



Bio-based Industries  
Joint Undertaking

# CONTRIBUTION OF THE BBI JU'S PROJECTS TO THE **SUSTAINABLE DEVELOPMENT GOALS**



September 2019, Brussels







## BACKGROUND

The European Union is committed to implement the sustainable development plan called **Sustainable Development Goals** (SDGs) mainstreamed into the Europe 2020 vision since 2010<sup>1</sup>. The EU's sustainable development strategy aims to tackle global challenges related to social, economic and environmental aspects and it includes 17 SDGs which represent the targets to achieve by the end of 2030 in order to ensure a better and a more sustainable future worldwide (Figure 1).



**Figure 1. Sustainable Development Goals (SDGs) <sup>2</sup>.**

The SDGs are related to the end of poverty, to the building of a strong and a stable economic growth strategy, and to addressing a range of social needs including education, health, social protection, and job opportunities, while tackling at the same time climate change and environmental protection<sup>3</sup>. The European bioeconomy strategy (review approved by European Commission in 2018) and its Action Plan<sup>4</sup> directly contribute to the implementation of the defined SDGs in order to establish a circular, secure and resource-efficient society that brings together food security and the sustainable use of renewables while preserving the environment. This strategy focuses on addressing the environmental, energetic and food supply issues faced by Europe through several actions aimed to a higher involvement of research in the bioeconomy sectors, a more coherent environmental policy, a better connection among global bioeconomy policies and a more efficient public dialogue.

<sup>1</sup> [https://ec.europa.eu/europeaid/sites/devco/files/communication-next-steps-sustainable-europe-20161122\\_en.pdf](https://ec.europa.eu/europeaid/sites/devco/files/communication-next-steps-sustainable-europe-20161122_en.pdf)

<sup>2</sup> <https://sustainabledevelopment.un.org/sdgs>

<sup>3</sup> <https://www.un.org/sustainabledevelopment/>

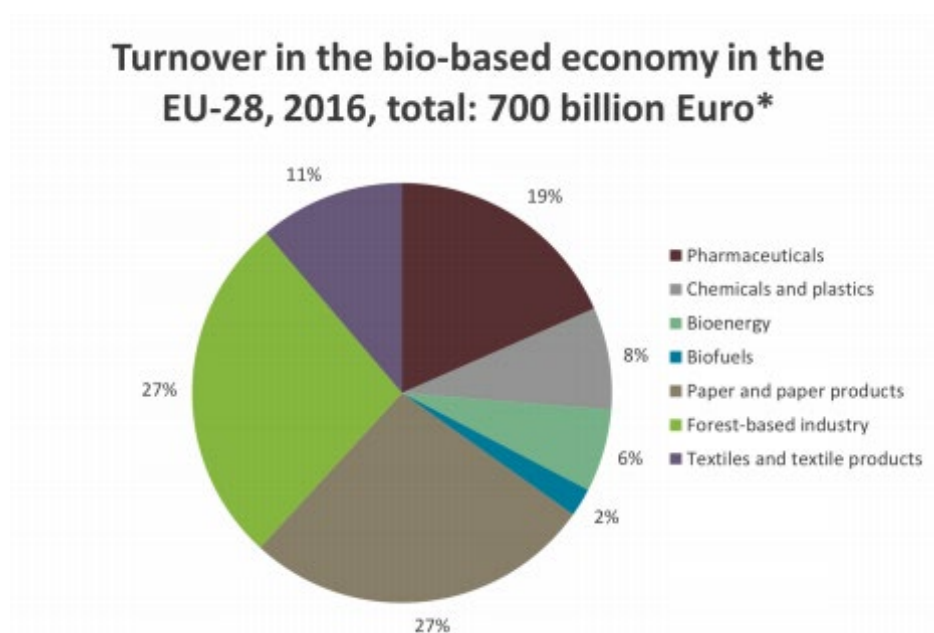
<sup>4</sup> [https://ec.europa.eu/research/bioeconomy/pdf/ec\\_bioeconomy\\_strategy\\_2018.pdf#view=fit&pagemode=none](https://ec.europa.eu/research/bioeconomy/pdf/ec_bioeconomy_strategy_2018.pdf#view=fit&pagemode=none)



## ABOUT BIO-BASED INDUSTRIES JOINT UNDERTAKING (BBI JU)

Considering the increase of the global population, the need for an improved use of natural resources and the issues related to the environment degradation and climate change, shifting our economies from fossil-based resources is essential to reach a more sustainable approach.

The European bio-based industry sector is expected to grow stronger and create new markets and jobs, and is already attracting substantial investments throughout the Europe. At this regards, the Bio-based Industries Consortium (BIC) has recently published an assessment of the turnover and employment of the European bioeconomy for the years 2008-2016, using Eurostat as the primary data source<sup>5</sup>. If only the industrial sectors are considered (excluding food, beverage and tobacco products as well as the primary biomass production sectors), the study reports that the total turnover of bio-based industries reached about 700 billion euro in 2016 (Figure 2).



**Figure 2. Turnover in the bio-based economy in the EU-28, 2016 <sup>5</sup>.**

The analysis shows that both biofuels and bioenergy sectors together accounted for around 8% of the total turnover of the EU industrial sectors, which corresponds to approximately 60 billion Euro. On the other hand, the total employment in the bio-based economy is of 3.6 million jobs in 2016 (Figure 3).

