



Bio-Based Industries  
Joint Undertaking

# 2018 CALL FOR PROPOSALS

The catalyst for a sustainable  
bio-based economy in Europe

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# BBI JU

Bio-Based Industries Joint Undertaking

## MISSION

BBI JU's mission is to implement the Strategic Innovation and Research Agenda (SIRA) developed by the Bio-based Industries Consortium (BIC), using Horizon 2020 rules and procedures.

BBI JU organises yearly calls for proposals to support research, demonstration and deployment activities enabling the collaboration between stakeholders along entire value chains, covering primary production of biomass, processing industry and final use.

## VISION

Our vision is a competitive, innovative and sustainable Europe leading the transition towards a post-petroleum society while decoupling economic growth from resource depletion and negative environmental impacts.

Together with pan-European and cross-sector industries/SMEs, research organisations, universities, regions, and countries, we will develop a bio-based economy for Europe.





## 1. INTRODUCTION



**Philippe Mengal**

Executive Director

Bio-based Industries  
Joint Undertaking

*The BBI JU was created with the ambition to make a strong impact and bring along the systemic change needed to develop a bio-based industry in the EU that would allow investments to remain in Europe, thus creating new jobs and value to the EU citizens.*

BBI JU operates its programme as the catalyst to enable the European Union (EU) and bio-based industries to align their strategy and vision, while respecting Horizon 2020 principles of openness, of transparency and of excellence for the Call for proposals organised each year supporting research, demonstration and industrial deployment activities.

Since our first projects from the Call 2014 to Call 2016, BBI JU projects have grown to 65 ongoing projects with 729 participants for a total grant of € 414 million. By the end of May 2018, 17 new projects from Call 2017 will be added to the BBI JU project portfolio. The current project portfolio is well-balanced between the type of actions and across the value chains of the Strategic Innovation and Research Agenda and confirms an excellent SME participation of 38% of beneficiaries.

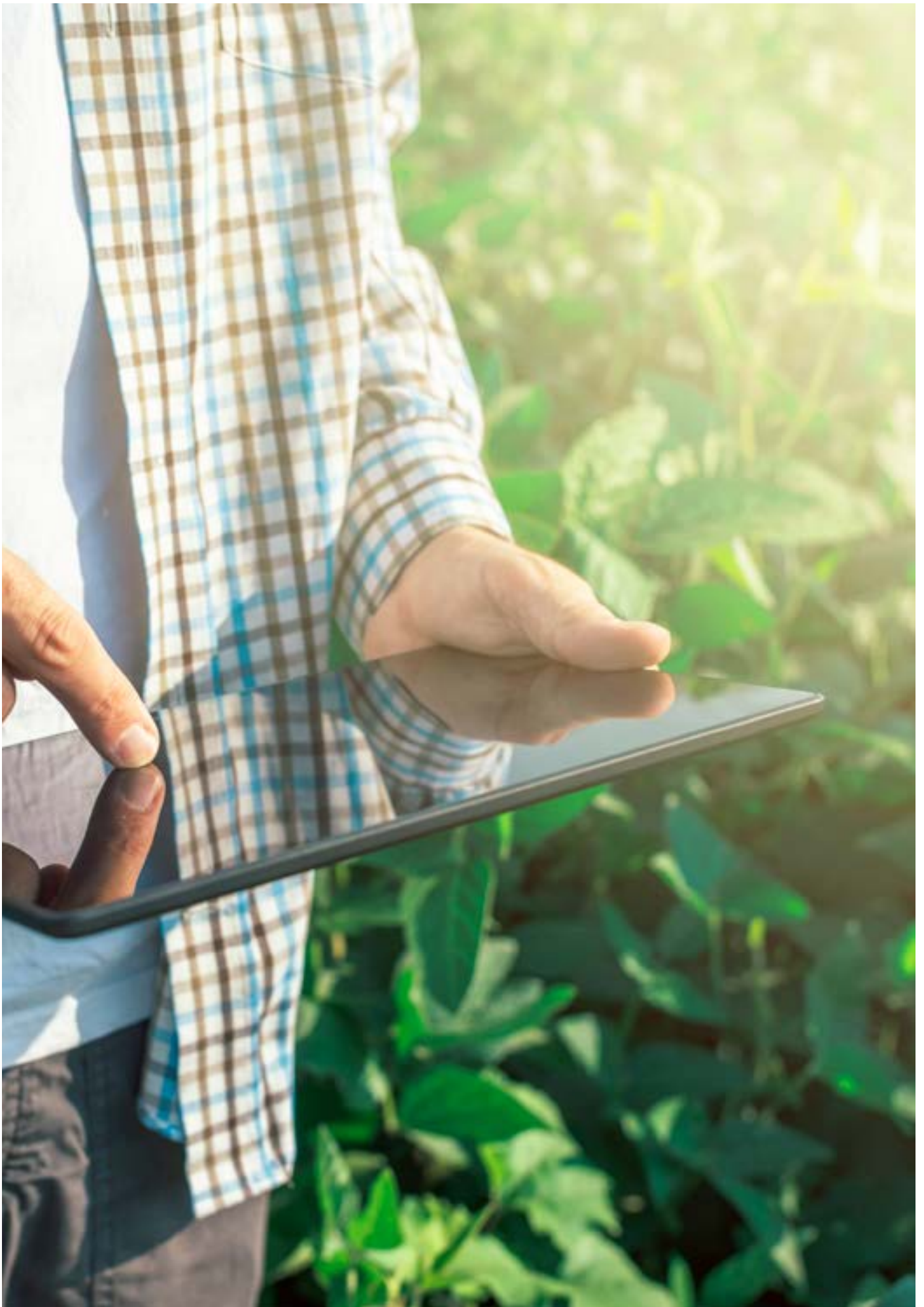
Thanks to the hard work and efforts put by all partners and the support by its advisory bodies, BBI JU has been consistently bringing together key actors with the purpose to produce innovative bio-based products helping to create a new bio-based community and economy in our continent.

With an indicative budget of € 115 million, our 2018 Call has moved away from a strict biomass feedstock 'push' based on historic value chains, towards a demand for biomass to enable processing in order to respond adequately to a 'pull' from the end markets. A total of 21 topics with 11 RIAs topics, 3 CSAs, 5 DEMOs and 2 FLAGs are included in this Call with the introduction in some cases of novel eligibility criteria.

*I would like to wholeheartedly thank you for your interest and engagement to BBI JU's activities. Our common efforts are building the bio-based sector Europe needs and deserves.*

Enjoy the reading and the best of luck in the preparation of your proposals!









**Dirk Carrez**

*Executive Director*

*Bio-based Industries  
Consortium (BIC)*

Time is flying! This is already our fifth call. This means that we will only have the 2019 and 2020 calls left under the current BBI JU regulation.

BIC became an important platform. By bringing companies from diverse sectors under one roof, we are able to 'institutionalise' the bioeconomy: this results in new, innovative value chains with companies from different sectors and not traditionally working together, using diverse feedstocks, and leading to common investments. And we are still growing: in 2017, BIC welcomed 21 new industry Members and 35 new Associate Members. We are delighted to have more than 200 companies on board today to help us further develop innovative bio-based value chains and contribute to Europe's circular and low carbon economy objectives.

*It is satisfactory to see that the BBI JU is delivering what we hoped: stimulate deployment, overcome the valley of death, and keep investments in research, innovation, and new processes and production facilities in Europe!*



**John Bell**

Director for Bioeconomy,  
Directorate-General  
for Research  
and Innovation

European Commission

Creating favourable conditions for increased investment in knowledge and innovation and overcoming technological challenges and technical dispersion were strong reasons for the Commission and the private sector to join forces in setting up the BBI JU.

*The preliminary evidence from BBI JU's funded projects indicates that it is providing a structuring effect and a substantial boost to the innovation performance of the European bio-based industry, with new bio-based value chains, materials and demonstrated consumer products being created.*

The bio-based economy provides the means to reduce Europe's dependency on fossil fuels and contribute to meeting its energy and climate change policy targets for 2020. Building on that, the 2018 BBI JU Call continues to look into the acceleration of the development of new sustainable value chains from biomass feedstock supply via efficient processing, to the acceptance and the application of bio-based products in the end-markets.

We are excited to see that H2020 Societal Challenge 2 and the BBI JU have delivered on funding R&I that contributes to generating jobs and increased competitiveness in the sector.

The 2018 Call is an example of another concrete step towards building the competitive and sustainable bio-based sector we all want for Europe and our citizens.







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

### DEVELOPING A SUSTAINABLE BIO-BASED INDUSTRIES SECTOR IN EUROPE

#### A. THE BIO-BASED INDUSTRIES SECTOR

The bioeconomy covers the use of renewable biological resources and their conversion into food, feed, bio-based products and biofuels via a range of technologies. In 2015 the EU28 bioeconomy sector accounted for 18.5 trillion jobs for a total turn over around 2.29 trillion euros.

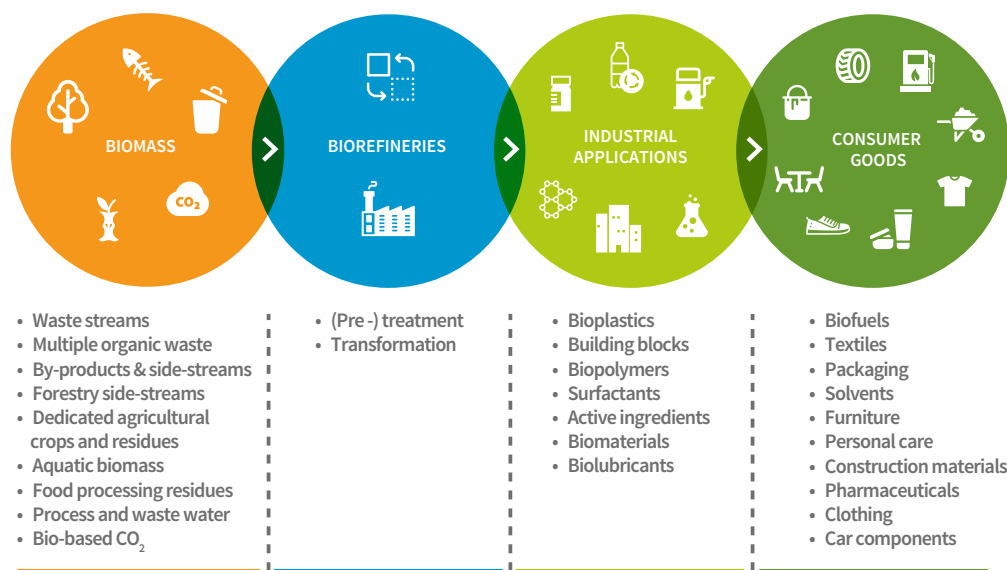
Bio-based industries are a significant and fast growing sub-sector of the bioeconomy, accounting for 3.7 million jobs and € 698 billion turnover in the EU28. Bio-based industries use renewable and sustainably-sourced biological raw materials, called biomass, as the basic materials for producing bio-based chemicals, materials and fuels replacing in a wide range of applications their oil-based equivalent.

However, a distinct and coherent single European bio-based industry sector does not yet exist, and currently comprises a wide range of different industrial sectors, often working in isolation.

Existing economic segments like the chemical, forestry, pulp and paper sectors, as well as technology providers including biowaste industries, all have an interest in moving from an unsustainable fossil-based economic model to a bio-based one. This can be achieved by improving the cooperation around all parts of the value chain and encouraging cross-sectoral collaborations.

Integrated biorefineries play a central role in the bio-based industry sector. They convert biomass, including organic waste, through efficient and innovative technologies into different types of bio-based products such as feed, fibres, materials, chemicals and bioenergy. By ensuring a sustainable supply of suitable biomass we can reduce the current European reliance on imported fossil-based raw materials.





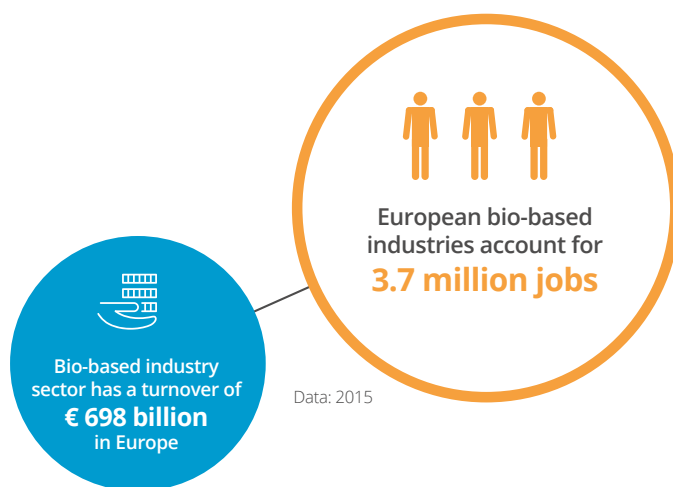
## B. CHALLENGES FOR THE EUROPEAN BIO-BASED INDUSTRIES

The European economy is heavily dependent on fossil-based raw materials as a source of chemicals, materials and energy. Reducing this dependency is of paramount importance in view of the increasing depletion of fossil resources and their impact on climate change.

A strong European bio-based industrial sector will help to reduce Europe's dependency on fossil-based products, moving Europe more quickly towards the many socio-economic benefits of a post-petroleum society. To unlock their full potential, Europe's bio-based industries will need to make sustainable, resource-efficient and largely

waste-free use of Europe's renewable materials to play an important role in spurring sustainable growth and boosting Europe's competitiveness.

