

## BioPlastic Collaborative Partnership: Corbion Purac and BASF

Source: Bioplastics News

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Another European Bioplastic Collaborative Partnership on Bio-Succinic Acid comes to fruition: a JV between Corbion Purac (Netherlands) and BASF (Germany) starts commercial production.

Succinity GmbH, the joint venture between Corbion Purac and BASF registered in 2013, has announced the successful start-up of its first commercial production facility. The plant, located at the Corbion Purac site in Montmeló, Spain, has an annual capacity of 10,000 metric tons and is producing commercial quantities of bio-based succinic acid for the global market. In addition to this first facility, Succinity plans a second large-scale facility. The final investment decision for this facility will be made following a successful market introduction.

BASF and Corbion Purac have been conducting research on bio-based succinic acid under a joint development agreement since 2009, combining the know-how of BASF, the global producer of chemical intermediates, and Corbion, a leading provider of bio-based food ingredients and bio-chemicals. Here again, like for DSM (Holland) and Roquette (France) which have started-up their 10,000 tons plant in Cassano Spinola, Italy, under JV Reverdia, back in December 2012, food science, and chemistry teamed-up to innovate with an original proprietary white biotechnology process to produce bio-succinic acid.

The Succinity® process is based on renewable raw materials and fixes carbon dioxide. The proprietary microorganism *Basfia succiniciproducens* allows for a flexible usage of different feedstocks. Furthermore, Succinity bio-based succinic acid can be produced efficiently without major waste streams thanks to a closed-loop process. An elaborate downstream processing method ensures the production of high quality bio-based succinic acid.

“The start-up of our first facility for Succinity® bio-based succinic acid represents a key milestone in our plan to become a major producer of bio-based succinic acid in the future,” comments Philipp Walter, Managing Director of Succinity. “The combined experiences of the team in Montmeló and the support from Corbion Purac and BASF have ensured the achievement of this important milestone within schedule. With the facility in Spain we will be able to serve the growing succinic acid market.”

Bio-based succinic acid features a significantly improved carbon footprint compared to conventional, fossil-based succinic acid or other dicarboxylic acids. It can be used in a variety of potential applications, such as bio-polymers like Polybutylene succinate (PBS), polyurethanes (PU), coatings and life science products.



## With 1 Billion Pounds of PLA sold, NatureWorks Sees Rapid Growth to 2 billion

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When NatureWorks LLC began selling its Ingeo polylactic acid, the resin was an environmentally-friendly niche product with a corn-based feedstock. Last year, though, the company marked 1 billion pounds of Ingeo sold. It is near capacity at its **original production plant in Blair, Neb., and in the final stages of planning the location of its second plant, likely to be in Thailand.** It has new feedstock sources lined up, more in development and is targeting more resins that it can replace.

“Now if you’re in the chemical industry, you probably say: ‘A billion pounds. So what?’” said Marc Verbruggen, president and CEO of NatureWorks during the Innovation Takes Root 2014 conference in Orlando Feb. 17-19. “True. You look at polystyrene sales in the U.S. and it’s what, 6 billion pounds annually? Seven billion pounds? It’s significantly larger. But in the world of bioplastics, having produced and sold a billion pounds means that we have come a long way.”

Every new plastic has its growth curve, Verbruggen said. When PS hit the market in the 1950s, it did not automatically blast to selling billions of pounds annually. It took time to develop its sales just as PLA has grown steadily — with an average annual sales growth of 20 percent each year for NatureWorks. To help build acceptance and boost technology going into PLA, Minnetonka, Minn.-based NatureWorks has hosted ITR as a bi-annual conference four times, inviting users, researchers, government experts and even competitors to talk about developments with the material.

**Metabolix Inc. used the conference to introduce its bio-based PHA modifier for PLA users.** While Metabolix has its own bio-based plastics on the market, it makes sense to target development with NatureWorks’ products as well, said Bob Engel, vice president for biopolymers. Wider acceptance and improved technology benefits all makers of bio-based materials.

The company’s modifier — which it refers to as a **“plastifier” rather than plasticizer** — improves flexibility within PLA while allowing it to retain its 100 percent bio-based feedstock. That improvement could, for instance, make it possible to produce a more flexible film that can still be composted, which would eliminate complaints about the “noisy” compostable bag for chips, Engle said.

### **Other uses target its potential for non-wovens in the medical industry.**

Elsewhere, potential growth is coming from global retail giants who are increasingly looking to more sustainable packaging in the products they put on their shelves, and PLA fits right into that market, said Tony Kingsbury, president of consulting firm TKingsbury LLC and a former Dow Chemical Co. global sustainability leader.

Target Corp. recently announced a product and packaging sustainability program emphasizing recyclability and recycled or renewable content. Consumer products maker Procter & Gamble Co. has its own a sustainability target for packaging and Wal-Mart Stores Inc. has set a goal of 0 percent of its packaging going to the landfill “And if Wal-Mart says, ‘Here’s what I’m going to do,’ then it practically becomes global legislation,” he said.

