BBI JU
2014 7 years
advancing the European bio-based industry
2020
Table of contents

BBI JU: a game changer in the European bio-based economy ............................................... 4
Leading the EU’s green recovery ......................................................................................... 6
Expected socio-economic impact ...................................................................................... 8
Expected environmental impact ....................................................................................... 10
Achievements of BBI JU-funded projects ...................................................................... 12
How is BBI JU supporting the development of the bio-based industry sector? ............ 15
BBI JU mission .................................................................................................................... 17
About the bio-based industries ........................................................................................... 18
At a time when Europe is still recovering from the devastating consequences of the pandemic, the need to transform the way we live, produce, and consume has become more obvious than ever. Such transformation is as urgent as challenging.

How can we enable the green transition, spur economic growth, and create new jobs locally, while making a positive impact on the environment and our health?

The achievements of Europe’s circular bio-based economy over the last seven years show concrete solutions to these challenges.
BBI JU: a game changer in the European bio-based economy

The Bio-based Industries Joint Undertaking (BBI JU) is a €3.7 billion public-private partnership between the European Union and the Bio-based Industries Consortium (BIC) that supports the development of innovative and competitive bio-based industries in Europe with the objective to replace fossil-based with locally sourced bio-based products. BBI JU aims to bridge the gap between bio-based innovations and the market, stimulate research & innovation in Europe, de-risk investments in this emerging field and encourage collaborations among the sector’s very diverse stakeholders. BBI JU’s goal is to reach a critical mass in Europe to address the strategic challenges of creating a sustainable, circular and flourishing bioeconomy and enhancing European competitiveness on a global scale.

Since 2014, BBI JU has been implementing the Strategic Innovation & Research Agenda (SIRA), the strategic document setting the objectives for the bio-based industries sector in Europe.
BBI JU is funding over 140 projects that develop better, sustainable solutions and bring them closer to the market. Fourteen of these projects are flagship biorefineries at commercial scale, and first-of-their-kind in Europe, with a high potential of replication.

They convert sustainable biomass into different types of bio-based ingredients, materials and products, such as feed, fibres, chemicals and bioenergy, and prove the viability of the biorefinery concept.

By contributing to the building of a competitive circular bio-based economy in Europe that will boost the local economies, BBI JU is helping to meet the EU’s economic and climate targets set in the European Green Deal and the EU Bioeconomy Strategy, while also making a major contribution to the green recovery.

AN AMBITIOUS BUDGET ATTRACTING PRIVATE INVESTMENTS

Over the last seven years, BBI JU has invested over €800 million in 142 projects.

By 2024, each euro of BBI JU funding is expected to have attracted a private contribution of 2.8 euros.
Leading the EU’s green recovery

BBI JU PROJECTS IN NUMBERS

- **142** PROJECTS
- **€822 M** BBI JU FUNDING
- **1055** BENEFICIARIES
- **39** COUNTRIES

SUPPORTING RESEARCHERS AND BUSINESSES ACROSS EUROPE

BBI JU-funded projects give funding opportunities to all relevant stakeholders – small and medium-sized enterprises (SMEs), large industries, researchers, primary producers, trade associations, and end-users – to develop technologies and business models advancing Europe’s green economy.

SMEs receive 37% of the total BBI JU funding. They also represent 40% of all beneficiaries and two-thirds of the private organisations taking part in the projects. With the help of BBI JU’s funding, small businesses scale up their technologies and get access to the market. At the same time, as technology and innovation providers, they play a crucial role in the projects.

Universities and research centres receive 30% of all BBI JU funding and represent 25% of all participations in projects. Their collaboration with industry and other bioeconomy actors in the projects helps to bring crucial innovations closer to the market.

BBI JU’s project participants are active across Europe. For example, the flagship biorefineries are set in Estonia, France, Ireland, Italy, Latvia, the Netherlands, Norway, Romania and Spain. They represent a great variety of business models transforming a wide range of sustainable feedstock sourced locally.

*Source: CORDA, June 2021*
BBI JU-funded projects contribute significantly to the regional development in Europe, and mainly in rural and coastal areas.

40% of BBI JU-funded projects create synergies with regional initiatives to boost their impact locally.

Moreover, 37% of them diversify the local economy.
Expected socio-economic impact

By developing sustainable bio-based industries in Europe, BBI JU is helping to create competitive innovations and jobs, as well as attract investments locally. Moreover, these green innovations are better for our health and quality of life.

CREATING JOBS

83% of ongoing BBI JU-funded projects result in the creation of new skilled jobs. In particular, 53% of projects create jobs in rural regions and 15% in coastal areas. 68% of these jobs are in product development and engineering. The first 14 flagship biorefineries funded by BBI JU will generate more than 3,500 direct and more than 10,000 indirect jobs.

