



Joint News Release

Synvina: Joint venture of BASF and Avantium established

- **Bio-based furandicarboxylic acid (FDCA) as main building block for the new polymer polyethylenefuranoate (PEF)**
- **FDCA production plant with up to 50,000 tons capacity planned**
- **PEF with multiple application opportunities like packaging, engineering plastics, coatings, and fibers**
- **Starting point to build up world-leading positions in FDCA and PEF**

Ludwigshafen, Germany, and Amsterdam, Netherlands – October 7, 2016 – BASF and Avantium, the renewable chemistry company, today announced the formation of a joint venture (JV) for the production and marketing of furandicarboxylic acid (FDCA), which is produced from renewable resources, as well as the marketing of the new polymer polyethylenefuranoate (PEF) based on the new chemical building block FDCA.

The aim of the JV named Synvina with headquarters in Amsterdam, The Netherlands, is to build up world-leading positions in FDCA and PEF. It is planned to invest a mid-three-digit million euro sum to build a reference plant with an annual capacity of up to 50,000 metric tons per year at BASF's Verbund site in Antwerp, Belgium, and to license the technology for industrial scale production. For the production of FDCA, Synvina will use the YXY process[®] developed by Avantium which is based on fructose as renewable raw material.

FDCA-based PEF: multiple application opportunities and better performance

Industry experts consider bio-based FDCA to be a promising platform chemical and a building block for various downstream products for different applications. Most significantly, FDCA is used for the production of PEF, a polyester suitable for food and beverage packaging as well as for fibers for carpets and textiles. For the packaging

industry, PEF offers better characteristics in comparison to conventional plastics, such as improved barrier properties for gases like carbon dioxide and oxygen, leading to a longer shelf life of packaged products. It also offers a higher mechanical strength, thus thinner PEF packaging can be produced and fewer resources are required. PEF is suitable for foil pouches, bottles for carbonated and non-carbonated soft drinks, water, dairy products, still and sports drinks and alcoholic beverages as well as personal and home care products. Alongside the polyester PEF, FDCA can be processed to polyamides for engineering plastics and fibers, to polyurethanes for foams, coatings and adhesives and to esters for personal care products and lubricants.

Synvina to continue Avantium's partnering activities with leading companies

Synvina will continue Avantium's established partnering activities with leading brands associated with FDCA and PEF. The goal of the cooperation platform is to develop a complete supply chain for PEF as sustainable bio-based packaging material. Together with Toyobo, the companies will jointly boost the PEF polymerization and further develop PEF films for food packaging, in electronics applications such as displays or solar panels, industrial and medical packages. With Mitsui, Synvina will work on developing PEF thin films and PEF bottles in Japan. Furthermore, Synvina aims to continue the development partnerships with The Coca Cola Company, Danone, ALPLA and other companies on the Joint Development Platform for PEF bottles.

BASF and Avantium providing prerequisites for excellent starting position

"With Synvina we will enter the promising business with FDCA and PEF and support our customers in the various industries to create value. We strongly believe that the future belongs to these products because they combine superior characteristics with a production process based on renewable feedstock," said Dr. Stefan Blank, President of BASF's Intermediates division. "Synvina is an innovative and highly competent company with an excellent starting position from which to build a globally leading role in FDCA and PEF."

"FDCA is a sleeping giant with huge potential. Although it was first produced in the 1950s, it has never been successfully developed and brought to market until now," said

Tom van Aken, Chief Executive Officer of Avantium. “I strongly believe that Synvina will wake up that sleeping giant and make it available for industrial use. With the development of a proven FDCA production process and the construction of a strong partnering and cooperation network, Avantium has provided Synvina with all necessary prerequisites. It will benefit from BASF’s expertise in market development and large-scale production and as a reliable chemical company in the business of intermediates and polymers.”

About Avantium

Avantium is a leading chemical technology company and a forerunner in renewable chemistry. Together with its partners around the world, Avantium develops efficient processes and sustainable products made from biobased materials. Avantium offers a breeding ground for revolutionary renewable chemistry solutions. From invention to commercially viable production processes. One of Avantium’s many success stories is YXY technology®, with which they created PEF: a completely new, high-quality plastic made from plant-based industrial sugars. PEF is 100% recyclable. It therefore offers a cost-effective solution to make anything from a wide range of plastic bottles and packaging to fibers. YXY is the most advanced technology, but Avantium is also working on a host of other ground-breaking projects and is providing advanced catalysis research services and systems to the leading chemical and petrochemical companies. Avantium’s offices and headquarters are based in Amsterdam, the Netherlands. Further information at www.avantium.com

About BASF Intermediates

The BASF Group’s Intermediates division develops, produces and markets a comprehensive portfolio of about 700 intermediates around the world. Its most important product groups include amines, diols, polyalcohols, acids and specialties. Intermediates are used for example as starting materials for coatings, plastics, pharmaceuticals, textiles, detergents and crop protectants. Innovative intermediates from BASF help to improve both the properties of final products and the efficiency of production processes. The ISO 9001 certified Intermediates division operates plants at production sites in Europe, Asia and North America. Around the globe, the division generated sales to third parties of about €2.8 billion in 2015. Further information at www.intermediates.basf.com

About BASF

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. The approximately 112,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into five segments: Chemicals, Performance Products, Functional Materials & Solutions, Agricultural Solutions and Oil & Gas. BASF generated sales of more than €70 billion in 2015. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (AN). Further information at www.basf.com.

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