanoplatelet dispersions that will enable paints, coatings and composite materials customers to improve the sustainability of their product formulations in response to growing market pressures.

Materials suppliers are being driven to invest in biobased innovation as customers and their end consumers become increasingly aware of the safety and environmental impact of the raw materials they use. Growing pressure to comply with stringent health and safety

legislation and demonstrate a reduced environmental impact is forcing manufacturers to progressively introduce bioderived alternatives to traditional chemicals.

AGM's Genable® 1700 series of eco-friendly graphene nanoplatelet dispersions are based on the Company's well-established Genable® graphene dispersion technology, which is already proven to deliver significant performance uplifts such as chemical resistance, barrier and anti-corrosion properties.

Click [here](#) for more information.

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### **World Centric® expands NoTree® packaging collection with 17 New 100% tree-free products**

World Centric® has announced that it has expanded its NoTree® collection of 100% tree-free, bio-based and compostable packaging with seventeen new products. Now available across North America, the expanded range provides more sustainable alternatives to traditional disposable foodservice ware for operators.

As with all items in the NoTree collection, the new product additions are made of renewable plant fibers like bamboo and sugarcane with bio-based moisture barrier linings instead of petroleum plastic. They are also heat lamp tolerant, warming oven friendly, and are suitable for hot or cold foods. All NoTree items are 100% compostable in commercial composting facilities.

Click [here](#) for more information.

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### **The world's first fossil-free steel ready for delivery**



*Pixabay*

In July, SSAB Oxelösund rolled the first steel produced using HYBRIT technology, i.e., reduced by 100% fossil-free hydrogen instead of coal and coke, with good results. The steel is now being delivered to the first customer, the Volvo Group.

SSAB, LKAB and Vattenfall created HYBRIT, Hydrogen Breakthrough Ironmaking Technology, in 2016, with the aim of developing a technology for fossil-free iron- and steelmaking. In June 2021, the three companies were able to showcase the world's first hydrogen-reduced sponge iron produced at HYBRIT's pilot plant in Luleå. This first sponge iron has since been used to produce the first steel made with this breakthrough technology.

The goal is to deliver fossil-free steel to the market and demonstrate the technology on an industrial scale as early as 2026. Using HYBRIT technology, SSAB has the potential to reduce Sweden's total carbon dioxide emissions by approximately 10% and Finland's by approximately 7%.

Click [here](#) for more information.

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## Twelve and LanzaTech partner to produce the world's first polypropylene from CO<sub>2</sub>

Carbon transformation company Twelve and biotechnology company LanzaTech have partnered to transform CO<sub>2</sub> emissions into polypropylene, a key polymer used for medical devices including syringes and IV bags, as well as for large-scale applications in automotive, furniture, textiles and other everyday products.

Twelve's carbon transformation technology converts CO<sub>2</sub> into materials that are traditionally made from fossil fuels. The company helps brands eliminate emissions by replacing the petrochemicals in their products and supply chains with CO<sub>2</sub>Made® carbon negative chemicals and materials, as well as carbon neutral fuels.

LanzaTech's carbon recycling Pollution To Products™ technology uses nature-based solutions to produce ethanol and other materials from waste carbon sources. The partnership will bring together the two platform technologies to enable additional product development from CO<sub>2</sub> streams, representing just one of many pathways to scale carbon transformation solutions.

Click [here](#) for more information.

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## Carbiolice announces the "OK Compost HOME" certification of Evanesto®



*Pixabay*

Carbiolice has developed an enzymatic additive which, when added during traditional transformation processes, makes PLA compostable under domestic conditions.

In November 2020, Carbiolice had validated a first step by receiving the "OK compost HOME" certification by the TÜV AUSTRIA Group, for flexible plastic packaging (single-layer films with a maximum thickness of 60  $\mu$  m and multi-layer films with a maximum thickness of 30  $\mu$  m), containing 33% PLA, 62% PBAT and incorporating 5% Evanesto®.

