

The catalyst for a sustainable
bio-based economy in Europe



Bio-based Industries
Joint Undertaking

2020 CALL FOR PROPOSALS



Bio-based Industries
Consortium



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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.

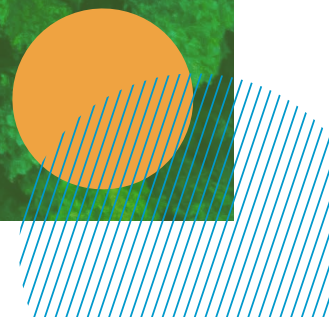
BBI JU organises yearly calls for proposals to support research, demonstration and deployment activities enabling the collaboration between stakeholders along entire value chains, covering primary production of biomass, processing industries, and final use.



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*

This year we are launching the seventh and last BBI JU call for proposals under the Horizon 2020 programme. What a great journey it has been. Since our first call in 2014, the BBI JU portfolio has grown to 101 projects with nearly 1,200 beneficiaries to almost 1,500 from 36 countries and total funding of € 600 million. By mid-2020, another 23 projects from the 2019 Call will join in, raising the number of beneficiaries to almost 1,500 and the number of countries to 37.

The current project portfolio is well balanced in terms of geographical coverage, types of actions and across the value chains of our Strategic Innovation and Research Agenda (*SIRA*). Furthermore, even though BBI JU is an industry-driven initiative, research organisations and higher education establishments play a significant role in our projects and attract about 30% of the funding. It is important to know that 41% of our unique beneficiaries are SMEs that provide key technologies and out-of-the-box solutions. A *recent study* dedicated to SME participation clearly shows that the BBI JU was essential to scale up their technologies and get access to the market.

As we enter our seventh call year, I can proudly say that the industry is maturing and our projects are delivering concrete results. The two main positive effects of BBI JU are still the structuring and mobilising effect of key stakeholders across sectors, regions and countries towards the creation of new value chains. BBI JU projects are expected to create more than 200 new cross-sector interconnections and 180 new bio-based value chains by 2020, well exceeding the targets set in *SIRA*, which called for 36 new interconnections and 10 new value chains.

The BBI JU projects are also delivering tangible socio-economic results. Our portfolio now includes nine flagship biorefinery plants that are well spread over Europe, with two more coming in 2020. The first nine biorefineries are creating around 3,300 direct jobs and more than 10,000 indirect ones, most of them in rural areas. In total, these nine flagships received €195 million worth of grants, leveraging €1.2 billion of private investment that enabled diversification and growth of farmers' income, as well as rural revitalisation. Once operational, the flagships will reduce CO₂ emissions by 600kT/year showing a flavour of contribution to the European Green Deal.

Our achievements demonstrate that the programming process of this institutional public-private partnership (iPPP) based on the *SIRA* developed by the Bio-based Industries Consortium in collaboration with the European Commission and our two advisory bodies - Scientific Committee and States Representatives Group - is more relevant than ever.

This year's call will continue in the same direction. With an indicative budget of €102 million, our 2020 Call will cover 16 topics in four strategic orientations: feedstock, process, products, and market uptake. I invite you to apply for this opportunity and join our community of beneficiaries who are working together to build a bio-based sector that is putting Europe back on the map of attractive areas for investment in bio-based industries.

Best of luck in the preparation of your proposals!

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



DEVELOPING A SUSTAINABLE BIO-BASED INDUSTRY SECTOR IN EUROPE

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 2016 the EU28 bioeconomy sector accounted for 18.6 million jobs for a total turnover around €2.3 trillion.

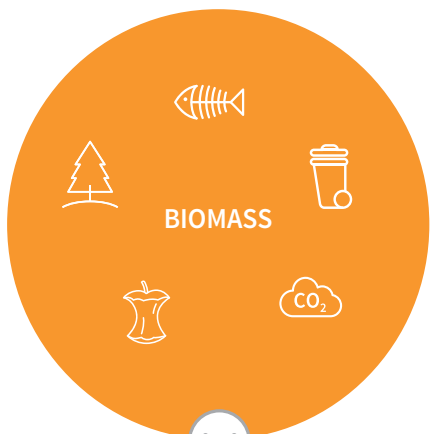
Bio-based industries are a significant and fast-growing subsector of the bioeconomy, accounting for 3.6 million jobs and around €700 billion turnover in the EU28*. Bio-based industries use renewable and sustainably-sourced biological raw materials, called biomass, as the basic materials for producing 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.

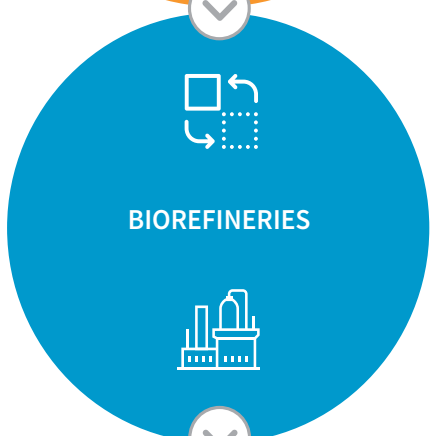
Existing economic segments like the chemical, forestry, pulp and paper sectors, as well as technology providers including biowaste industries, all have an interest in moving from an unsustainable fossil-based economic model to a bio-based one. This can be achieved by improving the cooperation around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

*Data: Eurostat (2016)



- ▶ Waste streams
- ▶ Municipal organic waste
- ▶ By-products & side-streams
- ▶ Forestry side-streams
- ▶ Dedicated agricultural crops and residues
- ▶ Aquatic biomass
- ▶ Food processing residues
- ▶ Process and waste water
- ▶ Bio-based CO₂



- ▶ (Pre-) treatment
- ▶ Transformation



- ▶ Bioplastics
- ▶ Building blocks
- ▶ Biopolymers
- ▶ Surfactants
- ▶ Active ingredients
- ▶ Biomaterials
- ▶ Biolubricants



- ▶ Biofuels
- ▶ Textiles
- ▶ Packaging
- ▶ Solvents
- ▶ Furniture
- ▶ Personal care
- ▶ Construction materials
- ▶ Pharmaceuticals
- ▶ Clothing
- ▶ Car components



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 socioeconomic 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.