To keep up with expected growth, NatureWorks currently has an engineering firm looking at sites for its second plant. While the company has said it prefers to locate that plant in Thailand, it is being courted by multiple Asian countries, said Steve Davies, marketing and public affairs director. Thailand’s PTT Public Co. Ltd. owns a 50 percent stake in NatureWorks.

With Asia becoming NatureWorks second largest regional market, it makes sense to build there, Davies said, and the company is also expanding its planned feedstock sources to keep up with its regional growth. “Wherever we build a plant, we’re going to use the most abundant feedstock available locally,” Verbruggen said. In Asia, that will likely begin with cassava, but other developments are under way to use the waste from sugar cane production as well as drawing from methane. Those new sources will help to counter complaints that PLA is taking corn out of the food production cycle to make plastic. “Nobody seems to care if the oil that went into my polystyrene coffee cup was drilled in Nigeria in a sustainable way, though,” Verbruggen noted.

The variable sources of raw materials also will help the company remain cost competitive with traditional materials. Sugar currently sells on the global market for 17 to 20 cents per pound, he said. From a feedstock point of view, that sugar price means that PLA can compete against an oil-based feedstock selling at \$50 per barrel, and oil currently is selling for far more than that.

The company may have taken ten years to reach its first billion pounds in sales, but Verbruggen said he expects that it will reach the 2 billion pound mark far faster. “Getting to 2 billion pounds is going to take us a heck of a lot less time to get to than it took to get to a billion pounds, and we’re going to get pretty quickly to a situation where growth is no longer depending on demand, it’s going to start depending on supply.”

## Novamont Buys Majority Stake in Mater Biopolymer Venture

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Bioplastics firm Novamont SpA has acquired a majority stake in Mater-Biopolymer srl, a unit of PET resin maker Grupo Mossi & Ghisolfi that operates a resin plant in Lazio, Italy. Novara, Italy-based Novamont now will own 78 percent of Mater-Biopolymer, including the 83-employee Lazio plant. The plant will work exclusively for Novamont and M&G, with one line producing PET for M&G and another making Origo-Bi, a line of renewably sourced polyesters. Origo-Bi is used to improve the characteristics of Novamont's Mater-Bi biodegradable and compostable bioplastics. The Origo-Bi

production line has been modified over the last four years using proprietary Novamont technology, officials said in a March 3 news release.

Novamont now has an option to buy the remainder of Mater-Biopolymer by the end of 2016. Officials said that the plant — known as the Patrica plant — had become too small for the economies of scale of M&G's PET production, but was an ideal size for Novamont. After the technological conversion, including the second production line, the plant "will be perfectly suited" to large-scale production of Origo-Bi, they added. Novamont "has extensive experience in the field of bioplastics, and will give new impetus to the site, creating jobs and competitive barriers and enhancing existing research skills in the areas of materials, process engineering and innovation in general," officials said. When work is completed, the plant will have annual capacity of about 220 million pounds of Origo-Bi. Novamont also operates a plant in Terni, Italy, with more than 100 million pounds of annual capacity for Mater-Bi. The 25-year-old firm employs 320 and has annual sales of about \$175 million.

Novamont's biodegradable materials are used for film and foam, and in extrusion, thermoforming and injection molded products. Industrial applications for Mater-Bi are in agriculture, hygiene, organic-food packaging, food service, and as additives in rubber. "At such a challenging time for our country, the bioeconomy sector and chemicals from renewable sources in particular are of proven strategic importance for economic recovery and creating value for the whole country," Novamont CEO Catia Bastoli said.

"With today's operation and with the range of operations we have completed in recent months ... Novamont is proving it is possible to create an economic and environmental model capable of re-industrialising the region, reusing skills and facilities and recreating jobs," he added. M&G CEO Marco Chisolfi added that officials at his Tortona, Italy-based firm "are pleased that the technological collaboration with Novamont is leading to the creation of flexible sites like Patrica, suited to the production of polymers with high sustainability."

The Patrica project "fits with our group's other activities, in particular through our affiliated companies Biochemtex and Beta Renewables, which offer the chance to reconvert other industrial sites in Italy to sustainable technologies," he added.

In North America, M&G is planning to build a massive 2.2 billion-pound capacity PET plant in Corpus Christi, Texas. That plant is expected to be online by the end of 2016.

## Global Market Value of Bioplastic

Source: Bioplasticsnews

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Global market for bioplastics reported to rise up to USD 5.8 Bn in 2021 by Ceresana. Plastics based on renewable resources are increasingly becoming a real alternative to petrochemical products. “Even in times of economic difficulties, bioplastics possess an enormous potential”, describes Oliver Kutsch, CEO of the market research institute Ceresana: “Until 2021, demand is likely to increase on average by 19% per year.” Ceresana, a leading international market research and consultancy companies for the industrial sector which operates branch offices in Constance, Vienna, and Hong Kong, is already publishing the third edition of its market report on bioplastics. The Ceresana business analysts are specialists in markets Plastics, Industry, Additives, Chemicals, Packaging, and Agriculture.

