

HiBarFilm

High barrier monomaterial flexible films for food contact applications

2022

Newsletter 1

Issue 1

HiBarFilm2 Project

The HiBarFilm2 Project is an Innovate UK funded project that started in March 2022 and is expected to run for 30 months. Haydale Composite Solutions Ltd is leading the consortium of nine companies - BASF, Bangor University, Cambridge Nanomaterials Technologies, Dunbia, Fre-Energy, Parkside Flexibles, Recycling Technologies, and Wells Plastics. The aim of the project is to develop the next generation of high barrier films for food packaging using functionalised nanomaterials

HiBarFilm2 has an ambitious objective to achieve the same barrier performance using a mono-materials polyolefin film as the currently used multilayer barrier films. The consortium aims to accomplish this using plasma functionalised nanomaterials to increase barrier performance in two main areas of focus; firstly by mixing the nanomaterials directly into the polyolefin prior to filming, adding barrier properties to the film itself – both polyolefin films and compostable plastics will be used to also address the issue with contamination of films with food waste such as fats and blood; and secondly, by dispersing the nanomaterials into a barrier coating which can be applied to the polyolefin substrate. The advantage being the two solutions can be combined to increase the barrier performance further. By manufacturing mono-material flexible films the recyclability of these materials will increase, and value will be added nanomaterials.

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HiBarFilm2

High barrier monomaterial flexible films for food contact applications

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HiBarFilm2 is an Innovate UK project, reference: 10015317.

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HiBarFilm 2 Consortium

Partners

Haydale Composite Solutions Ltd is leading the consortium of nine companies - BASF, Bangor University, Cambridge Nanomaterials Technologies, Dunbia, Fre-Energy, Parkside Flexibles, Recycling Technologies, and Wells Plastics.

Haydale Composite Solutions

Web: www.haydale.com



Haydale Composite Solutions Ltd (HCS) based in Loughborough specialises in the development and application of nanomaterial-enhanced polymers, composites, coatings and elastomers. The company has a wealth of experience in nanomaterial-enhanced materials using the latest in computer aided design systems and has access to its own prototyping workshops for manufacturing and testing.

Haydale is a global technology solutions company, passionate about creating the next generation of advanced materials to improve mechanical, thermal and electrical properties for its customers' products.

Haydale vision is to be a world-leader in the revolutionary development of plasma functionalisation of advanced performance-enhancing materials and nanomaterials across all industry sectors, providing cutting-edge technological solutions to improve people's life experience.

Haydale brings together cutting-edge technology and engineering expertise alongside its patented HDPlas® functionalisation process, which revolutionises repeatable performance and continued commercialisation of nanomaterials. Haydale's world-leading HDPlas® process has the potential to be a major spearhead in the drive to keep the UK at the forefront of world technology..

Haydale are based in a purpose-built facility in Ammanford, South Wales, designed to handle and process volume nanomaterials. Due to its unique position, Haydale has access to a large library of nanomaterials (250+), which have been analysed to assess the quality and potential property enhancements for a range of products across multiple applications.

BASF

Web: www.basf.com/gb/en.html



BASF companies supply raw materials to most industries in the UK, including agriculture, automotive, chemicals, construction, energy and pharmaceuticals.

We have about 700 employees in the UK. Our sales people are often home-based, and we also have staff working at customers' sites, particularly automotive plants

We have 6 manufacturing sites across the UK, from Littlehampton on the south coast of England to Callanish off the north west coast of Scotland.

We produce Polyurethane systems at Alfreton, Dispersions and additives at Bradford, omega-3 Fatty acids on the Isle of Lewis, Biopesticides at Littlehampton and Rodenticides at Widnes. We also recycle Auto-catalysts in Cinderford.

Bangor University

Web: <http://www.bc.bangor.ac.uk/>

The BioComposites Centre aims to facilitate and undertake research for innovation using bio-materials in industry. The Centre was established with the specific remit to collaborate with and provide research services for businesses. Accordingly, a significant area of their research responds to end-user demand and focuses on exploiting the functionality of new polymers. The Centre's work is targeted at developing bio-based materials in a wide variety of applications to reduce demand for fossil fuel-based polymers. Enhancement of barrier or permeation properties of polymers is essential across a wide range of industries. Therefore, one of the primary aims of the Centre's research is improving the barrier performance of single-layer substrates whilst simultaneously retaining and increasing recyclability. Most of the research is at Technology Readiness Level (TRL) 3, sometimes reaching 4-5 as potential component polymers are developed and undergo an LCA. All research projects are collaborative and linked to industry. The centre has competitively won over £2.7m of research projects linked to packaging and has been designated as a Key Enabling Technology (KET) centre, which carries out applied research (TRLs 3-8) in technologies deemed fundamental to the UK's future technological growth.