**Data: Eurostat (2016)*

WHAT IS THE BIO-BASED INDUSTRIES JOINT UNDERTAKING (BBI JU)?

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.

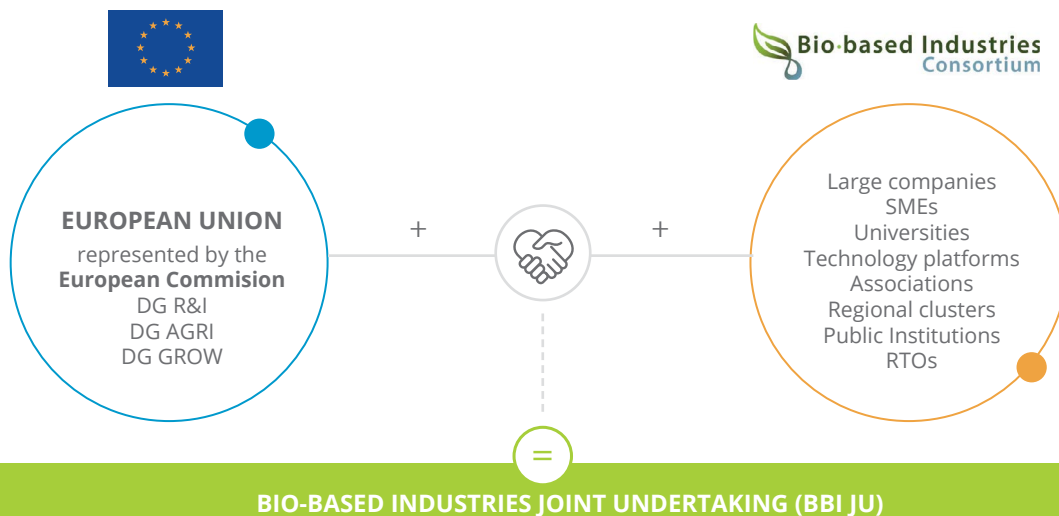
In 2012, as part of the impact assessment of the initiative, the European Commission conducted a public consultation. Respondents answered overwhelmingly in favour (over 94%) for the launch of an EU initiative for bio-based industries, and a large majority requested an institutional public-private partnership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

Bio-based industries and their value chains are faced with complex and substantial technological 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



Executive Director

Responsible for day-to-day management of the BBI JU in accordance with the decisions of the Governing Board

Programme Office

Responsible for the management of the grant management life cycle and implementation of specific activities to further consolidate BBI JU's vision and mission

Governing Board

(10 seats)

Responsible for the strategic orientation and the operations of the BBI JU and for the supervision of its activities

States Representatives Group

(Member States + Associated Countries)

Advisory body of the BBI JU, responsible for providing advice to the Governing Board on the programme progress and achievement of its targets

Scientific Committee

(15 seats)

Advisory body of the BBI JU, responsible for providing scientific advice to the BBI JU, such as scientific priorities to be addressed



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:



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:





Objectives

BBI JU's objectives are to contribute to a more resource-efficient and sustainable low-carbon economy and to increase 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:

1

Demonstrate technologies that enable new chemical building blocks, new materials, and new consumer products from European biomass, which replace the need for fossil-based inputs

2

Develop business models that integrate economic actors along the value chain from biomass supply via biorefinery plants to consumers of bio-based materials, chemicals and fuels, including the creation of new cross-sector interconnections and supporting cross-industry clusters

3

Set up flagship biorefinery plants that deploy the technologies and business models for bio-based materials, chemicals and fuels and demonstrate cost and performance improvements to levels that are competitive with fossil-based alternatives

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.

Calls

BBI JU implements open calls for proposals supporting projects 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.

Types of Action



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 - see details on next page) 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-FLAG)

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-sectoral 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.



Discover the impact of BBI JU and its projects in the publication [*BBI JU 2014-2019. Achievements of a high-impact initiative for the bioeconomy in Europe.*](#)



BBI JU ACTIONS



RIA
Research and Innovation
Actions



IA-DEMO
Innovation Actions -
Demonstration



IA-FLAG
Innovation Actions -
Flagship

TRL1 TRL2



TRL3 TRL4 TRL5



TRL6 TRL7



TRL8



TRL9

Development and validation
of technology

Demo-scale production
facility in Europe

A first-of-their-kind
application, large-scale
production facility in Europe



CSA
Coordination and Support Actions -
no link to TRLs*

* 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.

PARTICIPATION & FUNDING RATES PER ACTION (INDICATIVE)

Type of Participant	RIA	IA (DEMO & FLAG)	CSA
Large Industries	**	70%	**
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

** non-eligible for funding

More information about eligible costs is available in the Annual Work Plan and in the guidelines for participants available via the Participant Portal and the BBI JU website.

3 CALL CONDITIONS, RULES AND EVALUATION



Disclaimer: the overview of the BBI JU Call 2020 conditions, management rules and evaluation provided in this document serves as a quick summary. For a full description of the guidelines and procedures, as well as to consult all topics, please check the Annual Work Plan 2020 and other relevant Horizon 2020 Legal Framework documents available on the [Call 2020 page](#) and [reference documents](#).

For UK applicants: Please be aware that following the entry into force of the EU-UK Withdrawal Agreement [1] on 1 February 2020 and in particular Articles 127(6), 137 and 138, the references to natural or legal persons residing or established in a Member State of the European Union are to be understood as including natural or legal persons residing or established in the United Kingdom. UK residents and entities are therefore eligible to participate under this call.

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.