However, bio-based industries are still considered as an emerging sector that is extremely fragmented across geographical areas and organisations. This sector faces specific challenges related to feedstock supply, inadequate logistical infrastructure, and lack of consumer awareness. Biorefineries require large, risky investments, and the sector is also faced with non-technological and regulatory hurdles on several levels of the value chains.



## C. WHAT IS THE BIO-BASED INDUSTRIES JOINT UNDERTAKING?



*The Bio-Based Industries Joint Undertaking (BBI JU) is a €3.7 billion public-private partnership between the European Union (EU) and the Bio-based Industries Consortium (BIC).*

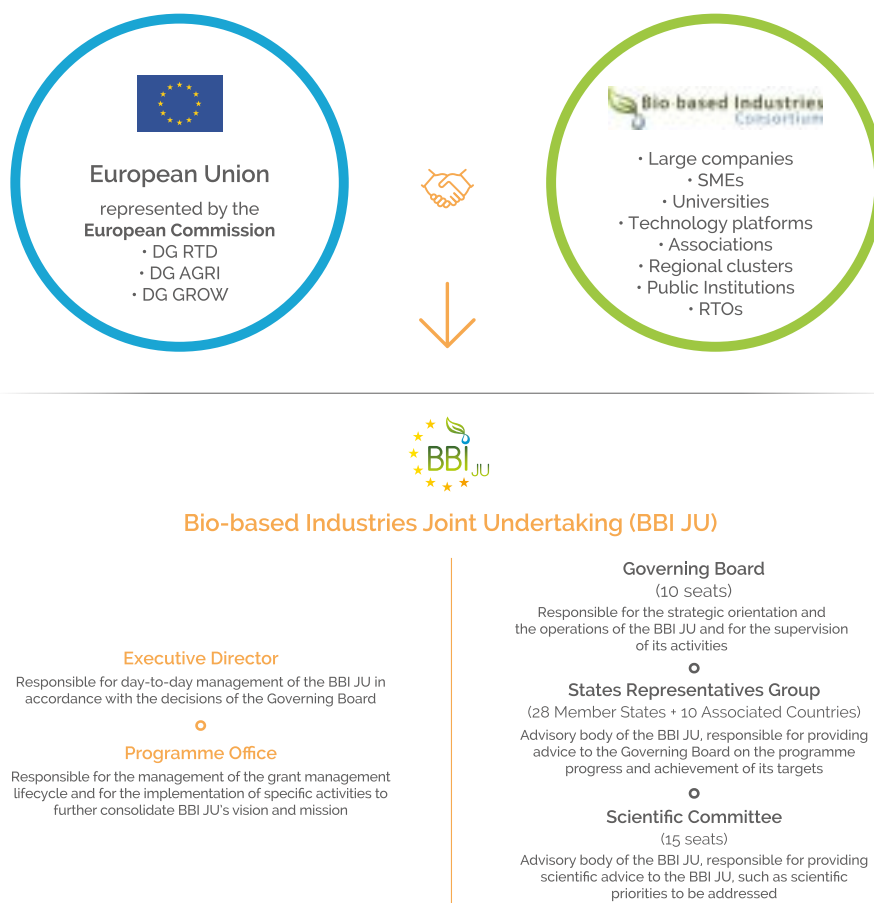
The BBI JU initiative is a € 3.7 billion public-private partnership between the European Union (EU) and the Bio-based Industries Consortium (BIC). It is an autonomous EU body operating under Horizon 2020 rules and procedures, dedicated to investing in research and innovation projects.

In 2012, as part of the impact assessment of the initiative, the European Commission conducted a public consultation. Respondents answered overwhelmingly in favour (over 94%) for the launch of an EU initiative for bio-based industries, and a large majority requested an institutional public-private partnership between the EU and the bio-based industry.

Bio-based industries and their value chains are faced with complex and substantial technology and innovation challenges. BBI JU was created to act as a catalyst to tackle these challenges by de-risking investments for private research and innovation, structuring the sector to allow it to reach critical mass in a focused and coherent way. This will enable long-term stability and predictability for the sector.

The BBI JU initiative is about connecting key sectors, creating new value chains and producing a range of innovative bio-based products to ultimately create a new bio-based community and economy.

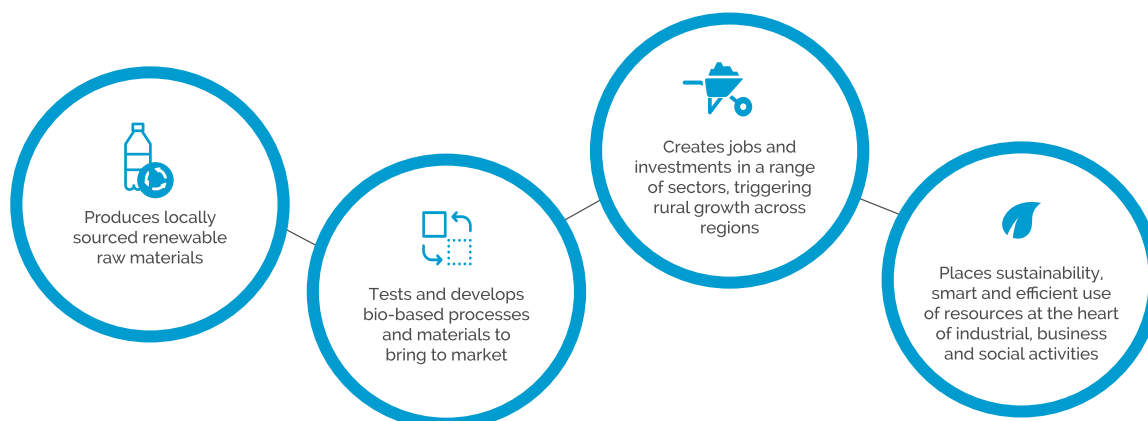
### BBI JU GOVERNANCE



## 1. Common Vision

BBI JU will realise the common vision of the EU and BIC for a competitive, innovative and sustainable Europe leading the transition towards a post-petroleum society, while decoupling economic growth from resource depletion and negative environmental impacts.

Together with pan-European and cross-sector industries/SMEs, research organisations, universities, regions, and countries, we will develop an economy that:

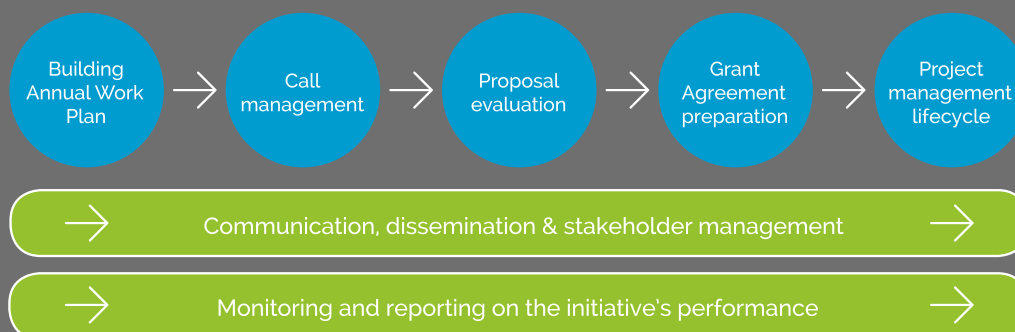


## 2. Mission

BBI JU's mission is to implement the Strategic Innovation & Research Agenda (SIRA) developed by industry in collaboration with the EU, operating under Horizon 2020 rules and procedures.

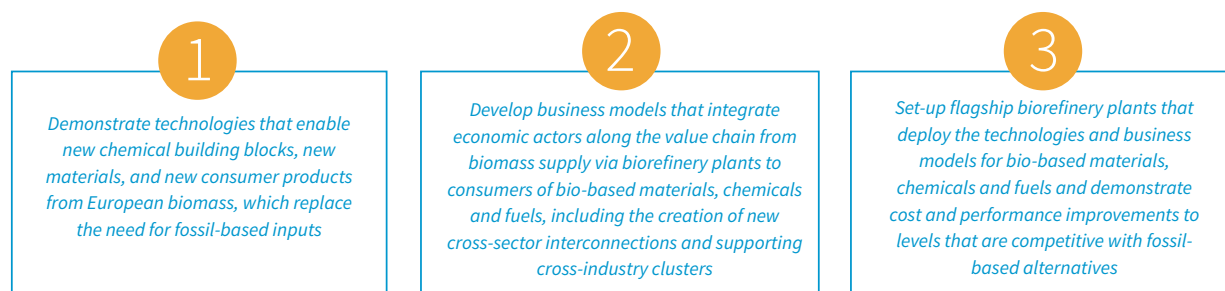
BBI JU organises yearly Calls for proposals to support research, demonstration and deployment activities enabling the collaboration between stakeholders along entire value chains, covering primary production of biomass, processing industries, and final use.

BBI JU is specifically in charge of:



## 3. Objectives

BBI JU's objectives are to contribute to a more resource-efficient and sustainable low-carbon economy and to increasing economic growth and employment, in particular in rural areas, by developing sustainable and competitive bio-based industries in Europe. These objectives will be based on advanced biorefineries that source their biomass sustainably, and in particular to:





## D. HOW WILL BBI JU ACHIEVE ITS OBJECTIVES?

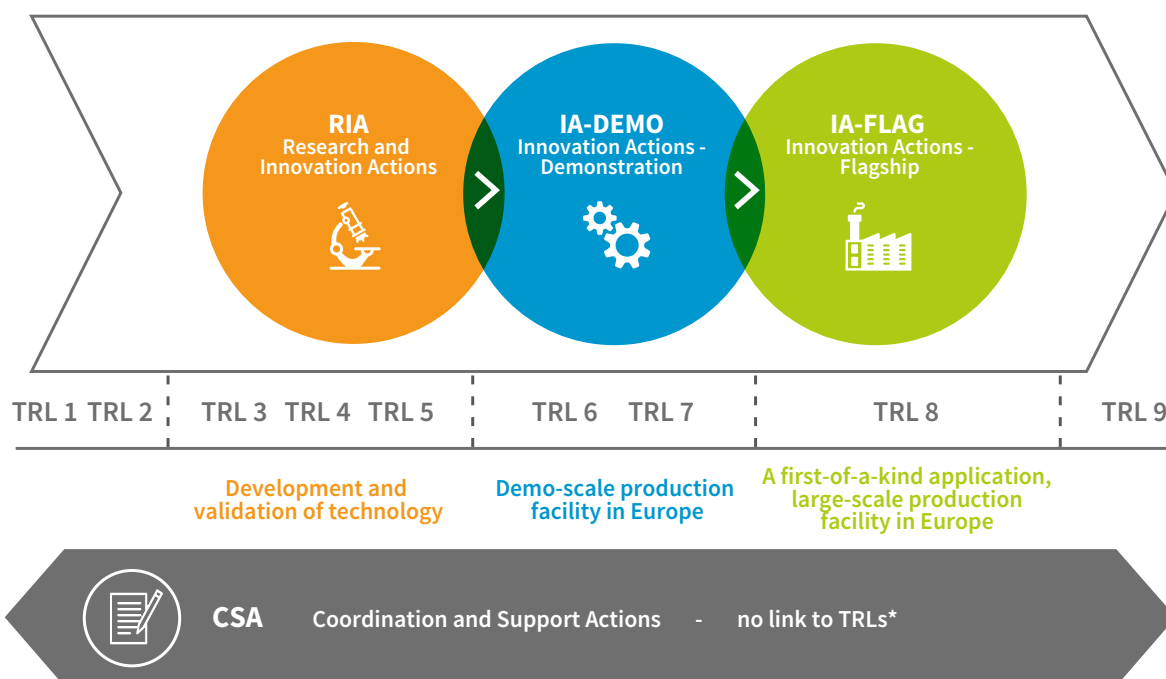
BBI JU is using its funding programme to support research and innovation to demonstrate enabling technologies which can produce new chemical building blocks, new bio-based materials, and new consumer products from sustainable sources of European and sustainably sourced biomass. This will reduce the need for raw materials based on non-sustainable inputs such as petroleum and natural gas into the European Economic Area.

### 1. Calls

BBI JU implements open Calls for proposals supporting research and innovation actions which operate under Horizon 2020 rules and procedures. BBI JU Calls are open to private & public 'for-profit' and 'not-for-profit' organisations, including large enterprises and SMEs, research and technology organisations (RTOs), universities, associations, and any other type of legal entity interested in BBI JU activities.



### BBI JU Actions



\* TRLs (Technology Readiness Levels) are a method of measuring the maturity level of the technology development in a project. This method provides a common understanding of technology status and innovation.

## 2. Type of Actions



### Research & Innovation Actions (RIA)

Research & Innovation Actions aim to fill the technological gaps within specific value chains, leading to the development of new knowledge or a new technology. RIAs cover actions with a Technology Readiness Level\* (TRL) 3 – 5 by the end of the project.



### Innovation Actions - Demonstration Actions (IA-DEMO)

Demonstration Actions include the establishment of a demo-scale production facility in Europe, being a new installation, a substantial modification of an existing facility, or the use of existing demo facilities. Demonstration projects aim at reaching TRL 6-7 by the end of the project, so that the scale-up of the technology and the business case are demonstrated.



### Innovation Actions - Flagship Actions (IA-Flagship)

Flagship Actions aim to support the application / market introduction of an innovation that has already been demonstrated but not at a size enabling commercial deployment. A flagship project must be the first of its kind in Europe and address a complete value chain from procurement, growth, feedstock supply via biorefineries to the final product or products. Flagship projects should aim to reach a TRL 8 by the end of the project.



