BIO-BASED INDUSTRIES SUCCESS STORIES

CASE STUDIES BY MEMBERS OF THE BIO-BASED INDUSTRIES CONSORTIUM (BIC)
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INTRODUCTION

The Bio-based Industries Consortium brings together close to 80 full industrial members and around 150 associate members in a public-private partnership (PPP) with the European Commission known as the Bio-based Industries Joint Undertaking (BBI JU).

Mobilising €3.7 billion worth of investment, the partnership is dedicated to supporting facilities, projects and processes which manufacture high-quality bio-based products, as well as in biorefining research and demonstration projects.

BIC’s membership features a unique cross-section of experts from the following industries:

• Aquaculture
• Agriculture and agri-food
• Forestry/pulp and paper
• Chemicals
• Biotechnology and technology providers
• Energy
• Other manufacturing sectors

The ‘Bio-based Industries Success Stories’ showcase investments by BIC members in innovative bio-based projects.

These real-life examples demonstrate how BIC members are harnessing the power of renewables to transition towards a post-petroleum society.

Each case study highlights the positive social and environmental impacts of BIC member bioeconomy projects and the important leveraging effect of the BBI JU in accelerating innovation and market uptake of bio-based products.
AGRI-BASED FEEDSTOCK
The next generation agri-based value chains
BIOSKOH – NOVEL SECOND GENERATION BIOREFINERY

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ABOUT THE PROJECT
A circular bioeconomy project, BIOSKOH will transform a brownfield industrial site in eastern Slovakia into a 55 kton cellulosic ethanol production facility.

PROJECT AIMS
A flagship research project, BIOSKOH will demonstrate a first-of-its-kind commercial-scale second-generation biorefinery.

Boosting the sustainable conversion of renewable biomass into bio-based products, chemicals and energy is central to Europe’s transition towards a sustainable bioeconomy. Currently, there are no full-scale producers of second generation (2G) bioethanol in Europe. BIOSKOH aims to change this by using ‘Innovation Stepping Stones’ to produce cellulosic ethanol for EU biofuel mandates.

The project will also explore emerging bio-based materials, such as lignin and bioethylene.

PROJECT DETAILS
- Type of project: BBI-Flagship
- Start date: June 2016
- Duration: 4 years
- Total cost: €30 million
- Industry investment: €9 million
- Headquarters: Tortona, Italy
- Website: www.bioskah.eu
EXPECTED RESULTS
Establish cross-industry collaboration between the agro-industry, bio-based, chemical and energy industries to build a first-of-its-kind second generation (2G) bioethanol refinery.

Develop a novel bio-based value chain and improve regional infrastructure. Make new storage and shipment facilities for agricultural products available to local farmers and businesses.

Introduce farmers to new biomass uses, which will help them to diversify, seize new business opportunities and exploit currently under-used resources.

Verify, optimise and upscale design and process solutions already proven at pilot/demo scale. Pave the way for a second-stage investment to scale-up the biorefinery to 110 kton.

Create an estimated 160 direct and 500 indirect jobs (in both energy and biotechnology) across the value chain.

BIOSKOH – NOVEL SECOND GENERATION BIOREFINERY
BIOSKOH – NOVEL SECOND GENERATION BIOREFINERY

PROJECT PARTNERS – BIC MEMBERS AND ASSOCIATE MEMBERS

Biochemtex, Italy (Full BIC Member)
Biochemtex is a leading producer of second-generation biofuels and biochemicals. Part of the Mossi Ghisolfi Group, Biochemtex develops and engineers technologies and biochemical processes to transform non-food biomass into renewable alternatives to fossil fuel products.

After seven years of research and a €150 million investment, Biochemtex developed the PROESA™ process, a proprietary technology platform for the production of biofuels and chemical intermediates. The company is also developing a new technology called MOGHI to convert lignin into bio-diesel and other aromatics.

For more information, visit: www.biochemtex.com

Energochemica, Slovakia (Full BIC Member)
Established in Prague in 2011, Energochemica is a holding company for the chemical and power industries. In recent years, Energochemica has also made investments in biotechnologies.

The holding’s core comprises well-established chemical factories which have a strong emphasis on product quality, environmental protection and occupational safety.

