

Bio-Based Industries Joint Undertaking

2016 Call for proposals



Bio-based Industries
Consortium





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Introduction



PHILIPPE MENGAL
Executive Director BBI JU

The Bio-based Industries Joint Undertaking (BBI JU) initiative was set up to provide the impetus for bio-based sectors to find new ways of collaborating, through the creation of new strategies and objectives. The issue we face in Europe is that, despite tremendous collective potential, we are still working partly in silos.

BBI JU, with a total budget of € 3,7 bn, acts as a catalyst to build new value chains and enable long-term stability and predictability for a sustainable European bio-economy, and contribute to a joint approach across the bio-based economy sector and member states in order to break the silos. By creating this public-private partnership, we aim to de-risk investment in a re-emerging, more streamlined bio-based economy.

The BBI JU programme provides the framework to enable a shared public-private financial commitment and a jointly defined research and innovation programme. It is a question of alignment of resources, objectives and strategies. It operates under Horizon 2020, and is driven by the Vision and Strategic Innovation and Research Agenda, developed by industry committed to creating a vital European bio-economy.

The BBI JU 2016 Call topics are fully inclusive, with 27 topics covering all possible types of actions, including 12 Research & Innovation actions, 9 demonstration actions, 2 flagship actions and 4 coordination and support actions. Prospective applicants can propose innovative ways to maximise usefulness and profitability from side and waste streams at all stages of the R & D cycle, and unique to BBI JU projects, receive support to establish first-of-a-kind flagships which scale up new applications and processes to industrial level. Winning applicants of this 2016 call will have access up to € 188.6 million of funding from the BBI programme for the 2016 Call for proposals.



The novel structure of the 2016 Call should encourage cross-sectorial collaboration by forming innovative partnerships that cut across traditional industry boundaries so that proposals will not be linked to a specific value chain.

As a result the bio-based sector will operate in a more coherent and integrated way to include feedstock suppliers as partners in the value chains, develop biorefinery technologies' and processes to increase the competitive position of the bio-based industries in Europe, as well as raise business-to-business and eventually end-consumer demand and customer awareness as innovative products and applications are developed, proved and come to the market.



Bio-Based Industry is already a sector of 3,2 million jobs. According to NOVA institute, the global bio-economy is worth € 2.1 trillion, with the EU28 bio-based market already at € 600 billion today. The bio-based industries have ambitious but realistic targets, aiming to replace 30% of the oil based chemicals and materials in Europe by 2030. The bio-based market can increase diversification and growth of farmers' income by adding up to 40% additional margins. It's estimated that around 700,000 new jobs will be created between 2013 and 2030 by bio-based industries in Europe. A high number, around 80% of these new jobs, will be in rural areas – good for farmers, their local economy, and for regional regeneration and redevelopment.

A strong European bio-based industrial sector will significantly reduce Europe's dependency on fossil-based products, moving Europe more quickly towards the many socio-economic benefits of a post-petroleum society. By reducing the import of oil-based raw materials, as well as foreign biomass, there's the added benefit of helping towards meeting the EU's climate change targets, and leading to greener, sustainable, more environmentally-friendly growth. Better for Europe – better for Europe's citizens – better for keeping industry engaged and actively investing in novel bio-based 'grown and made in Europe' technologies and innovation.



JOHN BELL

Director for Bioeconomy
Directorate-General for Research
and Innovation
European Commission

The next decade is a critical time period for the EU. We will need to reinvent our economy if we want to face the challenges of climate change, resource constraints, while maintaining growth and jobs. The question is – will Europe play its full part? Europe is committed to excelling in smart, inclusive and sustainable growth. Mobilizing investment to make new markets is key. Europe's commitment to building the world's leading bioeconomy by 2020 remains critical to achieve growth, fight climate change, contribute to the circular economy and the investment goals of the Juncker Commission.

One of the most forward-looking initiatives under Horizon 2020 is the Bio-based Industries Joint Undertaking (BBI-JU), a public-private partnership (PPP) between the Commission and the Biobased Industries Consortium (BIC). It demonstrates how a new approach to supporting research and innovation and de-risking investment in the European bio-based sectors can unlock the potential of a renewable resource-based, efficient and sustainable bio-based economy.

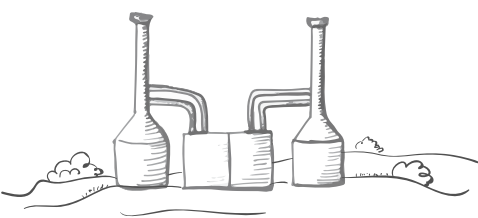
The BBI JU aims to achieve the highest leverage among the package of PPPs. It features a total budget of €3.7 billion to be invested in bio-based innovations over 2014-2020.

The EU contribution through Horizon 2020 will be €975 million, while the BIC will contribute €2730 million.

The BBI JU 2016 Call for proposals covers topics which promote the setting up of networks for integrated and diversified biorefineries and encourage the sustainable intensification of primary production. Europe's bio-based industries need to be technologically prepared and equipped to successfully address this challenge, along with all other participants in the value chain (e.g. farmers, foresters, waste managers).

In its competitive Calls for proposals the BBI JU programme funds cooperation between new actors to build new value chains. This, in combination with other funding and investment guarantees like the European Fund for Strategic Investments (EFSI), and new InnovFin – EU Finance for Innovators as well as Structural Funds will support new sources of growth for regions, in particular those where new sources of biomass can be unlocked.

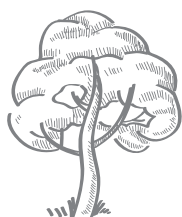
The development of bio-based industries, if successful, can bring rewards for many stakeholders: consumers who get access to new sustainable products based on renewable biological resources, bio-based industries that take technological and sustainability leadership and thereby build long-term competitive advantages; enhanced economic growth and new jobs in rural, coastal and industrial areas; and new revenue streams for the EU's agri-food, forestry and marine sectors.





DIRK CARREZ

Executive Director
Biobased Industries Consortium
(BIC)



The Bio-based Industries Consortium (BIC) represents the private sector in a public-private partnership (PPP) with the EU on Bio-based Industries (BBI). Worth €3.7 billion, the partnership mobilises investment in innovative facilities and processes that manufacture high-quality bio-based products as well as in biorefining research and demonstration projects. BIC brings together a unique cross-section of experts with over 200 members including technology providers and representatives from the agriculture, agro-food, forestry, pulp and paper, chemicals, energy and other manufacturing sectors.

In June 2014, the Public-Private Partnership for Bio-based Industries (BBI) was officially launched. The private partner, the Bio-based Industries Consortium (BIC), joined forces with the European Union to tackle the innovation 'valley of death', by seeking to bridge the gap between research and valorization. Now, almost two years later we are able to launch already the third call for proposals.

The focus of the BBI does not stop at research or pilot phase, but continues with demonstration projects, with the creation of small scale production plants which can be used to explore elements such as proof-of-concept, sustainability and competitiveness. And the so-called 'flagship projects' are innovative first-of-a-kind production plants in Europe. In this case funding is made available for the innovative aspects of such plants, and not the entire infrastructure. While this approach already exists in many other parts of the world, it is entirely new for Europe.

