



Bio-based Industries
Joint Undertaking (BBI JU)
Amendment nr. 2 to
ANNUAL WORK PLAN 2015

- 18 August 2015 -

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Revision History Table		
<i>Version n°</i>	<i>Issue date</i>	<i>Reason for change</i>
V1	09/12/2014	Adoption BBI GB
V2	05/05/2015	Amendment nr. 1 reflects the split of the 2015 call into Flagship 2015 CALL and RIA-DEMO-CSA 2015 CALL*. The current version only updates the information related to the flagship call. A further amendment of this document as well as the supporting call documents (i.e. guide for applicants) will be made available in July 2015 in view of the publication of the second call (RIA-DEMO-CSA 2015 CALL). The referred amendment will entail the addition of the second call text (topics). Specifically this document contains the following updates: Subchapter 3.4.5. added including the content of the Flagship 2015 call. Two subchapters added (3.5.1.1 and 3.5.1.2) including the conditions of the FLAGSHIP 2015 CALL and the conditions of the RIA-DEMO-CSA 2015 CALL. Subchapter 5.3 added including risk management of the BBI JU Annual Work Plan 2015
V3	18/08/2015	Amendment nr. 2 comprises the addition of the RIA-DEMO-CSA 2015 call. Specifically this document contains the following updates: Subchapter 3.2. updated including additional Indicators of results and impact. Subchapter 3.4.6. added

		including the content of the RIA-DEMO-CSA 2015 CALL. Subchapter 3.5.1.2 updated including the conditions of the RIA-DEMO-CSA 2015 CALL.
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** The split into two calls reflects on the one side the intention to front-load flagship actions as described in section 3.4.4 and on the other to maximise the timing in which the second call (RIA-DEMO-CSA 2015 CALL), where a high participation is expected, will remain opened.*

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1. INTRODUCTION: MISSION, OBJECTIVES AND CHALLENGES

1.1. BACKGROUND AND MISSION

This document establishes the second Annual Work Plan (AWP) of the Bio-based Industries Joint Undertaking (BBI JU), outlining the scope and details of research and innovation activities prioritised for Calls for Proposals in 2015. It also describes the objectives of the BBI JU, the policy and global context, assessment criteria, technical targets and rationale for individual activities.

The Bio-based Industries Consortium (BIC) developed a vision paper and a Strategic Innovation and Research Agenda (SIRA¹), based on extensive consultation with public and private stakeholders. The Strategic Innovation and Research Agenda describes the main technological and innovation challenges that need to be overcome in order to develop sustainable and competitive bio-based industries in Europe and identifies research, demonstration and deployment activities to be carried out by a Joint Technology Initiative on Bio-based Industries.

BIC is a non-profit organisation that was created to represent the industry group that supports the BBI Initiative. Its members cover the entire bio-based value chain and consist of large industries, small and medium-sized enterprises (SMEs), regional clusters, European trade associations, and European Technology Platforms. The aim of BIC is to ensure and promote the technological and economic development of the bio-based industries in Europe. Any interested stakeholders along the bio-based value chain may apply for membership. It applies general principles of openness and transparency regarding membership, ensuring a wide industrial involvement.

The Commission Communication of 13 February 2012 entitled "Innovating for Sustainable Growth: A Bioeconomy for Europe", and in particular its Action Plan, calls for a public-private partnership to support the establishment of sustainable and competitive bio-based industries and value chains in Europe. In view of the move towards a post-petroleum society, the Communication aims to integrate better biomass producing and processing sectors in order to reconcile food security and natural resource scarcity and environmental objectives with the use of biomass for industrial and energy purposes.

The Commission Communication of 10 October 2012 entitled "A Stronger European Industry for Growth and Economic Recovery" confirms the strategic importance of bio-based industries for the future competitiveness of Europe, as identified in the Commission Communication of 21 December 2007 entitled "A lead market initiative for Europe", and stresses the need for the BBI Initiative.

¹ http://biconsortium.eu/sites/biconsortium.eu/files/downloads/BIC_BBI_SIRA_web.pdf

On 6 May 2014, the Council adopted Regulation (EU) No 560/2014 establishing the Bio-based Industries Joint Undertaking (BBI Regulation). According to Article 19 of the Regulation, the Commission shall be responsible for the establishment and initial operation of the BBI Joint Undertaking until it has the operational capacity to implement its own budget. Autonomy should be achieved in the course of autumn 2015.

1.2. OBJECTIVES

The objective of the BBI Initiative is to implement a programme of research and innovation activities in Europe that will assess the availability of renewable biological resources that can be used for the production of bio-based materials, and on that basis support the establishment of sustainable bio-based value chains. Those activities should be carried out through collaboration between stakeholders along the entire bio-based value chains, including primary production and processing industries, consumer brands, SMEs, research and technology centres and universities.

The objective of the BBI Joint Undertaking should be achieved by means of supporting research and innovation activities by using resources from the public and private sectors. To this end, the BBI Joint Undertaking should organise calls for proposals for supporting research, demonstration and deployment activities.

To achieve maximum impact, the BBI Joint Undertaking should develop close synergies with other Union programmes in areas such as education, environment, competitiveness and SMEs, and with the European Structural and Investment Fund (ESIF), which can specifically help to strengthen national and regional research and innovation capabilities in the context of smart specialisation strategies.

The founding members of the BBI Joint Undertaking are the European Union and BIC.

In particular, the BBI JU will contribute to the objectives of the BBI Initiative of a more resource efficient and sustainable low-carbon economy and increasing economic growth and employment, in particularly in rural areas, by developing sustainable and competitive bio-based industries in Europe based on advanced biorefineries that source their biomass sustainably, and in particular to:

- 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;
- develop business models that integrate economic actors along the whole value chain from supply of biomass to biorefinery plants to consumers of bio-based materials, chemicals and fuels, including by means of creating new cross-sector interconnections and supporting cross-industry clusters; and
- 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.

The Strategic Innovation and Research Agenda (SIRA) prepared by the Bio-based Industries Consortium outlines the main challenges that need to be addressed in order to fully realise the potential of bio-based industries in Europe on the basis of the five value chains.

Value Chain 1 - From lignocellulosic feedstock to advanced biofuels, bio-based chemicals and biomaterials: realising the feedstock and technology base for the next generation of fuels, chemicals and materials

Value Chain 2 - The next generation forest-based value chains: utilisation of the full potential of forestry biomass by improved mobilisation and realisation of new added value products and markets

Value Chain 3 - The next generation agro-based value chains: realising the highest sustainability and added value by improved agricultural production, and new added value products and markets

Value Chain 4 - Emergence of new value chains from (organic) waste: from waste problems to economic opportunities by realising sustainable technologies to convert waste into valuable products

Value Chain 5 - The integrated energy, pulp and chemicals biorefineries: realising sustainable bio-energy production, by backwards integration with biorefinery operations isolating higher added value components.

2. GOVERNANCE

The BBI JU is composed of two Executive bodies: the Governing Board and the Executive Director. In addition, there are two advisory bodies: the Scientific Committee and the States Representatives Group.

2.1. GOVERNING BOARD

The Governing Board has overall responsibility for the strategic orientation and the operations of the BBI Joint Undertaking and shall supervise the implementation of its activities, in accordance with Article 7 of the BBI JU Statutes².

The EC and BIC each have five representatives with the same voting rights.

² Annex to the Council Regulation (EU) No 560/2014 of 6 May 2014 establishing the Bio-based Industries Joint Undertaking ("BBI Regulation").

The Governing Board was established at its first meeting on 27 June 2014. In 2015, the Governing Board is planning to hold two ordinary meetings, as well as one extraordinary meeting for the request for autonomy.