### Coordination and Support Actions (CSA)

Coordination & Support Actions typically address cross-sectorial challenges, and support value chains through knowledge development, studies and networking. Funding covers the coordination and networking of research and innovation projects, programmes and policies.

#### Participation & Funding rates per action (indicative)

Type of Participant	RIA	IA (DEMO & Flag)	CSA
Large Industries	n/a	70%	n/a
SMEs	100%	70%	100%
Universities & RTOs (non profit, legal entities)	100%	100%	100%
Duration of the project	3-5 years	4-5 years	1-3 years

More information about eligible costs is available in the Annual Work Plan and in the guidelines for participants available via the Participant Portal and [www.bbi-europe.eu/participate/participate](http://www.bbi-europe.eu/participate/participate).

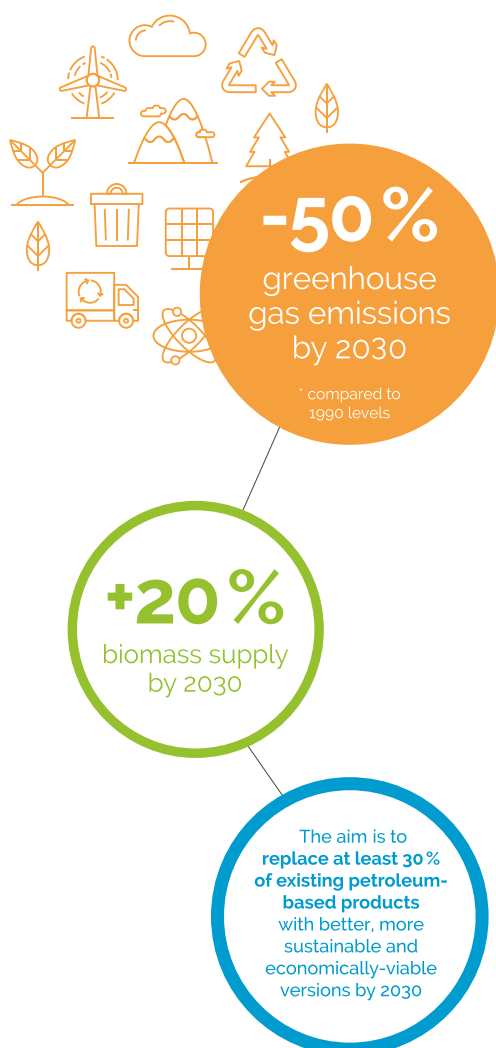
## 3. Widening and SMEs participation – synergies and other initiatives

A broad country participation in the BBI JU programme is desired in order to leverage the full European bio-based potential. As to be expected with a new programme initiative, take up rates have been higher with some Member States and Associated Countries which were already in positions to take advantage of the programme's early Calls, as compared to certain - e.g. EU13 - member states. In response to this issue, BBI JU, in collaboration with the States Representatives Group (SRG) and its partners (European Commission and BIC), elaborated a strategy with the objective of widening the participation of Member States, Associated countries, regions and stakeholders in the BBI JU programme.

With respect to SMEs, BBI JU will ensure that innovative SMEs are an integral part of the programme, and has a specific approach to ensure support for SMEs concerning critical issues such as financing, market information and forecasts, legal obstacles and international partnering.

Finally, BBI JU promotes close synergies with other European funding instruments such as the European Structural and Investment Funds (ESIF) in the context of smart specialisation strategies and the European Fund for Strategic Investments (EFSI). BBI JU-funded projects might find synergies with projects funded under other relevant instruments such as ESIF, SPIRE, national funding instruments, etc. or financed via the European Investment Bank. BBI JU works towards promoting these synergies to maximise the impact of the BBI JU funding.

BBI JU AIMS FOR:



## E. EXPECTED RESULTS AND BENEFITS: HOW IS BBI JU MONITORED?

The progress of the BBI JU programme is monitored at four levels:

- ④ Efficiency and cross cutting issues monitoring is based on Horizon 2020 Key Performance Indicators (KPIs) common to all Joint Undertakings (JUs) and further indicators linked to programme monitoring and cross-cutting issues, like gender dimension, widening participation, SME participation and private sector participation.
- ④ Project outcomes are monitored through 8 KPIs described in the SIRA, measured against yearly project reporting and agreed objectives, in terms of new cooperation, new cross-sectors collaborations, new bio-based building blocks, new consumer products, new large scale biorefineries and higher TRL in RIAs.
- ④ The leverage effect of private contribution versus public funding is monitored on a yearly basis. For a public-private partnership the objective is to leverage private investment through public funding. At the end of the initiative in 2024 it is expected that for each € 1 of public money funding in BBI JU projects, a minimum of € 2.7 of in-kind or financial contributions from BIC or and its members will follow. BBI JU reports in-kind contribution in projects (IKOP) and in-kind additional activities (IKAA) on a yearly basis, together with the calculation of the leverage effect.
- ④ Monitoring of expected socio-economic and environmental impact of the BBI JU projects based on a yearly reporting of project coordinators.

### 1. Outcome of the projects: 8 KPIs

Project outcomes monitored through eight KPIs described in the SIRA are measured against yearly project reporting in terms of new cooperations, new cross-sectorial collaborations, new bio-based building blocks, new consumer products and new large-scale biorefineries. KPI reporting took place for the second time in 2017, and confirmed the trend of 2016 with all KPIs showing better results compared to agreed objectives, further confirming the contribution to the systemic evolution of the sector in bridging the gap between research and the market.

Specifically, and after launching 3 out of 7 Calls for proposals (2014, 2015 and 2016), BBI JU's projects reported the following expected outputs:

- ④ **167 cross-sector interconnections** (against a target of 36 by 2020). These data show the impact of collaborative research in accelerating at a faster rate than expected the cross-sectorial integration along and across value chains
- ④ **136 new bio-based value chains** (against a target of 10 by 2020), 44% of them being linked to new technologies and 63% of them offering new products and/or markets. This confirms the significant structuring effect of the BBI JU programme and the fact that the future of the sector is also concerned with the creation of a network of a higher number of new, interconnected value chains than initially estimated **65 new grant agreements** (against a target of 200 by 2020)
- ④ **51 new bio-based building blocks based on biomass of European origin** (against a target of 5 by 2020), 45% of them offering a better performance than their fossil-based equivalents
- ④ **119 bio-based materials** (against a target of 50 by 2020), 52% of them offering a better performance and 17% of them being breakthrough



- ④ 54 new demonstrated bio-based consumer products (against a target of 30 by 2020), 56% of them ensuring a reduction in CO<sub>2</sub> emissions
- ④ 6 flagship grant agreements signed (against a target of 5 by 2020)
- ④ 23 validated “TRL gain” technologies (against a target of 20 by 2020).

## 2. Leveraging private investment

BBI JU activities clearly reflect the ambitions of our industrial partners to contribute to a sustainable society in the longer term. It's clear that this vision cannot be achieved by one single party working alone; it requires commitment from a range of private and public parties, and each needs to play their role.

BBI JU's programme is built around leveraging public funding against private contributions to encourage industry to invest through the BBI JU Programme via financial & in kind contributions, and by investing in bio-based infrastructure through additional investments.

By solving these infrastructural challenges, BBI JU will encourage industry to take the critical steps to 'de-risk' operations, including the secure availability of local, affordable raw materials, and demonstrating new technologies at an industrial scale.

Collectively this will encourage more bio-based investments in Europe and 'de-risk' the operations for industry in this emerging sector. As an indication of the potential of the bio-based industries investment in Europe the figures identified by BIC show that their members' estimated pipeline investments across EU regions were € 2.16 billion in 2014, rising to more than € 5 billion in 2017.

## 3. The added-value for European citizens

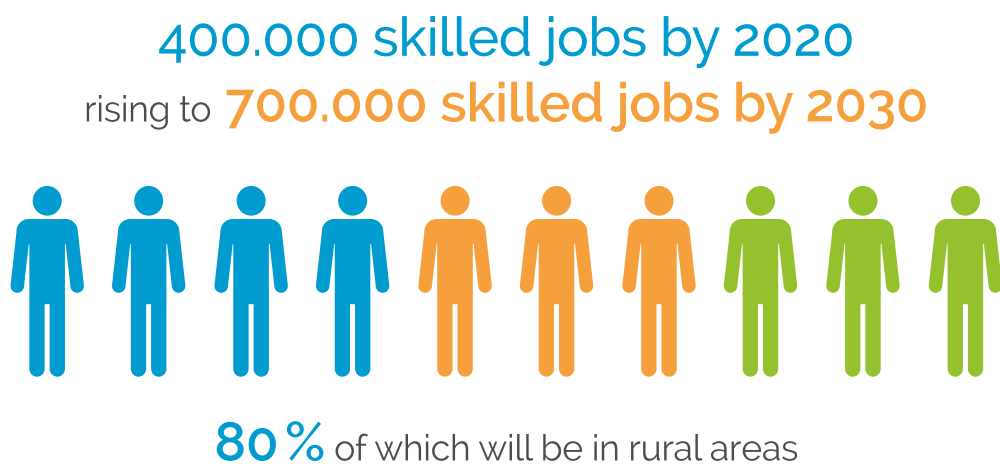
Overall, everyone benefits from a strong European bio-based industrial sector which can significantly reduce Europe's dependency on fossil-based products. It will help the EU meet its climate change targets, and lead to more sustainable and more environmentally friendly growth, preparing the EU for a post-petroleum era.

BBI JU has as its guiding principle the need to maximise and valorise the complexity of nature, so that developed products and applied processes make the most of materials' natural properties. This results in the development of a sustainable sector, and goes a step further in improving the environment and our quality of life.

More concretely, bio-based industries are capable of delivering sustainable everyday products that are comparable or superior to fossil-based ones by their outstanding performance, competitive price and/or availability.

BBI JU's projects will develop the potential of waste as well as agricultural and forestry residues. They are perfect examples of the circular economy in action, meaning sustainable, resource-efficient and largely waste-free utilisation of Europe's renewable raw materials for industrial processing.

The creation of a competitive bio-based infrastructure in Europe is expected to significantly boost employment, as well as support regional development by expanding local economies. This will result in new, higher and more diversified revenues for farmers and cooperatives and will create jobs in rural areas.





### 3. CALL CONDITIONS, RULES AND EVALUATION

**Disclaimer:** the overview of the BBI JU Call 2018 Call conditions, management rules and evaluation texts provided in this document is aimed at providing a quick summary of the 2018 Call for Proposals. For a full description of the guidelines and procedures, please consult the Call 2018 Annual Work Plan and other relevant H2020 Legal Framework documents available on <https://bbi-europe.eu/participate/call-proposals-2018> and <http://www.bbi-europe.eu/about/reference-documents>.

*The BBI JU operates under the Horizon 2020 rules for participation, set out in Regulation (EU) No 1290/2013 of the European Parliament and of the Council of 11 December 2013.*

#### A. CALL CONDITIONS

**Call identifier:** H2020-BBI-JTI-2018  
**Publication date:** 11 April 2018  
**Deadline:** 6 September 2018 17:00:00  
 (Brussels local time) - (single stage call)

**Indicative budget:**  
 € 115 million

Indicative budget by type of actions	
Type of action	Indicative budget
Research and Innovation Actions	€ 41 000 000
Innovation Actions - Demonstration Actions	€ 30 000 000
Innovation Actions - Flagship Actions	€ 42 000 000
Coordination & support Actions	€ 2 000 000
<b>Total</b>	<b>€ 115 000 000</b>



## B. CALL MANAGEMENT RULES

Rules for participation in BBI JU Calls for proposals are the same as in Horizon 2020. This means that BBI JU Calls are open to private for-profit and not-for-profit organisations, including large enterprises as well as SMEs, Research and Technology Organisations, universities, associations, or any legal entity interested in BBI activities.

Everyone can apply and everyone is strongly encouraged to do so. The principles of openness, transparency and excellence prevail, and the three Horizon 2020 criteria for evaluation of excellence, impact and quality & efficiency of implementation apply. The main exception is that large enterprises are not eligible to receive funding for Research and Innovation Actions and Coordination and Support Actions under the BBI JU programme.

In the Call for proposals 2018, in line with Article 9(5) of the Horizon 2020 Rules for Participation and according to the Commission Delegated Regulation (EU) No 623/2014, six RIAs topics have an additional eligibility criterion where among the participants in the Consortium, there is at least one constituent entity of the Bio-based Industries Consortium (BIC) not eligible for JU funding by the Call deadline.

## C. EVALUATION

The BBI JU programme office is the neutral facilitator for the administration of the BBI JU Call processes and procedures. It selects and appoints independent experts to conduct a fair and transparent evaluation of the

received proposals. The evaluation process is monitored by independent external observer(s), who ensure that each evaluation process is conducted in line with these principles.

Proposals are evaluated on their scientific excellence, potential impact, and potential of proposal implementation to resolve the issues posed in the Call topics. Proposals (excluding CSAs) are also evaluated on their potential socio-economic impact, and all processes and products described in the proposal have to undergo a lifecycle analysis to prove that they will contribute to a lower carbon footprint.

External evaluators are selected based on their expertise, and come from different professional backgrounds including industry (both large and small), academic and research institutions, public bodies, associations, etc.