For more information visit: www.energochemica.eu
Novozymes, Denmark
(Full BIC Member)

Novozymes is a world leader in biological solutions. Together with its customers, partners and the global community, the company improves industrial performance while preserving the planet’s resources and helping to build better lives. As the world’s largest provider of enzyme and microbial technologies, Novozymes’ bioinnovation enables higher agricultural yields, low-temperature washing, energy-efficient production, renewable fuel and many other benefits. Novozymes’ approach is called ‘Rethink Tomorrow’.

For more information, visit:
www.novozymes.com
FIRST2RUN – INTEGRATED BIOREFINERY FOR DRY CROPS

“We believe that the Bio-Based Industries Joint Undertaking, through this first flagship project, can produce a decisive acceleration towards a circular bioeconomy, creating not only new knowledge but also opportunities for economic growth and employment in Europe,” Novamont CEO Catia Bastioli.

ABOUT THE PROJECT
A flagship demonstration of an integrated biorefinery for the sustainable transformation of dry crops into bio-based materials.

PROJECT AIMS
By setting up a value chain which integrates the regional agricultural sector with a new biorefinery, First2Run will demonstrate how low-input and underutilised oil crops like cardoon, grown in arid and/or marginal lands, can be used in biomaterials. A 50/50 joint venture (JV), this project will see the reconversion of the Porto Torres petrochemical site into a biorefinery with an integrated production chain for chemical intermediates.

The biorefinery will make use of every fraction (cascading use of biomass) to produce chemicals and animal feed. An agreement between Novamont and Coldiretti (the Italian Farmer’s Federation) will ensure the biorefinery is the centrepiece of a circular economy model.
EXPECTED RESULTS
Cultivate cardoon on a large-scale (up to 3.5 kha) with the support of local farmers and using low-input, optimised agricultural tools.

Reduce consumption of thermal and electric energy for chemical processes by up to 50% and 20% respectively. Apply sustainable, cost-effective and innovative catalytic and biocatalytic processes for the production of bio-based building blocks (such as azelaic acid, pelargonic acid and glycerol).

Manufacture bio-based azelaic and pelargonic acid in a plant with a production capacity of up to 10,000 tons/year for each acid. Demonstrate batch production of biodegradable esters of up to 20,000 tons/year.

Reduction in greenhouse gas (GHG) emissions by 35%.
First2Run – Integrated Biorefinery for Dry Crops

Project Partners – BIC Members and Associate Members

Novamont, Italy
(Full BIC Member)
Novamont is a world-leading company in the bioplastics and biochemicals sectors, working at the cross section of chemistry, environment and agriculture. It promotes a new bioeconomy model within the circular economy, not only based on efficiency and sustainable use of renewable resources but also taking into account territorial regeneration. Novamont’s development model begins in local areas and creates integrated biorefineries by converting uncompetitive industrial sites.

Alma Mater Studiorum – Università di Bologna, Italy
(Associate Member)
The first of its kind in the Italian university system, since 1989, the Alma Mater Studiorum has been structured as a multi-campus: the Bologna campus works alongside the campuses in Cesena, Forlì, Ravenna and Rimini.

Each Campus is has a strong scientific identity, as well as its own structures and services devoted to learning activities, cultural and sporting events, as well as associations.

For more information, visit:
www.novamont.com
www.unibo.it
FUNGUSCHAIN – MUSHROOM RESIDUE TRANSFORMATION

“Funguschain is a highly integrated project with a unique consortium specialising in various elements across a range of value chains. It brings together leading scientists and companies, who from the project outset have worked closely together to make this challenging project a success. Funguschain will provide an important example of a new way of working in the bio-based economy,” Dr Bart van der Burg, Director of Innovation at BDS.

ABOUT THE PROJECT
Funguschain will use novel cascading processes to extract high-value molecules from fungal residue to meet end-user needs in the food, cleaning and plastics sectors.

PROJECT AIMS
The European mushroom farming industry generates over 60,000 tons of agri-residues each week. Funguschain aims to transform this waste into bio-based additives, bioplasticisers and biopolymers using innovative new procedures.

The project will demonstrate the industrial viability of building a new biorefinery which uses cost-effective extraction technologies and transforms more than 65% of the mushroom waste into valuable additives.