The key activities are listed below:

Key activities in 2015 – timetable	
Adopt/approve the key documents for the BBI JU's operations: 2015 Annual Report, reference documents relating to Call for proposals, 2014 Annual accounts, etc.	Q1
Appoint the Executive Director of the BBI JU and delegate the appointing authority	Q3-Q4
Adopt appropriate implementing rules as regards the Staff Regulations and the Conditions of Employment	Q1
Approve the list of actions selected for funding on the basis of the ranking list produced by a panel of independent experts of the 2014 Call for proposals	Q1
Adopt an amendment of the 2015 AWP including the addition of the content (topics) and conditions of the Flagship Call 2015 to be opened in April 2015	Q2
Adopt the practical arrangements for implementing Regulation (EC) No 1049/2001 regarding transparency and access to EU documents	Q2
Adopt the practical arrangements for implementing "Regulation (EU, Euratom) No 883/2013 of the European Parliament and of the Council of 11 September 2013 concerning investigations conducted by the European Anti-Fraud Office (OLAF) and repealing Regulation (EC) No 1073/1999 of the European Parliament and of the Council and Council Regulation (Euratom) No 1074/1999 (OJ L 248, 18.9.2013, p. 1)."	Q2
Adopt an amendment of the 2015 AWP including the addition of the content (topics) and conditions of the RIA-DEMO-CSA call 2015 to be opened in August 2015	Q3
Arrange, as appropriate, for the establishment of an internal audit capability of the BBI Joint Undertaking	Q4
Adopt/approve the key documents for the BBI JU's operations in 2016: 2016 Annual Work Plan, 2016 budget and staff establishment plan	Q4
Approve the request for autonomy of the BBI JU	Q4

2.2. EXECUTIVE DIRECTOR AND PROGRAMME OFFICE

According to Article 9 of the BBI JU Statutes, The Executive Director is the chief executive responsible for the day-to-day management of the BBI Joint Undertaking in accordance with the decisions of the Governing Board. The Executive Director is the legal representative of the BBI Joint Undertaking. The Executive Director is accountable to the Governing Board. He is supported by the staff of the Programme Office.

The Commission is responsible for the establishment and initial operations of the BBI JU until it has the operational capacity to implement its own budget. The Commission will carry out, in accordance with Union law, all necessary actions in collaboration with BIC and with the involvement of the competent bodies.

For that purpose, until such time as the Executive Director takes up his/her duties, the Commission has assigned a limited number of its officials, including one to fulfil the functions of the Interim Executive Director, as of 23 July 2014. He will fulfil the functions of the Executive Director until such time he/she takes up his/her duties.

The interim Executive Director may authorise all payments covered by the appropriations provided in the annual budget of the BBI Joint Undertaking once approved by the Governing Board and may conclude agreements, decisions and contracts, including staff contracts, following the adoption of the BBI Joint Undertaking's staff establishment plan.

The interim Executive Director shall, with the agreement of the Executive Director of the BBI Joint Undertaking and subject to the approval of the Governing Board, determine the date on which the BBI Joint Undertaking will have the capacity to implement its own budget. From that date, the Commission shall abstain from making commitments and executing payments for the activities of the BBI Joint Undertaking.

Autonomy is aimed to be achieved at the latest on 1.1.2016.

2.3. SCIENTIFIC COMMITTEE

According to Article 10 of the BBI JU Statutes, the Scientific Committee is an advisory body to the Governing Board. It was established at its first meeting on 1 September 2014. It conducts its activities in close liaison and with the support of the Programme Office.

The members reflect a balanced representation of world-wide recognised experts from academia, industry, SMEs, non-governmental organisations and regulatory bodies. Collectively, the Scientific Committee members have the necessary scientific competencies and expertise covering the technical domain needed to make science-based recommendations to the BBI Joint Undertaking. At present, the Scientific Committee consists of fourteen members. It can be composed of no more than fifteen members.

The Scientific Committee carries out the following tasks:

(a) advise on the scientific priorities to be addressed in the annual work plans;

(b) advise on the scientific achievements described in the annual activity report.

The Scientific Committee was consulted on the preparation of this Work Plan.

During the year 2015, at least two meetings of the Scientific Committee are planned (Q1 and Q3/Q4). Additional meetings could take place to address major issues.

Key activities in 2015 - timetable	
2 nd Meeting of the SC. The SC would: - Provide advice on the scientific achievements described in the annual activity report 2014 - Provide advice on the detailed plan of the research and innovation activities for 2015 Calls.	Q1
3 rd Meeting of the SC. The SC would: - Advise on the scientific priorities to be addressed in the annual work plan 2016 - Provide advice to the GB on the programme progress of the BBI (in relation to work plan 2016) and other strategic issues	Q3/Q4

2.4. STATES REPRESENTATIVES GROUP

The States Representatives Group was established at its first meeting on 3 September 2014. According to Article 11 of the BBI JU Statutes, the States Representatives Group consists of one representative of each Member State and of each country associated to Horizon 2020. It elected a chair and a vice-chair among its members.

The States Representatives Group is consulted and, in particular, reviews information and provides opinions on the following matters:

(a) programme progress of the BBI Joint Undertaking and achievement of its targets, including the calls for proposals and proposals evaluation process;

(b) updating of strategic orientation;

(c) links to Horizon 2020;

(d) annual work plans;

(e) involvement of SMEs.

The States Representatives Group was consulted on the Annual Work Plan 2015 of BBI.

The States Representatives Group also provides information to, and acts as an interface within, the BBI Joint Undertaking on the following matters:

(a) the status of relevant national or regional research and innovation programmes and identification of potential areas of cooperation, including deployment of relevant technologies, to allow synergies and avoid overlaps;

(b) specific measures taken at national or regional level with regard to dissemination events, dedicated technical workshops and communication activities.

(c) specific measures taken at national or regional level with regard to deployment activities in relation to the BBI Initiative.

The States Representatives Group may issue, on its own initiative, recommendations or proposals to the Governing Board on technical, managerial and financial matters as well as on annual plans, in particular when those matters affect national or regional interests.

During the year 2015, at least two meetings of the States Representatives Group are planned (Q1 and Q3/Q4). Additional meetings could take place to address major issues.

Key activities in 2015 - timetable	
2 nd Meeting of the SRG. The SRG would: - Provide an opinion on the detailed plan of the research and innovation activities for the 2015 calls. - Select the Vice-chair of SRG (the second one). - Amend the Rules of Procedures. - Discuss on measures to be taken at national or regional level to strengthen the Bioeconomy in Europe and the deployment of bio-based industries.	Q1
3 rd Meeting of the SRG. The SRG would: - Provide opinions to the GB on the programme progress of the BBI (in relation to work plan 2016) and other strategic issues - Provide updated information and discuss initiatives on: regional and national research and innovation programmes to allow synergies; dissemination and communication activities; and deployment activities in relation to BBI.	Q3/Q4

3. OPERATIONAL ACTIVITIES: OBJECTIVES AND INDICATORS

3.1. STRATEGIC ORIENTATIONS FOR 2015³

3.1.1. Cross-sectorial integration along and across value chains

Achieving the full potential of the bio-based industries requires swift and concerted action of today's dispersed stakeholders across various sectors, disciplines and Member States. This strategic orientation aims at accelerating biorefinery development by overcoming fragmentation and by identifying and exploiting cross-sectorial synergies. It deals with the establishment of new collaborations and business models that integrate economic actors along whole value chains and enhance strategic cooperation between sectors: linking actors involved in biomass supply (breeding and plant production, forestry, valorisation of waste, farming), to biorefineries and to consumers of bio-based products. Integration along value chains will particularly benefit SMEs as it will provide them with up- and down-stream partners.