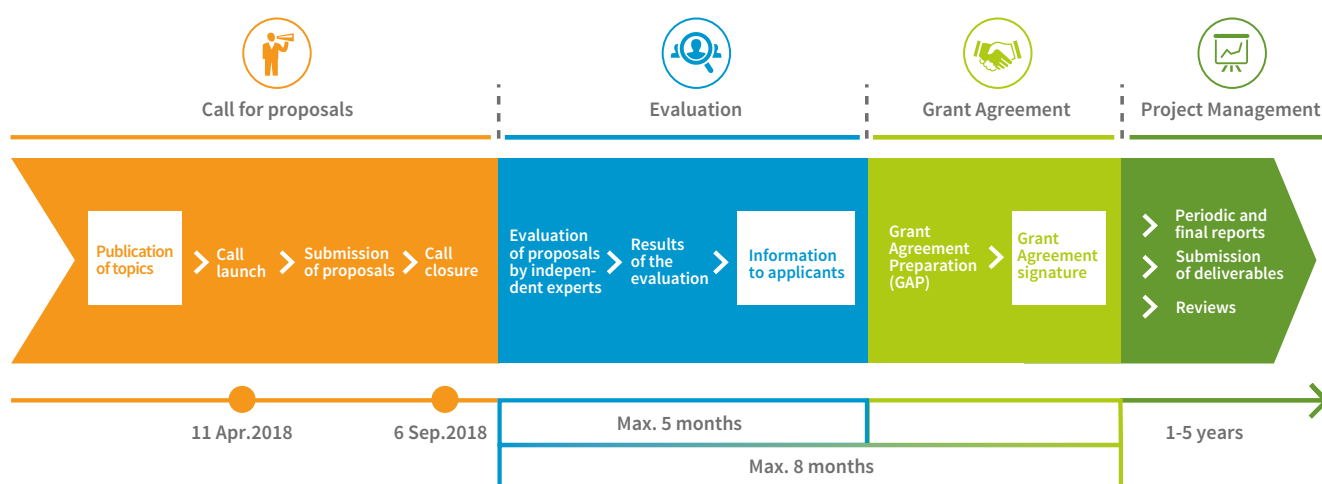
## D. PARTICIPANT PORTAL

The Participant Portal is the single-entry point for all interactions with the EU research and innovation programmes offered by the European Commission, its Executive Agencies, and BBI JU. It offers tools and services that facilitate the monitoring and management of your proposals and projects.

All BBI JU Call information and documents are published centrally on the Participant Portal. These include:

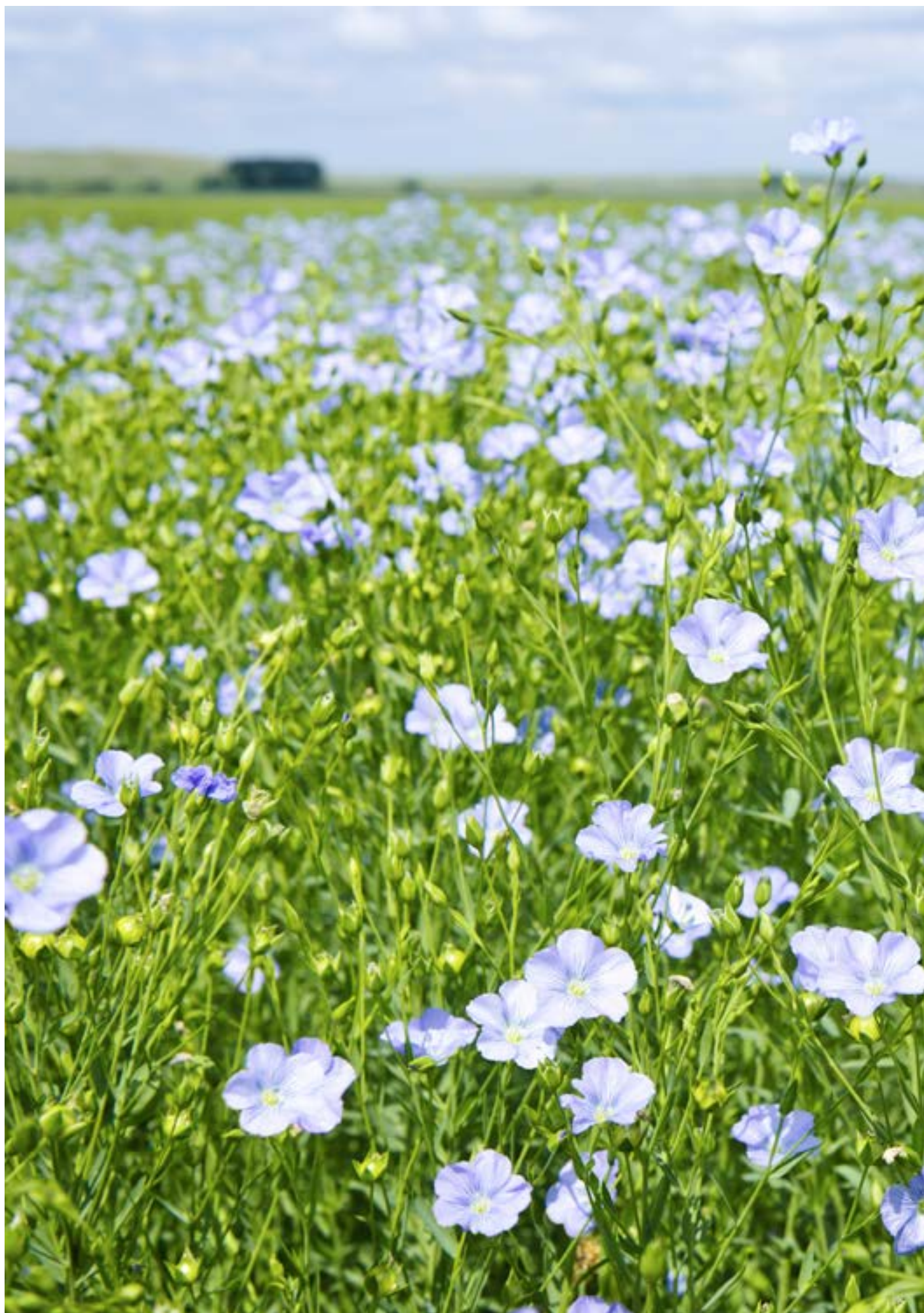
- 🔍 Call description
- 🔍 Topics and submission service
- 🔍 Call documents
- 🔍 FAQs and support

## GRANT MANAGEMENT LIFE CYCLE



More information regarding Call Conditions and Rules as well as links to the Participant Portal are available on the BBI JU website under the main heading 'Participate'.







## 4. CALL FOR PROPOSALS 2018

### A. THE STRATEGIC ORIENTATIONS

The 2018 Annual Work Programme and Budget (AWP) is the fifth one on the critical path towards 2020; it continues to be based on the acceleration of the development of new sustainable value chains from biomass feedstock supply via efficient processing, to the acceptance and application of bio-based products in end markets.

The AWP 2018 will continue to focus on the need to better integrate biomass feedstock suppliers at the front end of the value chain, creating a demand for biomass feedstock from biorefining processes. Similarly, the AWP will stimulate the building of partnerships with end market actors to create a 'market pull' for bio-based products for identified applications.

The Strategic Research and Innovation Agenda (SIRA) presents the overall strategic orientation of the BBI JU and has been developed by the industry, based on extensive consultation with the European Commission and other public and private stakeholders. The original SIRA was published in 2013 and has undergone a process of revision which has delivered an adjusted SIRA published in July 2017.

The SIRA 2017 presents a broadened scope that reflects the changes occurring in the rapidly evolving sector of the bio-based industries, as the inclusion of new sectors and the incorporation of new sources of feedstock, such as aquatic biomass, bio-waste and CO<sub>2</sub>. In addition, the SIRA 2017 pursues the crossover between 'traditional' value chains, moving to a multi-value-chain approach that increases the opportunities to transform and valorise new feedstock into numerous new bio-based products for a wide range of applications.

The SIRA defines four strategic orientations of the bio-based industry in Europe:



**Feedstock:** Foster supply of sustainable biomass feedstock to feed both existing and new value chains



**Process:** Optimise efficient processing for integrated biorefineries through research, development and innovation (R&D&I)



**Products:** Develop innovative bio-based products for identified market applications



**Market uptake:** Create and accelerate the market-uptake of bio-based products and applications



### B. 2018 CALL TOPICS

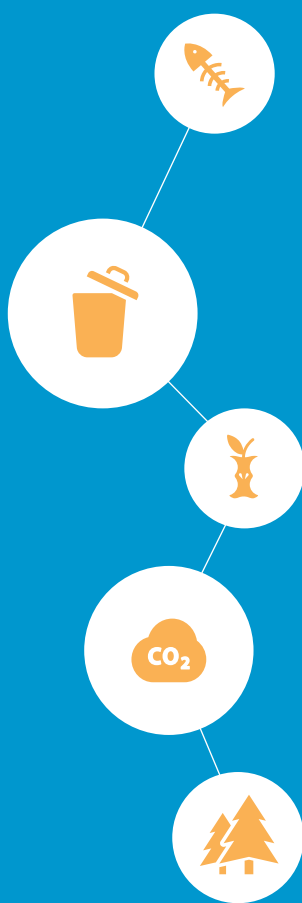
Thus, as initiated in previous calls, the BBI JU Call 2018 moved away from a strict biomass feedstock 'push' based on the traditional value chains, towards a demand for biomass to enable processing in order to respond adequately to a 'pull' from the end markets.

In 2018 the Call has an indicative budget of EUR 115 million for a total of 21 topics with 11 RIA topics, 3 CSAs, 5 DEMOs and 2 FLAGS. For the first time in BBI JU Calls, 6 RIA topics are included with the additional eligibility criterion that at least one participant of each consortium has to be a constituent entity of the Bio-based Industries Consortium (BIC).

**Disclaimer: the scope sections of the BBI JU Call 2018 topic texts described in this document are indicative and solely aimed at providing a quick overview of all Call 2018 topics. However, all proposal evaluations will be based on the full topic texts and the relevant Horizon 2020 Legal Framework as described in the Call 2018 Annual Work Plan available on [www.bbi-europe.eu/about/reference-documents](http://www.bbi-europe.eu/about/reference-documents)**

The anticipated total contribution of BBI JU funding shown for each topic is the estimated amount which would allow the specific challenge to be addressed appropriately. Nonetheless, this estimate does not preclude the submission and selection of proposals with another requested contribution.





## Strategic Orientation 1 - FEEDSTOCK

### Fostering a sustainable biomass-feedstock supply to feed both existing and new value chains

The first strategic orientation aims to expand and diversify the biomass feedstock portfolio through improving utilisation of existing sources and tapping into new sources.

*Focus areas for this strategic orientation are:*

- ④ Improve the utilisation of existing feedstock sources from the agro-, forest, marine, chemical and waste industry sectors, also in geographical areas with currently low biobased activities. This includes feedstock from the paper and pulp and the food production and processing industries.
- ④ Expand the utilisation of the organic fraction of municipal solid waste (MSW), sludge from urban wastewater treatment, industrial organic waste and residues from perennial crops as a feedstock for the bio-based industry.
- ④ Exploit the opportunities of aquatic biomass as feedstock for the bio-based industry.
- ④ Valorise co-products and residues from bio-based operations, including (existing) biorefineries.

## IMPROVE THE UTILISATION OF EXISTING FEEDSTOCK SOURCES



### BBI 2018. SO1.D1 - Improve the logistical and pre-processing steps of locally sourced biomass to serve as feedstock for the bio-based industry

#### BBI JU FUNDING

max. € 7 million / project

#### TYPE OF ACTION

Innovation Action  
Demonstration Action

Getting biomass feedstock from its sources in rural and coastal areas to processing plants in the bio-based industry today has to contend with many hindrances. These relate to the (often varying) quality of the biomass, its quantity, location and distance from the operating facilities and state-of-the-art logistical systems and equipment.

Besides adding weight in transportation, high water content may cause the biomass to degrade during transportation and storage. Compacting or drying techniques to reduce weight, volume and moisture could modify the biomass composition and properties.

Also, residual biomass in particular often occurs in relatively small quantities in scattered locations, and its low value does not justify an efficient, modern logistical system for valorisation. Consequently, residues that are potential feedstock for the bio-based industry are left on the field or are burnt.

In many areas, too, the disconnect between actors in the rural and coastal areas and those in the bio-based operational stages prevents the introduction of new and innovative technologies and practices into the supply chain.

This lack of connection between the planning and resource management and downstream value chain operations often means that there is no business case for efficient integration of locally sourced feedstock with bio-based industry operations.

**The specific challenge** of this topic is to cost-effectively mobilise local biomass, from source to the gates of an advanced biorefinery, for further processing into value-added market applications, thereby avoiding losses in feedstock quantity or quality.

## EXPAND THE EXPLOITATION OF UNDER-UTILISED OR NEW FEEDSTOCK FOR THE BIO-BASED INDUSTRIES



### BBI 2018. SO1.R1 - Resolve logistical, infrastructural and technological challenges to valorise residual and side streams from aquaculture, fisheries and the aquatic biomass processing industries

#### BBI JU FUNDING

max. € 2-5 million / project

#### TYPE OF ACTION

Research and Innovation Action

Fully developed and sustainable biorefineries at an industrial scale require optimal valorisation of side streams generated during the different process steps. However, current practice is to divert these streams to low-value applications such as

energy and fuels. Valorising these streams for higher-value applications requires further downstream processing steps. In some cases, within a cascading set-up of biorefining operations, the subsequent side streams could have a complex composition that makes it increasingly difficult to process them into valuable products.