Cambridge Nanomaterials Technologies Ltd.

Web: www.cnt-ltd.co.uk

Cambridge Nanomaterials Technology Ltd (CNT) is an innovation management and nanotechnology consulting company based in Cambridge, UK. The CNT Ltd helps companies, academic and government institutions to develop world-class innovative solutions for nanomaterials related R&D and IPR strategy, partnership, products, technologies, funding and markets. CNT Ltd is specialised in carbon nanomaterials R&D consulting and collaborative R&D project management, including exploitation and dissemination management, consortium and supply chain building. CNT has done a number of patent landscaping and market research analysis studies regarding production and use of various nanomaterials helping to link inventors and technology developers with end-users and investors.



The Centre has also won awards for projects in the food packaging sector such as the Green Life award for Bread4PLA, where PLA was polymerised from waste bread. The Centre works closely through the Bio-based and Biodegradable Industries Association (BBIA), the trade association for the biopolymer sector. Through this link the centre has responded to UK Government calls for evidence, for example around the use of LCA. Recent work funded via Innovate UK includes HDT BioPol (the development of Biobased coffee cup lids for the replacement of HIPS with Wells Plastics) and SafeBioPack, (an EPSRC (Engineering and Physical Sciences Research Council) project working with Tesco and Parkside Flexibles to develop of novel packaging products with Malaysia). The Centre has experience of pilot scale production and prototyping of new packaging formats with improved functional performance such as antimicrobial surfaces. It has also developed in-house test methods that help to screen the biodegradation profiles of new materials in their early stages of development. The Centre aims to raise awareness of the recycling properties of different materials through the development of impact case studies that show the potential for increasing recycling rates of plastics whilst retaining the necessary properties for use in businesses.



CNT is leading private Nano-Carbon Enhanced Materials (NCEM) consortium with members from leading industrial organisations and academic institutions, such as Airbus Group, Rolls Royce, Nokia, Bosch, Nissan, Whirlpool Corporation, ArcelorMittal, Tecnalia, Johnson Matthey, Prysmian Group, National Grid, Schneider Electric, GE, Nexans, Henkel, Stattnet, Arup, Bose, ST Microelectronics, Trinity College Dublin, Copper Industry Association. Based on a similar concept, CNT started a new private consortium Advanced Materials for Additive Manufacturing (AMAM) in November 2018. In March 2019 CNT has opened a sister company CNT Innovation based in Brussels, Belgium (<http://www.cnt-innovation.com/>).

Dunbia

Web: <https://dunbia.com/>

Dunbia is one of Europe's leading food companies. Founded in 1976, Dunbia is a family business and the desire to create better food naturally is the driving force behind everything they do. A combination of organic growth, strategic acquisition & entrepreneurial vision has seen Dunbia grow into a multi-site, multi-species operation, processing cattle & sheep for national and international markets.

Headquartered in Northern Ireland with 12 sites throughout the UK, a division of Dawn Meats, they are the supplier of choice to a range of leading supermarket, food service and restaurant businesses, exporting to over 50 countries, their customers value their unquestionable commitment to sustainability and quality.

Fre-Energy

Web: www.fre-energy.co.uk/

Fre-energy specialises in anaerobic digestion and associated technologies. An established, innovative designer of on-farm anaerobic digestion systems, based in north-east Wales, we pride ourselves in providing bespoke technological solutions for the management of on-farm wastes, tailoring our installations to meet the specific needs of each agricultural setting to complement our clients core farm business.

Parkside Flexibles

Web: www.parksideflex.com

With over 180 employees across two locations in the UK and Malaysia, Parkside is a sustainable, flexible packaging innovation and development pioneer. Since 1970, it has designed and created award-winning packaging solutions that apply to markets from food and beverage to personal care, snack, confectionery and tobacco and much more, with a wide variety of packaging formats available. Parkside delivers its expertise to customers through an intrinsic understanding of fast-moving consumer goods markets. Its innovation team provides the latest thinking in sustainable and recyclable packaging design backed by market-leading operations, supply chain and customer service teams.