A major contribution to biorefinery development is the realization of a cascading use of biomass⁴. Again, the development and deployment of schemes for cascading use of biomass requires the establishment of new partnerships along the value chain and across sectors. With sustainability and competitiveness as a guiding principle, they can substantially optimise the use of biomass as a resource and maximise the derived value.

3.1.2. Ensuring sufficient and sustainable biomass supply

Biological resources are limited and have a number of competing uses. Competition between food/feed, energy and industrial applications is expected to worsen with the decline of natural and fossil resources (and the associated price increase) and in the context of a growing world population and climate change effects. Thus a first key factor for the success of the European Bioeconomy will be the EU's capacity to sustainably mobilise the necessary biomass (in sufficient quality and quantity) for energy and industrial uses in a manner which does not compromise the ability to produce food and does not exceed the carrying capacity of the environment (e.g. soil fertility) and does not jeopardise the provision of ecosystem services by agriculture and forestry. This in turn requires a clear understanding of

³ These strategic orientations have been considered for 2015-2016 in the pre-final version of the scoping paper.

⁴ Commission Staff Working Document accompanying the document Communication on Innovating for Sustainable Growth: A Bioeconomy for Europe: "Biorefineries should adopt a cascading approach to the use of their inputs, favouring highest value added and resource efficient products, such as bio-based products and industrial materials, over bioenergy. The principle of cascading use is based on single or multiple material uses followed by energy use through burning at the end of life of the material, including taking into account the greenhouse gas emissions (GHG) mitigation potential. By-products and wastes from one production process are used to feed into other production processes or for energy. Biorefineries can thus contribute to the principles of a "zero-waste society."

sustainable biomass availability and demand across sectors under different possible future scenarios - considering internal and external dimension, as well as the effect of policies on allocation of biomass to different end-uses (e.g. land competition) . The JU will follow these aspects in close cooperation with EC activities in this field carried out for example by the JRC, the Bioeconomy Observatory and the Bioeconomy Panel, in the frame of the EU Forest Strategy and EIP on Raw Materials, as well as on-going Horizon 2020 projects (e.g. under SC2).

At the same time, there is a need for reinforcing the long-term stability and competitiveness of European primary production sectors (e.g. agriculture, forestry) by increasing productivity and efficiency, diversifying the product portfolio and maximising the use of wastes and residues.

A successful implementation of biomass supply chains will require alternatives for optimising the sustainable production of existing feedstock (forest and agricultural biomass), developing new feedstock supply chains (e.g. forest residues, agricultural lignocellulosic residues or dedicated crops), as well as for unlocking the potential of industrial side streams and organic municipal waste. This can be achieved by developing competitive valorization routes. Albeit essential to ensuring a secure biomass supply is the optimisation of logistics and increased collection. This need is inherent to the scattered, variable and seasonal nature of the biological resources. In the field of biomass availability and mobilisation the JU will build on the results obtained within the various studies as initiated by the Bioeconomy Panel and Bioeconomy Observatory, as well as various other EC-funded projects in these fields. Moreover, the following will also be taken on board: (i) the strict environmental conditions imposed upon farmers by the Common Agricultural Policy, (ii) the new EU Forest Strategy that is identifying objective, ambitious and demonstrable sustainable forest management (SFM) criteria, (iii) the certification approaches for biofuels recognised by the Commission and (iv) the current work on sustainability indicators/criteria and assessment approaches for bio-based products within CEN TC 411.

3.1.3. Development of biorefinery technologies

Technological breakthroughs are required on conversion processes for upgrading existing bio-based industries into integrated biorefineries and for the development of new integrated biorefinery systems.

3.1.4. Secured market demand and customer awareness

There is a strong technology push for the development of bio-based products to be competitive in price and quality with products based on fossil resources (thus independent from premiums), or products that provide entirely new and innovative functionalities and potential for new and existing markets. This strategic orientation aims at aligning technology push and market development thus mitigating the probability of "technology mismatches" e.g. development of technologies and products which face insufficient market demand. One

of the key elements in this respect is the life cycle analysis of new products along with their intended and non-intended effects.

Furthermore, this strategic orientation aims at improving the understanding from onset of different stakeholders' interests, needs and aspirations: Newly developed products can face a lack of consumer interest, acceptance and prevalence of consumer fears e.g. new technologies; lack of knowledge regarding environmental impacts and product performance; to increase the consumer awareness on the characteristics of bio-based products; to identify demand-side actions for the uptake of bio-based products not only in consumer markets but also in green procurement, e.g. by developing standards. The JU will follow these aspects in close cooperation with EC activities on this field carried out by the Bioeconomy Panel, the Commission Expert Group for Bio-based Products, and the EC funded research projects on public procurement.

In addition to the previously stated strategic orientations for 2015, one of the overarching goals of the JU is to bridge the gap between technology development and commercialisation. The 2015 calls should have strong focus on funding Innovation Actions, aiming to accelerate the implementation and deployment of the bio-based economy. This includes flagship projects that are based on prior results of research and demonstration at industrial scale.

3.2. EXPECTED RESULTS, IMPACTS AND KEY PERFORMANCE INDICATORS

<i>Expected result(s) and impact as a result of successful 2015 actions</i>	Contribution of AWP 2015 to the 2020 Targets	Addressed in AWP 2015		
		RIA	Demo	Flagship
A significant increase in private research & innovation investment with:				
– Five new building blocks for the chemical industry by 2020 (KPI 4⁵)	3	VC1.R1 VC1.R2 VC1.R3 VC2.R4	VC1.D1 VC3.D3 VC4.D6	VC1.F1 VC2.F2 VC4.F3
– Fifty new biobased materials by 2020 (KPI 5)	8	VC1.R1 VC1.R2 VC1.R3 VC2.R4 VC3.R8	VC3.D3	VC1.F1 VC2.F2 VC4.F3
– Five flagship biorefinery plants by 2020 (KPI 7)	3-5			VC1.F1 VC2.F2 VC4.F3
– Thirty new consumer products by 2020 (KPI 6)	7	VC2.R4 VC3.R8 VC3.R9	VC1.D1 VC2.D2 VC3.D3 VC3.D4	
A shorter time to market with:				
– Ten new bio-based value chains by 2020 (KPI 2)	3	VC1.R1 VC2.R4 VC2.R6 R10	VC3.D3 VC3.D5	VC1.F1 VC2.F2 VC4.F3
– A broad participation of SMEs	20% Target H2020 EC contribution to SME			
The methodology for monitoring the above expected results and impacts will be based on data collected from the periodic reporting, as well as close follow up of the project by the respective Project Officers. Each Project Officer will report annually during the preparation of the Annual Activity Report.				
<i>Indicators of results and impact</i>				
– Monitoring of public (EC and other) and private funding;	Public funding: EUR 206 million. Private funding: incl. a minimum of EUR 105 million in-kind contributions in projects			

⁵ KPI numbers refer to Table 7 'BBI Key Objectives' in SIRA, page 28

* KPIs under development including also the methodologies to estimate the targets and for their monitoring.