The BBI focuses on using Europe's biomass and wastes to make high value products and bring them to market. Advanced biorefineries and innovative technologies are at the heart of this process, converting renewable resources into sustainable bio-based chemicals, materials and fuels, allowing the EU to reduce its dependence on finite fossil resources.

The BBI projects bring the researchers from the European centers of excellence – being companies, research institutes or universities - together to develop new technologies and products, and bring them to maturity or even commercial level.

The first batch of projects has been selected and funded. In addition to research projects and demonstration projects, several major flagships will also be set up by the end of this year. If we look at the impact for the years ahead, this will result in new investments and jobs, new feedstocks and new products.

The real added value of BBI is that it brings different sectors and industries together. This leads to the creation of new value chains, with different partners working together within a single project. These initiatives inevitably mean greater visibility: companies become more and more interested and see new opportunities to work together with other sectors for their mutual benefit and valorization. In addition, these projects also mean more visibility for the bio-economy as a whole, at European, national and regional level.



II. ABOUT BBI JU

Using renewable natural resources and innovative technologies for greener everyday products

What is the challenge?

A strong European bio-based industrial sector will significantly reduce Europe's dependency on fossil resources, help the EU meet climate change targets, and lead to greener and more environmentally friendly growth. The key is to develop new

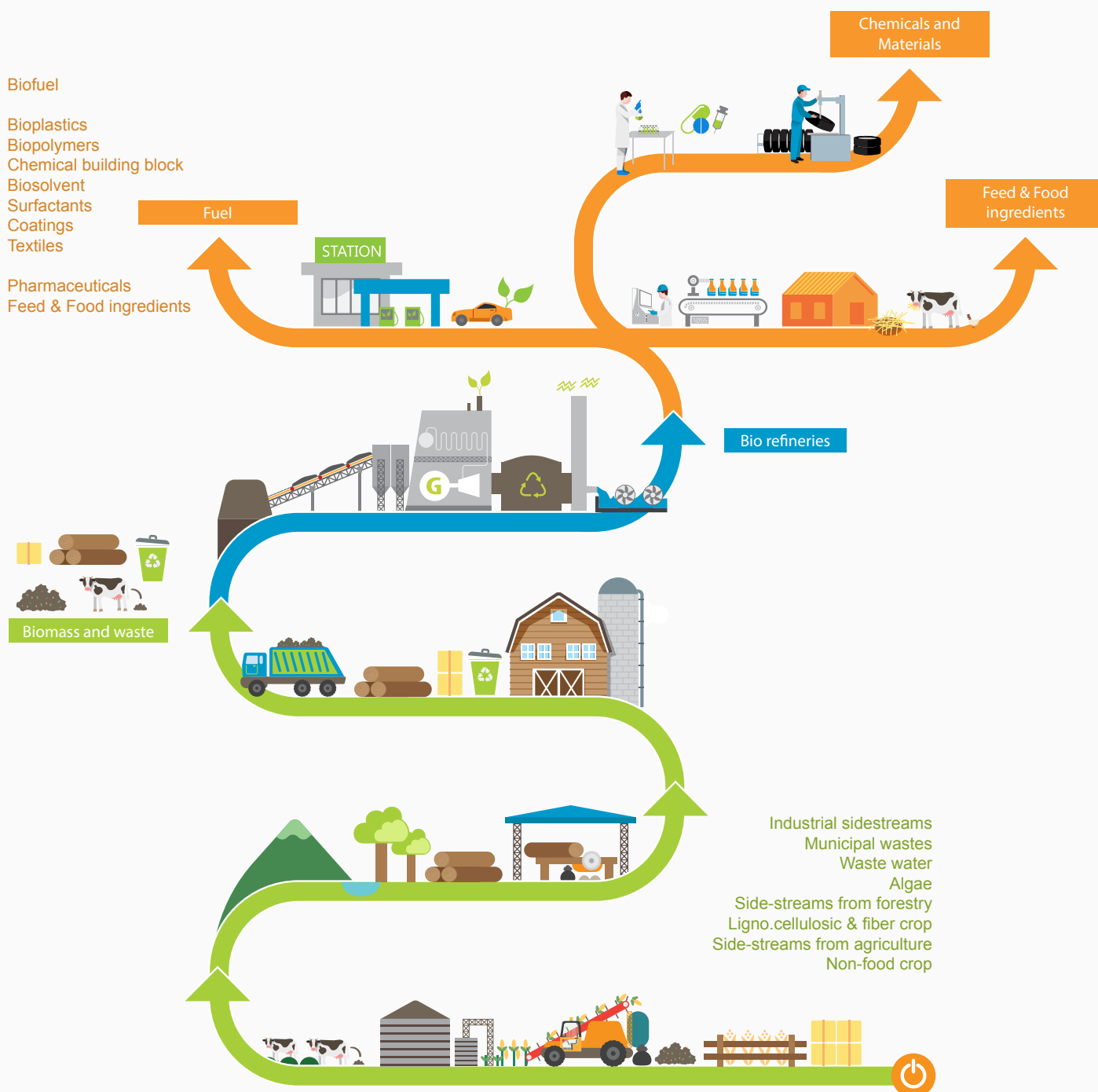
biorefining technologies to sustainably transform renewable natural resources into bio-based products and biofuels.

This nascent sector is expected to grow rapidly and create new markets and jobs, and is already attracting substantial investments in the US, China and Brazil. The EU is, therefore, pooling its public and private resources and expertise to exploit its potential for research and innovation.

Bio-Based Economy concept

BBI value chains represent 3.2 million jobs and €600bn turnover but are extremely fragmented between actors and across geographies.

Bio-Based Economy in 3 segments



What is BBI JU?

The Bio-Based Industries Joint Undertaking (BBI JU) is a €3.7 billion Public-Private Partnership (PPP) between the EU and the Bio-based Industries Consortium (BIC). It is dedicated to realising the European bioeconomy potential, turning biological residues and wastes into greener everyday products through innovative technologies and biorefineries, which are at the heart of the bioeconomy. The BBI JU is about connecting key sectors, creating new value chains and producing a range of innovative bio-based products to ultimately form a new bio-based community and economy.

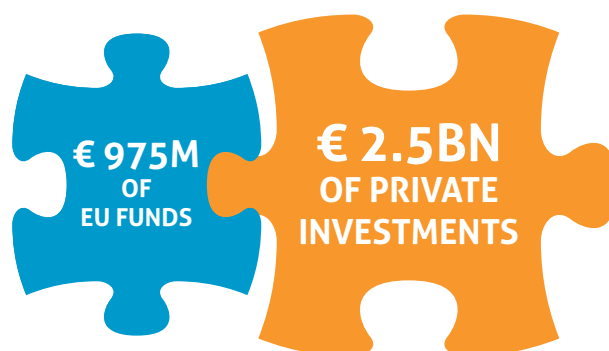
BIC, the industrial partner in the PPP, hosts a unique mix of sectors including agriculture, agro-food, technology providers, forest-based, chemicals and energy. It was established in 2012 to represent the private sector in the BBI JU. The BIC membership consists of full industrial members (large companies, SMEs, universities, associations and technology platforms) and is still growing.