Carbiolice now obtains a new "OK Compost HOME" certification, this time for thicker packaging (up to 450  $\mu$  m in monolayers), and with a higher PLA content (70%). This new milestone allows everyday packaging (yoghurt pots, trays, cups, but also horticultural pots, etc.) to obtain the "OK Compost HOME" certification. The close collaboration between TÜV AUSTRIA and Carbiolice will enable packaging manufacturers to facilitate their own certification process when their products contain Evanesto®.

Click [here](#) for more information.

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## **INZEA® PLA: bio-based plastic performs well in processing test**

At its Customer Center in Lossburg, Germany, ARBURG regularly carries out processing tests on bio-based plastics, including the INZEA® product family distributed by Biesterfeld. The world-leading manufacturer of injection moulding machines found that the compostable PLA biopolymer compound can be used to produce high-quality parts with high process reliability and without the need for additional machine equipment. This makes INZEA® an excellent alternative to fossil-based materials.

INZEA® is a bio-based and fully biodegradable and compostable polymer in accordance with EN 13432. The product family is based on polylactic acid from renewable and non-genetically modified sources, which does not compete with the food chain. Some types also contain a proportion of starch. INZEA® is suitable for injection moulding, extrusion and thermoforming.

The product family can be used in a wide range of applications. It is suitable for food contact in accordance with Regulation (EU) 10/2011, particularly in the household segment, catering, packaging and agriculture. Typical applications for INZEA® include plastic bags, coffee capsules, bottles and boxes. The product family can also be used in many other short-lifespan applications as well as in 3D printing.

Click [here](#) for more information.

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## **PACCOR to start bio-pp products for Orkla**



*Pixabay*

PACCOR, a leading global player in the packaging industry, is ready to produce 100% biobased polypropylene (Bio-PP) products for its customer Orkla, a leading supplier of branded consumer goods to the grocery, out-of-home, specialized retail, pharmacy, and bakery sectors in the Nordics. In alignment with PACCOR's CARE strategy the company managed to improve and accelerate decarbonization efforts along the value chain.

PACCOR started the testing with the 100% Bio-PP together with Orkla in its Finnish production site in Hämeenlinna. The material is composed from renewable resources and follows the ISCC certified mass balance principle – a chemical industry standard for managing and tracing sustainability characteristics of circular and/or bio-based materials in a complex value chain. In addition to the site in Finland, the PACCOR production site in Ravensburg, Germany, also has ISCC certification.

Click [here](#) for more information.

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## Chemicals

### Huue and Ginkgo Bioworks partner to accelerate production of sustainable dyes



*Pixabay*

Ginkgo Bioworks, Inc., which is building the leading horizontal platform for cell programming, have announced a new cell program in partnership with Huue, a biotech startup that's pioneering sustainable bio-based dyes for the fashion industry and beyond.

Ginkgo, which recently announced a business combination with Soaring Eagle Acquisition Corp., serves customers across industries seeking to develop new and better products using biology. Huue will leverage Ginkgo's platform to optimize microbe strains to accelerate production of its sustainable indigo dye, pioneering new models for product-focused startups to collaborate with Ginkgo.

Indigo is the dye responsible for giving denim its iconic blue. However, manufacturing the dye that powers the billion pairs of jeans produced annually is responsible for over 1.4 million metric tons of CO<sub>2</sub> and utilizes toxic chemicals including benzene, formaldehyde, and sodamide.

Using its proprietary biosynthetic dye-making process, Huue produces indigo that's just as effective as conventional solutions — without the environmental impact and harmful chemicals. By leveraging Ginkgo's microbial engineering platform and its strain optimization capabilities, Huue expects to accelerate the production of its dyes for its first partners in 2021 and 2022.

Click [here](#) for more information.

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### Helsinki introduces bio-based road marking compound

On the 24<sup>th</sup> August, the Finnish capital announced that the business administration Stara is working on reducing pollution by changing the city's road markings. Although many people may be unaware of this, the wear and tear of road markings results in the emission of microplastics: small fragments under 5mm in length which contain harmful substances and threaten the safety of living organisms.

Environmental Engineer Kati Nurminen explained that one of the main raw materials used in traditional road marking compounds is oil-based resin. According to Nurminen, when this material is worn and ground under tires, it results in microplastics emissions that eventually travel to waterways with stormwater.