– Follow-up of additionality; (these are indicators for the overall impact of the BBI JU by 2020)				
*New skilled jobs, of which a target share is in rural and currently underdeveloped areas				
*Grow incomes of primary producers (farmers, forest owners) associated to BBI actions including additional margins with existing and currently underutilized residues				
– Selection of projects and allocation of funding; • Time to grant • Time to pay	In line with H2020			
– Technical monitoring against well-defined specific programme milestones; see expected results on KPI's above. In addition:				
36 new cross-sector interconnections in bio-based economy clusters in 2020 (KPI 1). Monitoring methodology. Same as above indicated.	2-3	R10 D7		
More than 200 cooperation projects through cross-industry clusters in 2020 (KPI 3). Monitoring methodology. Analysis of the call results.	30	All	All	All
– Adherence to time schedule;	Budget committed; call launched			
– Quantified monitoring of market penetration in target sectors				
Bio-based chemicals and materials produced by BBI actions (see KPI's 4 and 5)				
* Advanced biofuels produced by BBI actions (see KPI 6)				
- Level of SME participation and of participation from the newer Member States; • EC contribution to SMEs	20%			
– Follow-up on sustainability; (these are indicators for the overall impact of the BBI JU by 2020)				
* The new bio-based products resulting from BBI JU have lower GHG emissions versus fossil alternatives (comparison based on LCA's).				
* Increase sustainable biomass (including bio-waste) supply for bio-based industries (level of sustainability based on LCA/environmental impact assessment)				
* The new bio-based products resulting from BBI JU have superior properties and characteristics than fossil based ones (e.g. biodegradability, recyclability, others etc)				

3.3. FOLLOW-UP OF THE 2014 CALL FOR PROPOSALS

The call 2014 was closed on 15 October 2014. A total of 40 proposals were received, among which 2 were ineligible. The 38 proposals were evaluated by independent experts first remotely from 10 to 21 November 2014 then centrally from 24 to 28 November 2014. A decision by the Governing Board on the list of projects to be funded and reserve lists have been adopted at the beginning of the year 2015 (Q1). The Grant Agreements have been prepared and signed on Q2 2015.

Finalisation of the 2014 call management process (*)	
Finalisation of evaluations (information on outcome of the evaluation)	Q1
Preparation and signature of the grant agreements for the selected proposals	Q2
Pre-financing payments	Q2/Q3
Follow-up implementation of projects	Q3 to Q4

(*) maximum 8 months from 15/10/2014 according to Horizon 2020 rules

3.4. THE 2015 CALLS FOR PROPOSALS

3.4.1 Main priorities

There are a number of distinct features in the following focus areas as compared to the previous work plan: (1) Coverage of biomass supply and market development aspects by embedding in value chain development initiatives (2) Strong emphasis on the cross sectorial integration of actors along but also across value chains; and (3) Introduction of coordination and support actions aimed at knowledge gathering (studies) and networking and in particular on strengthening integration and market uptake of bio-based products.

3.4.1.1. Cross-sectorial integration along and across value chains

Engage actors for the establishment of new schemes for cascading exploitation of biomass with new business and cooperation models, e.g. for primary and secondary economic sector cooperation. Establish networks of biorefineries to enhance knowledge transfer and exploit synergies between concepts and sectors. *Impact: This focus area will result in new partnerships and business models.*

Demonstrate of integrated biomass to bio-based products value chains aimed at the production of (A) Advanced biofuels (based on waste, residues and/or ligno-cellulosic

feedstock) based on integrated biorefinery concepts with the aim to deploy the technology in Europe and reduce costs by process improvement.

(B) Bio-based chemicals and materials such as upstream intermediates (e.g. sugars), 1st transformation products (e.g. glycols, organic acids, monomers, rubber) and 2nd transformation products functionalised for specific applications (e.g. polymers, additives, specialty chemicals).

(C) Bio-based polymers, fibres and composites able to match the performance of competing fossil-based alternatives. *Impact: Contributes to the SIRA objective of 2% of Europe's transport energy demand to be met by sustainable advanced biofuels, 20% of chemicals and materials to be bio-based in 2020, and the objectives of 10 functionalised chemicals and materials, the 5-times market increase with respect to today's share and the objective of 50 new bio-based materials.*

3.4.1.2. Ensuring sufficient and sustainable biomass supply

3.4.1.2.1. Sustainable increase of productivity and mobilization of biomass through innovations in agriculture and forestry and emerging biomass sources

R&I actions focused on improved biomass supply for specific value chains under development. Increased productivity, efficiency and mobilisation/harvesting of forest and specific industrial agricultural crops including the possible use of marginal lands. Develop new industrial agricultural crops/tree varieties that are resource efficient, have high production rates and have improved processability. R&I actions on valorisation of emerging alternative feedstock such as algae and aquatic plants to increase their demand. *Impact: It contributes to the SIRA objective of 10% increase in biomass supply.*

3.4.1.2.2. Unlock the potential of side and waste streams

Optimise residual biomass supply chains (agricultural/forest residues, municipal waste and industrial side streams and by-products). R&I and Innovation actions on the development of competitive valorisation routes, addressing relevant supply and pretreatment issues, into bulk or higher added value products. *Impact: It contributes to a 15% increase utilisation and mobilisation of these potential resources.*

3.4.1.3. Development of biorefinery technologies

3.4.1.3.1. Full utilisation of biomass and closing the loops

Address recovery, full utilisation and valorisation of recalcitrant residues from existing biorefineries (e.g. lignin-and fibre-rich streams), reducing waste streams. Develop of food and feed additives (e.g. proteins, active compounds) from agro-food and forest-industry residues. *Impact: contributes to the SIRA objective of 15% reduced import of proteins.*

3.4.1.3.2. Addressing biorefinery technological gaps

Support innovation in pre-treatment, separation, conversion and functionalisation technologies. Develop new conversion routes for bio-based components enabling future replacement of several classes of fossil-based molecules or materials (upstream

intermediates, 1st transformation and 2nd transformation products). Develop technologies to produce a diversity of chemical building blocks from biomass in sustainable and competitive way to enable a new wave of innovation in chemicals, fibres and polymers beyond drop-in. *Impact: Breakthrough innovations enabling new value chains.*

3.4.1.4. Secured market demand and customer awareness

Evaluate the sustainability (clear definitions and indicators) of the different value chains, by building upon the existing and on-going standardisation work, e.g. under CEN TC 411 as well as the certification approaches for biofuels recognised by the Commission, the strict environmental conditions imposed upon farmers by the Common Agricultural Policy, the new EU Forest Strategy that is identifying objective, ambitious and demonstrable sustainable forest management (SFM) criteria, in view of clarifying the pros and cons of different feedstock options and processes. Develop and qualify novel, broad based communication models to achieve a pan-European awareness, which takes into account the question of public acceptance and involvement within the bioeconomy; Establishing common standards: Develop common definitions and specifications of interfaces as a contribution to the development of standards based on existing and on-going documents and activities allowing to broadening feedstock base and product range; *Impact: It contributes to Consumers engagement and better market uptake of bio-based products.*

3.4.2 Implementation

It is envisaged that these focus areas are to be implemented through the following types of actions:

- (A) Research and Innovation Actions
- (B) Innovation Actions, including "Demonstration" actions and "Flagship" actions
- (C) Coordination and Support Actions

3.4.3 Involvement of SMEs

A substantial part of the transition to a bioeconomy will be initiated and/or developed by innovative starters and SMEs. These SMEs are essential in offering and developing specific services, technologies, equipment and instruments. They will enhance developments in large enterprises as well as in stand-alone projects or local cooperation. In addition, innovative SMEs capture the potential of new technologies extremely fast, thus pushing the bioeconomy as a whole. SMEs are therefore an integral element in the Call development, as well as the activities to be performed.