BBI JU will fund projects aimed at:

- Building new value chains based on the development of sustainable biomass collection and supply systems with increased productivity and improved utilisation of biomass feedstock (incl. co- and by- products);
- Unlocking the utilisation and valorisation of waste and lignocellulosic biomass;
- Bringing existing value chains to new levels, through optimised use of feedstock and industrial side-streams while offering innovative added value products to the market, thus creating a market pull and reinforcing the competitiveness of EU agriculture and forest based industries.
- Bringing technology to maturity through research and innovation, by upgrading and building demonstration and flagship biorefineries that will process biomass into a range of innovative products.

A MAJOR PUBLIC AND PRIVATE EFFORT

€ 3.7 bn
Investments in bio-based
innovation from 2014-2020
(Horizon 2020)



Leveraging capital markets and
additional private & public funds

What is our focus?

- **Feedstock** – Foster a sustainable biomass supply with increased productivity and building new supply chains.
- **Biorefineries** – Optimise efficient processing through R&D and demonstrate their efficiency and economic viability at large-scale biorefineries.
- **Markets, Products & Policies** – Develop markets for bio-based products and optimise policy frameworks.

How is it managed?

BBI JU is a partnership between the EU and industry. It establishes its own strategic research agenda. Projects are selected through open and competitive calls for proposals. The best proposals will be selected based on independent peer review and conclude by formal funding agreements. The Public-Private Partnership is managed by formal funding agreements. The Public-Private Partnership is managed by a dedicated Joint Undertaking

whose Governing Board comprises an equal number of European Commission and BIC representatives.

What results and benefits are expected?

BBI JU will create new jobs, especially in rural regions, and offer Europeans new and sustainable products sourced and produced locally.

Bio-based industries will increase the competitiveness of the European economy through re-industrialisation and sustainable growth. New value chains will be created between often unconnected sectors, ranging from primary production and processing industries to consumer brands.

The development of new bio-based products and markets based on smart and efficient use of resources will diversify industries' revenue streams. The BBI JU should therefore enable European companies to be more competitive in the global bio-economy race with the US, China and Brazil.

The BBI is expected to bridge European research knowledge with commercial scale bio-based products, making full use of European scientific and technological knowledge. The BBI JU should benefit all Member States where regions can play an important role through their Smart Specialisation Strategies.

How much will it cost?

A total of €3.7 billion will be invested in bio-based innovations over 2014-2020. The EU contribution (Horizon 2020) is expected to be €975 million, while the Bio-based Industries Consortium will contribute €2730 billion (of which €1755 billion will be dedicated to additional activities). As an emerging industry, it will be important to use this PPP to leverage capital markets and additional private and public funds (e.g. synergies with the EU Structural Funds) to top up existing public and private commitments.





III. Call Conditions, Rules and Evaluation

The overview of the BBI JU Call 2016 Call Conditions, Management Rules and Evaluation texts provided in this document is aimed at providing a quick summary of the Call 2016. For full comprehension of the guidelines and procedures, it is recommended to consult the Call 2016 Annual Work Plan and other relevant H2020 Legal Framework available on the BBI JU website.

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-2016

Publication date: 18-04-2016

Deadline: 08-09-2016, 17:00:00 (Brussels local time)
(single stage call)

Indicative budget: 188.65 Million Euros

Estimated value of the in kind contributions by the members other than the Union or their constituent entities (BIC): Minimum 110 Million Euros

Call Management Rules

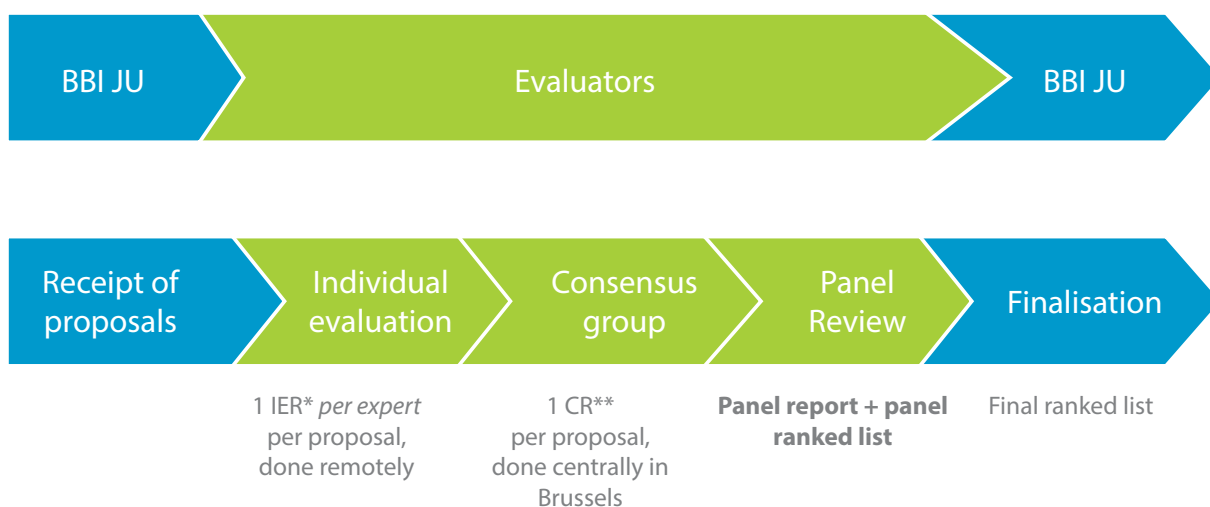
According to the applicable Regulation, for Research & Innovation Actions (RIAs) and Coordination & Support Actions (CSAs), only SMEs, secondary and higher education establishments,

non-profit legal entities (including those carrying out research or technological development as one of their main objectives), the JRC and international European interest organisations are eligible for funding.

Call Evaluation

Evaluators of BBI JU Calls have a diverse background and expertise, which is needed to evaluate the whole value chain of BBI JU topics. The Evaluation process comprehends five different phases with three of them having external experts. These external experts and the BBI JU team evaluate the proposals following strict criteria such as the excellence of the proposal, its impact and the quality and efficiency of the implementation.