CALL CONDITIONS



Call identifier	H2020-BBI-JTI-2020
Publication date	15 April 2020
Indicative deadline	03 September 2020 17:00 (Brussels local time) - single stage call
Indicative budget	€ 102 million

Indicative budget by type of actions	
Type of action	Indicative budget
Research and Innovation Actions	€ 22 000 000
Innovation Actions - Demonstration Actions	€ 28 000 000
Innovation Actions - Flagship Actions	€ 47 000 000
Flagship BBI2020.SO1.F1	€ 15 000 000
Flagship BBI2020.SO1.F2	€ 16 000 000
Flagship BBI2019.SO1.F3	€ 16 000 000
Coordination & Support Actions	€ 5 000 000
Total	€ 102 000 000

[1] Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community.

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 JU 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.

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. Independent external observer(s) monitor the evaluation process and ensure that it is conducted in line with these principles.





Proposals are evaluated on their scientific excellence, potential impact, and potential of proposal implementation to resolve the challenges defined 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.

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.

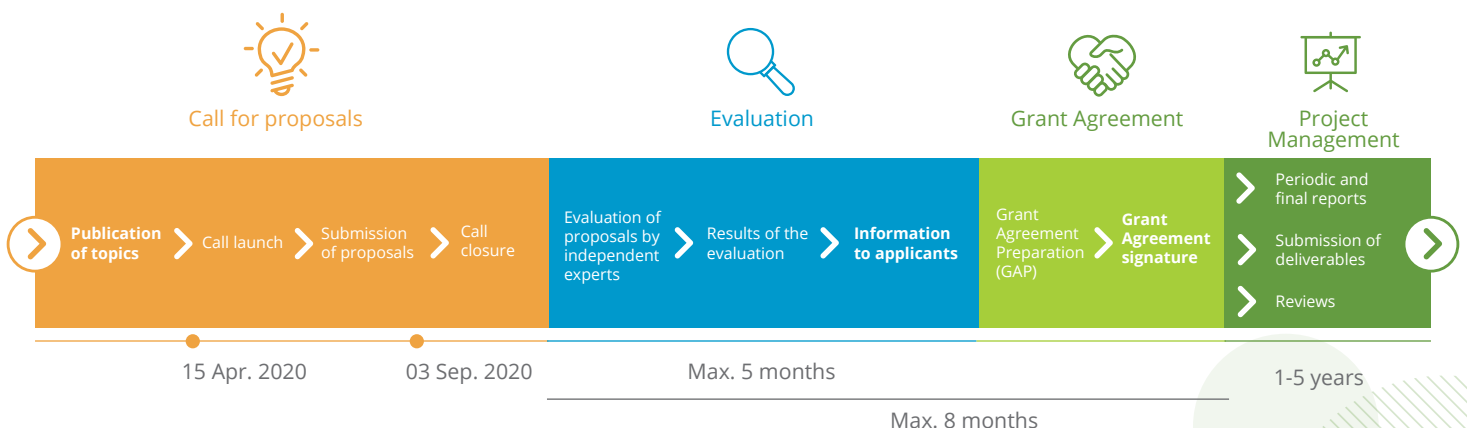
FUNDING AND TENDER OPPORTUNITIES PORTAL – SEDIA

The *Funding and Tender Opportunities portal – SEDIA* (former 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 BBI JU proposals and projects.

All BBI JU Call information and documents are published centrally on the *SEDIA portal*. These include:

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

GRANT MANAGEMENT LIFECYCLE



4 CALL FOR PROPOSALS 2020



THE STRATEGIC ORIENTATIONS

This is the seventh BBI JU Annual Work Plan and Budget (AWP). It continues focussing on faster development of new sustainable value chains, from biomass feedstock supply via efficient processing, to the acceptance and application of bio-based products in the end-markets.

The AWP 2020 confirms the focus on better integrating biomass feedstock suppliers at the front end of the value chain, creating a demand for biomass feedstock from biorefining processes. Similarly, the 2020 AWP will stimulate the building of partnerships with end-market actors to create a 'market pull' for bio-based products for identified applications.

The scientific priorities and impacts for the year 2020 were identified by BIC and the EC, in collaboration with BBI JU, via a wide consultation of industry members that are part of BIC, as well as universities, RTOs, European Technology Platforms and European industry associations, and BBI JU's advisory bodies - the States Representatives Group (SRG) and the Scientific Committee (SC). The scientific priorities are aligned with the SIRA, which presents four main strategic orientations:



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



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



Develop innovative bio-based products for identified market applications



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

A priority paper for 2020 has been developed, which updates the priority paper 2019-2020 of February 2018. The update reflects the priorities left to be dealt with taking into account the AWP 2019. In addition, BIC industry members have included a few new potential themes for 2020.

In 2020, the Call has an indicative budget of €102 million for a total of 16 topics with 5 RIA topics, 4 CSAs, 4 DEMOs and 3 FLAGs.

2020 CALL TOPICS

Disclaimer: the scope sections of the BBI JU Call 2020 topic texts described in this document are indicative and solely aimed at providing a quick overview of all Call 2020 topics. However, all proposal evaluations will be based on the full topic texts and the relevant Horizon 2020 Legal Framework as described in the Annual Work Plan 2020 available on the [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

Foster supply of sustainable biomass-feedstock 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:

- 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.
- 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.
- Exploit the opportunities of aquatic biomass as feedstock for the bio-based industry.
- Valorise co-products and residues from bio-based operations, including (existing) biorefineries.



MAKE BETTER USE OF EXISTING FEEDSTOCK SOURCES

BBI2020.S01.D1 – RESOLVE SUPPLY-CHAIN HURDLES FOR TURNING RESIDUAL WASTE STREAMS INTO FUNCTIONAL MOLECULES FOR FOOD AND/OR NON-FOOD MARKET APPLICATIONS



INDICATIVE FUNDING: maximum € 7 million

TYPE OF ACTION: Innovation Action – Demonstration Action

Residual streams from various industries contain functional molecules that could be used for food and non-food market applications. The functions of interest depend on the intended use of the final products that operators intend to make with the targeted molecules. Residual streams are any streams that are not main products of an industrial operation and are disposed of at low or no value. They include residues from the agricultural, livestock, marine, aquatic, fisheries, food processing, forestry and forest-based industry sectors.