3.4.4 Distribution of funding over the different actions

For the Joint Undertaking to succeed, it is important that at an early stage of its operations a number of successful demonstration or flagship projects are put in place for jobs and growth in Europe. In this context, it is proposed that a major share of the budget of the 2015 Calls is dedicated to Innovation Actions, in particular Flagship projects. According to the SIRA, at least 5 Flagship biorefinery plants will be established by 2020. The comparative longer duration of Flagship projects (as compared to Demo and RIAs) which is associated not only to the challenging nature of deploying first of their kind plans but also with regulatory issues (e.g. permits), calls for front loading Flagship projects in the 2015 Calls. This approach should nevertheless be complemented with an adequate coverage of the research and innovation actions.

3.4.5. Content of the Flagship 2015 call

This section describes the topics for which proposals will be called in this call.

BBI VC1.F1 - From lignocellulosic feedstock to advanced bio-based chemicals, materials or ethanol

Specific challenge: Lignocellulosic biomass is one of the most abundant resources of fixed renewable carbon on earth. It is present in resources such as woody crops, agricultural and forest residues, residues from agro-industrial processing and forest-based industries, as well as residues from conventional biomass conversion plants. While bio-based chemicals, materials and ethanol produced from food crops are already on the market, meeting market standards for a wide variety of applications, their production from lignocellulosic feedstock opens up large opportunities in terms of enhancing sustainability, avoiding land conflicts and expanding resource potential. Demonstration activities are already being pursued to exploit this vast renewable resource through the application of biotechnological, chemical or other processes. However, the challenge lies in establishing at industrial scale a first-of-a-kind, cost-effective biorefinery concept leading to the conversion of lignocellulosic feedstock into bio-based chemicals, materials and ethanol.

Scope: Demonstration of the techno-economic viability of transformation of one or multiple lignocellulosic feedstock into one of the following bio-based products/applications:

- i) bioethanol targeting a production capacity of at least 50,000 ton/year. Proposals should address the valorisation of co-products and show a credible path towards becoming an integrated biorefinery concept by applying a cascading approach.
- ii) diols and/or diacids as bio-based chemical building blocks targeting a production capacity of at least 5000 ton/year. Proposals should address their further conversion into sustainable biomaterials within an integrated biorefinery concept applying a cascading approach.

Proposals should pursue all possible means of industrial symbiosis and integration of actors along the whole value chain and, wherever possible, make use of existing facilities. Proposals should prove the sustainable and economical access to sufficient raw material to set up the whole value chain, and include activities to ensure the functioning/organisation of a sustainable supply chain. Proposals will

assess market demand of the targeted products and will consider market-pull related activities (e.g. standardisation, consumers' perception) aimed at facilitating their market uptake. Proposals should include a Life Cycle Analysis in order to evaluate the environmental and socio-economic performance of the developed products. Proposals are expected to verify and validate safety, quality and purity of end products to meet commercial requirements. The leading role of relevant industrial partners is considered essential to achieve the full impact.

It is considered that proposals with a total eligible budget of up to EUR 35 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Demonstration of a new local bio-based value chain maximising the use of lignocellulosic resources for the production of bio-based chemicals, materials or ethanol.
- Opening up significant potential for job creation in rural areas. Creating green jobs and facilitating the development of entrepreneurial activities throughout the entire value chain, with advantages for the primary sector (i.e. agriculture and forest), the secondary sector (e.g. logistics, bioproduct transformation industry) and the tertiary sector;
- Improving cost-efficiency and sustainability of bioethanol/diols/diacids as compared with conventional ones;
- Proposals dealing with bioethanol will reach: a dry matter content in the fermentation process of less than 20%, an improved Capex and decreased energy use, specifications of the bioethanol matching those required by downstream processing and/or regulations where applicable.
- Proposals dealing with diols and diacids will demonstrate at least 2 bio-based materials with more than 80% of bio-based content;
- Contributing to realising the objectives of Biotechnology and/or other Key Enabling Technologies under Horizon 2020 and dedicated EU policy to address the development of scientific and technological know-how in key enabling technologies and its translation into industrial products and solutions to societal challenges.

Type of action: Innovation actions – "Flagship" actions.

BBI VC2.F2 - Valorisation of cellulose into new added value products

Specific challenge: Cellulose is a well-known and widely exploited material. Besides its traditional uses, recent technological developments are opening up the opportunity for the use of cellulose in new and higher added value applications. This does not only enhance the competitiveness of the concerned industrial sectors but also significantly improves their environmental performance. While demonstration activities are being pursued to this end, the challenge lies in demonstrating at industrial scale first-of-a-kind cost-effective biorefinery concepts leading to the production of economically competitive cellulose-based products for bulk materials and volume applications.

Scope: Demonstration of the techno-economic viability of biorefinery concepts leading to new cellulose-based products with tailored functionalities into either of the following applications:

i) Microfibrillar cellulose (MFC) based additives providing enhanced properties such as control of rheology, barrier and strength properties for stabilizers of emulsions and dispersions, biodegradable viscosifiers, barrier and strength enhancers, industrial thickeners in glues, paint, pastes and slurries and many more new applications. Proposals should realise an industrial scale process to produce MFC in suitable quantities, for at least 1000 ton/y of MFC-based products with an optimised efficiency in terms of performance, throughput and energy requirements so as to allow a suitable price for a significant industrial production;

ii) Lightweight structural composites based on (bio-based and/or conventional) polymers reinforced with cellulose pulp fibres. Proposals should address the technological challenge represented by the different polarities and viscosities between the cellulose and the matrix. Proposals should realise an industrial scale process of at least 25000 ton/year of composite materials, which can be converted with established processes used in volume applications, especially injection moulding. Application of the developed composites should be demonstrated up to the end products in markets such as structural elements for the automotive and building industry, cases for electronics products or household appliances.

Proposals should pursue all possible means of industrial symbiosis and integration of actors along the whole value chain and, wherever possible, make use of existing facilities. Proposals should address the industrial integration of the developed concepts into a cascading use of forest biomass. Proposals should include testing of the products at relevant scale in potential applications, and prove that the bio-based alternatives match functional and price requirements from the industry. Proposals should prove the economical access to sufficient raw material to set up the new value chain, and elaborate on the actions taken to ensure the functioning/organisation of the supply chain. Proposal will assess market demand of the targeted products and will consider market-pull related activities (e.g. standardisation, consumers' perception) aimed at facilitating their market uptake. A Life Cycle Analysis should be included in order to demonstrate the environmental and socio-economic performance of the developed products. Safety and quality of end products must be verified in order to meet commercial requirements. The leading role of relevant industrial partners is considered essential to achieve the full impact.

It is considered that proposals with a total eligible budget of up to EUR 35 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Opening up significant potential for job creation in rural areas. Creating green jobs and facilitating the development of entrepreneurial activities throughout the entire value chain, with advantages for the primary sector (i.e. forest), the secondary sector (e.g. logistics, bioproduct transformation industry) and the tertiary sector;
- Proposals dealing with microfibrillar cellulose will demonstrate MFC-based products with validated potential for exploitation in at least 10 applications in 5 market segments (food

and/or industrial applications). MFC-based demonstrated products will match or outperform properties of competing conventional products (e.g. synthetic polymers like acrylics, gums, hydrocolloids, thickeners and high molecular weight polymer stabilizers), and show a CO₂ footprint 25% lower than competing technologies.

- Proposals dealing with structural composites will demonstrate products that replace pure fossil based materials and compete with pure polymer solutions or mineral filled or short-fibre-glass reinforced composites in terms of mechanical properties, while exhibiting a significantly lower weight, reaching at least 25% weight reduction and a 100 times reduced tool wear compared to existing materials. Composite materials will be converted into at least 20 applications, thus increasing the competitiveness of leading European industries such as the automotive or chemical industry, along the value chain.

Type of action: Innovation actions – "Flagship" actions.