EVALUATION PROCESS



* IER - Individual Evaluation Reports

** CR - Consensus Report

Participant Portal:

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

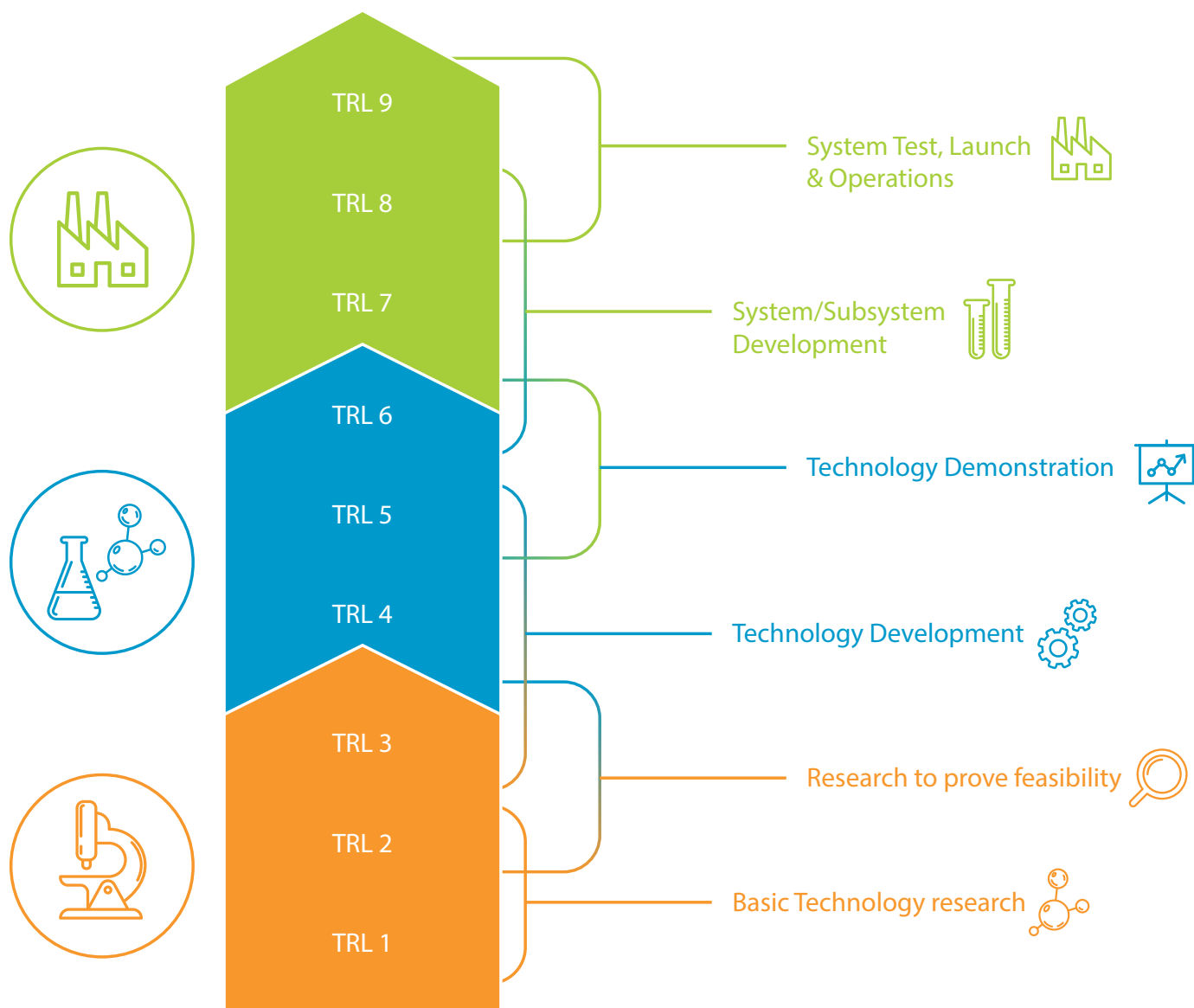
All BBI Call information and documents are centralised on the Participant Portal. These include:

- Call description
- Topics and submission service
- Call documents
- FAQ and Support.

More information about Call conditions and rules as well as links to the portal are available on the BBI JU website under 'Participate'.

TECHNOLOGY READINESS ACTIONS (TRL)

The Technology readiness levels (TRLs) scale is used as a tool for decision making on research, development and & innovation investments at EU level. The TRL scale was developed to enable assessment of the maturity of a particular technology and the consistent comparison of maturity between different types of technologies.



TECHNOLOGY READINESS LEVELS FOR BBI JU PROPOSALS

This table shows the technology readiness levels that evaluators will look for when deciding on the best project proposals to recommend for funding. BBI JU projects cover R&D that is aiming at resolving identified technology gaps in value chains.

Action	Purpose/Outcome	TRL
RIA	Technology validated in lab/pilot level	3-5
IA - Demo	E demo-scale production facility in Europe (= a new installation, modification / use of existing demo facilities)	6-7
IA - Flagship	A first-of-a-kind application, large scale production facility in Europe	8
CSA	Cross-sectorial challenges, supporting VCs, networking...	n/a

RIA = Research & Innovation Action

IA = Innovation Action

CSA = Coordination & Support Action

PARTICIPATION AND FUNDING RATES PER ACTION

This table shows the possible levels of funding that can be requested as a maximum for each type of BBI JU action. More information about costs that are eligible for funding are available in the Annual Work Plan and in the guidelines for participants available via the Participant Portal.

Participant	RIA	IA	CSA
Large Industries	/	70%	/
SME	100%	70%	100%
Universities	100%	100%	100%
RTOs - non profit, legal entities	100%	100%	100%



IV. CALL TOPICS 2016

The summaries of the BBI JU Call 2016 topic texts described in this document are aimed at providing a quick overview of all Call 2016 topics. However, all proposal evaluations will be based on the full topic texts and other relevant H2020 Legal Framework as described in the Call 2016 Annual Work Plan available on the BBI JU website.

The anticipated total eligible budget 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 budget.

RESEARCH AND INNOVATION ACTIONS

Research & Innovation actions aim to fill the technological gaps within specific value chains. The impact for the whole value chain must be clearly shown. R&I actions cover actions with Technology Readiness Actions (TRL) from 3 to 5.

BBI 2016.R1 - Valorisation of the organic content of wastewater as feedstock, contributing to the renewable circular economy € 2-5 million eligible budget

Wastewater contains organic matter and nutrients that can lead to eutrophication if discharged to aquatic systems. On the other hand, these types of sludge also contain potentially valuable components for bio-based industries that are currently not exploited. Using wastewater as a source of bio-based feedstock contributes to unlocking alternative biomass feedstock sources, helps to create new value chains for a strong bioeconomy and contributes to realising the EU circular economy through agricultural and industrial symbiosis.

The challenge is to develop technologies for the recovery and conversion of the bio-based components in wastewater from industrial activities (chemical, pulp and paper, agro-food, etc.) or from municipal sewage to bio-based products.

BBI 2016.R2 - Develop consolidated bioprocesses for direct fermentation into bio-compounds for chemicals and materials € 2-5 million eligible budget

In recent years, various studies have identified efficiency improvements for the pre-treatment, fermentation and downstream phases of biorefining processes. However, the relatively high costs for pre-treatment and enzymatic hydrolysis have limited a wide application at industrial levels, especially because enzymes represent significant capital and operational costs for many biorefineries. Consolidated bioprocesses exist, conver-

ting at lower-scales, pre-treated biomass in one step into valuable bio-products without using technical and specific enzymes. These are promising results that need to be further improved to allow implementation at industrial scale.

The challenge is to develop a conversion process based on a direct fermentation of the pre-treated biomass into bio-compounds that is competitive in terms of costs and yields with processes that include the separate enzymatic hydrolysis step.