The better this cascading operational set-up is at valorising subsequent liquid and solid side streams, the higher its competitiveness and sustainability will be. Resolving these challenges of downstream valorisation will potentially result in additional and new supplies of biomass feedstock for conversion into chemicals and materials.

**The specific challenge** is to valorise liquid and solid biorefinery side streams with a composition that impedes their further processing into high added-value products beyond the state-of-the-art.



### BBI 2018. SO1.D2 - Find solutions to dilution, pollution and content diversity challenges to turn mixed urban bio-waste into sustainable feedstock for the bio-based industry

#### BBI JU FUNDING

max. € 7 million / project

#### TYPE OF ACTION

Innovation Action  
Demonstration Action

In 2016, an estimated 54 % of the world's population lived in urban areas. That figure is projected to exceed 60 % in 2030. Cities, and the people living within them, produce an immense amount of solid waste and wastewater.

Despite the widespread availability of sorting practices, mixed waste streams going to landfill or for incineration still contain a large volume of biodegradable organic matter (for example, 60 % in the UK) that could well be used as feedstock for the bio-based industry. Furthermore, such a large amount of organic matter going to landfill falls short of the aim in Council Directive 1999/31/EC on the landfill of waste of limiting the share of landfilled biodegradable waste to 35 % by 2020.

Wastewater contains several valuable components, including cellulose and nutrients, especially phosphorus. The content of municipal wastewater and the derived sewage sludge could cover around 15 % of the world's phosphorus demand. Every year the average citizen sends 10 kg of toilet paper into the sewage system. This would provide an enormous source of cellulose for further upgrade to chemical precursors and/or polymers.

High dilution and the wide variety of exploitable components in urban wastewater streams make it difficult to recover usable components at higher scale efficiently. As a result, urban wastewater treatment tends to focus on producing energy or biogas.

Even though their contaminant levels and diversity present challenges for valorisation, organic urban waste streams can provide a significant volume of feedstock for the bio-based industry all year round without any conflict with land use and food production.

**The specific challenge** of this topic is to utilise mixed waste streams, separately collected organic waste and the organic fraction of sewage sludge from wastewater treatment – all coming from urban sources – as sustainable feedstock for the bio-based industry, overcoming their high dilution level, pollution and disparity of content.





## Strategic Orientation 2 - PROCESS

### Optimising efficient processing for integrated biorefineries

The second strategic orientation aims to improve efficiency and sustainability of 'biorefining biomass into compounds for chemicals (including food and feed ingredients) and materials' and to develop new, breakthrough processes.

*Focus areas for this strategic orientation are:*

- ④ Improve the effectiveness of pre-treatment steps.
- ④ Further increase the efficiency of chemo- and bio-catalysis targeting better product quality, higher selectivity, higher output, lower cost and/or lower energy consumption.

## CONVERSION OF PRE-TREATED FEEDSTOCKS TO BIO-BASED CHEMICALS AND MATERIALS



### BBI 2018. SO2.R2 – Develop techniques and systems to improve the performance of biocatalysts

**BBI JU FUNDING** max. € 2-5 million / project

**TYPE OF ACTION** Research and Innovation Action

Biocatalysts – enzymes and the microorganisms that contain them – offer great potential for the large-scale production of high-value products from renewable, bio-based feedstock. Unlike the conventional chemical conversion processes, biocatalytic conversions typically take place under mild conditions and achieve higher selectivity of specific characteristics, such as chirality. In addition, biocatalysis can realise the targeted conversion of specific biomass fractions such as lignin.

Currently available methods to screen and engineer microbial strains to display the desired biocatalytic features are often time-consuming and expensive, due to the inherent complexity of the metabolic networks involved. A significant improvement of these steps would allow for optimising the biocatalytic conversion of specific feedstocks in well-defined operating conditions, and would help consolidate the competitive advantage of biocatalysis over traditional chemical processes.

Moreover, the success of using biocatalysts for conversion processes is often dependent on the type of the targeted biomass feedstock and the presence of bioprocess inhibitors therein. Feedstock with a mixed composition, like lignocellulose and residual biomass that also contains inhibitors, presents the greatest challenges to biocatalytic transformation. Consequently, for the optimisation and monitoring of a bioprocess there is a need for a detectable/selectable microbial phenotype that correlates biocatalytic activity to the formation of the desired chemical end-product.

**The specific challenge** of this topic is to phenotypically link the performance of biocatalysts to specific product formation, considering feedstock type and quality, and operating conditions including the presence of inhibitors.



### BBI 2018. SO2.R3 – Introduce new technologies to make pulping operations more resource-efficient

**BBI JU FUNDING** max. € 2-5 million / project

**TYPE OF ACTION** Research and Innovation Action

The objective of wood pulping is to separate cellulose fibres from the other wood components (lignin, hemicelluloses,

extractives, etc.). Those components end up as side streams, making up a considerable share of the pulp mill's output. For example, in the case of the dominant chemical pulping process (the kraft process, which accounts for roughly 90 % of the world's chemically produced pulp), around half of the initial wood substances degrades and dissolves into the cooking liquor or black liquor. Black liquor is concentrated and burnt to obtain energy. However, there are opportunities to obtain more value for the substances diverted to black liquor.

Moreover, the pulp and paper sector is focusing on reducing its environmental impact by consuming less energy, curbing its use of polluting chemical products and bringing down CO<sub>2</sub> emissions from its operations. Key to achieving this target is the development of new pulping processes that can be effective at lower temperatures, use fewer chemical agents and make better overall use of the biomass feedstock.

Several disruptive technologies have surfaced in recent years. A study by the Confederation of the European Paper Industries (CEPI) in November 2013 singled out eight breakthrough concepts projected to change the face of pulp- and papermaking processes by 2050.

**The specific challenge** of this topic is to bring breakthrough concepts in lignocellulosic pulping from lab scale to pilot scale and paving the way for further upscaling and industry uptake.



### BBI 2018 SO2.R4 – Apply advanced biotechnologies to convert biomass that contains inhibitors into high value-added chemicals and materials

**BBI JU FUNDING** max. € 1-2,5 million / project

**TYPE OF ACTION** Research and Innovation Action

Residual streams from various bio-based operations contain, among others, low-molecular compounds that severely inhibit the growth of the currently known fermenting microorganisms. As a result, the yields and quality of the desired products are too low for a successful, large-scale application of fermentation pathways to valorise these residual streams. To solve these problems, microbes must be adapted to enable the desired conversion steps.

However, there are microorganisms that are resistant to inhibitors and can perform the desired conversion steps in inhibitor-containing streams. Using omics and other techniques to identify and isolate these microorganisms could lead to new systems producing value-added products through fermentation. Their performance may be further improved through metabolic engineering or any other advanced, new biotechnology in this field.

**The specific challenge** of this topic is to better exploit microorganisms that are resistant to inhibitors.

*- To be eligible for participation, a Consortium must contain at least one constituent entity of the Bio-based Industries Consortium that is a beneficiary not eligible for JU funding, as laid down in Commission Delegated Regulation (EU) No 623/2014.*



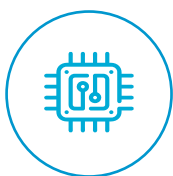
### BBI 2018 SO2.R5 – Develop innovative single-step processes for conversion of a biomass feedstock into multiple readily usable intermediate streams

<b>BBI JU FUNDING</b>	max. € 1-2.5 million / project
<b>TYPE OF ACTION</b>	Research and Innovation Action

Due to the nature of most bio-based feedstocks, industry often faces a situation in which just a fraction of the feedstock is converted into a main product. The other fractions are discarded or routed through subsequent cascading steps to recover or produce useful compounds. These cascading operations allow for the recovery of useful materials, but require high capital and operating expenses.

**The specific challenge** of this topic is to achieve single-step technologies able to make biomass fractions and/or first conversion products available.

- To be eligible for participation, a Consortium must contain at least one constituent entity of the Bio-based Industries Consortium that is a beneficiary not eligible for JU funding, as laid down in Commission Delegated Regulation (EU) No 623/2014.



### BBI 2018 SO2.R6 – Apply emerging breakthrough technologies to improve existing value chains

<b>BBI JU FUNDING</b>	max. € 1-2.5 million / project
<b>TYPE OF ACTION</b>	Research and Innovation Action

The emerging bio-based industry in Europe is taking shape thanks to its many value chains, either built on existing value chains from the participating industrial sectors, or afresh, from new partnerships across sector boundaries. As the industry progresses, the existing situation offers opportunities to (further) improve existing value chains by integrating breakthrough technologies where applicable. The targeted improvement could be higher performance, lower costs, and/or enhanced sustainability.

**The specific challenge** of this topic is to identify possible technological improvements to existing value chains when breakthrough technologies are included.

- To be eligible for participation, a Consortium must contain at least one constituent entity of the Bio-based Industries Consortium that is a beneficiary not eligible for JU funding, as laid down in Commission Delegated Regulation (EU) No 623/2014.



### BBI 2018 SO2.R7 – Electrochemical processes for bio-based monomers and polymers

<b>BBI JU FUNDING</b>	max. € 1-2.5 million / project
<b>TYPE OF ACTION</b>	Research and Innovation Action

Electrical energy prices fluctuate greatly, due to the widespread adoption of renewable sources. At peak production times – on sunny summer or windy winter days, for instance – energy can become virtually free. Electrochemical processes are becoming attractive, as they can be integrated into smart grid set-ups to exploit surplus energy and convert bio-based feedstock into chemicals and materials. This, in turn, may lead to considerably less expensive production than conventional routes can offer.

Moreover, smart electrochemical processes have the ability to setting the process conditions more precisely, providing a tool to ‘custom-make’ molecules with, for example, the desired molecular weights or specific functionalities. Depending on the biomass feedstock, the processes can produce various groups of intermediate bio-based platform molecules for direct use or further processing.

**The specific challenge** of this topic is to exploit surplus electric energy for the inexpensive electrochemical conversion of biomass feedstock and prepare this technology for upscaling.

- To be eligible for participation, a Consortium must contain at least one constituent entity of the Bio-based Industries Consortium that is a beneficiary not eligible for JU funding, as laid down in Commission Delegated Regulation (EU) No 623/2014.



### BBI 2018. SO2.D3 – Valorise sugars from the cellulosic and/or hemicellulosic fractions of lignocellulosic biomass

<b>BBI JU FUNDING</b>	max. € 7 million / project
<b>TYPE OF ACTION</b>	Innovation Action Demonstration Action

The use of lignocellulosic feedstock to produce chemicals and materials for commercially viable applications usually focuses on valorising cellulose.

Current processes that use hydrolysis to convert carbohydrate chains into sugars mostly focus on glucose from cellulose for further processing, leaving the other sugars in hemicellulose unused. These include potentially valuable monomers such as xylose, mannose, galactose, arabinose and rhamnose. They could be used either directly,

or fermented into compounds for high-value products. Valorising these co-products into specialty sugars or high-value products can significantly increase a biorefinery's profitability.

Unlike first-generation sugars, the sugars derived from lignocellulosic feedstock often suffer from low purity and/or high dilution levels. This makes fermenting these sugars into usable products and materials very difficult. They have less impact on the production of chemicals such as ethanol or other volatile compounds that can be easily purified and concentrated in the downstream processing steps. Several existing technological solutions to convert cellulose via sugar platforms into ethanol will soon be operating on a large scale. Other product types (bioplastics or non-volatile compounds, for example) with a complex post-conversion purification process require high-purity sugars.

While a great deal of work is ongoing to valorise lignin, valorising the third component of lignocellulose, hemicellulose, presents hurdles that need to be tackled.

**The specific challenge** of this topic is to better use the sugars from lignocellulosic feedstock in a sustainable way.

Both developments demand reliable modelling systems to cope with many variables in simulating the full value chain, from feedstock to products, in search of the most effective combinations.

The design phase should be long enough and have sufficient tools available to test different and radical concepts. And ultimately, in the scaled-up and (semi-)commercial operating phase, there should be guidelines for continuous improvement cycles.

Today's methods for scaling-up often take a more limited view and do not look at the bigger picture, so that optimisation takes place at lab level, not at plant operation level.

Industry needs reliable modelling approaches, able to predict entire pathways from feedstock and energy intake to product output. This may mean designing tailor-made paths for each specific feedstock – from its intake and preparation, through the processing steps to the end-products.

Recent developments in computation-driven frameworks can help cope with many variables in designing optimal feedstock-organisms-bioprocess configurations and simulating scaling-up. These computation approaches are already standard in fields other than microbial technology and industrial biotechnology.

**The specific challenge** of this topic is to design and apply reliable and robust computational modelling approaches for bioprocesses.