Today, most of these residual streams either find low-value applications that are mainly based on their calorific content (i.e. they are used as fuel), or they are not used at all, often because of supply-chain constraints. The supply-chain constraints could be due to a variety of reasons, including: (i) the relatively long distances between where the residues are generated and where they can be processed; (ii) the low density and/or high water content of the residues; (iii) the capacity of available processing units exceeding available local feedstock.

It is crucial that the functional molecules from these residual streams be separated in a way that is cost-efficient, energy-efficient and eco-efficient. This will mean that these molecules can be made available for subsequent use in higher-value applications, which will provide significant employment and income opportunities for the primary sectors and may improve the commercial sustainability of existing processes.

Fully enjoying the opportunities of these functional molecules will only be possible if the availability of the residual streams can be maximised by resolving any supply-chain constraints.

Various technologies exist to separate and convert the functional molecules from residual streams into high added-value intermediates and products. However, the applicability of these technologies depends on sustainable integration of the feedstock supply.

The **specific challenge** is to resolve supply chain hurdles and enable the recovery and processing of functional molecules in residual streams from various sectors.

MAKE GREATER USE OF UNDER-USED OR NEW FEEDSTOCK FOR BIO-BASED INDUSTRIES

BBI2020.S01.F1 – VALORISE THE ORGANIC FRACTION OF MUNICIPAL SOLID WASTE THROUGH AN INTEGRATED BIOREFINERY AT COMMERCIAL LEVEL



INDICATIVE FUNDING: maximum € 15 million

TYPE OF ACTION: Innovation Action – Flagship Action

The organic fraction of municipal solid waste (OFMSW) presents an important feedstock for biorefining to convert it into valuable compounds for applications in a variety of market segments. However, this precious feedstock is often perceived as a challenge for urban agendas, due to its potential pressure on the environment and human health. Together with other waste streams, the OFMSW is often used for energy recovery or sent to landfill. This pre-empts exploiting its potential for valuable products achievable in cascading operations. Aerobic (composting), anaerobic digestion and energy recovery processes on the OFMSW have been able to reduce this fraction going to landfill. However, these processes mainly result in low-value products such as compost, biogas and digestate, and incineration of valuable resources.

Building on earlier projects on OFMSW, industry is ready to scale up the total value chain to a first-of-a-kind biorefinery at commercial level. Successful operation at this level will start to realise a better exploitation of the potential of the OFMSW in Europe.

The **specific challenge** is to sustainably scale up the conversion of OFMSW into added-value products to commercial levels.

BBI2020.SO1.D2 — USE BIOGENIC GASEOUS CARBON TO INCREASE FEEDSTOCK AVAILABILITY FOR THE INDUSTRY



INDICATIVE FUNDING: maximum € 7 million
TYPE OF ACTION: Innovation Action – Demonstration Action

Gaseous-carbon emissions are a threat to climate stability when they exceed the extraction capacity of plants, forests and the sea. This threat has been present since gaseous-carbon emissions from industrial activities started to add to the natural (biogenic) carbon cycle. Some sections of industry are therefore seeking to create a low-carbon emission economy by avoiding or reducing fossil-based carbon emissions or capturing these emissions for storage or use. Carbon-containing emissions are also potential feedstock sources for industry (serving as 'C1-carbon' sources). Some conversion and use technologies for gaseous carbon have been proven in the laboratory and even at pilot scale. It is now time to scale up these technologies to demonstration level so they can subsequently be commercialised.

The bio-based industry can demonstrate efficient recycling and recovery concepts for its biogenic gaseous emissions. Turning biogenic emissions into something of value by producing valuable chemicals contributes to the industry's 'zero-waste' biorefining objectives and abates climate change.

Biogenic gaseous carbon can be used: (i) as a feedstock for the conversion into platform chemicals; (ii) to increase the growth of biomass as feedstock for industrial exploitation; or (iii) to create energy solutions. However, the last option is not within the scope of this topic.

The **specific challenge** is to use biogenic gaseous carbon as a feedstock for the bio-based industry through: (i) direct conversion into bio-based chemicals or intermediates; or (ii) growing new biomass sources.

BBI2020.SO1.F2 — TURN LIGNIN INTO MATERIALS AND CHEMICALS FOR HIGH-END APPLICATIONS



INDICATIVE FUNDING: maximum € 16 million
TYPE OF ACTION: Innovation Action – Flagship Action

Lignin occurs in wood and non-wood cellulosic biomass. It is available in very large quantities as a by-product of lignocellulosic biorefineries and chemical pulping operations. Although it is a valuable biopolymer, it is currently mainly burnt as low-value fuel.

Several projects are running or have been completed at demonstration levels (TRL 6-7) to turn the by-product lignin from industrial operations into added-value products, often replacing fossil-based counterparts in the process. Industry now sees enough opportunities to scale up these value chains to commercial levels. Large-scale transformation of lignin into high-end applications will significantly improve the economics of lignocellulose biorefineries. And replacing fossil-based products with lignin-based high-end products will make a significant contribution towards a climate-neutral Europe by 2050.

Lignin can be used 'as is' in various added-value applications, among others in the construction industry. In the latter case, lignin is able to sequester biogenic carbon for decades, and can substantially contribute to climate change mitigation. Lignin can also be treated to increase its usability in chemical and biotechnological processing. This processing allows it to be used in fibre applications, platform chemicals, and building blocks. The high polymeric character of lignin means it contains many functionalised molecules. Smart processing steps can therefore retain the desired polymerisation and functionality. Functionalised building blocks can lead to high-end applications in a variety of market sectors.

The **specific challenge** is to sustainably commercialise the transformation of lignin into chemicals and materials for high added-value applications.