<sup>5</sup>[https://biconsortium.eu/sites/biconsortium.eu/files/documents/European%20Bioeconomy%20in%20Figures%202008%20-%202016\\_0.pdf](https://biconsortium.eu/sites/biconsortium.eu/files/documents/European%20Bioeconomy%20in%20Figures%202008%20-%202016_0.pdf)



### Employment in the bio-based economy in the EU-28, 2016, total: 3.6 million\*

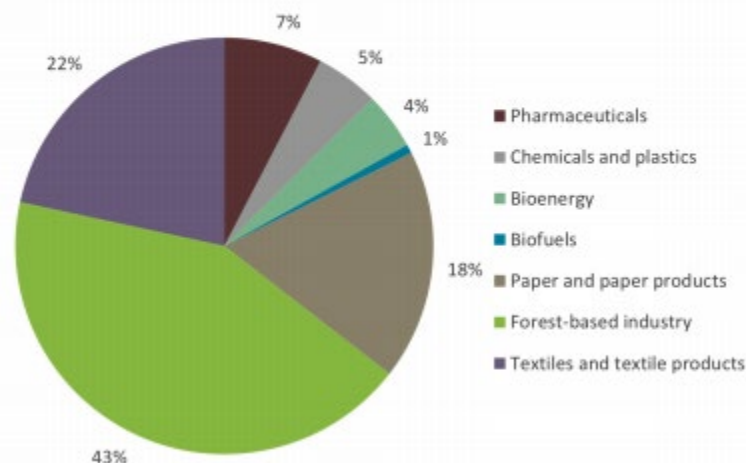


Figure 3. Employments in the bio-based economy in EU-28, 2016 <sup>5</sup>.

The most prominent industries for the employment in EU-28 are the forestry and textile industry and paper products.

In this context, **BBI JU** plays a crucial role in the EU's bioeconomy strategy by establishing a platform for the European bio-based industrial sector and providing opportunities for bio-refining technologies to sustainably transform renewable natural resources into bio-based products, materials and fuels. BBI JU has been set up as Public-Private Partnership between the public partner European Commission and the private partner BIC to support research and innovation in Europe.

The BBI JU is operating under Horizon 2020 and it is driven by the Strategic Innovation and Research Agenda (SIRA, 2017)<sup>6</sup>, setting out the main technological and innovation challenges to develop bio-based industries in Europe. The document reflects the industries' vision on the European transition towards a bioeconomy, decoupling economic growth from resource depletion and environmental impacts.

BBI JU's main mission is to support research, demonstration and deployment activities along the entire bio economy value chain covering from biomass growth to biorefinery establishments and the final use of bio-based products. With a broad spectrum of industry-led projects, Europe aims through the BBI JU programme to generate knowledge and to develop technologies for an improved use of biological resources (residues, side streams and wastes), contributing to meeting the UN Sustainable Development Goals, and at the same time creating value for European society, climate change mitigation, environment and biodiversity. However, and most importantly, such

<sup>6</sup> <https://www.bbi-europe.eu/sites/default/files/sira-2017.pdf>



efforts, are paving the way for implementing new technologies, which will also contribute to a more sustainable development at global scale.

BBI JU represents itself an example of SDG 17 "Partnership for the Goals", where industries and public institutions cooperate to create a programme aimed to develop a sustainable bio-based sector in Europe. BBI JU's projects are currently contributing to several UN's Sustainable Development Strategy and this report provides an overview of these contributions.



## METHODOLOGY

Under Horizon 2020 and in accordance with the Council Regulation (EU) No 560/2014, BBI JU has a legal obligation to monitor and annually report its programme implementation and to disseminate the results of this monitoring. By means of a survey, which is annually addressed to the consortia of granted projects, BBI JU monitors their progress in terms of expected results. The survey includes a series of standard questions on BBI JU specific Key Performance Indicators (KPIs), which are clearly identified in SIRA<sup>6</sup>, on the expected impacts (socio-economic, environmental, others) of BBI JU projects by 2020 or by the end of the project), as well as on the projects' contribution to SDG, assuming that the project will be successful. The BBI JU's KPIs cover several aspects like creating new bio-based products, validating technologies, socio-economic and environmental contributions, as well as a dedicate section on the project's contributions to the UN's SDGs. The project coordinators are invited to consult the consortia and assess how and to which extent the project specific inputs contribute to the specific KPIs set out in SIRA and to its overall expected impacts. The outcomes of this annual survey, together with other BBI JU monitoring activities, contribute to the BBI JU Annual Activity Report (AAR). In the latest version of the questionnaire addressed in 2018, the project coordinators have been requested to provide also information about the SDGs their projects are related to, with a short description of their contribution.

The projects' content and technological maturity level differ widely as BBI JU's research and innovation programme includes four different type of actions: (1) Research and Innovation (RIAs); (2) Innovation Actions (IAs) - Demonstration (DEMO); (3) Innovation Actions (IAs) - Flagship Action (Flagships) and (4) Coordination and Support Action (CSA).



## RESULTS

At the end of 2018, BBI JU's project portfolio covered 82 granted projects. 42 RIA, 22 DEMO, 7 Flagship and 8 CSA projects have joined the BBI JU's survey on SDGs (2 DEMO and 1 RIA projects have not responded to the survey). As shown in figure 4, the majority of the BBI JU's projects reported to contribute to the **SDG 12** "Responsible consumption & production", **SDG 13** "Climate Action", **SDG 9** "Industry, Innovation & Infrastructure", **SDG 8** "Decent Work & Economic Growth", and **SDG 3** "Good Health & Well-Being". The contributions to those SDGs reported by less than 25% of the total projects in one action type are no further detailed in this report.