*- To be eligible for participation, a Consortium must contain at least one constituent entity of the Bio-based Industries Consortium that is a beneficiary not eligible for JU funding, as laid down in Commission Delegated Regulation (EU) No 623/2014.*

## SYSTEMS MODELLING



**BBI 2018. SO2.R8 – Develop adequate computational systems for modelling the design, start-up, scaling-up and continuous improvement of bioprocesses involving microorganisms**

**BBI JU FUNDING**

**max. € 1-2.5 million / project**

**TYPE OF ACTION**

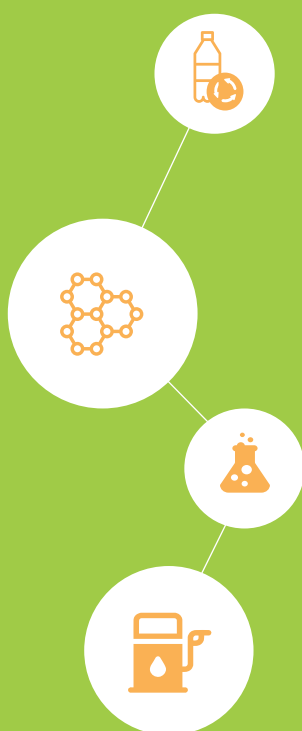
Research and Innovation Action

The state-of-the-art approach to designing, scaling up and starting up bioprocesses is governed by 'trial and error' and replicating traditional manufacturing methods. These methods often cause scaling-up losses and start-up delays or failures. There are many variables that have an impact on the design and scaling-up of bioprocesses, making this a very complex exercise. Among the major causes of these variables are:

- an increasingly wider range of biomass feedstock and their varied and heterogeneous composition; and
- revolutionary developments in molecular biology producing more efficient microorganisms that can create a wider range of bio-products.







### Strategic Orientation 3 - PRODUCTS

#### Developing innovative bio-based products for specific market applications

The third strategic orientation aims to increase the applicability of high value-added bio-based products and avoid price competition with fossil-based products by pursuing advanced functionalities and unmatched performance.

*Focus areas for this strategic orientation are:*

- ✓ Bio-based materials that outperform fossil-based materials in comparable applications in the packaging, construction, agriculture, transportation, personal care and hygiene sectors.
- ✓ Breakthrough bio-based chemicals that have no fossil-based counterpart or industrial scale production.
- ✓ New bio-based chemicals and materials for high-value applications meeting all safety and regulatory requirements.
- ✓ Proteins and bio-based additives from plants, residual streams in the food production and other (waste) streams that are rich in protein and high-value molecules.
- ✓ Bio-based plastics that are biodegradable/compostable or suitable for recycling.

## BIO-BASED PRODUCTS THAT OUTPERFORM FOSSIL-BASED COUNTERPARTS



**BBI 2018. SO3.R9 – Develop functional molecules for bio-based coatings outperforming existing products and meeting market requirements**

**BBI JU FUNDING**

**max. € 2-5 million / project**

**TYPE OF ACTION**

Research and Innovation Action

The global market for coatings is changing and growing as the requirements for the properties and performances of end-products (durability for packaging, wear resistance in machinery, etc.) become more demanding.

These changes open up interesting market prospects for bio-based coatings or coatings including bio-based components. However, generally speaking these coatings are not yet able to compete with traditional synthetic products on technical properties or cost. Although many research activities have been focusing on improving the characteristics of bio-based coatings, increasing their market share to meet new demand and to replace synthetic coatings is only just beginning.

Work to develop bio-based products to match the new high-performance requirements for coating applications should be speeded up to fill the projected gaps in quality and quantity.

**The specific challenge** of this topic is to employ bio-based formulations to meet the market requirements for the properties and performances of products used in coating applications.



**BBI 2018. SO3.R10 – Develop bio-based packaging products that are biodegradable/ compostable and/or recyclable**

**BBI JU FUNDING**

**max. € 2-5 million / project**

**TYPE OF ACTION**

Research and Innovation Action

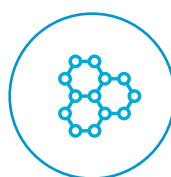
Currently, most of the packaging used in a wide variety of applications in different market sectors – including food, pharmaceuticals and clothing – is not recyclable. It consists mostly of multi-layer packaging, with each layer composed of different polymers that perform specific functions, making it technically non-recyclable. The end-of-life phase for this packaging, therefore, is either incineration or landfill.

Moreover, the compostable bio-based packaging that is currently available mainly ends up in industrial composting facilities. This is because other biological waste treatment

processes like anaerobic digestion and home composters are generally not suitable for most of the current compostable polymers.

Novel alternative solutions should 'eco-design' packaging products to avoid the incineration and landfill routes at their end-of-life phase, rerouting them instead towards approved and accepted applications, where they can add value without adding an environmental burden.

**The specific challenge** of this topic is to make the end-of-life phase for packaging significantly more sustainable.



**BBI 2018. SO3.R11 – Develop technologies and systems to produce bio-based aromatics that outperform fossil-based counterparts**

**BBI JU FUNDING**

**max. € 1-2.5 million / project**

**TYPE OF ACTION**

Research and Innovation Action

Aromatic building blocks make up a significant share of today's building blocks for a wide array of day-to-day products and applications, including nylons, polystyrene, resins and polycarbonates.

Current production routes from fossil-based feedstock are energy-intensive and have a significant environmental footprint.

Moreover, the gradual introduction of shale gas and other light feedstocks in oil refining and cracking operations is resulting in significant production cuts to building blocks heavier than ethylene.

Until now, production costs have been the prime obstacle to bio-based aromatics penetrating the market. The maturity of the petrochemical industry makes purely cost-based competition unrealistic for most bio-based aromatics, especially benzene, toluene, ethylbenzene and xylene. However, better performance at an acceptable premium price would increase the marketability of bio-based aromatics for mass consumption.

Composition complexity and other characteristics of various biomass feedstock hinder the exploitation of their enormous potential to produce aromatic compounds that could outperform petrochemical alternatives.

**The specific challenge** of this topic is to increase the process yields of aromatics from sustainable biomass sources able to outperform fossil-based counterparts.

*- To be eligible for participation, a Consortium must contain at least one constituent entity of the Bio-based Industries Consortium that is a beneficiary not eligible for JU funding, as laid down in Commission Delegated Regulation (EU) No 623/2014.*



#### BBI 2018. SO3.D4 – Produce biopesticides or bio-based fertilisers as components of sustainable agricultural management plans

##### BBI JU FUNDING

max. € 7 million / project

##### TYPE OF ACTION

Innovation Action  
Demonstration Action

Biopesticides are pesticides derived from natural materials such as animals, plants, bacteria and certain minerals. They can improve the management of pests for sustainable agricultural management programmes, by combatting only the targeted pest and closely related organisms, making them sometimes more selective than conventional pesticides. If in addition they are effective in small quantities and decompose quickly, they can greatly reduce the use of conventional (synthetic) pesticides.

The components that can be used to produce biopesticides have also anti-pathogenic capabilities: they are able to prevent biomass degradation by fungi, bacteria or other kinds of pathogenic agents. Upscaling their use for biopesticides requires sustainable supply and optimum production.

Sustainable agricultural management programmes also entail the supply of nutrients to crops. The existing supply of nutrients can be expanded and diversified by tapping side streams from bio-based operations. These streams are nutrient-rich and moreover, are a zero-ILUC (indirect land use change) feedstock for fertilisers, nutrients and plant biostimulants. However, current practice is to spread them on the land with little pre-treatment. This practice is wasting a potentially valuable resource and is often not the most effective and efficient way to add nutrients and carbon to the soil. Further development work is needed to optimise the separation and purification of these streams and expand their use in nutrient mixtures for the targeted soil conditions.

Sustainable agricultural management can greatly benefit from the contribution of new, bio-based pesticides and fertilisers.

**The specific challenge** of this topic is to overcome hurdles in the production of biopesticides and bio-based fertilisers to benefit sustainable agricultural management.



#### BBI 2018. SO3.F1 – Produce on a large scale competitive bio-based building blocks, polymers and materials that outperform existing alternatives in identified market applications

##### BBI JU FUNDING

max. € 21 million / project

##### TYPE OF ACTION

Innovation Action  
Flagship Action

Research and demonstration activities have applied innovative technologies and processes to obtain novel bio-based building blocks, polymers and materials with improved functionalities and performances for packaging, coatings, resins and paints, additives, composites, fibres, cosmetics and others.

These innovative products can outperform state-of-the-art products, both fossil-based and current bio-based in comparable applications, in terms of performance and sustainability. However, despite their better performance and the high interest from the market in benefiting from this, their higher production costs and consequent higher prices slow down market uptake.

**The specific challenge** of this topic is to realise the high market potential of innovative bio-based building blocks, polymers and materials at a competitive level with benchmark products.

### PROTEINS AND ACTIVE INGREDIENTS FOR FEED/FOOD, PHARMA AND COSMETICS



#### BBI 2018. SO3.D5 – Produce sustainable and cost-efficient high-performance functional ingredients from alternative sources

##### BBI JU FUNDING

max. € 7 million / project

##### TYPE OF ACTION

Innovation Action  
Demonstration Action

Boosted by the increasing world population and the subsequent growth in demand for functional products for food, feed, nutraceuticals, cosmetics, pharma, etc., industry and academia are looking at alternative sources for bio-active ingredients that can provide functionality.

In looking at alternative sources, R&I efforts have been focusing on secondary biomass sources such as agro-food residues and alternative primary biomass sources like algae, microorganisms and invertebrates. However, to-date none of them has been able to establish itself as a large-scale alternative to food crops due to cost, technology readiness and regulatory hurdles.

The seasonality and high variability in the composition of some potential alternative feedstocks (such as residual biomass from agricultural, food or forest sectors, or seasonal aquatic biomass) are preventing them from being a sustainable source of bio-active compounds.

**The specific challenge** of this topic is to help meet the increasing demand for high-performance functional ingredients for various applications through the use of sustainable alternative sources.



**BBI 2018. SO3.F2 – Large-scale production of proteins for food and feed applications from alternative, sustainable sources**

**BBI JU FUNDING**

**max. € 21 million / project**

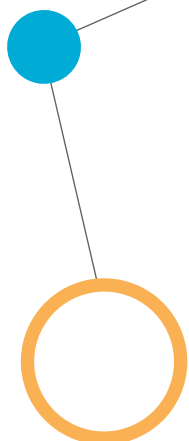
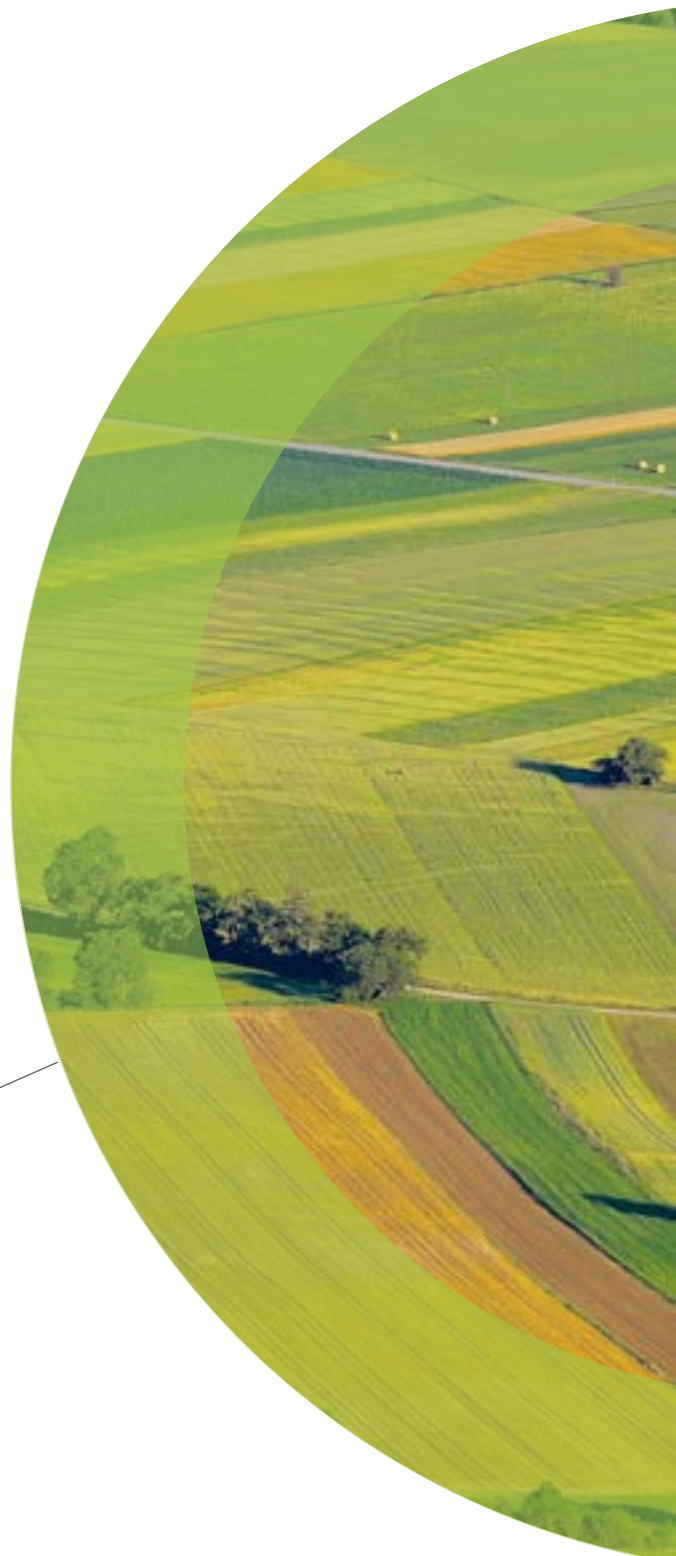
**TYPE OF ACTION**

Innovation Action  
Flagship Action

The worldwide demand for protein is progressively expanding due to strong growth in the world's population. Improvements in the standard of living in large parts of the world are adding to the protein demand. Forecasts to 2050 show that current protein availability will not be sufficient to meet protein demand for food purposes. At the same time, Europe is highly dependent on imports of protein-rich material for feeding livestock: About 70 % of the total amount required is imported. Already 60-70 % of global arable land is used for animal feed to meet animal protein demand.