BBI2020.SO1.F3 — PRODUCE FOOD INGREDIENTS WITH HIGH NUTRITIONAL VALUE FROM AQUATIC SOURCES



INDICATIVE FUNDING: maximum € 16 million

TYPE OF ACTION: Innovation Action – Flagship Action

Among the UN Sustainable Development Goals, ‘feeding the planet’ features prominently. The growing world population will need additional sources of protein and ingredients with high nutritional value that do not deplete finite natural resources. The food industry can make a substantial contribution by increasing its resource efficiency. However, there will also be a need to tap new sources of protein.

The aquatic and marine worlds and the fisheries and aquaculture industries contribute to the UN’s goal while maintaining healthy marine and aquatic ecosystems. Scientific evidence unambiguously points to sustainable culture and capture at low trophic levels as a way to bring about an increase of food production from aquatic resources. These include, for example, microalgae, seaweed, marine invertebrates, side streams from the fish processing industry, and herbivore filter feeders (e.g. molluscs). Moreover, the recent implementation of the landing obligation for fish bycatch under the common fisheries policy opens up opportunities for the efficient and sustainable transformation of such under-used streams into valuable ingredients.

A number of projects have demonstrated the successful conversion of aquatic biomass, mainly algae, into high-value ingredients for food applications. Actors in the aquatic and marine worlds are confident that by combining forces they can start converting the many aquatic and marine species and fisheries/aquaculture-industries side streams into food applications at commercial level. Europe can take the lead in this direction by enabling such a first-of-its-kind operation.

The **specific challenge** is to sustainably scale up the conversion of new and sustainable aquatic and marine sources for human food and contribute to food and nutrition security.





Strategic Orientation 2 - PROCESS

OPTIMISE EFFICIENT PROCESSING FOR INTEGRATED BIOREFINERIES THROUGH R&D&I

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:

- Improve the effectiveness of pre-treatment steps.
- 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

BBI2020.SO2.R1 — USE ENABLING TECHNOLOGIES TO IMPROVE FEEDSTOCK AVAILABILITY AND SUSTAINABILITY FOR THE BIO-BASED INDUSTRY



INDICATIVE FUNDING: between € 2 million and € 5 million
TYPE OF ACTION: Research and Innovation Action

Bio-based operations often deal with variable or even unpredictable conditions (e.g. weather, geographical differences, pathogens) affecting the overall resource efficiency of the targeted value chains. Proper planning of bio-based operations must take into account multiple inputs on soil conditions, biodiversity, logistics, resources management, etc. There are many enabling technologies that promote smarter, safer, more efficient and more environmentally friendly bio-based value chains. These technologies include: 'big data', geographic information systems, sensors, artificial intelligence, the internet of things, and prediction algorithms. The technologies can also assist the bio-based industry to better evaluate quality and availability of (residual) biomass as feedstock for bio-based operations. Consequently, the bio-based industry can better plan its feedstock supply and align its operational steps accordingly.

The technologies mentioned above will also help bio-based operators to adapt and fine-tune the technological steps in pre-treatment, conversion and downstream processing.

The **specific challenge** is to increase biomass availability, resource efficiency and sustainability for the bio-based industry through enabling (advanced and innovative) technologies.

BBI2020.SO2.R2 — DEVELOP INTEGRAL FRACTIONATION OF LIGNOCELLULOSE TO PRODUCE COMPONENTS FOR HIGH-VALUE APPLICATIONS



INDICATIVE FUNDING: between € 2 million and € 5 million
TYPE OF ACTION: Research and Innovation Action

Lignin and hemicellulose are mostly treated as low-quality, low-value side streams of lignocellulose fractionation. However, both lignin and hemicellulose are some of the most abundant raw materials — and a potential feedstock — for the bio-based industry. They could play a crucial role in promoting the regional supply and refinement of sustainable biomass feedstock for both existing and new value chains. Several high-value and moderate-value applications of lignin and hemicellulose have already been demonstrated. And both lignin and hemicellulose are potentially already available in large quantities from existing operations. However, it remains a challenge to raise their quality to suitable levels for further processing in an affordable resource-efficient way. To do so, it will be necessary to identify specific, sustainable and economically attractive applications. It will also be necessary to specify the required quality aspects of lignin and hemicellulose to help promote commercialisation.

For example, lignin has enormous potential as a feedstock for aromatics. However, turning it into a feedstock for bio-aromatic value chains requires chemical reactivity for further processing. Technologies to convert hemicellulose are advancing. Some of these technologies use conversion methods such as fermentation. However, the feedstock must be of adequate quality, and further developments in yeast strains able to transform hemicellulosic sugars are needed. Moreover, new high-volume applications are essential to create a large enough outlet for the large stream of hemicellulose becoming available. Industry is interested in using both lignin and hemicellulose as feedstock for new bio-based value chains.

The **specific challenge** is to break up lignocellulose into its components to create value for most of all fractions (not only cellulose) in identified applications.

BBI2020.SO2.R3 — DEVELOP BIO-BASED SOLUTIONS TO RECYCLE COMPOSITES



INDICATIVE FUNDING: between € 2 million and € 5 million
TYPE OF ACTION: Research and Innovation Action

The full recyclability of composites through the effective separation and recovery of their components is still an issue. This is mainly due to the adhesives used to bind the different layers and materials together. The fossil-based bonding components that are currently used cannot easily be separated from the other components, nor can they be recycled together with the matrix material.

Industry can improve the recyclability of composites by designing bio-based bonding materials that will decompose²¹ under specific conditions (e.g. pH, temperature, microorganisms). These new bonding materials will replace fossil-based counterparts in composites and allow multilayer plastics and composites to be recycled more easily.

A useful concept when considering recyclability is 'extended producer responsibility' (EPR). EPR makes manufacturers of composites – or any product – responsible for the entire life cycle of the product, especially for the take-back, recycling and final disposal. EPR is crucial for creating a sustainable and circular bioeconomy. EPR will be an important input to some quickly expanding application areas, such as 3D printing of cellulose-based materials, which offers new opportunities for regional industries.