To reduce the emission of these harmful fragments, Stara will now switch to a more environmentally friendly road marking compound. That is, instead of using the conventional oil-based resin, it will opt for a compound containing bio-based resin made of tall oil.

Taking this further, the City of Helsinki reported that Stara currently uses 60,000 to

100,000 kg of materials per year to renew worn-out markings. This includes markings on streets, bicycle lanes, footpaths, and parking areas, among others. Replacing the harmful compound with one that is more environmentally friendly will, therefore, substantially reduce pollution.

Click [here](#) for more information.

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### **Producing rare, natural ingredients with Givaudan**

Nature creates all kinds of wonderful things that excite our senses: from fragrance and flavor molecules that smell and taste amazing to molecules that make cosmetics and foods have just the right texture. Many of these ingredients are found in very small quantities in the plants and other organisms that produce them. Extracting these valuable ingredients can be costly as well as hard or impractical to scale; they can be subject to supply chain disruptions and are increasingly at risk due to climate change.

Givaudan—the world's leading flavors, fragrances, and cosmetic ingredients company—has signed a multi-program collaboration with Ginkgo to help address these challenges. Givaudan will leverage our long-established expertise in helping companies develop bio-based products. The goal of the programs will be to produce a number of innovative and sustainable ingredients using fermentation.

Click [here](#) for more information.

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## **Consumer Products**

### **Our I'm green™ EVA is a key component of PUMA's more sustainable footwear models**



*Pixabay*

PUMA, one of the world's largest sporting goods manufacturers, is looking to increase its use of more sustainable materials in production, reducing the carbon footprint of its products as much as possible. Braskem is part of this strategy, with its I'm green™ EVA made of sugarcane, providing PUMA with an important raw material in the development of sustainable plastic elements in their products.

The result is "Better Foam," a PUMA-developed midsole based on 35% sugarcane-based I'm green™ EVA that will be used in footwear products starting this summer. It will start with the "Emerge" model, a training shoe available from 1<sup>st</sup> July.

The "Emerge" is part of PUMA's plans to use more sustainable materials in 9 out of 10 products by 2025.

Click [here](#) for more information.

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## REI Co-op announces Flash and Traverse footwear new designs

REI Co-op Brands, the outdoor retailer's performance gear and apparel label, introduces two new footwear lines.

Although REI has partnered with footwear brands in the past, this is the co-op's first-ever footwear line designed in-house, using materials and technologies that uphold REI's ongoing commitment to sustainability. Both Traverse and Flash footwear styles feature some of the most sustainable materials available while offering the quality and hiking support REI Co-op members expect. Six design technologies give these boots one of the lightest footprints on the planet.

- HydroWall™ waterproofing: Uses 75% recycled polyester for waterproofing that keeps feet dry even when the trail ahead is not.
- TerraLoft™ Cushion: Uses 10% algae-based BLOOM™ to cradle and protect, providing a cushioning system that feels like your favorite trail runner.
- TerraGrip™ Tread: Anti-slip grip made with 20% recycled rubber gets you off the beaten path whatever the terrain—hard, soft, craggy, or slick.
- FirmaKnit™ Uppers: Made from 99% recycled plastic bottles, it is both strong and sock-like, allows hikers to get after the trail in lightweight, durable comfort with little to no break-in needed.

Click [here](#) for more information.

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## Crocs Introduces New Bio-Based Croslite™



*Pixabay*

Crocs announced that as part of the company's commitment to achieve net zero by 2030, it has begun introducing a new bio-based Croslite™ material into its iconic product lines.

At 3.94 kg CO<sub>2</sub> eq. per pair of Classic Clogs, Crocs™ shoes already have a low carbon footprint. As part of its broader sustainability efforts, the company is targeting a 50% reduction in its carbon footprint per pair of Crocs™ shoes by 2030 as part of its overall commitment to becoming a net zero brand.

In partnership with Dow®, a global materials science company, this "shoe of the future" incorporates new ECOLIBRIUM™ Technology that transforms sustainably sourced waste and by-products into a shoe that has all the comfort you expect from Crocs, but with far less carbon. Crocs is the first footwear brand to go-to-market with this new technology.