PROJECT DETAILS
- **Type of project:** BBI-Demo
- **Start date:** November 2016
- **Duration:** 4 years
- **Total cost:** €8 million
- **Industry investment:** €2.3 million
- **Headquarters:** Amsterdam, the Netherlands
- **Website:** [www.funguschain.eu](http://www.funguschain.eu)
EXPECTED RESULTS
Make use of new cascading processes in a new biorefinery to extract high-value molecules from fungal residues. Use any remaining residues for composting or biogas synthesis.

Define, demonstrate and validate five new product types including food supplements, cleaning products, thermoplastic masterbatches, plasticisers and industrial films.

Improve the environmental performance and cost efficiency of resulting products.

Boost innovation in agricultural waste management and establish circular economy business models.
FUNGUSCHAIN – MUSHROOM RESIDUE TRANSFORMATION

PROJECT PARTNERS – BIC MEMBERS AND ASSOCIATE MEMBERS

Mi-Plast, Croatia
(Full BIC Member)
Mi-plast specialises in the gathering, processing, use and recycling of secondary raw materials, polyethylene waste and raw materials from non-renewable sources. The company develops new materials based on bio-polymers and is proud to work on the creating novel and sustainable future materials.

Novamont, Italy
(Full BIC Member)
Novamont is a world-leading company in the bioplastics and biochemicals sectors, working at the cross section of chemistry, environment and agriculture. It promotes a new bioeconomy model within the circular economy, not only based on efficiency and sustainable use of renewable resources but also taking into account territorial regeneration. Novamont’s development model begins in local areas and creates integrated biorefineries by converting uncompetitive industrial sites.

For more information, visit:
www.mi-plast.eu

For more information, visit:
www.novamont.com
FUNGUSCHAIN – MUSHROOM RESIDUE TRANSFORMATION

PROJECT PARTNERS – BIC MEMBERS AND ASSOCIATE MEMBERS

**Aitiip, Spain**
*(Associate BIC Member)*
The Aitiip Innovation and Technology Centre was founded in 1995. Its activities focus on the design, manufacturing and transformation of plastic materials. Aitiip works across a number of sectors including the automotive, aeronautics, product design, packaging and eco-innovation industries. The AITIIP engineering design team has experience in advanced plastic transformation processes for thermoplastics – bio-based plastics, polyolefins and thermosets.

For more information, visit:  
[www.aitiip.com](http://www.aitiip.com)

**KTH – (Royal Institute of Technology, Sweden)**
*(Associate BIC Member)*
Since its founding in 1827, the KTH Royal Institute of Technology in Stockholm has grown to become one of Europe’s leading and most innovative technical and engineering universities. KTH is Sweden’s largest technical research institute and home to students, researchers and faculty from around the world.

For more information, visit:  
[www.kth.se](http://www.kth.se)
**FUNGUSCHAIN – MUSHROOM RESIDUE TRANSFORMATION**

**PROJECT PARTNERS – BIC MEMBERS AND ASSOCIATE MEMBERS**

**Universidad de Alicante, Spain**  
*(Associate BIC Member)*

The University of Alicante was created in October 1979, but it has roots dating back to 1545. The University offers courses in over fifty degrees and has over seventy departments and research groups covering a variety of subjects, including Social Science and Law, Experimental science, Technology, Liberal Arts, Education and Health Sciences, as well as five research institutes.

For more information, visit:  
[www.ua.es](http://www.ua.es)
FOREST-BASED FEEDSTOCK
The next generation forest-based value chains
BIOFOREVER – CONVERSION OF WOODY BIOMASS

“MetGen has always been enthusiastic about building new industrial value chains through collaboration. Bioforever brings together technologies with great potential for Europe and unifies professionals behind them to tackle the ambitious goal of enabling the next generation of biorefining industry,” Matti Heikkilä, Chief Technical Officer, MetGen Oy.

ABOUT THE PROJECT
Bioforever will demonstrate the conversion of woody biomass to value-added chemical building blocks like butanol, ethanol and 2,5-furandicarboxylic acid (FDCA) on an industrial scale.

PROJECT AIMS
Woody biomass, including waste wood will be converted to lignin, (nano-) cellulose and (hemi-) cellulosic sugars and further converted to lignin derivatives and chemicals. Feedstocks will be benchmarked with crop residues and energy crops.