BBI 2016.R3 - Improve control over micro-organism growth in bio-catalysis operations in order to reduce/avoid contamination without antibiotics € 2-5 million eligible budget

With the introduction of several and different feedstocks, the risk of contamination increases due to longer fermentation times and weaker genetically modified production organisms. This leads to more stringent requirements for control of contamination within the bio-catalysis reactor. The objective is to overcome this challenge without exacerbating cumbersome sterilisation procedures or increasing the use of antibiotics, which would spread antibiotic resistance in the microorganisms.

The challenge is to develop new methods to control contamination, with alternatives such as microbial consortia, non-antibiotic antimicrobials, more robust production microorganisms and more suitable bio-reactor conditions.



BBI 2016.R4 - Flexible biorefining technologies able to handle different feedstock, leading to new value chains or enlarging existing ones by using the same processing plant

€ 2-5 million eligible budget

Dependence on a single source of feedstock is one of the main bottlenecks for biorefinery operations. If biorefineries have the ability to process multiple inputs or to switch to different raw materials, they would have a substantial higher degree of flexibility in coping with feedstock price and availability variations. The challenge is to increase the ability to process a diverse and flexible supply of biomass feedstocks at an acceptable quality, allowing a better utilisation of biorefinery capacity and improving its competitiveness.

BBI 2016.R5 - Advanced biomaterials for smart food packaging

€ 2-5 million eligible budget

Bio-based packaging materials with advanced functionalities are gaining ground as compared to traditional paper bags, board boxes, fossil-based plastic containers, films, wrappers and bottles. Users in the end-markets are increasingly demanding advanced, 'smart' and even 'active' packaging to help increase the shelf-life of food. Furthermore, the society and users are also demanding improved end-of-life options for packaging materials.

A key challenge for ensuring market uptake and realising the full potential impact of bio-based materials useable in new food packaging concepts is to prove their ability to meet market demands – a proof of concept. This requires close cooperation between industries and market actors and between biomass feedstock producers and suppliers.

BBI 2016.R6 - Bio-based alternatives to improve protection of human health and the environment

€ 2-5 million eligible budget

Consumers and producers are becoming increasingly aware of the need to make consumer goods that require less finite resources and that protect human health and the environment. This is also the aim of the REACH legislation, by placing the responsibility on industry to manage the risks from chemicals and to provide safety information on the substances.

The challenge consists of developing suitable and safe bio-based compounds and derivatives to meet the high technical and safety requirements of downstream applications, in order to reduce the eco-toxicity.

BBI 2016.R7 - Biopolymers with advanced functionalities for high performance applications

€ 2-5 million eligible budget

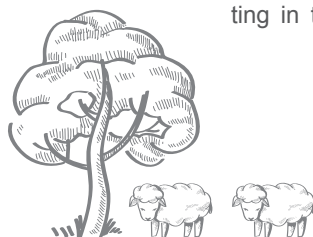
With an expected significant growth in the next 4 years, biopolymers represent one of the leading sectors for bio-based products, thanks to the need to substitute conventional fossil-based materials with more sustainable bio-based ones. The ability of bio-based polymers to achieve improved functionalities, surpassing those of fossil-based ones, or even realising functionalities that are not achievable by fossil-based polymers offers opportunities to expand market applications for biopolymers far beyond the current state-of-play.

The challenge is to develop and validate biopolymers with advanced functionalities for demanding sectors such as the biomedical, construction, automotive and aerospace sectors.

BBI 2016.R8 - Emerging technologies for conversion of the organic content of Municipal Solid Waste and improving waste-to-chemicals value chains

€ 2-5 million eligible budget

The organic fraction of Municipal Solid Waste (MSW) represents an abundant and cheap, albeit highly variable, bio-based feedstock. The advancements in sorting in the last years have made bio-waste an extremely affordable feedstock, attracting the interest of the biochemical industry. However, due to its high complexity in composition as well as the variability during the year, the performance of conversion processes is hindered by the high variability of the input feedstock, resulting in the need of tailored sorting and pre-treatment of the



feedstock. Therefore, the costs of the sorting and pre-treatment steps, combined with the need of high performance separation and purification, often hinder the overall economic feasibility of a waste-to-chemicals value chain.

The challenge is to develop and validate at lab scale innovative processes for the conversion of the organic fraction of MSW into chemical intermediates, aiming at maximising the yield of recovery of intermediates from the substrate and minimising the presence of inhibitors in order to enable profitable yields from the conversion of intermediates into products. The innovation should focus on production of intermediates at high yield and low impurity level.

BBI 2016.R9 - Exploiting algae and other aquatic biomass for production of molecules for pharma, nutraceutical, food additives and cosmetic applications

€ 2-5 million eligible budget

Algae are important sources of specialty or fine chemicals that allow high added-value applications in several market segments, due to the enormous variety in the composition of naturally occurring varieties. Algae and other aquatic biomass thus can be excellent feedstock from aquatic/marine sources to produce chemical building blocks and materials for specific niche market applications, while at the same time not compromising the food chain.

The goal now is to validate the technology for the utilisation of algae and other aquatic/marine biomass for the production of ingredients and proteins for food and feed, and of chemicals for pharmaceutical, cosmetics and nutraceutical applications.

BBI 2016.R10 – Industrial biotransformation for the production of bio-based chemicals

€ 2-5 million eligible budget

Bio-catalysis enables transformations of starting biomass into bio-based products, often with higher selectivity and catalytic efficiency as well as requiring milder operational conditions versus chemical routes. The continuity of bio-based production, needed to increase the overall economic sustainability, is hindered by the drawbacks associated with the use of living microorganisms.

In order to increase the industrial bio-catalysis production cy-

cle, the challenge is to improve the techniques for microbial construction and control, having microorganisms capable of maintaining their bio-catalytic characteristics for longer periods of time and mitigating the impact of environmental microbial flora that may negatively affect the bio-production in terms of yield and/or quality of the products.

BBI 2016.R11 – Recover and reuse enzymes to reduce costs of existing industrial processes

€ 2-5 million eligible budget

Enzyme cost is a significant part of the overall cost of biomass conversion. A possible way to optimise costs is a partial or total recycle of the enzymes, permitting the same batch to process more than one cycle and/or to reduce the need for input of 'fresh' enzymes per cycle. Some approaches have been proposed, but the yield and costs still need significant improvement to allow feasible industrial application, through the development of effective enzyme technologies and processes.

The challenge is to develop effective enzyme technologies and processes with a substantial reduction of fresh enzyme intake while still achieving the same targeted process or reaction yields.

BBI 2016.R12 - Emerging technologies for separation and purification of fermentation products to obtain high grade bio-based molecules at industrial level

€ 2-5 million eligible budget

Separation and purification of fermentation products can be a major bottleneck in terms of productivity and cost competitiveness. Several technologies, based on reactive extraction, membrane technologies, electro-dialysis, ion exchange and distillation have been proposed, as well as approaches based on fermentation with simultaneous purification such as multistage fermentation or combination of fermentation with adsorption. Nonetheless, it is still needed to make separation and purification processes available to a wider range of products.

The challenge is to select and advance suitable new technologies for separation and purification of fermentation products for feasible subsequent industrial application.