Employing over 5,000 people across a wide range of high-tech and multi-skilled disciplines, Dunbia is at the cutting edge of new product development, winning numerous industry awards including Meat, Poultry and Seafood Manufacturing Company of the Year 2022, Northern Ireland Food & Drink Awards 2022 Winner, World Steak Challenge Winner and numerous Great Taste Awards.



Our aim is to create an on-farm circular economy where farm wastes are used to fuel the digester thereby producing useable energy for onfarm/local use and a high-quality nutrient-rich digestate used as a soil conditioner to optimise crop growth. We passionately believe that an on-farm AD facility is about environmentally positive and sustainable agriculture rather than a farm becoming a rural power station.



From shelf-life extension for inventory management and waste minimisation to lightweight design for a low carbon footprint and/or meeting convenience needs, Parkside has the skills, experience and technology to meet any packaging brief.

The company offers a wide range of pack formats and solutions, including pouches, lidding films, flow wraps and bags, Parkside manufactures from films, foils and papers to provide cost-effective, consistent, high-quality packaging.

Recycling Technologies

Web: <https://recyclingtechnologies.co.uk/>

UK-based Recycling Technologies is on a mission to accelerate the evolution of plastic into a more sustainable material. Currently, 88% of the plastic used in the world is either buried, burned, or leaked into the environment. This means that the world recycles only 12% of the plastic waste produced each year.



Through a decade of research, engineering, and collaboration with both academia and industrial partners, RT has developed innovative technologies to turn hard-to-recycle plastic waste including polystyrene and flexible packaging into feedstocks for new plastic production, and has established itself as a prominent player in the chemical recycling sector both at national and global level.

Wells Plastics

Web: <https://wellsplastics.com/>

Wells Plastics is a specialist additive masterbatch and bespoke compound manufacturer based in the heart of the UK, with a strategy to continue to develop tailor made solutions and technically advanced masterbatches and compounds for the polymer industry. Established in 1984, Wells has become a major supplier to the polymer industry within the film, fibre, sheet, profile extrusion and moulding marketplaces.

Recent significant investment and expansion, in response to the continued growth and demand for Wells Plastics products and services both locally and internationally, included the installation of two new state-of-the-art twin-screw compounding lines, creating extra capacity and functionality.



This significant expansion was in response to the continued growth and demand for Wells Plastics products and services both locally and internationally.

Wells has a wealth of experience in collaborative research and development having been involved in several IUK/EU projects, both as Lead and Collaboration Partners, in diverse applications such as food packaging, barrier compounds, agricultural films, high temperature biopolymer compounds and medical implants.

The company is ISO9001/ISO14001 and has achieved a Silver EcoVadis rating.