A number of pre-treatment and conversion technologies will be demonstrated, as well as routes for commercialising the most promising value chains. The project will establish optimal feedstock, biorefinery technology, end-product and market combinations to offer competitive value-added products for the European bioeconomy.

PROJECT DETAILS
Type of project: BBI-Demo
Start date: September 2016
Duration: 3 years
Total cost: €16 million
Industry investment: €6 million
Headquarters: Heerlen, the Netherlands
Website: www.bioforever.org
**EXPECTED RESULTS**
Establish conversion routes to transform woody biomass into intermediates (such as cellulose, C5/C6 sugars, lignin and humins) and further transform these intermediates into six bio-based building blocks (such as carbon binders, butanol, resin acid, enzymes and FDCA).

Demonstrate five lignocellulosic (LC) value chains at pre-industrial scale for the selected final products. Develop three pathways to exploit industrial side-streams using four different cascading biorefinery concepts.

Generate competitive bio-based products which match or outperform existing fossil-based products in terms of cost and product performance.

Achieve up to 85% reductions in CO2 emissions compared to fossil-based value chains.

Create 1,200 direct jobs and 6,000-7,500 indirect jobs in the agricultural/forestry sector by sourcing European biomass.
BIOFOREVER – CONVERSION OF WOODY BIOMASS

PROJECT PARTNERS – BIC MEMBERS AND ASSOCIATE MEMBERS

Avantium, the Netherlands
(Full BIC Member)
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 bio-based materials. Avantium offers a breeding ground for revolutionary renewable chemistry solutions.

One of Avantium’s many success stories is YXY technology®, used to create PEF: a completely new, high-quality plastic made from plant-based industrial sugars. PEF is 100% recyclable.

For more information, visit: www.avantium.com

Bioprocess Pilot Facility (BPF), the Netherlands
(Full BIC Member)
The Bioprocess Pilot Facility is an R&D facility situated in Delft dedicated to the scale-up of bioprocesses. BPF is a multi-purpose facility where companies and academic institutions can develop novel, sustainable and environmentally-friendly production processes based on biological materials.

The BPF is especially designed to enable the step-up from laboratory-scale to industrial-scale. Users can couple separate modules to investigate and develop their own processes. The facility also provides training and education.

For more information, visit: www.bpf.eu
BIOFOREVER – CONVERSION OF WOODY BIOMASS

PROJECT PARTNERS – BIC MEMBERS AND ASSOCIATE MEMBERS

Borregaard, Norway (Full BIC Member)
Borregaard has one of the world’s most advanced biorefineries. By using natural, sustainable raw materials, Borregaard produces advanced and environmentally-friendly biochemicals and biomaterials which can replace oil-based products. The company is listed on the Oslo Stock Exchange and has 1,080 employees in factories and sales offices in Europe, America, Asia and Africa.

For more information, visit: www.borregaard.com

DSM, the Netherlands (Full BIC Member)
Royal DSM is a global science-based company active in health, nutrition and materials. DSM delivers innovative solutions which nourish, protect and improve performance in global markets such as food and dietary supplements, personal care, feed, medical devices, automotive, paints, electrical and electronics, life protection, alternative energy and bio-based materials. DSM and its associated companies deliver annual net sales of about €10 billion with approximately 25,000 employees. The company is listed on Euronext Amsterdam.

For more information, visit: www.dsm.com
MetGen, Finland
(Full BIC Member)
MetGen was founded in 2008 by CEO Alex Michine and CSO Alex Azhayev, a professor of bioorganic chemistry at the University of Eastern Finland (Kuopio, Finland). The company designs and markets novel enzymatic solutions for the most challenging industrial conditions.

MetGen’s enzymes – MetZyme® – are industrial, highly-active, natural catalysts which accelerate chemical reactions. They can survive in harsh industrial environments and can be used in combination with other enzymes, enabling novel applications.

For more information, visit:
www.metgen.com

Nova Institute, Germany
(Associate BIC Member)
The nova-Institute was founded as a private and independent institute in 1994. It is located in the Chemical Park Knapsack in Huerth, which lies at the heart of the chemical industry around Cologne, Germany.