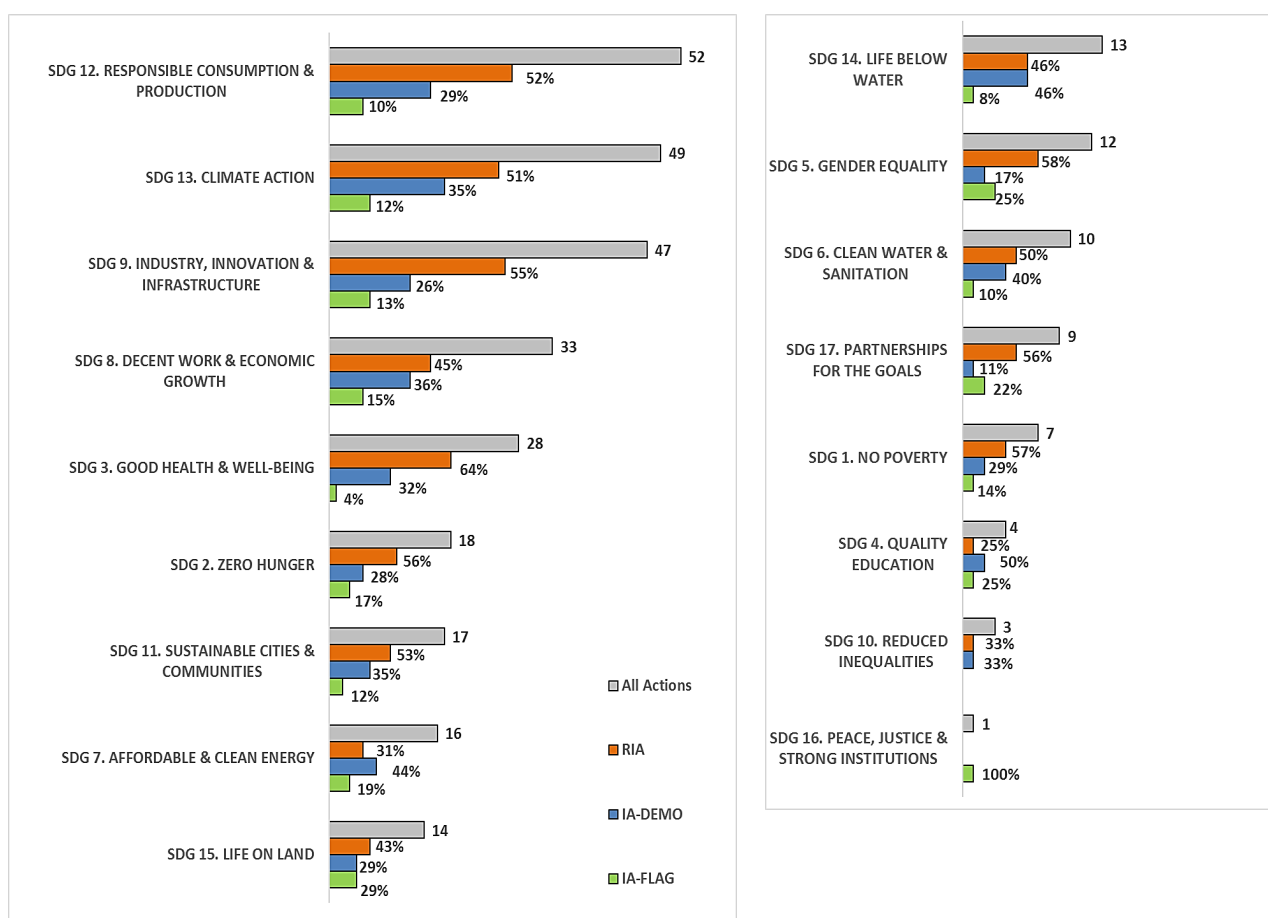


Figure 4. The number of BBI JU's projects that report to contribute to UN' SDGs and the share of the SDG per action.





## RIA AND DEMO PROJECTS' CONTRIBUTION TO SDGs

As reported in figure 5, the data gathered from the survey showed that the majority of RIA and DEMO projects are contributing to SDGs 12, 13, 9, 3 and 8.

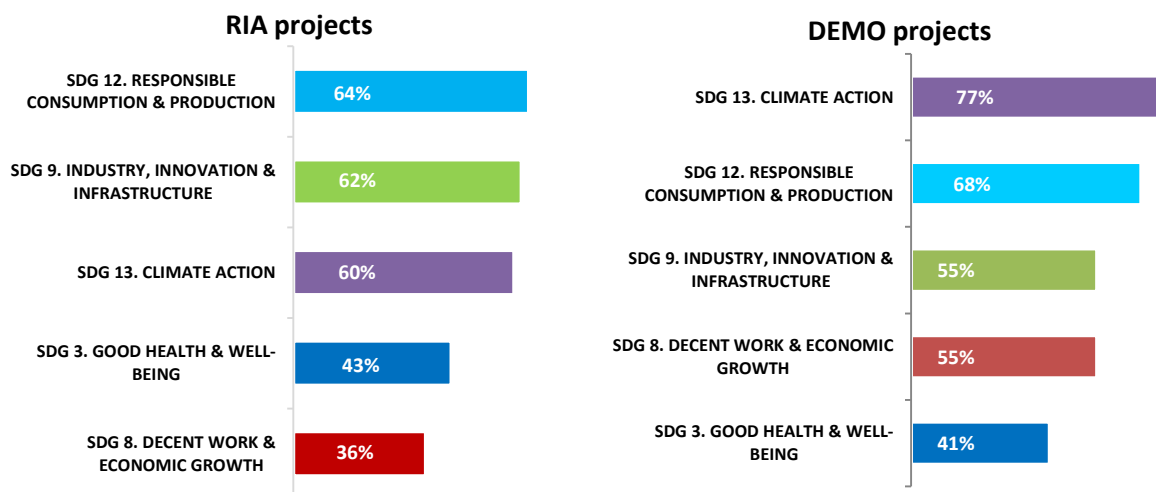


Figure 5. Reported RIA and DEMO projects' contribution to SDGs.