### Untapped Potential

The improved properties of the most recent bioplastics allow for a faster and wider substitution of petrochemicals plastics. Technological progress and a rapid expansion of production capacities enable manufacturers to reduce prices and to continue to increase the competitiveness of bioplastics. A large potential still remains untapped nonetheless: many processors and consumers are still expressing doubts regarding the performance and process-ability of “green” plastics. However, processors and innovative consumer goods companies around the world are introducing bioplastics to improve their image and their sustainability rate.

### Europe Leading the Way

Ceresana forecasts revenues generated on the global market for bioplastics to raise to approx. US\$5.8 billion in 2021 — compared to current values, revenues will triple. Europe currently accounts for more than one third of total global bioplastics consumption. According to Ceresana, this will continue to be the case for several years to come, not least because Europe is leading in the research and development of bioplastics. However, Asia-Pacific and South America in particular are catching up significantly. They have access to plenty of biomass and agricultural resources, growing sales markets, and governments that promote bioplastics.

### Focus on “Drop-In” Bioplastics

The short term trend is in favor of the so called “drop In” green plastics such as green polyethylene or green PET; their properties are similar to those of their fossil equivalents, and, like those, they are recyclable but not biodegradable. These developments are backed by large enterprises in the segments foodstuff, consumer goods, and the automotive industry that intend to reduce their ecological footprint by using easy to recycle bioplastics.

Biodegradable plastics are utilized in all applications where they help to reduce disposal costs: packaging that decomposes alongside leftover food, agricultural films that simply can be plowed in or flower pots and trays for seedlings. Long term, these true bioplastics, bio-sourced and bio-degradable, will take the lion share of the growth as economies of scale are realized in massive bio-refineries and downstream plan

## Scotland's Food and Drink Sector to Aid Green Campaigns

Source: PRW

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A group of organisations and companies operating across the drinks and food packaging supply chain has been established to work with the Scottish Government to help it boost recycling and provide support for waste reduction and anti-littering programmes.

The Packaging Recycling Group Scotland (PRGS) aims to work positively and collaboratively with the Scottish Government and its agencies, and with local authorities, to assist them in raising recycling awareness as well as in increasing recycling rates and quality.

Ian Shearer, PRGS co-ordinator, explained: “We have strong support – almost 30 organisations now – with a collective desire to work more closely with key bodies on these objectives. A collaborative strategic approach, with a willingness to share knowledge and best practice, and develop partnership solutions, is the right way forward.

“PRGS is well-positioned to harness the expertise and enthusiasm for progress presented by an unprecedented coalition of market-leading manufacturers, suppliers, retailers and trade organisations – representing businesses large and small – with a proven track record of supporting Scottish recycling.”



## Magna to Develop Bioplastic for Automotive Interiors

Source: Plastics News

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Canadian automotive supplier Magna International is exploring potential automotive applications for a bioplastic made from by-products of sugar production. Magna, headquartered in Aurora, Ontario, has signed a cooperation agreement with Italian bioplastics company Bio-on, to develop automotive-compatible products from Bio-on's polyhydroxyalkanoate (PHA)-based bioplastic as an alternative to conventional plastics.

The project was launched in response to a call for sustainable solutions from Magna's customer base, said Dieter Fahrländer, vice president of advanced engineering for Magna's Interiors operating unit. Magna has worked with bioplastics in the past, but sought a solution that did not rely on a food source, he said. "We searched for a long time for material that is in no way [bound] to the food chain," Fahrländer said. "Because if you are talking about oil or corn or something like that, that is always really a setback to our customers, because they do not want to touch the food chain."



Because Bio-on's product is made from a waste material — the syrup left over when sugar beets are used to make commercial-grade sugar — it's a more sustainable solution, Fahrländer said. "In this case we are operating within the waste of the sugar production, which is also available in a really high yearly tonnage, so on the one side we have enough of it... and on the other side we found now one solution that does not affect the food chain," he said.

PHA, a bacterially synthesized polymer, is produced from the fermentation of sugars. The bacteria used by Bio-on digest sugars in sugar beet molasses and produce PHAs, which are extracted and dried. The result is a white powder that can be further processed into products with properties comparable to objects made with traditional plastics, said Marco Astorri, Bio-on CEO. The bioplastic is also biodegradable.

Bio-on's PHA has been used for a variety of things including home furnishings, mobile phones and food packaging, Marco said. Magna's first job is to develop an automotive-grade resin, and to test the material in processes including thermoforming and injection molding.

Fahrländer said the company will pursue interior automotive applications first, and eventually expand to exterior products. But with added sustainability comes added cost, at least for now. "To reduce the carbon footprint of the car production, that is our main goal. The problem is the cost, and I think for the next year we will always have the problem with the cost for the biomaterials... so that is something we have to overcome," Fahrländer said. Testing will take place at Magna's facility in Liberec, Czech Republic.