Press release

Avantium successfully produces polyesters with its plantMEG™ from the Ray Technology™ demonstration plant

AMSTERDAM, 13 April 2021, 07:00 hrs CEST – Avantium N.V., a leading technology company in renewable chemistry, has completed the application validation for its plant-based glycols *plantMEG*™ and *plantMPG*™ produced in the Ray Technology™ demonstration plant in Delfzijl. Key applications include polymerisation to *PEF* and *PET* polyesters and functional fluids used for de-icing and heat transfer. Proving the functional performance of the plant-based glycols is an important step in the scale-up of the Ray Technology™.

Avantium aims to commercialise its proprietary plants-to-glycols Ray Technology™, which is used to produce plantMEG - a vital ingredient in the production of polyesters widely used in textiles and packaging - and plantMPG - a valuable intermediate used in a wide variety of applications such as industrial fluids. Both plantMEG and plantMPG are expected to significantly reduce greenhouse gas emissions compared to their fossil-based equivalents. In 2020, Avantium successfully commissioned its Ray Technology™ demonstration plant, which utilises all process steps in converting industrial sugars to glycols, allowing for the production of plantMEG and plantMPG samples that are representative of the final product from subsequent commercial-scale plants.

Avantium has now produced 100% plant-based PEF by polymerising Avantium's monomers FDCA (furandicarboxylic acid) and plantMEG. Ray plantMEG can also be used to produce bio-PET (30% plantMEG), reducing the environmental footprint versus the fossil-based production routes. Furthermore, relevant functional properties of Ray plantMEG and plantMPG in de-icing fluids have been demonstrated. These fluids are mainly used in airport operations for the de-icing of airplanes.

Zanna McFerson, managing director Renewable Chemistries at Avantium says: "A critical step in commercialising the Ray Technology is ensuring that the resulting products, Ray plantMEG and plantMPG, perform in customer-specific applications. We have now succeeded in demonstrating that our plant-based glycols are a great solution in a broad range of applications that can drive us towards a circular economy. This application validation paves the way for future licensees of the Ray Technology™ to tap into the growing demand for plant-based, renewable and recyclable materials."

Definitions plantMEG™, plantMPG™, PEF and PET
With its Ray Technology™, Avantium can produce *mono-ethylene glycol (MEG)* from plant-based feedstocks rather than fossil sources: plantMEG™. Currently, MEG is widely used as an important chemical building block for plastic bottles and packaging, polyester textiles for clothing and furniture, and antifreeze applications.

Mono-propylene glycol (MPG) is a chemical used in airport operations for the de-icing of airplanes, it is also used in unsaturated polyester resins, for example in modern windmill blades, as well as heat transfer fluids. *Ray plantMPG*™ is a wholly plant-based version of MPG.

PEF (polyethylene furanoate) is a polyester made from MEG and FDCA. PEF produced by Avantium's YXY® Technology is a 100% plant-based and recyclable polymer that can be used in an enormous range of applications, including packaging for soft drinks, water, alcoholic beverages and fruit juices. PEF's barrier and thermal properties are superior to conventional PET. In combination with a

significantly reduced carbon footprint, the added functionality gives PEF all the characteristics to potentially become a next-generation polyester.

PET (polyethylene terephthalate) is a transparent polyester used for bottles and film. Currently PET is made from fossil-based MEG and fossil-based terephthalic acid.

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 like-minded 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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