

Final Investment Decision Progress Update

Avantium secures new offtake contracts for planned FDCA flagship plant

AMSTERDAM, 24 March 2021, 07:00 CET – Avantium N.V., a leading technology company in renewable chemistry, announces that its subsidiary Avantium Renewable Polymers (“Avantium RNP”) has signed two additional conditional offtake agreements for the supply of PEF resin to manufacture bottles and films, bringing the total now to four such contracts. The partners involved include specialty chemical company Toyobo (Japan), specialty polyester film producer Terphane (USA), the beverage bottling company Refresco (Netherlands), and a major global food & beverage brand owner.

Avantium RNP aims to commercialise its proprietary plants-to-plastics YXY® Technology, which is used to produce FDCA (furanicarboxylic acid) – the main building block of the high-performance, plant-based and fully recyclable polymer PEF (polyethylene furanoate). Avantium has demonstrated the technology in its pilot plant in Geleen and the company plans to open, dependent on a positive Final Investment Decision (FID), the world’s first commercial FDCA plant in 2023.

Avantium has been in active discussions with various commercial parties on agreeing capacity allocations from the planned flagship plant. The offtake commitments signed so far represent 30% of the plant’s annual FDCA production capacity. Those commitments are subject to a positive FID, financial closing, other customary approvals and party specific conditions. The partners will purchase Avantium’s FDCA or PEF at agreed price levels for a period of at least five years, depending on both the product application and the specific terms and conditions included in each agreement.

In addition to signing two more offtake agreements, further commercial progress has also been made recently. Avantium and the Carlsberg Group have signed a collaboration agreement to jointly develop several PEF applications, including the Green Fibre Bottle, with the aim to validate the circularity of the applications, which should lead to additional demand for FDCA from Avantium’s flagship plant. As a further sign of their commitment, Carlsberg has recently joined the PEFerence consortiumⁱ.

CEO Tom van Aken comments: “These further developments in commercial commitments bring us closer to making a positive FID for our FDCA flagship plant. We very much value our partners’ dedication to helping to build a completely new PEF value chain. We look forward to welcoming more like-minded collaborators on this exciting journey where we have a shared ambition to transition to next generation materials for a truly circular and sustainable future.”

Avantium will provide a further update on the progress towards the FID in due course.

Testimonials commercial partners

Toyobo

Avantium and Toyoboⁱⁱ have been partners since 2016, when the companies decided to partner on PEF polymerisation and PEF films. PEF film can be used for food packaging, electronics applications such as displays or solar panels and industrial and medical packaging. In 2019, Avantium and Toyobo

jointly developed biaxially oriented PEF (BOPEF) film, which can be used in pouches. Toyobo now plans to develop PEF polymer for high barrier packaging film and for optical films used in electronics. To this end, Toyobo signed a conditional offtake agreement with Avantium to secure a fixed volume of FDCA from the planned flagship plant.

“Toyobo believes PEF is the only bio-based polymer which has superior properties compared to its closest fossil based equivalent. PEF fits well in our strategy to introduce sustainable and innovative materials and products to the market. We are pleased to strengthen our position in the field of high barrier film by collaborating with Avantium,” states Chikao Morishige, Senior Managing Executive Officer at Toyobo.

Refresco

Refrescoⁱⁱⁱ is the world’s largest independent bottler for retailers and A-brands in Europe and North America and produced 11.7 billion liters of beverages in 2020. Refresco continuously looks for new, innovative and more sustainable solutions to meet its customers’ changing needs.

Hans Roelofs, CEO of Refresco: “With PEF, we will be able to offer retailers and branded beverage companies another sustainable and renewable packaging solution. As PEF is plant-based and fully recyclable, it is well aligned with our efforts to increase recycled content in our packaging and offer circular solutions. We are pleased to support this initiative, by which we further support our customers in achieving their sustainability targets.”

Terphane

Avantium and US-based converter Terphane^{iv} share a common goal to develop and commercialise PEF as a sustainable, high quality material for use in specialty polyester films. Terphane believes that PEF can provide additional performance benefits, particularly with regard to being an oxygen barrier, which makes it ideal for food packaging. Terphane is convinced that PEF has the potential to replace polyethylene (PE) in some critical food packaging applications, enabling higher barrier properties and fully recyclable packaging opportunities.

Marcos Vieira, North America Sales and Global R&D Director, explains: “Food waste is a widely known global problem. To combat this, Terphane is continuously looking for solutions to improve the barrier properties of packaging material and extend the shelf life of the packaged products. We strongly believe that PEF offers this capability with its improved barrier properties. Equally, PEF film is an environmentally-friendly solution, as it can be fully recycled together with PET. The conditional offtake agreement with Avantium is another important step for Terphane to provide our customers with highly sustainable options.”