The **specific challenge** is to increase the recyclability of composites.

BBI2020.SO2.R4 — EXTRACT BIOACTIVE COMPOUNDS FROM NEW, UNDER-EXPLOITED AND/OR RECALCITRANT RESIDUAL BIO-BASED STREAMS FOR HIGH-VALUE APPLICATIONS



INDICATIVE FUNDING: between € 2 million and € 5 million
TYPE OF ACTION: Research and Innovation Action

There is a strong continuing interest in obtaining high-value, sustainable, bio-based ingredients from new and alternative sources. These sources include under-exploited, 'recalcitrant' (i.e. requiring innovative processes/technologies to handle) side streams containing bioactive compounds with high market potential.

Currently, there is great demand for bio-based bioactive compounds in market sectors such as food, feed, performance chemicals, cosmetics, nutraceuticals, pesticides and pharmaceuticals. This trend is driven by consumer demand for functional products with ever-better performance, and for 'natural' and sustainable products.

Extracting bioactives from diverse sources brings challenges. These challenges include finding appropriate methods for the pre-treatment, handling and processing of raw materials and for properly characterising their diverse bioactive contents. In addition, the extraction processes themselves should be environmentally sustainable and economically viable while simultaneously preserving the functions and qualities of the targeted compounds.

The **specific challenge** is to develop appropriate processing schemes to extract bioactives from new, under-exploited and/or recalcitrant residual streams so they can be used in high-value-added applications.



BBI2020.SO2.D3 — UPSCALE THE PRODUCTION OF BIO-BASED PLATFORM MOLECULES FOR LARGER MARKET APPLICATIONS



INDICATIVE FUNDING: maximum € 7 million

TYPE OF ACTION: Innovation Action – Demonstration Action

The sustainable production of bio-based platform molecules with a broad range of potential applications could increase the competitiveness of bio-based materials and products compared with their fossil-based counterparts.

Platform chemicals are intermediate molecules that can be used to produce a large number of end-products, such as biopolymers, high-value additives, and other bio-based products. They can therefore unlock entire bio-based value chains if produced at competitive cost, to a high quality, and in sufficient quantities. Promising bio-based platform molecules include: HMF, FDCA, some organic acids, and alcohols from various biomass feedstocks.

Market interest in bio-based platform molecules is increasing, and market actors are requesting larger quantities of these molecules for further formulation and testing in specific applications, including food, feed and consumer personal care. To foster the market penetration of these molecules — and make them competitive against fossil-based counterparts — industry must increase the production of targeted bio-based platform molecules. This must be done at a competitive cost and quality compared with the state of the art.

The **specific challenge** is to upscale the production of bio-based platform molecules in sufficient quantities and at sufficient quality to promote their larger application in new and existing markets.



Strategic Orientation 3 - PRODUCTS

DEVELOP INNOVATIVE BIO-BASED PRODUCTS FOR IDENTIFIED 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

BBI2020.SO3.R5 — IMPROVE THE SUSTAINABILITY OF COATINGS



INDICATIVE FUNDING: between € 2 million and € 5 million
TYPE OF ACTION: Research and Innovation Action

Coatings are widely used in many applications, such as in glass, concrete, metal and furniture. Depending on the specific performance required by the intended applications, coatings must serve different purposes. These purposes include preventing reflectivity, self-cleaning, protection, waterproofing, fire resistance, anti-corrosion, insulation and anti-fouling.

Because of this diverse and expanding range of requirements, people increasingly demand sustainable coatings. As part of this development, producers are introducing bio-based alternatives in coating formulations, replacing fossil-based compounds. Some of these fossil-based compounds (e.g. some solvents) present potential health risks to humans.

The **specific challenge** is to substitute fossil-based compounds in coatings with bio-based alternatives, while ensuring that the performance of the coating is at least identical to the traditional coating.

BBI2020.SO3.D4 — DEMONSTRATE SUPERIOR BIO-BASED PACKAGING SOLUTIONS WITH MINIMAL ENVIRONMENTAL DAMAGE



INDICATIVE FUNDING: maximum € 7 million
TYPE OF ACTION: Innovation Action – Demonstration Action

Packaging is key to sustaining the quality and durability of consumer and industrial products through their lifespan. Today, most packaging materials are fossil-based and may cause environmental problems at the end of their life cycle if not properly managed.

For example, oxo-plastics (also called oxo-degradable plastics) are used in agricultural films, rubbish bags, carrier bags, food packaging and landfill covers. However, they break down into very small particles, potentially contributing to environmental (soil, marine, air) contamination by microplastics. And not all biodegradable packaging materials disintegrate quickly enough to avoid becoming marine litter or contaminating the soil.

With its 2018 plastics strategy, the European Commission has laid out plans to: (i) make all plastic packaging on the EU market recyclable by 2030; (ii) reduce single-use plastics; and (iii) restrict the intentional use of microplastics. Products made from oxo-degradable plastics will be banned from the EU market from July 2021.

Industry can develop and produce bio-based packaging materials that enable better functional performance than their fossil-based counterparts. This improved performance can be improved gas-barrier functionality; longer shelf lives for food-packaging applications; and better consumer safety features. In addition, bio-based packaging materials can be made reusable or recyclable in applications that demand recyclability for a sustainable end-of-life. For other applications, bio-based packaging material that outperforms fossil-based alternatives can be made biodegradable²¹, industry- or home-compostable, or degradable in specific environments if this feature is demanded. These features may be desirable for applications such as food packaging. If a packaging material contains food remains after use, it cannot always be recycled as part of recyclable plastic streams. Making packaging material for specific food applications compostable will allow it to be collected together with food waste and to be composted, thus diverting it from landfill or incineration.

The **specific challenge** is to upscale the production of sustainable and high-performing bio-based packaging solutions that do not create environmental damage during and after use.