Consequently, the exploitation of new protein sources is necessary to meet the worldwide demand. European crops, together with residues and co-products from primary biomass cultivation, are valuable sources of proteins. Residues from animal processing, fisheries, aquaculture and algae industries also offer a potential, albeit currently underexploited, source of proteins. The bio-based industry could help to expand the production of protein-rich ingredients by valorising existing alternative sources from food/feed value chains and by taking full advantage of the successes of earlier (and ongoing) R&D and small-scale industrial operations.

**The specific challenge** is to increase the availability of sustainable, safe proteins sourced from alternative, sustainable sources.







## Strategic Orientation 4 - MARKET UPTAKE

### Creating and accelerating the market uptake of bio-based products and applications

The fourth strategic orientation aims to respond to the concerns of society about bio-based products by engaging in dialogue with societal and consumer groups on benefits and how potential risks are addressed and managed.

*Focus areas for this strategic orientation are:*

- ⑦ Identify and propose solutions to remove (potential) hurdles to the increased use of the organic fraction of waste (specific co-products, side streams and residues from industrial and urban sources) for the bio-based industry.
- ⑦ Increase and improve communication and dialogue with all stakeholders on the benefits and possible risks of new bio-based products. These include materials for applications with food contact (such as nutraceuticals and packaging materials), in the pharmaceutical sector, and possibly also in the construction, agriculture, transportation, personal care and hygiene sectors.
- ⑦ Establish cooperation and partnerships with brand owners and consumer representatives to improve market access of sustainable bio-based products.



**BBI 2018. SO4.S1 – Benefit from previous and current work to create a coherent and stimulating ‘environment’ for a sustainable bio-based industry in Europe**

**BBI JU FUNDING**

**max. € 250 000 / project**

**TYPE OF ACTION**

Coordination and Support Action

Coordination and support actions (CSAs) funded by the 6th and 7th Framework Programmes, Horizon 2020 including the BBI JU, various Interreg and other European programmes have addressed many aspects related to the bio-based industry. These include: standardisation; awareness and communication; identifying regulatory hurdles; technological and non-technological road-mapping; foresight and market studies; biomass availability; sustainability; and analysing bio-based industries in Member States and regions. Current CSAs continue to address similar and different aspects to help the bio-based industry.

However, there is no ‘global overview’ of the results of completed work, the objectives of ongoing actions or a gap analysis versus long-term objectives. Moreover, these results and analyses are not collected or made available centrally for use in follow-up and future work. More needs to be done to communicate these results to the relevant stakeholders and a wider public.

**The specific challenge** of this topic is to benefit from the results from previous projects and from ongoing actions in the bio-based industry at the regional, national and European levels.



**BBI 2018. SO4.S2 – Expand the bio-based industry across Europe**

**BBI JU FUNDING**

**max. € € 750 000 / project**

**TYPE OF ACTION**

Coordination and Support Action

The level of activities of the Bio-based Industries Consortium (BIC) is not balanced throughout Europe. This is particularly the case in ‘moderate/modest innovator’ countries according to the European Innovation Scoreboard. This may be the result of insufficient knowledge of the potential for the bio-based industry in these countries, by actors in bio-based activities in these countries as well as by BIC. Additionally, actors in these countries may not be fully aware of the opportunities offered by BIC and the Bio-based Industries Initiative.

In order to explore how to remediate this situation, BIC has started in 2017 a pilot study in Portugal, Romania and Poland, identifying opportunities to expand the bio-based industry into these countries on a sustainable basis. This pilot study includes mapping local biomass sources that potentially could be used as sustainable feedstock for the bio-based industry, and mapping the major actors in the various relevant sectors. Additionally, the study sets up an action plan that seeks to establish interest and commitment from the actors and governmental institutions in the countries for expanding their industrial bio-based activities. BIC will continue this work in 2018 for Estonia, Latvia and Lithuania.

Similar work needs to be done in other countries, building on the ongoing work.

**The specific challenge** of this topic is to increase bio-based industrial activities in countries where these activities are relatively low.



**BBI 2018. SO4.S3 – Identify opportunities to promote careers, education and research activities in the European bio-based industry**

**BBI JU FUNDING**

**max. € 1 million / project**

**TYPE OF ACTION**

Coordination and Support Action

Crossing the boundaries between existing and new industrial sectors and involving partners in a variety of fields entails working in areas where different academic disciplines cross paths and in diverse teams to speed up innovation. Adequately skilled people will be needed to operate innovative value chains while establishing and sustaining a bio-based industry in Europe. The bio-based industry is looking to forge a true partnership with academia that delivers the right skills for the 21<sup>st</sup> century. This partnership should also raise the profile of career opportunities in the bio-based industry and related academic fields.

In recent years a number of sectors have carried out many activities and programmes to address a rising skills mismatch and prevent a widening skills gap in the future. These programmes are running at the regional, national and European levels. The bio-based industry does not have such programmes at European level. As the bio-based sector is expected to bring growth and jobs, particularly in rural and coastal areas, it could play a significant role in tackling unemployment in areas such as southern Europe, where youth unemployment is high. Often this may require retraining to provide the skills needed.

**The specific challenge** of this topic is to identify education needs and gaps in Europe’s bio-based sector and point to career opportunities in research and the industry.



## 5. SYNERGIES WITH BBI JU

### BioHorizon (NCPs)



#### National Contact Points for H2020 SC2 and KET-Biotechnology

*(Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research, Bioeconomy and Biotechnology)*

BioHorizon runs for four years (March 2015 – February 2019). The project consortium comprises 15 NCP institutions, under the coordination of the Institute of Fundamental Technological Research Polish Academy of Sciences (IPPT PAN POLAND).

The overall idea behind the BioHorizon project is to establish a pan-European learning platform for the transnational activities engaged in by SC2 and KET Biotechnology NCPs, and to create

a network of NCPs capable of exploiting synergies with respect to distributed knowledge and collective development of training sessions and materials. This well established, active network will allow NCPs to learn from one another, increasing mutual understanding of the different approaches applied and requirements encountered in the daily work of an NCP.

The network will develop high quality services provided in turn to beneficiaries of funding under SC2 and KET-Biotechnology, namely researchers, representatives of industry and SMEs, and other stakeholders. The assistance provided by BioHorizon will surpass typical NCP services, with the network emphasising the importance of the complex and multidisciplinary aspects of Horizon 2020, including widening participation throughout the EU 28 and involving new stakeholders.

The members of the network require specific knowledge of a variety of aspects related to European research and innovation policy, such as the common agricultural policy (CAP), marine policy, the European Innovation Partnership (EIP), Joint Technology Initiatives (JTIs), the Standing Committee on Agricultural Research (SCAR), etc.

*For further information: [www.ncp-biohorizon.net](http://www.ncp-biohorizon.net)*



## EASME (Executive Agency for SMEs)



### **The Executive Agency for Small and Medium-sized Enterprises (EASME) is an Executive Agency of the European Commission located in Brussels.**

It is responsible for managing specific programmes in the fields of business support targeting SMEs but also energy, environment and maritime research & innovation. Its goal is to help create a more competitive and resource-efficient European economy based on knowledge and innovation.

The original mandate of the Agency was extended several times since its foundation in 2003 and from energy it evolved to cross-cutting support to the innovation, competitiveness and internationalization of European SMEs. As a consequence, the original name of the agency changed to reflect the evolving mandate and from the original name Intelligent Energy Executive Agency (IEEA), it was renamed the European Agency for Competitiveness and Innovation (EACI) in 2007 and finally becoming EASME in 2014.

### **The Project**

Today the Agency is responsible for the implementation of the following programmes:

- ④ Most of COSME, the EU programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (SMEs), including Enterprise Europe Network (EEN) and Your Europe Business;
- ④ Parts of the European Innovation Council (EIC) pilot
- ④ The SME Instrument
- ④ Fast Track to Innovation (FTI)
- ④ Part of Horizon 2020, the EU Framework Programme for Research and Innovation, and in particular:
  - ④ Innovation in SMEs (including the European IPR Helpdesks, INNOVACESS and Peer learning for innovation agencies)
  - ④ INNOSUP including the SME Innovation Associate pilot action
  - ④ The Sustainable Industry Low Carbon Scheme (SILC II)
  - ④ Part of the Leadership in Enabling and Industrial Technologies
  - ④ The Energy Efficiency part of the Societal Challenge 'Secure, Clean and Efficient Energy';
  - ④ The Societal Challenge 'Climate action, Environment, Resource Efficiency and Raw Materials'
- ④ Part of the EU programme for the Environment and Climate action (LIFE)
- ④ Part of the European Maritime and Fisheries Fund (EMFF)
- ④ The legacy of the Intelligent Energy – Europe programme and the Eco-innovation initiative

The EASME also organises the EU Sustainable Energy Week (EUSEW).





## EEN (Enterprise Europe Network) Sector Group Environment



Launched in 2008, the Enterprise Europe Network (EEN) is an initiative of the European Commission, designed to help SMEs innovate and succeed by providing a local gateway to global business opportunities.

- 🔗 **Mission:** to help European businesses grow and innovate by providing the local support and advice they need to nurture their international ambitions, find business partners and access funding and finance.

- 🔗 **Vision:** to help more of Europe's ambitious, growth-oriented SMEs to succeed in bringing innovation to the marketplace on an international scale.

The Enterprise Europe Network brings together around 600 business support organisations from more than 65 countries. The member organisations include chambers of commerce and industry, technology centres, research institutes and development agencies. Enterprise Europe Network local branches offer the following free of charge services:

- 🔗 Innovation support services
- 🔗 Cross-border partnering activities for business cooperation, technology transfer or Research & Innovation projects
- 🔗 Access to finance
- 🔗 Advice on EU law and standards
- 🔗 Support on access to EU research funding
- 🔗 Advice on Intellectual Property Rights (IPRs)
- 🔗 Speak up on EU law

*Learn more on EEN services and find out your local contact point: [www.een.ec.europa.eu](http://www.een.ec.europa.eu)*

## Sector Group Environment

The Sector Group Environment of the Enterprise Europe Network gathers approximately 50 advisors that team up to provide green businesses with customized support. They meet twice a year to exchange on the environmental-related challenges faced by companies and to accelerate business, technology and research cooperation in this key growing sector. The sector group Environment organize brokerage events, company missions, conferences and workshops specifically targeting the environmental sector. These activities bring together enterprises, science and technology institutes and public bodies active in the environmental field.

*For further information: [www.een.ec.europa.eu/about/sector-groups/environment](http://www.een.ec.europa.eu/about/sector-groups/environment)*



## SPIRE (Sustainable Process Industry through Resource and Energy Efficiency)



Launched in 2013, the SPIRE (Sustainable Process Industry through Resource and Energy Efficiency) Public Private Partnership is a cross-sectorial initiative involving the eight main players in the EU's process industries: chemicals, steel, engineering, minerals, non-ferrous metals, cement, ceramics and water.

### SPIRE Targets

SPIRE aims at realising three key resource and energy efficiency targets within a time horizon of 2030:

- ④ A reduction in fossil energy intensity of up to 30% from current levels through a combination of, for example, cogeneration-heat-power, process intensification, introduction of novel energy-saving processes, energy recovery, and progressive introduction of alter-native (renewable) energy sources within the process cycle.
- ④ Up to 20% reduction in non-renewable, primary raw material intensity compared to current levels, by increasing chemical and physical transformation yields and/or using secondary (through optimised recycling processes) and renewable raw materials. This may require more sophisticated and more processed raw materials from the raw materials industries.
- ④ Efficiency improvement of CO<sub>2</sub> - equivalent footprints of up to 40%.

### SPIRE Key Components

SPIRE will implement its research and innovation roadmap through six Key Components:

- ④ **Feed:** Increased energy and resource efficiency through optimal valorisation and smarter use and management of existing, alternative and renewable feedstock.
- ④ **Process:** Solutions for more efficient processing and energy systems for the process industry, including industrial symbiosis.
- ④ **Applications:** New processes to produce materials for market applications that boost energy and resource efficiency up and down the value chain.
- ④ **Waste2Resource:** Avoidance, valorisation and re-use of waste streams within and across sectors, including recycling of post-consumer waste streams and new business models for eco-innovation.
- ④ **Horizontal:** underpinning the accelerated deployment of the R&D&I opportunities identified within SPIRE through sustainability evaluation tools and skills and education programmes as well as enhance the sharing of knowledge and best practices and cross-sectorial technology transfer.
- ④ **Outreach:** Reach out to the process industry, policy makers and citizens to support the realisation of impact through awareness, stimulating societal responsible behaviour.

More than 75 projects related to the first calls cover different focus areas including integrated process control, flexible feedstock, improved downstream processing of mixtures, cross-sectorial sustainability assessment, process intensification, energy and resource management systems, and more.

For further information: [www.spire2030.eu](http://www.spire2030.eu)



## EuropaBio (European Association for Bioindustries)



EuropaBio, the European Association for Bioindustries, promotes an innovative and dynamic European biotechnology industry. EuropaBio and its members are committed to the socially responsible use of biotechnology to improve quality of life, to prevent, diagnose, treat and cure diseases, to improve the quality and quantity of food and feedstuffs and to move towards a biobased and zero-waste economy. EuropaBio represents 77 corporate and associate members and bio-regions, and 15 national biotechnology associations which in turn represent over 1800 biotech SMEs.