Click [here](#) for more information.

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## New thinksound™ headphones are first to market with sustainable materials



*Pixabay*

Known for its high-end, responsibly produced audio equipment, thinksound has launched its first over-ear headphones — the ov21 — using Eastman Trēva™ engineering bioplastic that contains more than 40% biobased content derived from sustainably harvested trees.

New thinksound™ headphones are first to use Eastman Trēva™ engineering bioplastic. Trēva is a USDA Certified Biobased® polymer that offers excellent acoustic properties in addition to the durability, chemical resistance and processability required for engineered applications in consumer electronic devices.

The audio company is also developing two wireless headphone products that will use sustainable materials as part of its commitment to environmentally responsible innovation.

Click [here](#) for more information.

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## Introducing the home-compostable coffee capsule

Jabil Packaging Solutions (JPS), a division of manufacturing solutions provider Jabil Inc, has announced a significant advancement in coffee pod sustainability with the launch of their home-compostable coffee capsule for single serve espresso brewers. This high-barrier coffee capsule improves on existing solutions by eliminating the need for a plastic or foil pouch that is sometimes required to preserve freshness in compostable coffee capsules. JPS co-developed the compostable coffee capsule with Productos Solubles S.A. (Prosol), a leading European coffee roaster, based in Palencia, Spain.

The technically complex coffee capsule format is cherished by consumers for its convenience and ease of use, but often challenged for its suboptimal end-of-life scenario. The new coffee pod does not require a secondary pouch to maintain optimal product freshness, keeping packaging to a minimum without sacrificing flavor or shelf life. Prosol's deep bench of expertise in the entire coffee process, including brewer performance, home compostability (ex: certificates and conditions for degradation) and the capsule fill process, was invaluable to creation of the design.

Click [here](#) for more information.

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## Timberland brings GreenStride™ eco-innovation to FW21 boots



*Pixabay*

Timberland is on a mission to inspire and equip a new generation to step outside and move the world forward. For FW21, the brand furthers its commitment to a greener future by bringing one of its most eco-conscious and comfortable experiences ever to boots.

GreenStride™ soles are naturally lightweight and comfortable; they are made from a 75% combination of renewable sugar cane and responsibly sourced rubber, offering cushion and rebound with every step. And now they come in boots – waterproof boots, designed for anything nature throws your way. New styles for FW21 include: GreenStride™ Solar Ridge Waterproof Hikers, GreenStride™ TBL® Originals Ultra Waterproof Boots and GreenStride™ Edge 6-Inch Waterproof Boots for men; and GreenStride™ Ray City 6-Inch Waterproof Boots and GreenStride™ Edge 6-Inch Waterproof Boots for women.

Click [here](#) for more information.

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## I'm green™ bio-based polymer for sustainable intimate apparel

Braskem has announced its partnership with Gelmart International, a leading global manufacturer of intimate apparel. Braskem is supplying its I'm green™ EVA biopolymer to support production of the world's first-of-its-kind plant-based bra cup sourced from sustainably grown sugarcane. Gelmart's new kindly line of sustainable intimate apparel launched in August and is available exclusively across 3,300 Walmart retail stores and online at Walmart.com

Gelmart has designed, developed, and produced over 1.25 billion units in underwear, bras, and shapewear for the world's biggest retailers and brands. Gelmart's kindly bra line is the culmination of more than three years of proprietary development, resulting in the world's first mass-produced, plant-based bra.

Click [here](#) for more information.

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## Events

### **Bioplastics Innovation Forum Online, 4<sup>th</sup>-5<sup>th</sup> November 2021**

The Bioplastics Innovation Forum, through a series of top-level presentations, interactive panel discussions, and solution-based case studies will try to give answers to some of the questions and solve some of the problems that the industry will face in that journey. At the same time, it will offer a learning platform to recognize and seize the opportunities to generate new revenue, implement new products and technologies, deliver process efficiency and reduce the risk in business operations that come with it.

Click [here](#) for more information.