Strategic Orientation 4 - MARKET UPTAKE

CREATE AND ACCELERATE 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:

- 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.
- 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.
- Establish cooperation and partnerships with brand owners and consumer representatives to improve market access of sustainable bio-based products.

BBI2020.SO4.S1 — HELP START-UPS AND SPIN-OFFS TO GAIN ACCESS TO FINANCE



INDICATIVE FUNDING: maximum € 1.5 million
TYPE OF ACTION: Coordination and Support Action

Start-ups and spin-offs, both young, innovative and entrepreneurial, often face big hurdles in attracting investors, or using financial instruments to help finance their business plans. They find it especially challenging in bio-based industries, as the hurdles to success are high, and investors find it more difficult to judge the associated risks. These risks are different compared with more familiar sectors like e.g. the digital sector. Entrepreneurs in the bio-based industry must cross extra hurdles to attract investors and become independent as soon as possible.

One of the ways to overcome these hurdles is by seeking out networking opportunities through suitable organisations, clusters and platforms. These opportunities can bring start-ups and spin-offs into contact with large enterprises, regional clusters, open-innovation scale-up facilities, reference customers and other market actors. This will make start-ups and spin-offs more visible, allowing them to secure financing from the contacts they made.

The **specific challenge** is to help start-ups and spin-offs to improve their networking activities with relevant stakeholders and help to improve their business case and to gain access to funding opportunities in the bio-based sector.

BBI2020.SO4.S2 — PROVIDE INSIGHT ON EMERGING TECHNOLOGIES FOR BIO-BASED VALUE CHAINS



INDICATIVE FUNDING: maximum of € 1 million
TYPE OF ACTION: Coordination and Support Action

Not all actors in the bio-based sector may be aware of or familiar with the existing and emerging technologies that could be used in bio-based value chains. Moreover, technologies are continuously evolving, and new technologies emerge so frequently that industry can hardly keep up. Without a clear overview of relevant technologies for specific applications, selecting the right one(s) for a particular value chain becomes difficult.

Mapping these technologies in a user-friendly database could resolve this situation and provide toolboxes for various cases. Such a database should categorise each technology by its characteristics: application fields, feedstock (e.g. source, size, and composition), working principle (e.g. chemical, biotechnological, mechanical), maturity (TRL), energy consumption, maximum capacity (tonne/hr), application conditions (e.g. temperature, pH), combined use with other technologies, relevant engineering studies, etc.

It would also be relevant to include information on: (i) organisations that are active in the development and licensing of the technology; (ii) where laboratory/pilot facilities are available; (iii) capital and operational costs; (iv) competing technologies; etc.

The **specific challenge** is to provide a complete overview of relevant technologies for the bio-based industry, both existing and emerging.

BBI2020.SO4.S3 — CREATE AND INTERLINK BIO-BASED EDUCATION CENTRES TO MEET INDUSTRY'S NEEDS OF SKILLS AND COMPETENCES



INDICATIVE FUNDING: maximum € 1.5 million
TYPE OF ACTION: Coordination and Support Action

Due to its cross-sectoral nature and (relative) novelty, the bio-based industry requires a set of skills and competencies that are not available in some regions, but that are available — and taught — in certain academic and vocational schools.

Part of the process of closing the skills gap is increased cooperation between industry and the academic world. In some countries and regions, there is already interaction between the bio-based industry, academia and government. This cooperation occurs in training or innovation centres that mostly focus on joint projects or initiatives. In some regions, these centres also have education projects to meet industry's future needs for skills, and to meet the training needs of the existing workforce. The existing centres typically focus on their regional situation and needs, benefiting local SMEs in particular. There is very little coordination between existing centres.

Industry would like bio-based 'education centres' to interact with education institutions on the skills that will be needed in the future, and on the skills that are needed by the existing workforce. Also, although regional centres focus on local needs, connecting these centres to each other will help them to draw up a common framework of standards and skills that could be tailored for local application. Increasing interaction in this way will also benefit the society at large and the bioeconomy in general.

The **specific challenge** to increase cooperation between the bio-based industry and the education system to avoid skills and competences gaps.

BBI2020.SO4.S4 — EXPAND CIRCULAR ECONOMY TO INCLUDE THE UNDEREXPLOITED CIRCULAR BIOECONOMY



INDICATIVE FUNDING: maximum € 1 million
TYPE OF ACTION: Coordination and Support Action

The circular economy aims to maintain the value of products, materials and resources for as long as possible by returning them into the product cycle at the end of their use, while minimising the generation of waste. The bioeconomy covers all sectors and systems that rely on biological resources (animals, plants, microorganisms and derived biomass, including organic waste), their functions and principles.

The circular economy is a concept that has been promoted for more than 20 years. It brings together many interest groups, including stakeholders from the processing industry, waste management industry, recycling industry and others. In the early 1990s, several European countries began passing waste-related laws and regulations, which prompted the European Waste Framework Directive in 2008. New EU waste rules approved in May 2018 require more rigorous enforcement of the waste hierarchy and introduce new requirements for waste management in the European Union.

With the bioeconomy becoming a reality, new interests have come into play, such as those focused on making use of waste streams or residual streams that so far have not been used, or that have only been used for burning as fuel.

This emergence of new interests can lead to potential conflicts of interests or at least to divergences of views as regards strategies to adopt. Some stakeholders focus on waste disposal (via landfill, incineration, etc.). Others focus on waste avoidance (e.g. by using renewable resources, utilising side streams). And others focus on using the materials found in waste. For this last category, regulations preventing the use of waste as a feedstock for other products, or preventing the moving of waste across borders, can be a hurdle. Changes in the waste hierarchy lead to conflicts between different stakeholders. The same conflict can arise when diverting biogenic waste streams from use in power- and-heat generation and composting to bio-based operations for material use.

The description and visualisation of circular economy as a concept mostly refer to the 'two-winged butterfly' by the Ellen MacArthur Foundation. Recent discussions on circular bioeconomy lead to different and evolving positions by several actors.