INNOVATION ACTIONS

Innovation Actions should address the whole value chain from feedstock sourcing to the market applications.

Demonstration Actions

A Demonstration Action moreover shall include the establishment of a demo-scale production facility in Europe, being it a new installation, substantial modification of an existing facility, or use of existing demo facilities. Demonstration projects cover TRL 6-7. This requires that access to European biomass is ensured. It also means that they need to include an exploitation plan, sustainability assessment and to address consumer engagement. Related costs at the level of the action are eligible for Horizon 2020 funding only within the limits of the applicable Horizon 2020 rules for innovation actions.

BBI 2016.D1 - Improve sustainability of value chains based on forest biomass and increase productivity and profitability on supply side by adapting forests to climate changes

€ 15 million eligible budget

The demand for forest-based biomass for various applications is increasing. The markets of forest-based products are very competitive, with other regions leading in production efficiency. The European forest-based sector could improve its competitiveness by increasing the sustainable mobilisation of forest resources through better forest infrastructure, suitable machinery, consolidated ownerships and better management of undeveloped wood markets. A sustainable increase of the productivity of its forests

will increase the value of forest land itself. The need to increase the resilience of forests to climate change is a common issue all over Europe, in order to retain their economic value and to maintain the sustainability of value chains based on forest-based biomass. The challenge is to find ways to retain the economic value of the forests and to maintain the sustainability of value chains based on forest-based biomass. At the same time, it is impossible to keep increasing the resource, energy and process efficiency of wood processing within forest-based sectors, in order to enlarge the suitability of the various kinds of forest biomass with a wider range of marketable products. from municipal sewage to bio-based products.

BBI 2016.D2 – Improvement and adaptation of industrial crop varieties and novel sources of biomass to diversify biomass feedstock for biorefineries

€ 15 million eligible budget

A strong bioeconomy requires a diverse biomass feedstock for the bio-based value chains. The bio-based industries are looking into diversification of their feedstock base by adding new sources. Dedicated, purposely grown industrial crops and novel sources of biomass to deliver specific compounds for further processing into chemicals and materials present an attractive route to high-value applications.

The challenge is to demonstrate the sustainability of these new value chains on a larger scale. Demonstrating the benefits for the environment, the economy and the society will contribute to the market-uptake of the end-products and to an improvement of the competitive position of the European bioeconomy.

BBI 2016.D3 - Valorisation of lignin and other side-streams to increase efficiency of biorefineries and increase sustainability of the whole value chain

€ 15 million eligible budget

High costs of feedstock and energy in the EU require biorefineries to apply highly efficient processes to remain competitive, including processes to handle and convert by- and co-products from different industrial and commercial activities, the integration of own biorefining operations and the maximization of the use of intermediate and side-streams, with lignin being the pre-

dominant component of side-streams from lignocellulosic biomass processing. At lab and small pilot scale, there are many examples of valorisation of lignin-rich streams.

The challenge is to demonstrate at a larger scale the feasibility and sustainability of valorisation of lignin-rich streams at the core of a full value chain in order to set the basis for a future market deployment of the obtained products.

BBI 2016.D4 - New and optimised biorefinery approaches enabling the creation of local value chains in underdeveloped or unexploited areas

€ 15 million eligible budget

The European bioeconomy starts expanding to include new actors and less developed regions. This expansion is needed to build a bioeconomy at a sufficiently large scale to sustain itself and to fully exploit the European biomass potential. Among the major challenges in expanding the bioeconomy in new areas is the scale of operation. The challenge is to design innovative models to enable the build-up of sustainable new, local bio-based value chains involving biomass producers, waste management operators, logistics operators, government administrations and the processing and end-market actors.

BBI 2016.D5 – Bio-based polymers/plastic materials with new functionalities for medical, construction, automotive and textile industries

€ 15 million eligible budget

With a foreseen market growing around 300% during the next four years, bio-based plastics are a broad sector with the potential of expanding in virtually all fields presently dominated by fossil-based plastics. In order to continue this revolution, the demand for new and improved functionalities, such as fully competitive bio-based products and a wider range of bio-based polymers/plastic materials and of useable feedstock is increasing.

The challenge is to demonstrate the techno-economic viability of the production of innovative biopolymers/bioplastic materials with identified functionalities that can outperform fossil-based processes and materials in the fields of health and medical, construction, automotive and textile markets.

BBI 2016.D6 - Valorisation of the organic content of Municipal Solid Waste and contributing to the renewable circular economy

€ 15 million eligible budget

Despite the improvements in sorting and recycling, a large fraction of Municipal Solid Waste (MSW) is still landfilled (32%) or incinerated (26%) across Europe. This practice is posing environmental concerns, as well as wasting potentially useful resources contained in MSW, that could be an alternative source of feedstock for the bioeconomy. Differentiating and enlarging the biomass feedstock portfolio are key objectives of the bio-based industries in Europe. Utilizing MSW as a feedstock source for biorefineries also helps realising the EU circular economy, i.e. through collaboration between producers to use each other's by-products. Lab scale technologies have shown feasible treatment and subsequent conversion of the organic fraction of MSW into a number of products or intermediates for further use.

The challenge is to demonstrate that these processes can work in a large-scale and be economically competitive.

BBI 2016.D7 - Optimise technical production routes to bio-based chemicals in bio- or chemo-catalytic processes

€ 15 million eligible budget

Production of bio-based products, like chemicals or proteins, requires affordable high quality feedstock, industrial stable conversion and sufficiently high purity levels of product streams and yields to permit further downstream conversion steps. There are still various possibilities to optimise bio-based production routes not fully applied in the bioeconomy, i.e. minimising feedstock or nutrient losses over the whole process chain that are caused by either processing or partial use of the feedstock.

The challenge is to find industrially viable solutions for the processes and reduce environmental footprints via optimisation of bio-based production routes. These solutions may include use

of agricultural side streams as substrates, optimized process options with matched fermentation organisms or new solutions regarding nutrient management.

BBI 2016.D8 - New sources of proteins for animal feed from co-products to address the EU protein gap

€ 15 million eligible budget

Livestock feed production is the single largest land user in the world. The rapidly growing world population and increasingly demanding consumers are causing a huge rise in the demand for meat, causing the necessity to identify alternative protein sources to ensure a more sustainable supply of proteins for animal feed. Low value biorefinery side-streams, residues from the agro-food industry, seaweeds, algae and dry land crops have been identified as potential sources.

The challenge is to demonstrate the sustainability and efficiency of the identified new protein sources at sufficiently large scale to meet market demands.

BBI 2016.D9 - Biomass production on unused land for conversion into added-value products while 'boosting rural and industrial development'

€ 15 million eligible budget

Europe has substantial unused land. Some of this land is in this condition because of its inherent characteristics (difficult access, location, soil composition, climate). Other parts have once been profitable as farm land and are now abandoned as a result of overexploitation, pollution, climate change and exodus from rural areas. The challenge is to put unused land back into production by cultivating dedicated industrial and forestry crops and their conversion into added-value products for identified applications. The challenge also includes establishing required logistics to ensure the supply of these crops to biorefineries, providing for a sustainable operation with minimal losses within the value chain.