Below, some examples were selected among the RIA and DEMO projects that have better described in the survey their contribution to these SDGs (numerical order). As mentioned above, this report focuses on the SDGs which have been reported most frequently by projects as having contribution towards (more than 25%), considering all the projects in one action type.



Around 40% of both RIA and DEMO projects contribute to SDG 3, which is related to the promotion of a sustainable development through the support of human health, and well-being at all ages. Below, few examples about the contribution of BBI JU's projects to SDG 3 are reported:

- **ABACUS**

The RIA project aims to development of a new bio-refinery for the valorisation of up to 95% of the algal biomass into high-value ingredients for nutraceutical and cosmetic industries. However, the application of the new algal-based products may be extended to medical sector to help new-borns and pregnant women in the developing countries.



- **BioBarr**

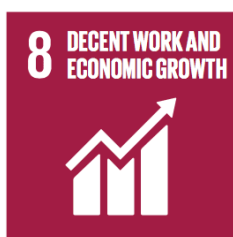
This is a RIA project which focuses on the production of 100% bio-based food packaging material (polyhydroxyalkanoates PHA) to increase shelf-life of food products in safer manners. The manufacturing of PHAs will also emit less toxins pollutants to air, water and soil. The benefits for environment and human health are expected to be quantified via Life Cycle Assessment (LCA) by the end of project in 2021.

- **EUCALIVA**

The DEMO project aims to develop wearable bio-based electronic sensors which will replace centralized hospital-based care systems. Bio-sensors can be used for home-based personal diagnostics which will lead to the reduction of both healthcare costs and the real-time analysis for a diagnosis.

- **SpiralG**

In this DEMO project, algae are processed for the production of phycocyanin, a natural dye which is used in food industry. The use of fossil based food colorants is banned due to their hazardous effect on human health such as toxicity, cancerous effect and 'Attention Deficit Hyperactivity Disorder'. In SpiralG process the phycocyanin is produced in sustainable conditions, providing the food industry with this natural and quality based blue colouring, and it has been approved as a safe product for consumption by the US Food and Drug Administration agency in 2015.



SDG 8 is related to the promotion of an inclusive and a sustainable economic growth of EU countries. For this reason, projects are requested to support socio-economic growth within the project lifetime and beyond by creating new job opportunities and decent working conditions and by boosting the local economics. As for SDG 13, RIA and DEMO projects declare for the time being their contribution to SDG 8 mainly with some predictions on revitalization of rural areas or direct job creation.

- **DEMETER**

The main goal of the DEMO project is to establish an innovative enzymatic technology in order to increase the yield of industrial fermentation processes by at least 20% and reduce overall product cost by at least 15%. The implementation of the developed



process and the replication of a pilot plant will increase the income in rural areas and create new job opportunities.

- **FUNGUSCHAIN**

The project partners are working in close collaboration with mushroom producers to convert the fungal side streams to valuable compounds for bio-based industry. Thanks to this collaboration, higher income for mushroom farmers are predicted as well as the creation of skilled-job opportunities in rural areas.



The number of jobs created is still at project level; however, the real impact of this DEMO project can be presented at the end together with the economic analysis.



SDG 9 is related to the building of resilient infrastructures, to promote a sustainable industrialization and to foster the innovation. More than half of the RIA and DEMO projects report to contribute to SDG 9 related to the investments in infrastructures, technological progress and manufacturing.

- **POLYBIOSKIN**

The aim of this RIA project is to develop skin contact biopolymer-based products commonly used in cosmetic, biomedical and sanitary industries with an increased performance and functionality. The adaptation and combination of processing technologies is expected to economically impact these sectors and to create an environmental-friendly manufacturing of bio-based products. A high innovation potential is also associated with boosting the use of biopolymers that offer unprecedented antimicrobial, absorbency, skin-compatibility features in order to deliver new high-performance products.

- **URBIOFIN**

The project is involved in the construction of a demo-plant for the conversion at semi-industrial scale of the organic fraction of municipal solid waste into chemicals,



biopolymers and additives. The technology adopted integrates traditional process (e.g. biological urban waste treatment) with algae for polyhydroxyalkanoates and long chain fatty acid productions or catalytic processing for ethylene production units. This methodology is expected to contribute to a more sustainable waste management model, with the implementation of innovative industries, and to be the future urban waste management infrastructure of Europe.

- **EMBRACED**

The EMBRACED project will demonstrate, in a relevant industrial environment, a sustainable model of integrated bio-refinery based on the valorisation of the cellulosic fraction of Post-Consumer Absorbent Hygiene Products (AHP) waste for bio-based building blocks, polymers, and fertilizers production. The bio-refinery will use a circular economy approach, closing the cycle of raw materials and minimising the use of primary resources. The EMBRACED consortium is led by FATER, a large industry subsidiary of Procter & Gamble International Operations (P&G), firmly committed to sustainability and circular economy that within the project cooperates with other relevant industrial partners for the establishment of virtuous models of cooperation among the stakeholders involved along the whole value chain in a circular economy domain.