ATTRACTING INVESTMENTS

€2.5 billion of private investments will be leveraged by €272 million of BBI JU funding for the first 14 flagship projects. By 2024, the total industry’s participation in BBI JU-funded projects is expected to be nearly three times higher than the BBI JU funding.

SUPPORTING PRIMARY PRODUCERS

32% of projects help primary producers, such as European farmers, diversify their income sources, thus contributing to rural development.
FOSTERING COLLABORATIONS

74% of the projects increase the cooperation between academia and industry, as well as across regions and countries, which would not happen otherwise.

BOOSTING INNOVATION

81% of projects create knowledge and come up with scientific breakthroughs. 44% have produced new patents and IP rights, and 13% created spin-offs and start-ups.

ENABLING CHANGE

61% of the projects provide training and education in the bioeconomy, preparing students, researchers, and professionals for new jobs in the sector. Additionally, 68% of the projects increase the awareness and understanding of the bio-based economy amongst citizens and empower them to become actors of change.

PROTECTING HEALTH

44% of BBI JU-funded projects produce healthier products than their fossil-based equivalents. Some of them focus specifically on developing safer solvents and chemicals, while others develop bio-based pesticides, thus giving farmers sustainable alternatives for crop protection. Moreover, the circular bio-based production processes contribute to considerably reducing waste and plastic pollution.

Source: 2020 questionnaire to the BBI JU project coordinators
Expected environmental impact

BBI JU-funded projects are developing bio-based products, chemicals and materials with a lower environmental impact. As a result, they significantly cut greenhouse gas emissions, reduce waste, and improve land use while preserving biodiversity and fostering efficient use of natural resources. In other words, BBI JU business models lead to economic growth while protecting the environment.

REDUCING EMISSIONS

58% of ongoing projects will deliver bio-based alternatives to fossil-based products that will lower greenhouse gas emissions. The total CO₂ savings of the 14 BBI JU flagship biorefineries are expected to reach 720 kT per year.

Furthermore, all BBI JU’s demonstration and flagship projects must undergo a Life Cycle Assessment analysis to prevent damage to the environment and competition with food production and guarantee the sustainability of the whole value chain.

ENHANCING SUSTAINABILITY AND CIRCULARITY

64% of the projects will contribute to waste reduction, reuse, and recycling, while half of them will reduce energy consumption. 35% of projects will also improve land use.

Over one-third of all projects will contribute to the sustainable management of natural resources and will foster efficient water use. By doing so, they will concretely support a circular and sustainable economy in Europe.
PROTECTING BIODIVERSITY
In addition to their objectives, more than one-fifth of the projects funded by BBI JU safeguard and enhance biodiversity on agricultural land, while others protect it in water and forests.

For example, the BeonNAT project creates bio-based products from underused tree and shrub species grown on marginal lands in Germany, Romania, and Spain. The project is restoring marginal lands, reducing deforestation and forest degradation, and preserving forest genetics while diversifying the range of forest-based biomass.

USING SUSTAINABLE FEEDSTOCK
All feedstock used in BBI JU-funded projects must be sustainably sourced in Europe and not compete with food production.

91% of the biomass of agricultural origin used in the projects is waste and by-products of the agri-food industry, while 7% is made of dedicated crops grown in marginal lands not suitable for agriculture.

96% of forest-based feedstock used by the projects is made of wood residues, cellulose and sidestreams from the pulp and paper industry.

100% of the aquatic feedstock used in BBI JU projects is algae and by-products of fish and seafood, which provides more sustainable raw materials for a wide range of applications, including food and pharmaceutical sectors.

Source: 2020 questionnaire to the BBI JU project coordinators
Achievements of BBI JU-funded projects

A sustainable and competitive bioeconomy in Europe is key for the success of the European Green Deal and the EU’s green recovery. The projects funded by BBI JU contribute to organising the bio-based industry sector, boosting market uptake and supporting innovation.

ORGANISING THE BIO-BASED INDUSTRIES

The main positive impact of BBI JU is the involvement of all actors across sectors resulting in key innovations. BBI JU-funded projects bring in innovative interconnected bio-based value chains and new cross-sectoral collaborations, which are fundamental to make the European economy abreast of the times.

More than 230 new bio-based value chains expected by 2024
of which 33 have already been achieved by 18 finalised projects

A value chain covers the whole production, from raw materials to product applications.

More than 270 new cross-sector interconnections expected by 2024
of which 47 have already been achieved by 18 finalised projects

These new interconnections represent the links created between different actors across new value chains triggering collaborations that did not exist before.