BBI VC4.F3 - Innovative processes for sugar recovery and conversion from Municipal Solid Waste (MSW)

Specific challenge: The biodegradable fraction of MSW represents an abundant feedstock rich in sugars and therefore suitable for conversion into bio-based chemicals and fuels through biotechnological processes. However, this fraction is highly variable (both in terms of season and geographic location) and contains other components, such as proteins, fats, ashes and other inhibitor compounds which affect the overall yield of fermentation and enzymatic conversion processes. Despite the existence of MSW-based biorefinery concepts at demonstration plant level, further innovation efforts are needed with a view to demonstrating at industrial scale a first-of-a-kind, cost effective new value chain for the recovery and conversion of MSW-based sugars into bio-based products.

Scope: Demonstration of the techno-economic viability of the valorisation of the biodegradable fraction of MSW from sourcing and management of MSW to its conversion. Proposals should address the pre-treatment and/or fractionation of the biodegradable fraction of MSW into a suitable substrate for subsequent biotechnological conversion into sugar derived end products, e.g. bioethanol, biochemical and bioplastics in a cascading approach. When dealing with unsorted MSW, proposals could address the efficient separation of the biodegradable fraction. Proposals should demonstrate technological solutions overcoming inhibitory effects of the various relevant compounds. Proposals should prove the economical access to sufficient raw material to set up the new value chain and ensure the functioning/organisation of the sustainable supply chain. Proposals should pursue all possible means of industrial symbiosis and integration of actors along the whole value chain (including, when relevant, involvement of municipal authorities) and, wherever possible, make use of existing facilities. Safety, quality and purity of the products must be validated in order to meet commercial requirements. Proposals should assess market demand of the targeted products and will consider market pull related activities (e.g. standardisation, consumer perception) aimed at facilitating their market uptake. A Life Cycle Assessment should be carried out in order to evaluate

the environmental and socio-economic performance of the developed products. The leading role of relevant industrial partners is considered essential to achieve the full impact.

It is considered that proposals with a total eligible budget of up to EUR 35 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Contribute to transforming MSW from a problem into an economic opportunity.
- Improving process parameters such as yields, starting by reaching at least a 70% yield for the saccharification process.
- Reaching purity of the final products in line with EU legislation for immediate access to the market.
- Reduction of CO₂ emissions by 70% with respect to landfilling.
- Opening up new business models and creating new job opportunities in rural and urban areas.
- Contributing to realising the objectives of Biotechnology and/or other Key Enabling Technologies under Horizon 2020 and dedicated EU policy to address the development of scientific and technological know-how in biotechnology and its translation into industrial products and solutions of societal challenges.

Type of action: Innovation actions – "Flagship" actions.

3.4.6. Content of the RIA-DEMO-CSA 2015 call

This section describes the topics for which proposals will be called in this call.
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RESEARCH AND INNOVATION ACTIONS

BBI VC1.R1 - Conversion of lignin-rich streams from biorefineries

Specific challenge: Existing lignocellulose-based biorefineries generate large-quantity side streams (e.g. hemicellulose, lignin, sugar derived condensed polymers) with limited accessibility for further conversion into valuable bio-based products, with the result that parts of these streams are currently burnt for energy production. Lignin is the most abundant of them as its complex structure makes it difficult to process it. Moreover, variations in feedstock and lignocellulose processing technologies significantly influence lignin properties thus requiring flexible approaches to be applied to the various heterogeneous lignin streams. The challenge is to enable the conversion of lignin-rich residual biorefinery streams into higher added value applications with a view to improving the sustainability and cost efficiency of the whole lignocellulose-based biorefinery concept.

Scope: Develop efficient processes for the conversion of lignin-rich side streams from lignocellulosic biorefineries into biochemicals that have a higher value than their current energy application.

Processes should be adaptable to different European-relevant feedstocks. A cascading process could be envisaged in which lignin is progressively purified, depolymerised and refined to obtain different products from basic purified lignin. These products are to be used as e.g. substitute to phenol or other chemical building blocks, as a precursor for carbon fibres, functionalized lignin polymers or oligomers and monomers that could be further converted into chemicals, and solvents. A life-cycle assessment should be carried out in order to evaluate the environmental and socio-economic performance of the developed products. A credible path to move forward from the research phase towards the commercialisation of the results should be presented. Strong weight will be put on industrial leadership with view to achieve the fully exploiting of the developed processes and products. Involvement of end-users could be considered to help assure the viability of the developed concepts in the value chain.

It is considered that proposals with a total eligible budget in the range of EUR 2-5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Closing the loop by utilising under-utilised side-streams from biorefineries in order to improve resource efficiency and environmental footprint of the whole sector.
- Reaching revalorisation of the lignin fraction of lignocellulosic biomass into valuable products that go beyond the current state of the art, reaching at least a 3-fold value increase as compared to the current energy value.
- Achieving technological validation of at least three new bio-based products resulting from purified lignin.
- Contributing to the establishment of new lignin-based value chains.
- Increasing sustainability and competitiveness of end-user sectors such as chemical, transportation, aerospace, textile, energy, and construction industries.

Type of action: Research and innovation actions.

BBI VC1.R2 - Pre-treatment of lignocellulose with simultaneous removal of contaminants and separation of lignin and cellulosic fractions

Specific challenge: Pre-treatment of lignocellulosic biomass is a crucial, although often overlooked step in processing: an optimised pre-treatment can increase productivity and reduce costs of subsequent processing stages. The quality of lignocellulosic feedstock is variable, both in terms of composition (i.e. sugar/lignin content) and in terms of presence of contaminants derived from e.g. the cultivation phase, harvest, previous applications of the feedstock, etc. Currently, the removal of contaminants and the separation between lignin and cellulose fractions are performed separately, with high cost for energy intensive pre-treatments and the generation of significant amounts of waste. Simultaneous pre-treatment and removal of contaminants today only exist on small scale by cocktails of fungi and enzymes on specific feedstock.

Release of degradation products is also common in the pre-treatment phase, during the breakdown of lignin. Presence of contaminants in the input biomass has repercussions on the final product

(especially when dealing with food/feed ingredients, packaging or other consumer products). Many of such contaminants and degradation products are also known inhibitors of fermentative processes, with negative effects on the process yield and overall profitability. The challenge is to tackle these issues while significantly improving efficiency and reducing cost and energy usage. Resolving this challenge will remove a significant hurdle in enlarging the portfolio of biomass suitable for processing into feedstock.

Scope: Develop a pre-treatment process that simultaneously performs the removal of contaminants and inhibitors arising from the separation of lignin and sugar fractions yielding a contaminant-free feedstock for subsequent processes. Proposals should aim for cost-efficient solutions that are able to simultaneously break down lignin and degrade contaminants. Proposals should assess the impact of the developed processes on the environmental, social and economic performance of the whole value chain, including consumer products and demonstrating safety benefits. Efficient ways to secure and manage safety issues using hazard assessment at critical control points, feeding into the regulatory framework, need to be addressed. Other elements can include savings in terms of time, additional compounds used and energy. A key aspect to be addressed is the balance between degradation of the pollutants and inhibitory products, and maximizing the yield of fermentable sugars from biomass, without compromising the downstream process of fermentation. A life-cycle assessment should be carried out in order to evaluate the environmental and socio-economic performance of the developed technologies. A credible path to move forward from the research phase towards the commercialisation of the results should be presented. Strong weight will be put on industrial leadership to fully exploit of the developed pre-treatment processes.