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### **International Conference on Cellulose Fibres 2022 Cologne, 2<sup>nd</sup>-3<sup>rd</sup> February 2022**

Third International Conference on Cellulose Fibres 2022, the fastest growing fibre group in textiles, the largest investment sector in the bio-based economy and the solution for avoiding microplastics

After the very welcomed conference launch in 2020, the online version of the '2nd International Conference on Cellulose Fibres 2021' was again a great success with 190 participants and 19 presentations. The innovation award "Cellulose Fibre Innovation of the Year 2021" was given for the first time and was one of the highlights of the conference.

Click [here](#) for more information.

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### **ICBC 2022 Paris, 22<sup>nd</sup>-23<sup>rd</sup> February 2022**

International Conference on Biobased Chemicals and Materials aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results on all aspects of Biobased Chemicals and Materials.

It also provides a premier interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the fields of Biobased Chemicals and Materials

Click [here](#) for more information.

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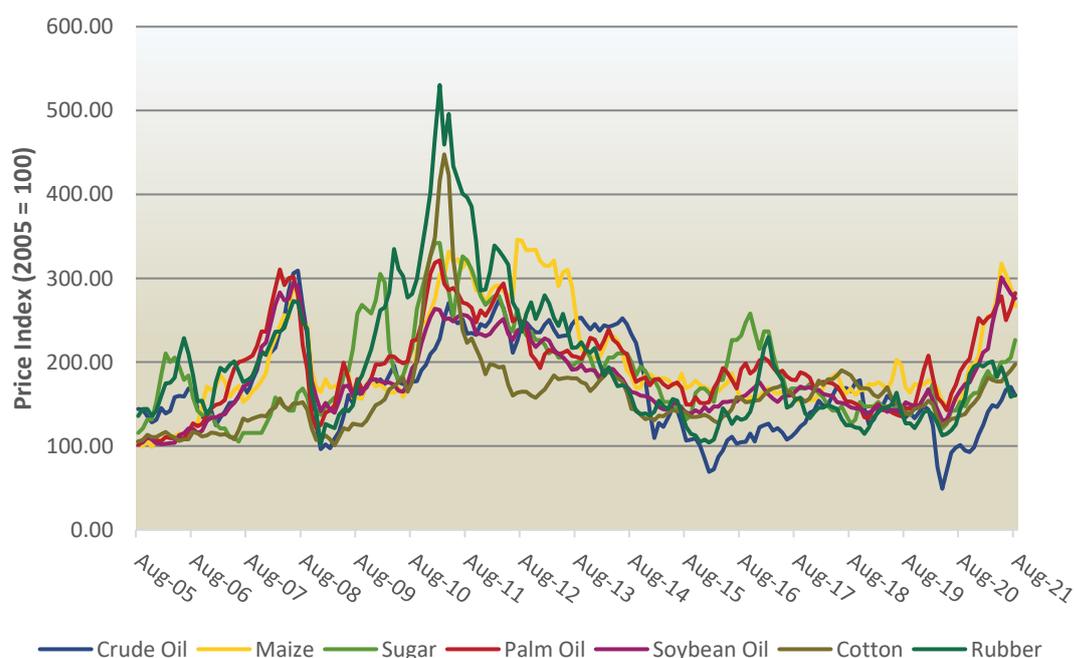
## Price Information

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\$ (Aug 21)	Price, US\$ (Aug 16)	Price Change
Crude oil (petroleum, barrel)	68.87 (↓)	44.88 (↓)	53%
Maize (corn, metric ton)	256.61 (↓)	150.15 (↓)	71%
Sugar (pound)	0.43 (↑)	0.44 (↑)	-2%
Palm oil (metric ton)	1,135.77 (↑)	771.02 (↑)	47%
Soybean oil (metric ton)	1,436.49 (↑)	824.42 (↑)	74%
Cotton (kilogram)	2.23 (↑)	1.77 (↑)	26%
Rubber (kilogram)	1.9 (↓)	1.55 (↑)	23%

For details on indexes please see [www.indexmundi.com/commodities](http://www.indexmundi.com/commodities)

## Raw materials 16-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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