SDG 12 is about the promotion of sustainable infrastructures, the increase of energy efficiency and quality of life, as well as the reduction of poverty, environmental and social costs. According to the survey, 64% of RIA and 68% of DEMO projects are reporting to have a direct impact on SDG 12. Some examples are presented below:

- **AQUABIOPRO-FIT**

The aim of the RIA project is to develop a technology that will allow a better utilization of side streams biomass deriving from fishery industry and enable resource and energy efficient production of high quality food supplements recovered from aquatic



biomass. Besides, they will affect the consumers behaviours in terms of choosing nutrient-rich and healthier supplements that are produced with lower environmental footprint comparing to fossil-based production.

- **Tech4Effect**

This RIA project improves forest management strategies by testing efficient harvesting and collection techniques in 5 different EU countries. Project targets to demonstrate how additional forest biomass can effectively be mobilized at the European level with enhanced environmental efficiency and at acceptable costs. This will ensure a sustainable use and production cycles of forest resources for the bio-based industry.

- **Dendromass4Europe**

This DEMO project aims to establish a sustainable, Short-Rotation Coppice (SRC) regional cropping systems of poplar for agricultural dendromass production on marginal land. The project develops an effective and a sustainable way of using natural resources for the packaging industry while demonstrating on an industrial scale how to add value to forestry resources without 'burning' or 'mulching' them. The significant reduction of chemicals for the forestry resources treatment was also considered, with less toxic release to air, water and soil.

- **GreenProtein**

GreenProtein is an industrial demonstration project that aims to produce high-added value, food grade proteins and other ingredients from vegetal food waste streams. The primary objective will be to extract and purify food-grade, fully functioning, RuBisCO protein isolated on an industrial scale, using discards from the vegetal processing industry. GreenProtein will contribute to a more sustainable consumption patterns, providing the industry with a high quality alternative to animal protein.

- **SpiralG**

Algae and phycocyanin production involves costly processes which directly impacts the price of products. Considering the economic competition with countries having lower labour hourly rates, SpiralG has the ambition to reduce the production costs by increasing the production rate and reducing the energy costs (natural energy sources and water based extraction methods). After phycocyanin extraction, residues will be screened for additional value in other sectors thereby giving more value to the produced bulk biomass. Through the different approaches, SpiralG will make algae and phycocyanin production in the EU sustainable and economically viable and hence it will provide consumers with sustainably produced products.

- **BIOMOTIVE**

The BIOMOTIVE is a DEMO project aims to demonstrate, in relevant industrial environments, the production of innovative and advanced bio-based materials





specifically for the automotive industry. The project is in line with 2 goals: a) achieve the sustainable management and efficient use of natural resources; b) achieve the environmentally sound management of all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce the chemicals' release to air, water and soil in order to minimize their adverse impacts on human health and the environment.



SDG 13 is related to the urgent actions that must be taken to fight the climate change that is affecting every country on every continent. The 77% of the DEMO and 60% of the RIA BBI JU's projects report to contribute to SDG 13 which is related to the efforts made to combat the climate change issue. Most of the projects reported a possible carbon-footprint reduction thanks to the use of biomass feedstock and new technologies to produce added-value products. However, it has to be considered that the advancements in RIAs and replication of DEMO projects in larger scale ensures the potential of a greater overall impact. Exact carbon-footprint calculations and overall impact assessment can only be provided at the end of the project once LCA analyses will be done.

- **LigniOx**

The aim of the DEMO project is to demonstrate the viability of new technology for the conversion of lignin-rich side-streams into dispersant. A significant reduction in carbon dioxide emission during the industrial dispersant production will be achieved by replacing raw materials (petroleum-based) with lignin and combustion process with chemical oxidation process. Since dispersants are widely used in the construction industry, the project findings can be considered as an important effort to combat the climate change.





- **SpiralG**

Since algae are primary biomass material which requires sun, water and nutrients, their carbon capture capability is significantly considered throughout the world. Capturing carbon through high-rate algae production systems along with the use of the bio-pigments as alternatives to petrol-based synthetic dyes can be considered an attractive way to act against climate change.

- **PROLIFIC**

The RIA project aims to implement a cascade technology approach to recover significant amounts of proteins/peptides, fibres and other added-value compounds from industrial processing residues of legumes, fungi and coffee. Thanks to the proposed technology, PROLIFIC estimated a carbon-footprint reduction of about 15% compared to the state-of-the art.

- **PROMINENT**

The RIA project is involved in the development of techno-economically and environmentally viable protein-based ingredients and food from cereal processing side streams. The proposed technique for protein production from plant resources will drastically reduce carbon dioxide emissions compared to the current protein production from animal resources. However, the exact carbon print reduction values can only be reported at the final stage of the project.



- **Dendromass4Europe**

The project is contributing to SDG 13 in two ways: a) by testing bark as an innovative component in bio-plastic production for packages, light construction elements and in many other different industries (e.g. automotive); b) by reducing the transportation disadvantages (gasoline consumption, carbon dioxide emissions) via functional adaption of a novel, lightweight, wood based board.