For example, the EFFECTIVE project has created innovative value chains by combining different types of biomass (e.g. sugar beets, beech wood) to produce bio-based nylon, a valuable material for a wide range of applications such as garments, carpets and packaging.
SUPPORTING MARKET UPTAKE

BBI JU is helping to bring innovations to the market by supporting the creation and boosting large-scale production of sustainable products and materials with an equal or overall better performance than their fossil-based counterparts. This results in a wide range of innovations aimed at satisfying consumer and industrial needs.

**Over 230 new bio-based materials expected by 2024**

*of which 24 have already been developed by 18 finalised projects*

Bio-based materials are derived from biological resources, such as leftovers from other production processes (e.g. wood, crops or fibres). They can be used for a wide range of products (e.g. construction, furniture, paper, food, textile, and chemicals).

**Over 120 new bio-based chemical building blocks expected by 2024**

*of which 22 have already been developed by 18 finalised projects*

The building blocks are intermediate molecules or chemicals that are used to produce new bio-based chemicals and materials.

**More than 150 new bio-based products expected by 2024**

*of which 17 have already been developed by 18 finalised projects*

The new products, such as materials, chemicals, biopolymers, additives, fibres, are expected to be more sustainable than their current fossil-based alternatives.

For example, the SpiralG project uses seaweed biomass to produce bio-based food dye, bio-stimulants for plants, functional protein-rich compounds for pet food and higher quality protein bioactive compounds for the pharmaceutical industry.
ENABLING TECHNOLOGICAL ADVANCEMENTS

BBI JU enables advancements to increase maturity levels in technologies, making the leap from lab-scale testing to industrial-scale biorefineries.

The research and innovation projects expect at least one technological advancement for 55 core technologies by 2024 of which 12 have already been achieved by 18 finalised projects.

Technological advancements are related to filling the gaps in value chains and enabling new chemical building blocks, new materials, new consumer products or new applications.

For example, the NEWFERT project developed new chemical and bi-electrochemical technologies to extract nutrients from ashes of different origins and livestock effluents, which are then used in the production of advanced fertilisers. The project drove these technologies from the laboratory to the first demonstration facility in Europe.
How is BBI JU supporting the development of the bio-based industry sector?

BBI JU is funding four types of projects: flagships, demonstration actions, research and innovation actions, and coordination and support actions.

**FLAGs**

**14 projects**

€272 million of BBI JU funding

Flagship projects support the design, construction of first-of-their-kind commercial-scale biorefineries in Europe.

As an example, the **First2Run** project built an integrated biorefinery to process cardoon crop grown on marginal lands into bio-based vegetable oils for the production of bioplastics, cosmetics, additives and biolubricants.

**DEMOs**

**39 projects**

€274 million of BBI JU funding

Demonstration actions build demo-scale facilities in Europe at a size large enough to prove their technical and economic feasibility and manufacture enough products to test the market.

For instance, the **PULP2VALUE** project demonstrated the potential of sugar beet industry sidestreams by refining underutilised sugar beet pulp and delivering high-value compounds for consumer products, such as cosmetics and food.
Research and innovation actions develop innovative technologies, create new knowledge and fill in the gaps within value chains.

For example, the BARBARA project brought together academia, research centres and industry, to develop new bioplastic materials from leftovers of broccoli, pomegranates, almond shells and lemons. The project used these materials for 3D printing parts for the building and automotive sectors.

Coordination and support actions accelerate the market uptake of bio-based, sustainable products by tackling many cross-sectorial challenges of the bioeconomy.

As an example, the Pilots4U project has set up a database of more than 260 open-access pilot and multipurpose demonstration infrastructures for the European bioeconomy, helping innovators bridge the gap between laboratory developments and market introduction.
STRATEGIC INNOVATION & RESEARCH AGENDA

SIRA is a strategic document developed by BIC and endorsed by the European Commission. Based on a wide consultation of key stakeholders, it identifies the main technological and innovation challenges to be addressed in the bio-based economy. The document suggests the research, demonstration and deployment activities that the BBI JU calls for proposals should cover.

BBI JU mission

The BBI JU mission is to implement the Strategic Innovation and Research Agenda via the Horizon 2020 research and innovation programme. In the 2014-2020 period, BBI JU organised yearly calls for project proposals to support research, demonstration, and deployment activities, enabling the collaboration between stakeholders across Europe along the entire value chains. Call preparation, evaluation and project management fully respect the principles of transparency, openness, and excellence of the Horizon 2020 programme.
About the bio-based industries

The emerging bio-based industries are transforming renewable biological feedstocks (such as agricultural by-products, forestry residues, organic waste and aquatic biomass) into bio-based chemicals, materials, energy and products, replacing their fossil-based versions.

Accounting for **3.6 million jobs and around €700 billion turnover in the EU**, it offers a vast potential to tackle societal challenges ranging from environmental degradation to climate change.

Additionally, the bio-based industry is enabling sustainable growth and boosting competitiveness areas across European regions.