Carlsberg

Avantium and Carlsberg’s relationship was established in 2019 with Avantium joining the Paper Bottle Project alongside the global brewer. Avantium and Carlsberg have now signed a collaboration agreement to take their partnership to the next level. The companies will jointly develop several PEF applications, including the Green Fibre Bottle, to validate the circularity of the applications and to establish the demand for commercial production from Avantium’s flagship plant. Carlsberg has also recently joined the PEference consortium as a partner. This underpins Carlsberg’s commitment to sustainable development, as well as the company’s targets to achieve 0 carbon emissions at its breweries, and reduce its value chain carbon footprint with 30% by 2030.

“We are always looking for partnerships and innovations that can help us make our business and products more sustainable, while moving the quality of our beers to an even higher level. This is deeply rooted in Carlsberg’s DNA,” says Myriam Shingleton, Vice President Group Development at Carlsberg Group. “The partnership with Avantium will enable us to reduce waste and the carbon footprint of our packaging material, a key part of our sustainability programme “Together Towards ZERO”. We highly value the many performance and sustainability features of PEF. Together, we aim at shaping the next-generation packaging for a circular and low-carbon future”.

About Avantium

Avantium is a leading technology development company and a forerunner in renewable chemistry. Avantium develops novel technologies based on renewable carbon sources as an alternative to fossil-based chemicals and plastics. The company currently has three technologies at pilot and demonstration phase. The most advanced technology is the YXY[®] plant-to-plastics-technology that catalytically converts plant-based sugars into a wide range of chemicals and plastics, such as PEF (polyethylene furanoate). Avantium has successfully demonstrated the YXY[®] Technology at its pilot plant in Geleen, the Netherlands. The second technology is the Dawn Technology[™] that converts non-food biomass into industrial sugars and lignin in order to transition the chemicals and materials industries to non-fossil resources. In 2018, Avantium opened the Dawn Technology[™] pilot biorefinery in Delfzijl, the Netherlands. The third technology is called Ray Technology[™] and catalytically converts industrial sugars to plant-based MEG (mono-ethylene glycol): plantMEG[™]. Avantium is scaling up its Ray Technology[™] and the demonstration plant in Delfzijl, the Netherlands opened in November 2019. Next to developing and commercialising renewable chemistry technologies, the company also provides advanced catalysis R&D services and systems to customers in the refinery and chemical industries. Avantium works in partnership with likeminded companies around the globe to create revolutionary renewable chemistry solutions from invention to commercial scale.

Avantium’s shares are listed on Euronext Amsterdam and Euronext Brussels (symbol: AVTX). Avantium is included in the Euronext Amsterdam SmallCap Index (AScX). Its offices and headquarters are in Amsterdam, the Netherlands.

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ⁱ PEFerence is a consortium of organisations aiming to replace a significant share of fossil-based polymers with the 100% plant-based PEF. The PEFerence project has received funding under Bio Based Industries Joint Undertaking under the European Union’s Horizon 2020 research and innovation programme under grant agreement No 744409.

ⁱⁱ Toyobo Co., Ltd (Toyobo) is a worldwide specialty chemical company, headquartered in Osaka, Japan. Since its foundation in 1882 as a textile company, Toyobo has expanded the boundaries of its business beyond textiles to specialty business segments such as films & functional materials, mobility, lifestyle & environment and life science with its unique core technologies originated in textiles and chemical fibers. Toyobo will continue to create the solutions needed by people and the earth with materials and science. For more information, contact: <https://www.toyobo-global.com/>

ⁱⁱⁱ Refresco is the world's largest independent bottler of beverages for retailers and A-brands with production in Europe and North America. Refresco offers an extensive range of product and packaging combinations from 100% fruit juices to carbonated soft drinks and mineral waters in carton, PET, Aseptic PET, cans and glass. Focused on innovation, Refresco continuously searches for new and alternative ways to improve the quality of its products and packaging combinations in line with consumer and customer demand, environmental responsibilities and market demand. Refresco is headquartered in Rotterdam, the Netherlands and has more than 10,000 employees. www.refresco.com

^{iv} Since 1976, Terphane has developed technologies and processes that produce specialty bioriented polyester films (BOPET). With significant experience and technical knowledge in film production, coating and metallization, the company is recognized for its vertical production, from resin to specialty films. A subsidiary of U.S.-based Tredegar Corporation (NYSE:TG), Terphane is the leader in PET films in Latin America and an important global player.