INNOVATION ACTIONS

Innovation Actions should address the whole value chain from feedstock sourcing to the market applications.

Flagship Actions

A Flagship Action aims to support the first application/deployment in the market of an innovation that has already been demonstrated but not yet applied/deployed in the market due to market failure/barriers to uptake. Proposers for a flagship project shall provide clear evidence of previous validation of the proposed process at demonstration scale. First means new at least to Europe or to the application sector in question. A flagship action shall address a complete value chain from procurement, growth, supply of feedstock material to the final product(s). It shall include the establishment of a large scale production facility in Europe or a substantial modification of an existing facility, or reconversion of old or abandoned industrial facilities. Related costs at the level of the action are eligible for Horizon 2020 funding only within the limits of the applicable Horizon 2020 rules for innovation actions. Flagships actions cover TRL 8. Projects may include limited research and development activities. Flagship initiatives are required to ensure deployment of technologies in biorefineries, and bring new bio-based products to the market, achieve the creation of new jobs and reduction of environmental impact.

BBI 2016.F1 - Valorisation of by-products or waste-streams from the food processing industry into high added-value products for market applications.

€ 30 million eligible budget

Around 100 Mt of food waste and residues from food processing industry are generated every year in the EU. The waste streams of the food industry include animal-based as well as plant-based streams, which are currently either unusable and go to disposal or find only partial, low value utilisation. Significant amounts of compounds with potential for valorisation into high added-value products are lost in these by-products or waste streams. Furthermore, disposing of these streams in landfills causes environmental issues due to their high landfill leachate and methane emissions. Valorisation of food processing by-products or waste-streams hence represents both an opportunity and a necessity.

The challenge is to demonstrate viable large scale valorisation of by-products or waste-streams from the food processing industry, capable of handling a wide variety in composition.

BBI 2016.F2 – Converting bio-based feedstocks via chemical building blocks into ad-

vanced materials for market applications.

€ 35 million eligible budget

Terrestrial biomass is the most abundant resource of fixed renewable carbon on earth. It is present in resources such as food crops and woody crops, as well as in agricultural and forest residues. This enormous resource of fixed renewable carbon is an attractive feedstock-base for a bio-based industry, provided this is realised in a sustainable fashion, without loss of biodiversity, neither causing indirect land use change (ILUC) nor negatively affecting food security. Tapping this resource in the EU for the production of bio-based chemicals and materials, will accelerate the establishment of an EU-wide bio-based industry and contribute to the goals of Europe 2020. Today, most polymers such as polyesters, polyamides and polyolefins depart from fossil-based chemicals as building blocks. However, there are also various routes to convert biomass or bio-based feedstocks into chemicals, polymers and materials.

There are already some projects pursuing the establishment of these new value chains by using bio-chemical, chemical or other technologies and processes. However, the challenge lies in establishing at industrial scale first-of-a-kind, cost-effective biorefineries that convert biomass into chemicals, polymers and materials for identified applications, demonstrating its techno-economic viability of transforming one or multiple bio-based feedstocks into one or more bio-based chemical building blocks.





COORDINATION AND SUPPORT ACTIONS

Coordination and Support Actions can address cross-sectorial challenges and supporting value chains through knowledge development (studies) and networking.

BBI 2016.S1 – A roadmap for the chemical industry to a bioeconomy.

€ 1 million eligible budget

The chemical industry in Europe is facing a number of challenges that may affect its global competitive position, some of them being the enormous growth of the market and subsequent investments and production in China; the production of chemicals and materials in the Middle East on amply available oil and gas; and the 'shale gas revolution' in the USA providing the local industry a significant advantage in raw material and energy availability. As a result, the share of European chemical production has dropped significantly and the chemical industry is now stepping up its drive towards higher resource and

energy efficiency, focusing on business and operational excellence towards sustainability. While safeguarding base chemicals production, the industry has started to utilise renewable raw materials, making 'drop-in' bio-based chemicals to replace fossil-based products where justified, and at the same time making new and successful bio-based products with new functionalities for initial niche market applications. However, the production of bio-based building blocks and applications is still limited.

The challenge is to make a clear overview of the hurdles in the fields of regulation and acceptance, set up a plan for their removal and agree on a roadmap for the chemical industry to increase production of bio-based building blocks for market applications that meet societal needs.

BBI 2016.S2 – Bioeconomy related open access research infrastructure and assessing its capabilities for industry driven development projects.

€ 1 million eligible budget

There are some open access research infrastructures spread across Europe, where applicants or interested parties can 'shop' for equipment and facilities they may need to carry out lab, test or pilot work. There is also a limited number of open access multipurpose demonstration facilities which are seen as a crucial alternative to effectively reduce the high capital investment requirements for bio-based industries from invention to the market. These infrastructures are not well known in the broad R&D&I communities across Europe. Neither are these communities aware of the type and available equipment and facilities that the various infrastructures have to offer.

The challenge is to improve access to existing bio-economy related open access research infrastructure in Europe and to catalyse the expansion of capabilities of the infrastructure to cost-efficiently meet the needs of bio-based industries.

BBI 2016.S3 – Open-innovation Platform strengthening cooperation and joint development of bio-based industries and downstream sectors.

€ 1 million eligible budget

As bio-based intermediates are becoming more mature and entering new markets, one of the major hurdles to develop new bio-based solutions is the lack of adequate knowledge of the bio-based industries of the applications; and vice-versa the unawareness of down-stream industries of those new mate-

rials. Cross-sectorial exchanges and joint development are therefore essential to imagine tomorrow's products and solutions. The challenge is to structure the exchange of bio-based industries and downstream sector in an open-innovation platform.

BBI 2016.S4 – Clustering and networking for new value chains.

€ 0.5 million eligible budget

Effectively operating bio-based industries encompass a wide range of actors and stakeholders spread across several economic and industrial sectors and geographic locations. Each one of them has to-date traditionally been part of a well-defined value chain. This paradigm is undergoing major changes to incorporate the rise of new valorisation routes for bio-based feedstock. In the new bioeconomy, actors in bio-based industries integrate in 'cross-sectorial' partnerships within their traditional value chains, and develop new value chains that lapse across the traditional ones. One significant result hereof is that intermediate 'by-product', 'waste' and 'residue' streams from separate value chains can be utilised as feedstock in other value chains through biorefining. This will imply an integrated biorefinery approach and establish a circular bioeconomy. In addition, actors in bio-based industries have developed new schemes for cascading exploitation of biomass in order to maximise the efficient use of resources and the value of products.

The challenge is to establish new industrial value chains across the EU (for example, based on industrial side-streams including those of food industry, urban bio-waste or aquatic biomass, etc.), crossing boundaries of traditional sectors and value chains as well as enhancing the exploitation of local resources. This will encompass the interaction across sectors with different expertise and new different business and cooperation models.





V. Infotorials

BBI JU's objectives provide for synergies and complementarities with other European organisations, networks and initiatives. Participants can find out more by consulting the websites for further details.