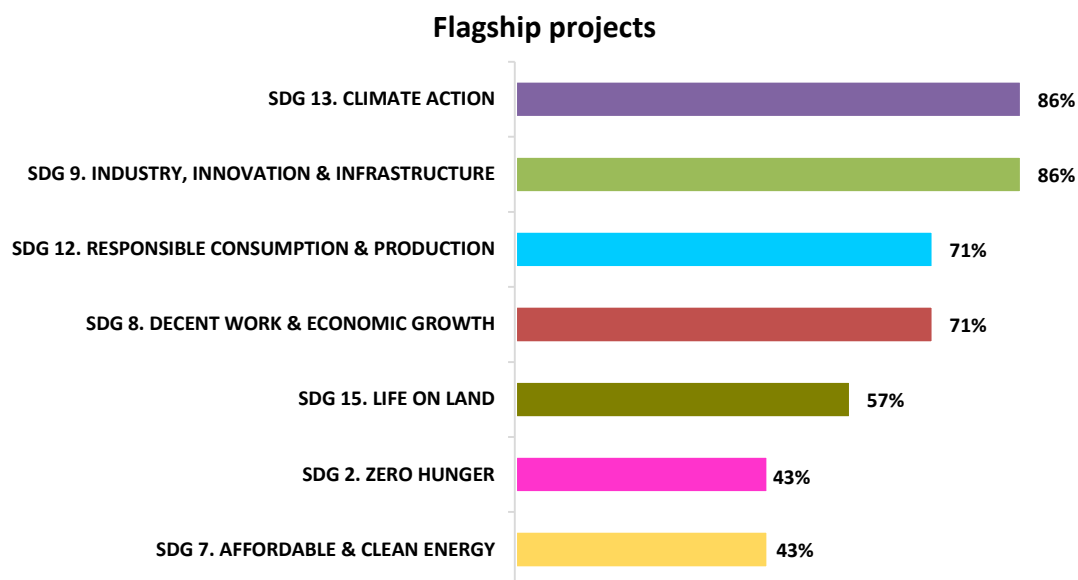
- **EMBRACED**

The project aims to a reduction of greenhouse gas emission from the pre-treatment technology and the integrated bio-refinery from a single integrated bio-refinery, thanks to the substitution of primary raw materials with secondary raw materials and to the production of bio-based building blocks, materials and products.



## FLAGSHIP PROJECTS' CONTRIBUTION TO SDGS

As of the end of 2018, seven Flagship projects have been granted under BBI JU's programme. BBI JU Flagship projects support the launch of an innovation (such as the production of bio-based products) that has been demonstrated but not yet brought on the market through the construction of bio-refinery facilities at industrial level. All Flagships responded to our SDG survey, showing that their participation is much wider compared to RIA and DEMO projects. As for RIAs and DEMOs, all the BBI JU's Flagships reported a strong contribution to SDG 13, 9, 12 and 8 plus to SDGs 15, 2 and 7 (Figure 6).



**Figure 6. Reported Flagship projects' contribution to SDGs.**

In order to provide a flavour of the contributions of Flagship projects towards the SDGs mentioned in the previous section, some examples are reported below.

The contribution of BBI JU's Flagship projects to **SDG 13 "Climate Action"** is the same as RIA and DEMO projects.



- **LignoFlag**

This project focuses on the ethanol production, as a sustainable transport fuel or chemical building block, starting from non-food cellulosic biomass. The project aims to foster the transition to a post-petroleum society and its production process is expected to reduce the carbon-dioxide release even up to 95% compared to its fossil-based equivalents.

- **BIOSKOH**

This project will use sugars contained in the woody and cellulosic biomass to obtain alcohols (cellulosic ethanol), biofuels and other chemicals. First indications of LCA analysis show that the project fully meets the objectives of EU environmental policy on climate change, with reduced emission of climate changing gasses and ensured competitive costs compared to fossil fuels resources.



- **First2Run**

In the past four years, First2Run has successfully established first-of-its-kind bio-refinery plant by regenerating dismissed sites and infrastructures through implementation at flagship scale of innovative low impact biobased processes in Porto Torres, Italy. The bio-refinery uses dry crops growing in underutilised marginal lands for the production of fine chemicals for cosmetics, bio-plastics and bio-lubricants.

- **BIOSKOH**

Considering the decline of the chemical industry in Eastern Slovakia in the recent years, BIOSKOH invested in bringing qualified employment back to the region, both directly as well as indirectly through distinctive associated agricultural activities, ensuring the raw material supply. The combination of the industrial brownfield site for the cellulosic ethanol



production and the BIOSKOH plant, offers an excellent opportunity for industrial symbiosis and bio-refinery side stream valorisation, leveraging on the existing infrastructure such as the wastewater treatment plant and energy delivery infrastructure.

- **AgriChemWhey**

The project aimed to build a bio-refinery at industrial-scale that will process by-products from the dairy industry for sustainable bio-plastic, nutrients, minerals and fertilizer production. This Flagship will provide an opportunity to establish an economic bound between the dairy, food and agriculture industries for a greater resource efficiency, a generation of less food waste and an integrated production of food and non-food compounds. The replication of such bio-refinery plant will build a resilient industrialization and foster innovation by means of supporting SDG 9.



- **First2Run**

This project also contributes to SDG 12 via promoting the knowledge on the crop production and storage conditions to avoid resources depletion and pollution generation, with a contemporary increase of agro-industry workplaces and land protection. This project is also promoting a responsible consumption and production patterns through the development of bio-based low impacts products conceived not as simple replacement of fossil based products but as a solution to environmental and social problems.



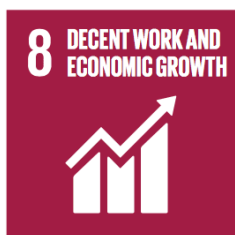
- **AgriChemWhey**

The project will contribute to the global wastewater reduction along the supply chain, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment. Moreover, the projects aims are to achieve a sustainable management and





efficient use of natural resources, to reduce waste generation and to encourage companies to adopt sustainable practices.