News

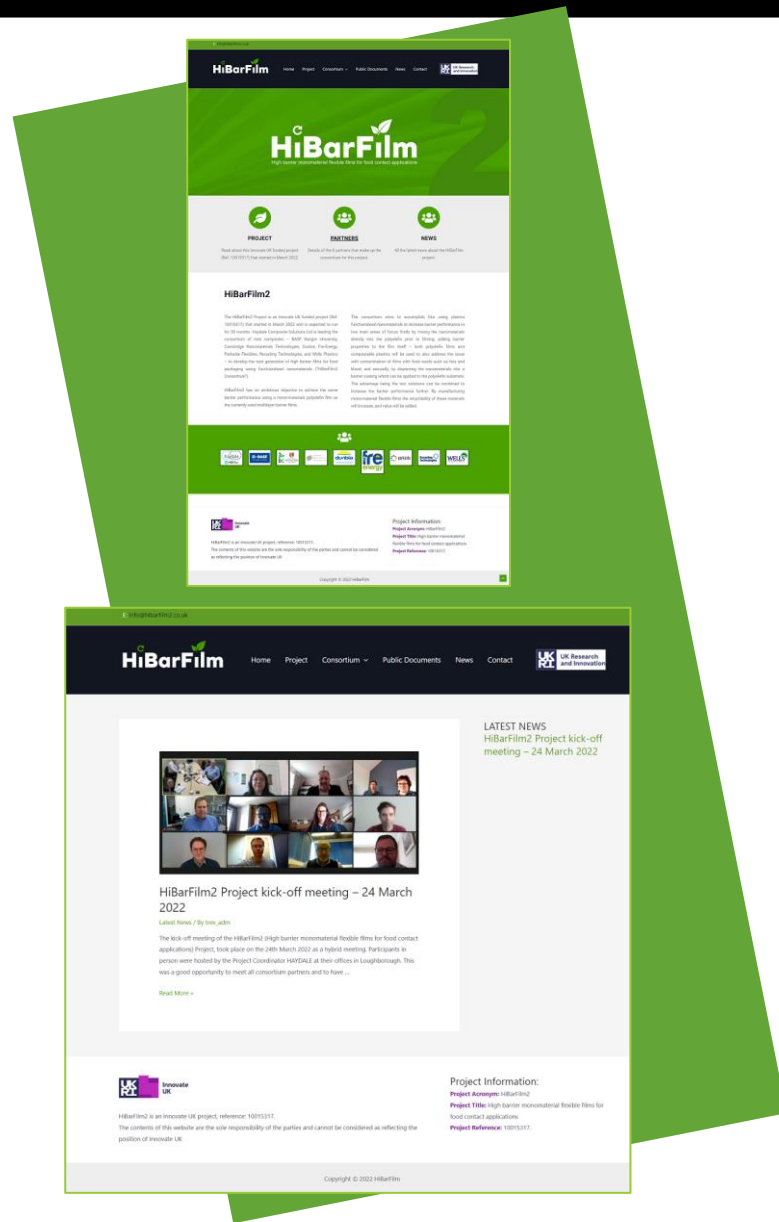
Kick-off meeting

The kick-off meeting of the **HiBarFilm2** (High barrier monomaterial flexible films for food contact applications) Project, took place on the **24th March 2022** as a hybrid meeting. Participants in person were hosted by the Project Coordinator HAYDALE at their offices in Loughborough. This was a good opportunity to meet all consortium partners and to have an introduction from the Project Monitor (Innovate UK).



Project website launched

The project website has been launched and can be found at the following link: www.hibarfilm.co.uk. Cambridge Nanomaterials Technology Ltd., the partner in charge of the exploitation and dissemination activities in the project, prepared the website with the input from all project partners. The project website will be an excellent tool to provide information on the progress of the project to a wider audience.



Q1 Project Review Meeting – 21 June 2022

The 1st project review meeting was held as a hybrid meeting, hosted by **Dunbia** at their Cross Hands site, in Wales. This was the first opportunity for most of the partners to meet in person. Partners presented and discussed various tasks carried out since the launch of the project. The new project logo and templates were also officially presented to the Project Officer and Monitor. After the meeting, partners had the opportunity to have a tour of the factory.

HiBarFilm at the Smart Sustainable Plastic Packaging Workshop - 6 September 2022

Bangor University gave a presentation at the Smart Sustainable Plastic Packaging September Workshops: Making Plastics Fit for a Sustainable Future, which took place in Wales on the 6 September. This is an InnovateUK KTN event.



Haydale talk at the RWM and Let's recycle Live (NEC Birmingham) 14 September 2022

Haydale represented the project at the Resource and Waste Management (RWM) Lets Recycle live conference (NEC Birmingham), 14th Sept in the Smart Sustainable Plastic Packaging, where the Project Coordinator, Dr Kayleigh McEwan has a talk.



The PackagingInsights.com Newsletter showcases the HiBarFilm project

The Partner Coordinator Haydale has contributed to an article that introduces HiBarFilm2 Project. The article has been published by PackagingInsights.com (Netherlands), under the title: UK consortium looks to functionalized nanomaterials to boost film barrier properties. To read the article in full, [please visit this link.](#)



Q2 Meeting – 27 September 2022

The Q2 project meeting took place on the 27 September 2022 and was hosted by the partner Wells Plastics Ltd, at their offices in Staffordshire. Participants who attended in person, had the opportunity to have a site tour of the Wells installations.



Future events

HiBarFilm2 Open Day Dissemination Workshop

The HiBarFilm2 Project will host its first Open Day mid next year. This Workshop will be a great opportunity to hear about the progress of the project and meet the project partners.

Participation to this event will be free but registration would be required. If you are interested in receiving more information on this event or any future activities, please send an email to: info@hibarfilm.co.uk



For more information on the project and to subscribe to the newsletter, please contact us at:

info@hibarfilm.co.uk

www.hibarfilm.co.uk