For two decades, the nova-Institute has been globally active in supporting the development of a sustainable bio-based economy through research into feedstock supply, techno-economic and environmental evaluation, market research, dissemination, project management and policy analysis. Today, nova-Institute has 25 employees and an annual turnover of more than €2 million.

For more information visit:
https://www.unilever.com
EXILVA – MICROFRIIBULLAR CELLULOSE PRODUCTION

“Borregaard is well-positioned to develop microfibrillar cellulose, a potentially new and exciting business area. The company has broad experience in the production of bio-based chemicals using natural raw materials and a strong competence base within R&D for specialty products,” Borregaard President and CEO Per A. Sørlie.

ABOUT THE PROJECT
Exilva is a flagship demonstration project for the large-scale production and supply of microfibrillated cellulose (MFC), a new performance additive made from renewable raw materials.

PROJECT AIMS
Sustainably sourced from Scandinavian forests, Borregaard’s Exilva is designed to outperform current oil-based additives. The speciality cellulose is made up of a network of microfibrils produced through cellulose fibre fibrillation. The novel fibril product has a very high surface area, giving it superior water retention capacity.

MFC has unique properties: it regulates viscosity, stabilises emulsions, provides consistency and is a water-binding agent. The product is suitable for a variety of applications, including adhesives, detergents, cosmetics, composites and other industrial uses.

PROJECT DETAILS
Type of project: BBI-Flagship
Start date: May 2016
Duration: 3 years
Total cost: €33 million
Industry investment: €8 million
Headquarters: Sarpsborg, Norway
Website: http://www.exilva.com
EXPECTED RESULTS
Facilitate the set-up of flagship plants for producing bio-based alternatives to fossil-based products by establishing the world’s first commercial production facility for MFC. Initial capacity of 1,000 tons per year with the potential for expansion.

Transform cellulose from wood into high added-value products such as paints, coatings, adhesives, personal care, home care, agricultural chemicals and more. Work in close cooperation with partners and customers to develop MFC applications.

Create direct and indirect jobs across the entire value chain through: MFC R&D, production, logistics, sales and marketing activities.

Produce an environmentally-friendly performance enhancer with a significantly lower carbon footprint than existing petrochemical products.
EXILVA – MICROFRIBULLAR CELLULOSE PRODUCTION

PROJECT PARTNERS – BIC MEMBERS AND ASSOCIATE MEMBERS

Borregaard, Norway
(Full BIC Member)
Borregaard has one of the world’s most advanced biorefineries. By using natural, sustainable raw materials, Borregaard produces pioneering and environmentally-friendly biochemicals and biomaterials that can replace oil-based products. The company is listed on the Oslo Stock Exchange and has 1,080 employees in factories and sales offices in 16 countries in Europe, America, Asia and Africa.

Unilever, UK
(Full BIC Member)
Unilever is a British-Dutch multinational consumer goods company co-headquartered in Rotterdam, Netherlands, and London, United Kingdom. Its products include food, beverages, cleaning agents and personal care products. Unilever is one of the oldest multinational companies, its products are available in around 190 countries.

For more information, visit:
http://www.borregaard.com

For more information visit:
https://www.unilever.com
EXILVA – MICROFRIEBULLAR CELLULOSE PRODUCTION

PROJECT PARTNERS – BIC MEMBERS AND ASSOCIATE MEMBERS

Royal Institute of Technology – KTH, Sweden (Associate BIC Member)
Since its founding in 1827, the KTH Royal Institute of Technology in Stockholm has grown to become one of Europe’s leading and most innovative technical and engineering universities. KTH is Sweden’s largest technical research and learning institute and home to students, researchers and faculty from around the world.

For more information, visit:
www.kth.se
PROJECT DETAILS
Type of project: BBI-Demo
Start date: January 2015
Duration: 4 years
Total cost: €18.5 million
Industry investment: €5.4 million
Headquarters: Augsburg, Germany
Website: www.valchem.eu

ABOUT THE PROJECT
ValChem (Value-added chemical building blocks and lignin from wood) is an ambitious project combining expertise from the forest, chemical and biotechnology industries in the development of a sustainable and integrated process to convert wood into useful end products.