- **AgriChemWhey**

The contribution of AgriChemWhey to SDG 8 is related to the creation of around hundred direct jobs during both the construction and operation of the plant at Lisheen (Ireland), where after 17 years of operation, the lead and zinc mine activity closed down. The area has been chosen in order to construct the bio-refinery, keeping the activity and revitalizing the rural area. The project will contribute to achieve higher levels of economic productivity through the diversification, technological upgrading and innovation in the high-value added sector. It will also improve global resource efficiency in production and will contribute to decoupling growth from environmental degradation.

- **EXILVA**

This project aims to upscaling an existing process for Microfibrillated cellulose (MFC) production, a revolutionary product with potential in a huge range of applications, starting from alternative non-food biomass instead of using food biomass resources. The ambition is to make MFC based products commercially available for the first time on the market and so both local partners and suppliers will create substantial ripple effects in society in terms of economic growth and job creation.



By the end of 2018, the seven running BBI JU's flagship projects are expected to create around 3,000 direct jobs and more than 10,000 indirect ones, most of them in rural areas. The flagships received € 159 million grant but they will generate € 1,000 million of private investment mostly in Central and Eastern Europe.



Differently from what reported by RIA and DEMO projects, BBI JU's Flagship contribute also to SDG 15, SDG 2, and SDG 7. Here are few examples:



SDG 15 is related to the protection of terrestrial ecosystems and forests in order to combat the desertification, land degradation and the loss of biodiversity.

- BBI JU Flagship projects such as [EXILVA](#), [SWEETWOODS](#) and [First2Run](#) reported contribution to SDG 15 mainly due to similar reasoning. These projects are adopting sustainable land (agricultural or forestry) management practices via the implementation of resource recovery while preserving the land and biodiversity.

- [SWEETWOODS](#)

For instance, is demonstrating on an industrial level the production of high-purity lignin from hardwood. The projects follows the principles and criteria of sustainable forestry developed by the *Forest Stewardship Council* (FSC) and *The Programme for the Endorsement of Forest Certification* (PEFC), establishing grounds for the assessment of economic, social and ecological aspects of the operations of forest owners.



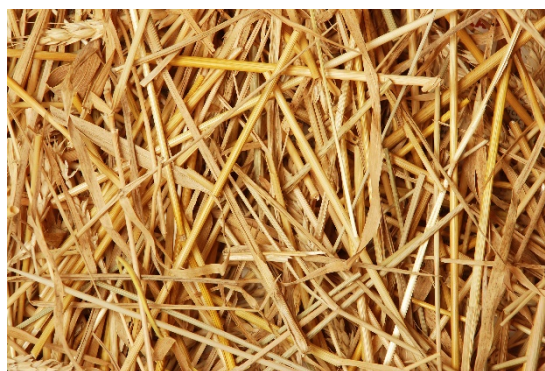


Working towards SDG 7 is one of the most significant challenge as energy is used in every aspects of our life. The universal access to energy and its sustainable production through the use of renewable resources are crucial aspects that must be faced for the prospective of a sustainable future.

- Projects like [LignoFlag](#) and [BIOSKOH](#) indicated an involvement in SDG 7, due to their use of sustainable technology for the production of clean biofuel, heat and power from local domestic feedstock like straw, corn and barley straw.

- [BIOSKOH](#)

This project proposed a strong cascading approach, which includes side stream valorisation (lignin and waste water to heat and power), leading to energy autonomy of the plant and external use of energy and enabling a self-sufficient bio-refinery and green utilities supply to local industries.



- [First2Run](#)

For First2Run, the lignocellulosic residues from cardoon cultivation and harvesting can be valorised for the energy production for the local territory and for the bio-refinery itself but also for the coproduction of thermal and electric energy suitable for being applied in the farming context. This will enable to reduce primary energy consumption and to develop affordable and clean energy systems linked to locally available biomass. The possibility to use a by-product from vegetable oils conversion as an advanced biofuel for the energy independency of the bio-refinery has been studied and positively evaluated both from economic and environmental perspectives, in alignment with circular economy principles and efficiency of the use of resources.



## CSA PROJECTS' CONTRIBUTION TO SDGS

By the end of 2018, nine CSA projects have been granted through BBI JU Calls. BBI JU's CSA projects tackle non-technological challenges and address issues like public awareness, improving market uptake, standardization and regulations of bio-based products, networking within bio-based industry, strengthening of bio-based clustering and road mapping activities, using ICT tools to increase biomass supply efficiency. The result of the survey for CSA projects shows that they mainly contribute to SDG 12 and to a smaller extent to SDG 9 (Figure 7).

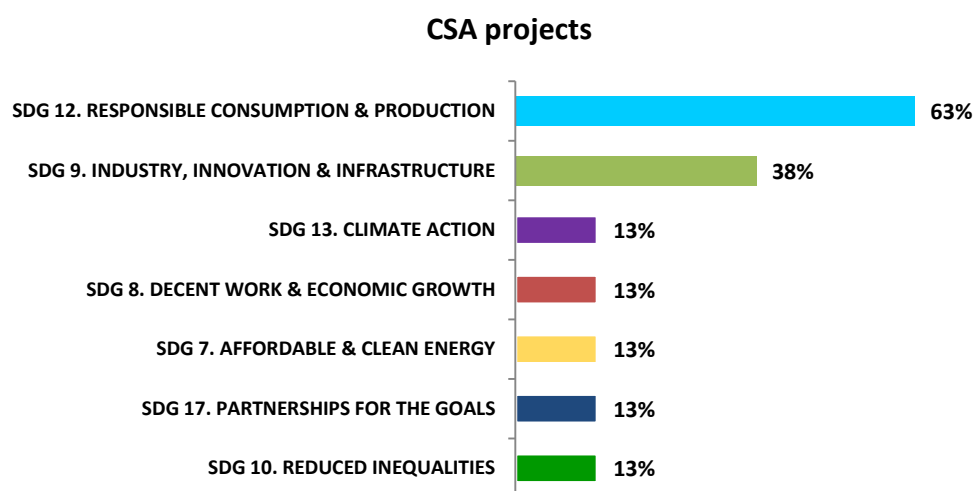


Figure 7. Reported CSA projects' contribution to SDGs.