### The leading voice for biotech in Europe

No other industrial sector enhances quality of life, knowledge, innovation, productivity and environmental protection like biotechnology, while also being beneficial for the economy. From new drugs that can address unmet medical needs and fight epidemics and rare diseases, to industrial processes that use renewable feed stocks instead of crude oil, to drought-resistant crops that allow farmers around the world to feed more people under ever-harsher climatic conditions, promoting and investing in biotech pays economic, social and environmental dividends.

For such reasons biotechnology has been a cornerstone of Europe's competitiveness in terms of research and innovation

as well as in terms of industrial growth, number of jobs and new companies created in Member States for numerous years. EuropaBio's purpose is to ensure this will continue, and that Europe not only remains the world's biotech research hub, but that European citizens also reap the benefits of innovative biotech products derived from that research.

### Driving and sharing industry insights

What is required firstly to realise biotech's potential for and in Europe is sound policy that supports innovation and entrepreneurial risk-taking, together with regulatory structures that reward long-term investment in research and development over short-term gain and quick consumption. To support such policies and structures, EuropaBio set out key recommendations around research and development, assessment and approval, and market access in the industry's 2014-2019 Manifesto.

### Fostering biotech awareness

Secondly, familiarisation of all parts of society with biotech and how it is helping to create a healthier, greener, more productive, and more sustainable economy, is paramount. To this end, EuropaBio showcases these benefits through a wide range of activities and events in the three specific sectors (healthcare, agriculture, and industry) as well as a series of cross-sectoral initiatives such as:

- 🕒 The European Biotech Week
- 🏆 The Most Innovative European Biotech SME Awards
- 🗣️ The European Forum on Industrial Biotechnology and the Biobased Economy
- 🌱 The Benefits of Biotechnology Event

For further information: [www.europabio.org](http://www.europabio.org)



## COPA-COGECA



**COPA** - Committee of Professional Agricultural Organisations in the European Union and

**COGECA** - General Confederation of Agricultural Cooperatives in the European Union

### The voice of 23 million European farmers and their cooperatives

Copa and Cogeca are the European umbrella organisations representing the united voice of farmers and agri-cooperatives in the EU. Together, Copa and Cogeca ensure that EU agriculture is sustainable, innovative and competitive, guaranteeing food security to half a billion people throughout Europe. Copa represents over 23 million farmers and their family members whilst Cogeca represents the interests of 22,000 agricultural cooperatives. Jointly, they have almost 70 member organisations from the EU Member States and 34 Partner Organisations.

### Mission

Our policy advisers and staff members work together with our members in order to keep EU farmers well informed and their positions heard and well represented in Brussels and beyond.

Copa and Cogeca aim to be a front runner in the discussions with EU decision-makers, putting all its in-house and member

expertise into achieving farmer and agri-cooperatives friendly policies, therefore also actively engaging in talks with our respective counterparts across the world and other stakeholders.

Research and innovation in agriculture have always been and will remain high on our agenda and promoting high-quality EU agriculture products also remains one of Copa and Cogeca's top priorities.

### How does Copa and Cogeca work?

The joint Copa and Cogeca Secretariat is headed by Copa-Cogeca Secretary-General Pekka Pesonen (FI). There are 50 staff in the Brussels office operating in 6 working languages (EN, FR, ES, DE, IT, PL) and working in four teams, among which the Secretary General's team; Commodities and Trade and General Affairs.

Copa and Cogeca has 45 Working Parties, dealing with market and policy developments and covering 25 agricultural sectors. The Working Parties prepare joint Copa and Cogeca positions on a wide range of, often very technical and key topics, such as research & innovation, rural development, bioeconomy, environment (climate change, soil, water, waste...), organic farming, animal health & welfare or animal products, just to mention a few.

In addition, Copa and Cogeca supports a growing number of great and highly innovative projects developed by our members across the EU.

Copa and Cogeca are also very active in media and in organising events, workshops, seminars and business forums, such as for Green Week, the Congress of European farmers and diverse European Parliament events.

For further information: [www.copa-cogeca.eu](http://www.copa-cogeca.eu)







## EUBA (European Bioeconomy Alliance)



The European Bioeconomy Alliance is a unique cross-sector alliance dedicated to mainstreaming and realising the potential of the bioeconomy in Europe. Bringing together the Alliance members are:

- ④ *The production and use of renewable resources as feedstock for making innovative, value-added everyday products and materials;*
- ④ *The commitment to maximise the unused potential of European renewable resources to encourage the production of bio-based products and materials “Made in Europe”;*
- ④ *Resource efficiency and sustainability as driving business principles.*

### EUBA Mission

The Alliance's mission is to lead the transition towards a post-petroleum society. Recognising that the bioeconomy is still a relatively new political, economic and social concept, the Alliance will strive to:

- ④ Raise EU, national and regional leaders' awareness on the benefits of the bioeconomy and bio-based industries;
- ④ Make the bioeconomy mainstream above and beyond the research and innovation policy;
- ④ Mobilise and engage stakeholders to realise the European bioeconomy potential;
- ④ Advocate for a coherent, flexible and stimulating policy environment for bio-based solutions.

### EUBA Objectives

- ④ Make bioeconomy a pan-European political priority;
- ④ Mobilise opinion leaders with a view to mainstreaming bioeconomy as a viable and accepted alternative;
- ④ Create a level playing field for bio-based products and materials.

### EUBA Members

- ④ BIC – Bio-based Industries Consortium
- ④ CEFS – European Association of Sugar Producers
- ④ CEPF – Confederation of European Forest Owners
- ④ CEPI – Confederation of European Paper Industries
- ④ COPA-COGECA – European Farmers and European Agri-Cooperatives
- ④ ePURE – European Renewable Ethanol Producers Association
- ④ EuropaBio – The European Association for Bioindustries
- ④ EUBP – European Bioplastics
- ④ FEDIOL – The European Vegetable Oil and Protein Meal Industry
- ④ FTP – Forest-based Sector Technology Platform
- ④ PFP – Primary Food Processors
- ④ Starch Europe – European Starch Industry Association

For further information: [www.bioeconomyalliance.eu](http://www.bioeconomyalliance.eu)

## EBRD (European Bank for Reconstruction and Development)



The European Bank for Reconstruction and Development (EBRD) is an international financial institution with a mandate to promote transition to well-functioning market economies, by financing projects and providing technical and policy support in 38 countries in Central-Eastern Europe, Central Asia and the Mediterranean region – including 12 EU Member States.

EBRD activities are characterised by rapid project scoping, approval and delivery, moulded around a business-oriented banking structure.

### The EBRD can offer the following financing solutions:

- ④ Debt at various levels of seniority as loans, with syndication of additional lending from partner banks where appropriate, or as bond purchases. Usually, the EBRD directly provides loans of €5m and above, although innovative projects with smaller financing needs are also considered. Average loan tenors are in the range of 5-7 years;
- ④ Equity and quasi-equity instruments are similarly available for larger-scale projects; Smaller-scale lending or leasing via local partner financial institutions, typically up to €1m;

- ④ Guarantees can be arranged in the form of trade facilitation for import/export operations, as pure guarantees or advanced trade finance;
- ④ Hybrid structures, tailored to the circumstances of each client, are also available.

The EBRD has a specific mandate to promote Green Economy Transition in its countries of operation, and can offer client-specific support to prepare and implement “green” projects:

- ④ Project scoping, such as technical feasibility studies, market analyses, assessments of business/investment plans;
- ④ Project management, implementation support including for procurement or for monitoring and verification of technical performance, company-level training and capacity building;
- ④ Technical assistance, e.g. support for R&D activities and services, assistance for developing and monetising carbon emission credits, assistance in applying for additional support under co-financing schemes managed by other organisations;
- ④ Concessional or grant co-financing, which can occasionally and selectively be mobilised to complement the EBRD finance. Its deployment can be focused on technology transfer or innovation: for example, through its FINTECC programme, the EBRD can provide technical and grant support to companies investing into innovative, green technologies in the context of an EBRD investment, with the aim of increasing market penetration of advanced environmental/ climate technologies and supporting R&D and innovation activities.

For further information: [www.ebrd.com](http://www.ebrd.com) and [www.ebrd.com/fintec](http://www.ebrd.com/fintec)





## 6. BBI JU FOUNGING PARTNERS



### BIO-BASED INDUSTRIES CONSORTIUM (BIC)

The Bio-based Industries Consortium (BIC) is a non-profit organisation set up in Brussels in 2012. BIC represents the private sector in a public-private partnership (PPP) with the EU, represented by the European Commission, known as the Bio-based Industries Joint Undertaking (BBI JU), established in June 2014 as one of the pillars of the European Commission Bioeconomy Strategy.

The Bio-based Industries Joint Undertaking is dedicated to transforming renewable, natural resources into innovative bio-based products. Operating under Horizon 2020, the BBI JU is driven by the Vision and Strategic Innovation and Research Agenda (SIRA) developed by the industry.

BIC's vision is to accelerate the innovation and market uptake of bio-based products and to position Europe as a world-leading, competitive bio-based economy where the basic building blocks for chemicals, materials and advanced biofuels are derived from renewable biological resources.

BIC's mission is to build innovative bio-based value chains by developing new biorefining technologies, optimising feedstock use and creating a favourable business and policy climate to accelerate market acceptance of bio-based products.

#### The SIRA focuses on 4 Strategic orientations:

- ⑦ Foster a sustainable biomass-feedstock supply to feed both existing and new value chains.
- ⑦ Optimise efficient processing for integrated biorefineries through R&D&I. Innovative bio-based products for identified applications
- ⑦ Develop innovative bio-based products for identified market applications.
- ⑦ Create and accelerate market uptake of bio-based products and applications

BIC members put forward ideas for research topics, demonstration projects and flagship projects for the annual BBI JU Work Plans. They also decide how to address non-technical issues affecting the bio-based industries.

BIC is host to a unique mix of sectors that currently covers agriculture, aquaculture, agro-food, technology providers, forestry/pulp and paper, chemicals and energy. With more than 200 members including large companies, SMEs, SME Clusters, RTOs, universities, technology platforms and associations spread across Europe, BIC brings together an authoritative pool of cross sector and multi-disciplinary expertise in the field of bio-based industries. Any interested stakeholders along the bio-based value chain may apply for membership.

Of the total €3.7 billion BBI JU budget, almost 75% is being invested by BIC members, in total €2.7 billion from 2014-2020. Their financial contribution will support the large-scale commercialisation of high-quality bio-based products, through investment in innovative manufacturing facilities and processes, as well as in biorefining research and demonstration projects.

For further information: [www.biconsortium.eu](http://www.biconsortium.eu)









## EUROPEAN UNION (EU)

The European Union, through the European Commission, represents the public sector in the BBI JU initiative. Within the BBI JU the European Commission promotes its citizens' overall interests.

The Commission is organised into policy departments, known as Directorates-General (DGs), which are responsible for different policy areas. DGs develop, implement and manage EU policy, law, and funding programmes. Three DGs are represented in the governance of BBI JU.

### Directorate-General for Research and Innovation (DG RTD)

The Directorate-General for Research and Innovation is responsible for EU policy on research, science and innovation, with a view to helping create growth and jobs and tackle the European's biggest societal challenges. The DG RTD defines and implements European Research and Innovation (R&I) policy with a view to achieving the goals of the Europe 2020 strategy and its key flagship initiative, the Innovation Union. To do so, the DG contributes to the European Semester by analysing national R&I policies, by assessing their strengths and weaknesses, and by formulating country specific recommendations where necessary. It monitors and contributes to the realisation of the Innovation Union flagship initiative and the completion of the European Research Area. It funds excellent Research and Innovation through Framework Programmes taking a strategic programming approach.

### Directorate-General for Agriculture and Rural Development (DG AGRI)

The Directorate-General for Agriculture and Rural Development is responsible for EU policy on agriculture and rural development and deals with all aspects of the common agricultural policy (CAP). This DG has the following objectives:

- ④ helping farmers to produce sufficient quantities of safe food, produced respecting EU norms on sustainability, environmental rules, animal welfare, traceability, etc. providing farm businesses with support systems to help stabilise their incomes in the face of less predictable production conditions
- ④ facilitating investment in a sustainable, modern farming sector
- ④ maintaining viable rural communities, with diverse economies
- ④ creating and maintaining jobs throughout the food chain

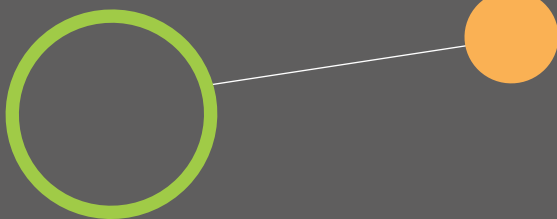
### Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROWTH)

The Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs is the European Commission service responsible for:

- ④ completing the Internal Market for goods and services;
- ④ helping turn the EU into a smart, sustainable, and inclusive economy by implementing the industrial and sectorial policies of the flagship Europe 2020 initiative;
- ④ fostering entrepreneurship and growth by reducing the administrative burden on small businesses; facilitating access to funding for small and medium-sized enterprises (SMEs); and supporting access to global markets for EU companies. All of these actions are encapsulated in the Small Business Act;
- ④ generating policy on the protection and enforcement of industrial property rights, coordinating the EU position and negotiations in the international intellectual property rights (IPR) system, and assisting innovators on how to effectively use IP rights;
- ④ delivering the EU's space policy via the two large-scale programmes Copernicus (European Earth observation satellite system) and Galileo (European global navigation satellite system), as well research actions to spur technological innovation and economic growth.

For further information: [www.ec.europa.eu](http://www.ec.europa.eu)







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