It is considered that proposals with a total eligible budget in the range of EUR 2-5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Developing efficient and integrated pre-treatment processes leading to a tangible reduction of investment and operating costs over the biomass to bio-product conversion.
- Delivering fermentable sugars of suitable quality for further conversion (e.g. advanced biochemicals). The fermentable sugars must be competitive with available sugars from current markets. The pre-treatment yield of sugars should be over 80%.
- Reducing GHG emission by at least 30% over the whole value chain of the targeted products as compared to conventional ones.
- Removal of contaminants by >98%.
- Increased consumer safety thanks to improved removal of contaminants in products.
- Reduction in environmental impact thanks to lower energy consumption, lower waste generation.
- Contributing to reinforcing cooperation along the value chain from feedstock suppliers (e.g. farmers, land and forest owners) to technology providers and end-users.

- Enabling the mobilisation and conversion of lignocellulosic feedstock into cost-competitive bio-based chemicals and materials. Enabling competitiveness of relevant lignocellulosic-based biorefinery concept(s).

Type of action: Research and Innovation actions.

BBI VC1.R3 - Bio-based functional molecules for coating and surface treatment

Challenge: Substitution of fossil-based chemicals with sustainable, bio-based alternatives is particularly relevant when dealing with chemicals that pose potential environmental hazards and/or suffer from limited biodegradability. This holds for several classes of molecules, such as fluorinates and silanes, used for surface treatment in a number of applications e.g. fluid barrier in packaging, hydrophobic/oleophobic coating, surface protection and visual enhancement of printed products. The market for coating additives is a growing one, due to the desire of increasing shelf life of products, avoid permeation and in general maintain the physical and visual properties of products for a longer time. Bio-based molecules could help solving the environmental concerns of hydrophobic and barrier applications. Moreover bio-based molecules, due to the available variety in their chemical composition, represent versatile alternatives potentially suitable for custom functionalisation. However meeting the required performance in specific applications still represents a challenge.

Scope: Development of new functional molecules from lignocellulosic biomass to be used for surface treatment in a number of applications e.g. packaging, coating and printing. The molecules should have a tailored molecular structure in order to fulfil the required functional properties (e.g. hydrophobic, oleophobic, liquid/gas barrier, surface protection) and impose desired properties to modified materials and surfaces or interfaces. Proposals should include an assessment of the potential impact of the introduction of the new processes and products on the environmental, social and economic performance of the whole value chain.

It is considered that proposals with a total eligible budget between EUR 2 and 5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected Impact:

- At least 2 new functional molecules for surface treatment;
- Enhanced or equal properties for the developed molecules with respect to conventional counterparts, measured against relevant industrial standards;
- Reduction in cost of more than 10% as compared with conventional molecules;
- Enhanced sustainability in terms of CO₂ emissions, with a target of at least 20% CO₂-reduction as compared to conventional molecules.

Type of action: Research and innovation actions.

BBI VC2.R4 - Separation and extraction technologies for added value compounds from wood and forest-based residues

Specific challenge: The manufacture of various forest-derived products in different biorefinery processes depends heavily on the availability of efficient fractionation, separation and purification processes. Important research and development efforts have been dedicated to the efficient separation of the major structural organic polymers of the wood matrix: cellulose, hemicellulose and lignin. However, in view of maximising the value derived from forest biomass, mobilisation and valorisation of lower value feedstock such as bark and branches is required. Such feedstock is potentially a rich source of extractives such as oils, waxes, terpenes, tannins, steroidal compounds etc., which are currently underexploited due to the lack of efficient extraction and separation methods. The challenge is to expand the commercial exploitation of extractives beyond the low volume/high value applications currently available (e.g. as fragrance or flavour enhancers), such that market size matches their available volumes.

Scope: Development of innovative and efficient processes for the separation and conversion of extractives from wood and wood residues, exploiting the large variety of chemical compositions available for obtaining specialty chemicals and/or larger volume products. Different approaches (such as microwave extractions, supercritical fluids, enzymatic and/or fermentative processes) can be applied, with a focus on providing energy- and cost-efficient solutions. Proposals are expected to address mobilization and use of low value feedstock such as bark and branches. Proposals should assess the impact of the developed processes on the environmental, social and economic performance of the whole value chain when scaled up at commercial level.

It is considered that proposals with a total eligible budget between EUR 2 and 5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Envisioned improved economics and model character for other biorefineries as well;
- A 5 times higher value from residues of wood processing as compared to their heat value;
- At least 3 new processes for the production of specialty chemicals / bulk chemicals;
- Beneficial economic impact to forest-based sector and underpin partnerships and synergies across biorefinery related industrial sectors.

Type of action: *Research and Innovation actions.*

BBI VC2.R5 - Practices increasing effectiveness of forest management

Specific challenge: Enhancing the efficiency and effectiveness of wood mobilisation (from planting of the tree to the harvesting phase and extraction from the forest) is a prerequisite for increasing the productivity, cost-effectiveness and sustainability of the European forestry sector. Challenges include improving the efficiency of planting, harvesting and collection (which still largely rely on manual work), wood preparation and pre-processing, wood harvesting logistics, seasonal inaccessibility of wood resources (e.g. linked to soil disturbance), and assuring soil preservation.

Scope: Development of improved methods aimed at achieving higher productivity in forest operation processes such as higher production of wood and lower impact on the environment (damage to trees and ground). Proposals should consider aspects including forest regeneration and preservation of soil quality and should contribute to sustainable forest management in line with the new EU Forest Strategy COM (2013) 659. Proposals could address knowledge-based resource management, automation and mechanisation of processes, soil preparation, planting, harvesting, collection and transportation. An assessment of the environmental and socio-economic performance of the developed methods on the whole value chain should be carried out. Strong weight will be put on industrial leadership to fully exploit the developed processes

It is considered that proposals with a total eligible budget in the range of EUR 2-5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Improving efficiency in silviculture and harvesting operations.
- Improving accessibility to wood resources leading to a significant increase in productivity in forest operations over a representative period of time: a 1% annual increase in forest growth, projected on a 20 year period, would yield 22% increase with respect to the original volume, roughly equivalent to 2 years of forest growth gained.
- Increasing forest operations output while minimising environmental impacts: reducing soil disturbance, more efficiently performed thinning and/or more efficiently extracted grot (residuals).
- Reducing fuel consumption in the forest harvesting process by at least 15%.

Type of action: Research and Innovation actions.

BBI VC2.R6 - Sustainable cellulose-based materials

Specific challenge: Although market prospects of cellulose-based products in textiles, films and thermoplastics are high, their current market share is relatively small due to the environmental and cost limitations of current cellulose based processes. The need to meet tighter environmental demands and to compete with cotton and fossil based polymers calls for the development of high-cellulose content pulp, and innovative cellulose dissolution, regeneration and derivatisation processes.

Scope: Develop innovative cellulose dissolution processes and related technologies enabling the production of cellulose-based products with innovative properties. Proposals should address the processing and processability of cellulose pulp (e.g. dissolving pulp, recycled viscose, recycled cotton), into new products such as textile fibres, films, and thermoplastic materials. Developed products should be tested against conventional products, at least matching and preferably outperforming their mechanical properties in dry and wet conditions and improving environmental impact. A life-cycle assessment should be carried out in order to evaluate the environmental and socio-economic performance of the developed technologies. The feasibility of integrating the

developed technologies into existing industrial processing chains should be assessed. Strong weight will be put on industrial leadership to fully exploit the developed processes.

It is considered that proposals with a total eligible budget in the range of EUR 2-5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact

- Delivering eco-friendly and cost-competitive cellulose products leading to a significant improvement in environmental performance, cost and quality as compared to established alternatives.
- Strengthening market position of cellulose-based products by a reduction of at least 10% of investment and operating costs of newly developed cellulose-dissolving processes as compared to conventional ones.
- Achieving technological validation of at least one of the targeted cellulose-based products to be ready for demonstration.
- For proposals dealing with innovative textile fibres: improvement of the mechanical properties, targeting the performance of cotton and outperforming viscose fibres.
- Enabling the realisation of relevant competitive biorefinery concept(s).