- **BIOWAYS** aimed at increasing consumer acceptance and awareness of bio-based products to improve their market uptake. Through communication, promotion and demonstration activities, the consortium targeted society at large to provide clear, attractive and accessible science-based on facts and data, and to highlight their positive impact on society, economy and environment. For the SDG 12, BIOWAYS launched an EU-wide online survey to collect data about the public perception and responsible consumption of bio-based products. The collected sample was of 530 respondents from several different EU countries who were aged between 25 and 65. The results indicated that there is a misconception on the bio-based products that are always considered as



biodegradable and organic. This indicates that more efforts should be done to bring public awareness about bio-based products.

- Project **RoadtoBio** also contributes to SDG 12 by formulating an Action Plan of the Roadmap which will integrate chemical industry suppliers to end users by means of liable production and consumption. The Action Plan of the Roadmap will be vertically integrated along the value chains of the chemical industry from suppliers to end users.
- **BioCannDo**  
This project will help to bridge awareness gaps, and inform the public opinion about the potential and long-term benefits of bioeconomy sector. It develops and distributes communication materials explaining the benefits of the bioeconomy and bio-based products in order to increase the awareness of bio-based applications among the general public. BioCannDo brings together a network of projects and initiatives engaged in the communication and education of bioeconomy issues to a broader public.



- **Pilots4U**  
This CSA aims to setup a very visible and easy accessible network of open access pilot and multipurpose demo infrastructure, open to all companies and research institutes to foster the European bioeconomy with Europe-wide coverage. This will contribute to the SDG 9 by supporting the bio-based industry facilities to share the accurate engineering knowledge and utilize the infrastructure for different innovations; indeed, the same equipment can be shared among the different companies, reducing the need to manufacture new pilot- and demo-equipment for each innovation venture.
- **BiOPEN**  
BiOPEN is a CSA project aimed to create a programme supporting the collaboration of industries, academia and research centres and sharing their knowledge in the field of bio-based industry in Europe. For SDG







9, the ambition of BiOPEN is to support 20 cross-sector co-innovation partnerships into a unique platform for the development of new products and markets in the European scenario.

Moreover, **BiOPEN** contributes to **SDG 13 "Climate action"** and **SDG 7 "Affordable & Clean Energy"** supporting new projects involved in lowering GHG emissions and energy consumption as well as to **SDG 8 "Decent Work & Economic Growth"**, supporting the development of 20 new partnerships along with new or existing value chains that will open new markets and will help to create job opportunities in different sectors.

**Pilots4U** is the only CSA project that reports to contribute to **SDG 10 "Reduced Inequalities"** and **SDG 17 "Partnerships for the Goals"** as it is aimed to find equipments for the scaling-up processes feasible for all companies (large, small, from any region) and to use the different pilot- and demo-infrastructure facilities belonging to companies that were not cooperating before.



## CONCLUSIONS

In view of moving towards the development of sustainable societies and economies, the collaboration between the primary sectors (farming, forestry, fishing for biomass production), with the manufacturing sectors can represent a unique opportunity to build a sustainable bio-economy for a sustainable society able to face challenges related to food security, natural resource scarcity and environmental degradation. The outcomes of the survey, which have been described in this report, show that BBI JU's project portfolio is well in line with the sustainable development objectives described in the SIRA.

A strong involvement of our projects in improving the use of the bio-resources is evident, aimed to valorise them for not only their energy content but also to unlock their full potential as residues, industrial side stream and bio-waste. The projects contribute to several of the SDGs defined by the UN by replacing the fossil-based products, feeding the world also under challenging climatic conditions, creating new jobs also in rural areas while preserving the biodiversity and the beauty of the nature.

All the SDGs have been mentioned at least once in the project reporting and a contribution to 12 out of 17 SDGs is reported by at least 10 projects of our portfolio. All the types of actions are concerned, to a different extent thus covering a wide range of technology maturity. BBI JU's projects address goals related to the promotion of a sustainable industrialization by building resilient infrastructures, to ensure access to renewable energy for everyone in an efficient way, and to contribute to a sustainable economic growth through the creation of new jobs, while always considering the impact that these actions might have on the environment.

Due to their scope, mainly related to the development of new technologies able to bring a high level of innovation to the bio-based industry sector, Flagship actions are also contributing to a large extent in promoting a sustainable agriculture and energy consumption, combating at the same time the desertification, the land degradation and the loss of biodiversity in the area where the bio-refinery is located.

However, the methodological approach used for this study provides only qualitative information on BBI JU's projects contribution to the SDGs. Based on a common agreed framework, the feedback received on the present report from our stakeholders and the ongoing collaborations with other organisations, a more quantitative and exhaustive approach will be developed, to build a monitoring process on BBI JU's contributions towards SDGs. This exercise will also inform the discussion on the preparation of a future partnership on Bio-based systems under Horizon Europe Framework programme.



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