It is therefore important to gain an insight into the different interests held by stakeholders about the end-of-life stage for materials. This will make it easier to find ways of moving towards a bioeconomy that fully uses the resources from the circular economy and fully contributes to a circular bioeconomy.

The **specific challenge** is to reconcile legislation, waste management, circularity and the bioeconomy.

5 TOPICS PER TYPE OF ACTION



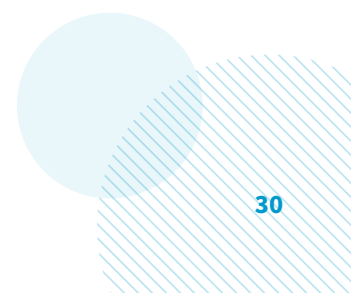
RIA Research and Innovation Actions	
Strategic Orientation	Topic
Feedstock	/
Process	R1 – Use enabling technologies to improve feedstock availability and sustainability for the bio-based industry
	R2 – Develop integral fractionation of lignocellulose to produce components for high-value applications
	R3 – Develop bio-based solutions to recycle composites
	R4 – Extract bioactive compounds from new, underexploited and/or recalcitrant residual bio-based streams for high-value applications
Products	R5 – Improve the sustainability of coatings
Market uptake	/

DEMO Innovation Action - Demonstration Action	
Strategic Orientation	Topic
Feedstock	D1 – Resolve supply-chain hurdles for turning residual waste streams into functional molecules for food and/or non-food market applications
	D2 – Use biogenic gaseous carbon to increase feedstock availability for the industry
Process	D3 – Upscale the production of bio-based platform molecules for larger market applications
Products	D4 – Demonstrate superior bio-based packaging solutions with minimal environmental damage
Market uptake	/



FLAG Innovation Action - Flagship Action	
Strategic Orientation	Topic
Feedstock	F1 – Valorise the organic fraction of municipal solid waste through an integrated biorefinery at commercial level
	F2 – Turn lignin into materials and chemicals for high-end applications
	F3 – Produce food ingredients with high nutritional value from aquatic sources
Process	/
Products	/
Market uptake	/

CSA Coordination and Support Action	
Strategic Orientation	Topic
Feedstock	/
Process	/
Products	/
Market uptake	S1 – Help start-ups and spin-offs to gain access to finance
	S2 – Provide insight on emerging technologies for bio-based value chains
	S3 – Create and interlink bio-based education centres to meet industry's needs of skills and competences
	S4 – Expand circular economy to include the underexploited circular bioeconomy



6 JOIN THE PARTNERING PLATFORM



Would you like to find consortium partners, pitch your project idea or establish long-lasting collaborations in the areas of the BBI JU call topics? Register free of charge on the BBI JU Partnering Platform and start networking online!

KEY FEATURES OF THE PLATFORM

- Partnering profiles of European stakeholder organisations
- Direct communications with other potential applicants
- Online networking features to help build proposals
- Secure tool to schedule meetings during BBI JU events

Find the link to the Partnering Platform on the [BBI JU website](#).

7 EXPERTS NEEDED



External evaluators of project proposals are drawn from the European Commission's independent expert database. BBI JU is looking to expand the database through a call for experts covering a broad range of fields related to bio-based industries.

If you fit the profile and would like to be considered as a proposal evaluator, please register - or update your profile - on the European Commission's independent expert database via the [Funding and tender opportunities portal](#) and send an email to experts@bbi.europa.eu.

As a proposal evaluator, you will gain valuable insight into the European bio-based industry and the Horizon 2020 programme.



8 BBI JU FOUNDING PARTNERS



BIO-BASED INDUSTRIES CONSORTIUM (BIC)

The Bio-based Industries Consortium is the leading European private sector association on the circular bioeconomy. BIC represents the private sector in the Bio-based Industries Joint Undertaking (BBI JU), established in June 2014 as one of the pillars of the EU's Bioeconomy Strategy.

Operating under Horizon 2020, the BBI JU is driven by the joint industry Vision for a circular bio-society and the Strategic Innovation and Research Agenda (SIRA) also developed by the industry.

BIC's Vision is to accelerate innovation and market uptake of bio-based products and to position Europe as the global hub for bio-based industrial investment and the international reference point for the circular bioeconomy.

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

The SIRA focuses on 4 strategic orientations:

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

BIC is host to a unique mix of sectors including agriculture & agri-food, bioenergy, chemicals and materials, forestry and pulp & paper, waste management and treatment and market actors. BIC has more than 200 industry members which include large enterprises, SMEs and SME Clusters, and more than 200 associate members including RTOs, universities, technology platforms and associations spread across Europe, bringing together an authoritative pool of cross-sector and multi-disciplinary expertise. Any interested stakeholders along the bio-based value chain may apply for membership. BIC members put forward ideas for research topics and demonstration and flagship projects for the BBI JU's Annual Work Plan.

2.7 billion EUR or 75% of the total €3.7 billion BBI JU budget is being invested by BIC members 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



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 R&I)

The Directorate-General for Research and Innovation is responsible for EU policy on research, science and innovation, with a view to help create growth and jobs and tackle the European's biggest societal challenges. The DG R&I 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:

- 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;
- facilitating investment in a sustainable, modern farming sector;
- maintaining viable rural communities, with diverse economies;
- creating and maintaining jobs throughout the food chain.

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

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

- completing the Internal Market for goods and services;
- helping turn the EU into a smart, sustainable, and inclusive economy by implementing the industrial and sectorial policies of the flagship Europe 2020 initiative;
- 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;
- 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;
- 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



Contact us

- ✉ info@bbi.europa.eu
- 🌐 www.bbi-europe.eu

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Visit us

- 📍 Visiting address: White Atrium | Av de la Toison d'Or 56-60
1060 Brussels | Belgium
- ✉ Postal address: BBI JU | TO56
1049 Brussels | Belgium



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