Founded in 2001, ERRIN is a unique Brussels-based platform of more than 120 regional stakeholders organisation most of whom are represented by their Brussels offices.

The network promotes knowledge exchange between its members, focusing on joint actions and project partnerships to strengthen regional research and innovation capacities. Through these actions ERRIN seeks to contribute to the implementation of the Europe 2020 Strategy, the Innovation Union flagship initiative and Smart Specialisation strategies.

ERRIN Vision: enhancing regional competitiveness

ERRIN will be recognised as an essential European network supporting regions in developing their collaborative and open regional innovation ecosystems to enhance the EU's research and innovation capacity and build a competitive Europe which supports smart, sustainable and inclusive growth in all regions.

ERRIN Mission: The ERRIN 4Ps

ERRIN is a respected, professional, open and dynamic Brussels-based network within the Brussels research and innovation landscape. ERRIN supports regional research and innovation capacity building by facilitating regional collaboration and partnerships and the open and rapid exchange of knowledge in a context of trust and confidence. ERRIN supports its members engage in and shape EU research and innovation policy, develop successful projects at the EU level and raise their profile in Brussels.

By working in a 4 P's approach ERRIN support its members in Projects, Policy, Partnerships and Profile raising. The 4 P's are the core of the network and well embedded in the 14 thematic Working Groups.

Bioeconomy Working Group

One of the Working Groups where more than 50 ERRIN member operates is the Bioeconomy Working Group. Within this group members have supported a Smart Specialisation mapping of Bioeconomy where regional activities were identified, organised high-level events with focus on the awareness raising of the Bioeconomy and has together with other partner networks developed a consensus document identifying four essential steps for the success of Bioeconomy at regional level. The Bioeconomy Working Group aims to share knowledge and best practices, attract investment to the regions and build on new value chains going outside the regions and supporting the global value chains. ERRIN's Bioeconomy Working Group organises Project Development Workshops on a regular basis covering several thematic Bioeconomy topics and attracting a critical mass from around Europe.

For further information and contact the website: www.errin.eu



ENRD is the hub that connects rural development stakeholders throughout the European Union (EU). Discover how the ENRD is contributing to the effective implementation of Member States' Rural Development Programmes by generating and sharing knowledge, as well as through facilitating information exchange and cooperation across rural Europe.

The rural development context

Rural development and agriculture are well placed to make a central contribution to the jobs growth and investment priority at the heart of the European Commission's economic agenda.

EU Rural Development policy

European Union Member States have sought to respond to the challenges and opportunities facing rural areas by developing an EU Rural Development policy as part of the Common Agricultural Policy (CAP).

Rural Development policy objectives

Within the overall framework of the CAP, European Rural Development policy aims to achieve the following objectives:

- fostering the competitiveness of agriculture;
- ensuring the sustainable management of natural resources, and climate action;
- achieving a balanced territorial development of rural economies and communities, including the creation and maintenance of employment.

For further information and contact the website: <https://enrd.ec.europa.eu>



Funded by the European Commission under the Horizon 2020 programme, the aim of the BioHorizon project is to align and enhance the services that National Contact Points (NCPs) for Societal Challenge 2 focussing on food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy (SC2) provide to applicants for research funding across Europe and beyond. In addition to NCPs for SC2, BioHorizon also addresses those responsible for the Key Enabling Technology (KET) 'Biotechnology.'

BioHorizon will run for four years (March 2015 – February 2019). The project consortium comprises 16 NCP institutions, under the coordination of the Institute of Fundamental Technological Research PAN (IPPT PAN POLAND).

The Project

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.

BioHorizon objectives

The BioHorizon project aims to improve this knowledge amongst Bio-NCPs by raising their awareness, and to enhance their skills. The methods employed to achieve these objectives include training sessions and workshops based on an assessment of NCP needs, a staff exchange programme and an e-mentoring scheme. In addition to improving the capacities of individual Bio-NCPs, the BioHorizon project will also facilitate their work by creating information material and by organising a series of transnational brokerage events for the benefit of researchers from across Europe and beyond.

For further information and contact the website: www.ncp-biohorizon.net



The Bio-based Industries Consortium (BIC) is a non-profit organisation based in Brussels. It represents the private sector in a public-private partnership (PPP) with the EU on Bio-based Industries (BBI JU). Worth €3.7 billion, the partnership mobilises investment in innovative facilities and processes that manufacture high-quality bio-based products as well as in biorefining research and demonstration projects.

BIC is host to a unique mix of sectors that currently covers agriculture, agro-food, forestry, pulp and paper, chemicals, energy and other manufacturing sectors. With close to 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.

Mission

- Define the BBI's Strategic Innovation and Research Agenda (SIRA)
- Lead the development and drafting of the annual BBI Work Plans and Call for Proposals Topics
- Mobilise industry (large, SMEs, SME Clusters), research organisations, universities, regions and all relevant stakeholders across Europe that are active/ought to be active, or interested in the field of bio-based.

BIC membership

- BIC members put forward ideas for research topics, demonstration projects and flagship projects for the annual BBI Work Plans. They also decide how to address non-technical issues affecting the bio-based industries.
- From their involvement in developing the BBI annual Work Plan, BIC members receive early insights on which to base project proposals, even before the official publication of the BBI Call for Proposals. This early information gives BIC members an advantage in writing successful project proposals and winning EU grants.
- BIC members are better informed about access to funding, loans and grants from EU institutions like the European Investment Bank (EIB). Online reference tools are also available to support members applying for funds.
- BIC private Partnering Events provide a platform for members to network with other key players in the bio-based sector.
- BIC members receive discounted entrance to bioeconomy events such as the European Forum for Industrial Biotechnology and the Bioeconomy (EFIB) or the BIO World Congress for Industrial Biotechnology.
- A regular newsletter keeps members informed on the latest policy developments affecting the bioeconomy, the BBI, relevant events and more.

For further information and contact the website: <http://biconsortium.eu>

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 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:

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

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

For further information and contact the website: <https://ec.europa.eu/easme>



Launched in 2008, the Enterprise Europe Network 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 60 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 our services and find out your local contact point: <http://een.ec.europa.eu>

The Sector Group Environment of the Enterprise Europe Network gathers 47 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.

More info: <http://een.ec.europa.eu/about/sector-groups/environment>

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 two key resource and energy efficiency targets within a time horizon of 2030:

- 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 alternative (renewable) energy sources within the process cycle;
- 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.

SPIRE Key Components

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

- Feed: Increased energy and resource efficiency through better preparation and product mix of raw materials, higher levels of alternative and renewable feedstock (including waste and waste water), as well as better managing increased quality variations in material resources.
- Process: Solutions for more efficient processing and energy systems for the process industry, including industrial symbiosis.
- Applications: New processes to produce materials for market applications that boost energy and resource efficiency up and down the value chain.
- Waste2Resource: 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.
- 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.
- Outreach: Reach out to the process industry, policy makers and citizens to support the realisation of impact through awareness, stimulating societal responsible behaviour.

34 projects related to the first 2014-2015 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 and contact the website: www.spire2030.eu



For further information about BBI JU and the
2016 Call for proposals visit us at:
www.bbi-europe.eu

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