



BIO-BASED

WORLD QUARTERLY

“WHILST THERE ARE PLENTY OF BIO-BASED SOLUTIONS, THEY DON'T ALWAYS PROVIDE A BETTER PERFORMANCE OR DELIVER THE QUALITY THAT WE NEED. THAT'S AN ONGOING CHALLENGE, BUT DEFINITELY AN EXCITING ONE.”

- INSIDE LEGO'S HUGE BIO-BASED COMMITMENT.



HOW UPM BIOCHEMICALS ARE MAXIMISING THE OPPORTUNITY FOUND IN OUR FORESTS.

INSIDE STORY: SYNVINA - THE JOINT VENTURE OF BASF AND AVANTIUM

GROWING PLANT-BASED FOOTWEAR IS “JUST THE FIRST STEP” FOR REEBOK.

INVESTMENT FOCUS: “MOMENTUM IS BUILDING IN THE FIELD...”

AND MUCH, MUCH MORE...

"PEF IS A FAR SUPERIOR POLYMER - IT OFFERS A BETTER BARRIER FOR CARBON DIOXIDE AND OXYGEN, IS STRONGER BUT THINNER, HAS A LONGER SHELF LIFE AND CAN BE MANUFACTURED IN A SIMILAR WAY LIKE PET. AS A RESULT, THERE'S A HUGE MARKET POTENTIAL FOR THIS MATERIAL WHICH WE AT SYNVINA CONSIDER A SLEEPING GIANT AND OUR FOCUS IS TO GROW AND DEVELOP ITS USE."

INSIDE STORY: SYNVINA - THE JOINT VENTURE OF BASF AND AVANTIUM.

If the longest journey starts with a single step, then even the biggest partnership begins with a single conversation. And that's certainly true of a very exciting new joint venture – Synvina – between BASF and Avantium. The story of this landmark alliance began with a manager from the German chemicals giant meeting representatives of the Dutch renewable chemicals company at a conference and led, more than four years later, to an announcement in October 2016 of the launch of Synvina. Today we gain an exclusive insight into this partnership from Patrick Schiffers, a BASF veteran who is now the CEO of Synvina, a company that not only aims to develop solutions but also to make and market them in a commercially viable and highly scalable production process.

At the core of the joint-venture is a focus on producing and marketing FDCA (furandicarboxylic acid) as well as the marketing of the new polymer PEF (polyethylenefuranoate) based on this chemical building block.

So why the focus on FDCA? Our editor Luke Upton asks Patrick for his thoughts: "Quite simply FDCA is a fantastic platform chemical which can be used in a wide variety of applications, most significantly in the production of PEF, a polyester ideal for food and beverage packaging. Most plastic bottles are made from PET (petroleum based polyethylene terephthalate) but PEF is a far superior polymer - it offers a better barrier for carbon dioxide and oxygen, is stronger but thinner, has a longer shelf life and can be manufactured in a similar way like PET. As a result, there's a huge market potential for this material which we at Synvina consider a sleeping giant and our focus is to grow and develop its use."



PEF offers clear commercial benefits but also reduces emissions and non-renewable energy, plus it is 100% recyclable. As a product it offers a win-win for both the industrial buyer and an increasingly green-aware consumer.

"FDCA was first patented in the 1950s, but its wide-spread acceptance and adoption has taken a long time to grow. Why? Because the production of FDCA at larger scales requires a cost-competitive technology and production process. To reach major markets and big buyers, you need to guarantee them the large quantities they require for production. Without confidence from the buyer that these can be delivered, there will be no deal. And this is where the partnership between a start-up like Avantium and a multi-national like BASF makes perfect sense. Synvina has been created to ally Avantium's IP portfolio and pilot plant development with BASF's experience and expertise in large scale production. Together our joint-venture will put aspects of the two businesses forward on a global platform with the aim of being the world's leading source of FDCA and PEF as well as licensing packages to produce both products" says Patrick.

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 and build up that all important buyer confidence.

Alongside Toyobo, Japan's top maker of fibres and textiles, Synvina will 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, the Japanese developer for chemicals, food and textiles etc., Synvina will work on developing PEF thin films and PEF bottles in Japan. Furthermore, the joint venture aims to continue the development partnerships with household names including Danone and ALPLA.

With its name being inspired by **SY**nergy, **V**itality and **NA**ture, the JV is headquartered in Amsterdam and intends 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 (a fruit sugar found in many plants) as its renewable raw material.

This joint-venture is a major step forward for the business of all things bio-based and should be welcomed by the whole industry, whatever your aspect of involvement. It underlines that the potential we all see in bio-based chemicals is now being matched by the backing of large organisations like BASF – the world's largest chemical company – and alliances like this make bio-based products far more likely to be utilised and deployed by large consumer brands. It comes down to scale and confidence, which BASF's expertise in market development and large-scale production (plus 112,000 staff globally) and Avantium's reputation as a leading chemical technology company and a forerunner in the renewable chemistry will help deliver.

To conclude, Luke asks Patrick what success in the first few years will look like; "We are building an organisation and that's a great challenge. Of course, we have challenging targets and timelines. Initially there's focus on the technology for the intended plant at the BASF site in Antwerp, Belgium on one hand and on the other developing partnerships along the value chain up to the end customer for the launch of FDCA and PEF on a commercial scale. Since announcing the joint-venture, we've had calls from companies who can now see that this could be an option for them. We are looking to work with new companies and begin producing on an increasingly commercial scale. I think we at Synvina have woken the sleeping FDCA giant and are excited to see what the next few years bring." ■

For more information visit: www.synvina.com