PROJECT AIMS
The project will demonstrate the technical and economic viability of an integrated biochemicals process covering the whole value chain from wood – the raw material – to a selected platform chemical and lignin-based performance chemicals.

“Each part of the process – wood-to-sugars for chemical production, production of bio-MPG from sugars and production of lignin-based performance chemicals – show progress well beyond the state-of-art,” Dirk Carrez, Executive Director of the Bio-based Industries Consortium.
EXPECTED RESULTS
Increase regional development and contribute to job creation. Locate future biorefineries based on this platform technology in rural areas, where biomass is readily available.

Use over 75% of the raw material (wood).

Utilise existing project partner demonstration plants to produce wood-based chemicals with a value two to six times higher than traditional products and competitive with fossil-based alternatives.

Improve the sustainability of industrial processing and wood production – increase the amount of wood with PEFC and FSC certificates being used.

Expand the market for bio-based chemicals and mobilise further investment to accelerate the transition towards a more sustainable industrial sector.
UPM, Finland
(Full BIC Member)
UPM serves a global customer base, manufacturing recyclable products made of renewable raw materials. The company is building a sustainable future in six business areas: UPM Biorefining, UPM Energy, UPM Raflatac, UPM Paper Asia, UPM Paper Europe and North America and UPM Plywood. UPM employs approximately 20,000 people and has annual sales of approximately €10 billion.

Metabolic Explorer, France
(Full BIC Member)
Metabolic Explorer is a pioneer in biological chemistry and aims to become an innovation leader in the bioeconomy. Metabolic Explorer provides competitive bio-based industrial solutions to make chemicals from renewable feedstock, thus creating value for its partners and stakeholders. Metabolic Explorer is based in Clermont-Ferrand, France.

For more information, visit:
www.upm.com

For more information visit:
www.metabolic-explorer.com
THE NEXT-GENERATION BIOPRODUCT MILL

“The bioproduct mill is a prime example of Metsä Group’s and the Finnish forest industry’s vitality and ability to renew. We are resolutely progressing towards the autumn of 2017, when the bioproduct mill will begin operations,” Kari Jordan, President and CEO of Metsä Group.

ABOUT THE PROJECT
Metsä Fibre, which is part of Metsä Group, is building a new bioproduct mill in Äänekoski in Central Finland. Metsä Group’s €1.2 billion bioproduct mill is one of the most significant bioeconomy investments in the EU since the start of BBI JU. Construction began in 2015 and the mill will come online in Q3 2017.

PROJECT AIMS
Metsä Fibre will build the world’s first next-generation bioproduct mill to produce a broad range of products, manufactured by a unique ecosystem of companies.

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<tr>
<th>PROJECT DETAILS</th>
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<tr>
<td>Type of project:</td>
<td>Company initiative</td>
</tr>
<tr>
<td>Start date:</td>
<td>May 2015</td>
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<tr>
<td>Duration:</td>
<td>3.5 years</td>
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<tr>
<td>Total investment:</td>
<td>€1.2 billion</td>
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<tr>
<td>Headquarters:</td>
<td>Äänekoski, Finland</td>
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<tr>
<td>Website:</td>
<td><a href="http://www.bioproductmill.com">www.bioproductmill.com</a></td>
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EXPECTED RESULTS

Create 2,500 jobs across the value chain, from the forest to the delivery of products, including 1,500 entirely new jobs.

Purchase raw materials and services worth €0.5 billion per year and increase the annual value of Finnish exports by €0.5 billion.

Reduce fresh water use per ton of pulp produced, improve energy efficiency, become totally independent from fossil energy, lower emissions to the air and use mill waste streams to produce key chemicals on-site to promote waste reduction and recycling.

Establish new bio-based value chains and bioproducts, through €1.2 billion investment and use the core mill as a platform. Three such new value chains/bioproducts have already been announced.

PROJECT PARTNERS
EXILVA – MICROFRIBBULAR CELLULOSE PRODUCTION

PROJECT PARTNERS – BIC MEMBERS AND ASSOCIATE MEMBERS

**Metsä Fibre, Finland**  
*(Full BIC Member)*

Metsä Fibre is a leading producer of bioproducts and bioenergy. The company’s Botnia brand softwood and birch pulp grades have been developed for the production of high-quality board, tissue and printing paper and speciality products. Currently employing approximately 850 people, the company’s sales totalled €1.4 billion in 2015. Metsä Fibre is part of Metsä Group.

For more information, visit:  
[www.metsafibre.com](http://www.metsafibre.com)
WASTE-BASED FEEDSTOCK

New value chains from waste
NEWFERT – NUTRIENT RECOVERY FROM BIOWASTE

PROJECT DETAILS
Type of project: BBI-RIA
Start date: November 2015
Duration: 4 years
Total cost: €2.4 million
Industry investment: €1.2 million
Headquarters: Madrid, Spain
Website: www.newfert.org

ABOUT THE PROJECT
Newfert will develop nutrient recycling strategies and lay the foundations for sustainable fertiliser manufacturing.

PROJECT AIMS
The project will create technologies which allow biowaste to be re-used as a secondary raw material in a new brand of cost-effective, eco-friendly and advanced fertilisers. NEWFERT targets a combination of specific organic and mineral components for fertilisers.

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EXPECTED RESULTS
Develop a new value chain which uses bioprocesses to recover nitrogen, potassium and phosphorus (NPK) from biowaste (sewage, manure and household waste).

Strengthen Europe’s economic competitiveness and boost the bio-based economy.

Reduce fertiliser production from fossil-based resources and help to avoid CO2 emissions.

Decrease raw material dependency and prevent resource depletion. Reduce environmental degradation and increase the sustainability of the fertiliser industry.

Improve waste management and cost-effective nutrient recovery. Contribute to the development of a circular economy.
Universidad de León, Spain  
(Associate BIC Member)  
Universidad de León is a Spanish university with campuses in León and Ponferrada. Founded in 1979, the university runs thirty-eight undergraduate and over thirty postgraduate degree programmes.

For more information, visit:  
www.unileon.es
AQUATIC/MARINE-BASED FEEDSTOCK

New value chains from algae and aquatic/marine biomass
FEEDSTOCK-FLEXIBLE PROCESSES

Bio-based chemicals and biomaterials from a broad range of renewable raw materials
PROJECT DETAILS
Type of project: Company initiative
Start date: 
Duration: 
Total investment: €30 million
Headquarters: Milan, Italy
Website: www.gfbiochemicals.com

ABOUT THE PROJECT
In 2008, a group of bio-based chemical experts saw the potential of levulinic acid to replace fossil-based products across a range of market sectors.

PROJECT AIMS
The project will produce levulinic acid at commercial scale directly from biomass. GFBiochemicals has retrofitted an existing plant to produce 10 kta of levulinic acid and 2 kta of formic acid from waste biomass. The GFBiochemicals process is feedstock-flexible and allows for a wide range of downstream transformations.

“Our Team of experts has decades of experience in innovation, production and business development. We are now perfectly-placed to bring bio-based levulinic acid to market and enable new applications that will replace petro-based products,” Maxim Katinov, CEO GFBiochemicals
EXPECTED RESULTS
Demonstrate cost-competitive reactor, recovery and purification technologies with high conversion yields for levulinic acid and formic acid.

Generate 600 direct and indirect jobs and inject €40 million into the economy by 2017.

Use bio-based products made with levulinic acid as replacements for fossil-based products and reduce greenhouse gas emissions (GHG) by 40,000 tons.

Cultivate land which is unsuitable for arable farming for energy crops.

Create a new value chain centred on levulinic acid – a versatile building block for chemicals and materials derived directly from biomass. Reduce fossil fuel dependence and contribute to the circular economy.

PROJECT PARTNERS
EXILVA – MICROFRIBULLAR CELLULOSE PRODUCTION

PROJECT PARTNERS – BIC MEMBERS AND ASSOCIATE MEMBERS

GFBiochemicals, Italy
(Full BIC member)
GFBiochemicals is one of the largest producers of levulinic acid at commercial scale directly from biomass. The company has a unique set of proprietary technologies that allow levulinic acid and formic acid production with a one-step process directly from a wide range of cellulosic feedstock. GFBiochemicals has an international presence employing more than 50 people with headquarters in Milan, Italy, R&D and commercial office in Geleen, The Netherlands and production sites in: Caserta, Italy and Minnesota, USA.

For more information, visit:
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