Type of action: Research and innovation actions.

BBI VC2.R7 - Tailoring tree species to produce wood designed for industrial processes and biorefining purposes

Specific challenge: The forest sector can enhance its revenues by expanding its traditional businesses beyond the traditional cellulose value chain towards an encompassing biorefinery concept aimed at the integral use of wood components for their conversion into a variety of added-value biomaterials and green chemicals. However the chemical structures naturally occurring in wood pose important challenges when it comes to wood processing. A twofold research and innovation effort is needed to tackle not only the development of downstream technologies aimed at improving wood processing, but also the engineering and generation of wood feedstock with a chemical structure optimally designed for subsequent processing steps.

Scope: Development of tree varieties with high production rates and tailored chemical structure, that will improve the economy and sustainability of wood processing, while enhancing downstream processing into chemicals and/or new materials. Proposals should include innovative solutions for the engineering of the chemical components of wood in such a way that it facilitates wood processing and/or yield chemical structures customised for industrial needs of the growing biorefinery sector. Proposals should address the full value chain from generation of the new tree feedstock to the pre-industrial evaluation and validation of the quality and the safety of produced wood (including by-products) according to application requirements, so enhancing the value of the

developed products. A life cycle assessment should be carried out in order to evaluate the environmental and socio-economic performance of the new value chain.

Proposals should provide evidence that the new technologies could be commercially implemented in Europe within a reasonable time frame. Strong weight will be put on industrial leadership with view to achieve the full exploitation of the developed products/processes. Involvement of end-users could be considered to help assure the viability of the developed concepts in the value chain.

It is considered that proposals with a total eligible budget in the range of EUR 2-5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Novel wood properties that increase the efficiency of wood-based biorefineries and decrease the use of energy during wood processing by at least 30%.
- Increase the overall profitability of forest-based sector, tree growers and forest owners throughout Europe thanks to better valorisation of wood by-products.
- Contribution to a secure and sustainable supply of lignocellulosic biomass for European biorefineries.

Type of action: Research and Innovation actions.

BBI VC3.R8 - Increasing productivity of industrial multi-purpose agricultural crops

Specific challenge: Securing sufficient and sustainable biomass supply for both the food/feed industry and for the growing biobased market is a key challenge for the agricultural sector and also an opportunity for its further growth. Natural resources are limited and a more efficient and sustainable exploitation of land and water is required to preserve them for continued use; at the same time, the market demand for food is increasing due to growing population, as is the demand for agricultural biomass to be converted into materials and chemicals. The challenges is to achieve more with less: crops that deliver a higher and constant yield, and/or resilient crops that require less water and nutrients and/or crops that can grow on marginal lands. Another challenge is to reduce harvest and post-harvest losses.

Scope: Development of new agricultural industrial multipurpose crop varieties that are resource efficient, have high production rates and have improved processability. This includes tools and methods enabling the enhancement of productivity in agricultural crops, leading to higher and more constant yields and lowering the pressure on natural resources. Developments should include improved multipurpose crop varieties, facilitating innovative crop production techniques, while enhancing downstream processing of biomass via cascading use of biomass approach into chemicals and/or new materials. Proposals should include innovative solutions for the engineering of the crop composition in such a way that it facilitates processing and/or yield chemicals customised for industrial needs of the biorefinery sector. Proposals should take particular account of field regeneration, management of residues and preservation of soil quality and soil carbon content including respect of residue incorporation/extraction rates based on latest research of expertise.

Proposals are expected to address the full value chain from generating new crop varieties and feedstock production to pre-industrial evaluation of the crop, including by-products, in order to validate the feedstock quality according to application requirements, and to enhance the value of the developed products. Proposals should assess the impact of the developed processes on the environmental, social and economic performance of the whole value chain. Proposals should build upon the current activities of sustainable agriculture and meet the environmental conditions of the new Common Agricultural Policy. Proposals need to provide evidence that the new technologies could be commercially implemented in Europe within a reasonable time frame. Involvement of end-users could be considered in order to help assure the viability of the developed concepts in the value chain.

It is considered that proposals with a total eligible budget in the range of EUR 2-5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Contribute to giving more value to agricultural production and introducing additional sources of income for the farmers.
- Increase of the economic output of the production chain for biorefinery operators, by focusing on industrial crops with multiple applications.
- Achieve a 10% increase in crop productivity (within 4 years) on the selected value chain with respect to state of the art.
- Achieve an increase of the efficiency of nutrient uptake, water use and land regeneration, thus contributing to environmental benefits while having a positive impact on the creation of green jobs and revitalisation of rural areas.

Type of action: Research and Innovation actions.

BBI VC3.R9 - Valorisation of aquatic biomass

Specific challenge: The use of ‘blue’ biomass such as algae, microalgae and aquatic plants for high value applications such as food ingredients, polymers, feed proteins, cosmetics, pharma and nutraceuticals represents a promising means of reducing Europe’s dependence on imports (e.g. fish, vegetable oils, proteins for animal feed) and diminishing the pressure on land resources. The integrated production of other bulk products together with the targeted high value added products could increase the cost competitiveness of the biorefinery concept. Although the production of biomass from a number of cultured algae and aquatic plants has been proved at pilot scale, the challenge is to reduce the costs of the extraction and conversion processes in order to achieve cost-competitive concepts.

Scope: Development of innovative multi-step approaches for the separation of the chemical components present in aquatic biomass and their cascading conversion, maximising the valorisation of biomass components into high added value applications such as ingredients for food, polymers, feed proteins, cosmetics, chemicals, pharma, nutraceuticals. Proposals should include the

optimisation of the separation, extraction and purification processes and evaluation of the bioactive (e.g. nutritional, antimicrobial and antibiotic) properties in view of their application in the corresponding markets. A life-cycle assessment of the entire process should be performed, taking into account requirements from the addressed markets. Proposals should assess the impact of the developed processes on the environmental, social and economic performance of the whole value chain. Strong weight will be put on industrial leadership to fully exploit the developed products/processes.

It is considered that proposals with a total eligible budget in the range of EUR 2-5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Delivering a robust scientific and technological basis for substantiating strategic decisions for the industrial development of algae for high added-value products.
- Decreasing dependency on imports of vegetal and fish oil and proteins for animal feed.
- Depending on the developed cascading concept, proposals will contribute to one or several of the following impacts:
 - Technological validation of high value products from aquatic biomass for aquatic biomass.
 - Technological validation of products for the food and feed markets with high nutritional content, at least a 40% higher content in amino acid than wheat and rice and up to 30% higher than soy.
 - Technological validation of products with high digestibility (at least 50% protein assimilation) and/or high functional value (binding, gluten replacement, gel forming);

Type of action: Research and innovation actions.

BBI R10 - Innovative efficient biorefinery technologies

Specific challenge: The establishment of competitive integrated biorefineries that process biomass in a cascading approach, and that are able to continuously operate year-round is one of the key goals of the whole BBI Initiative. This requires not only the establishment of new business and cooperation models (e.g. for primary and secondary economic sector cooperation) but, very importantly, research and development investments in (1) improving technologies pioneered by existing biorefineries in order to become cost-competitive with respect to fossil counterparts (2) developing a new generation of breakthrough technologies to form the basis for tomorrow's biorefineries, (3) the enabling the combination and processing of different kinds of input biomass leading to the establishment of larger biorefineries, benefiting from scale economy. At present, most existing biorefineries are designed to process only one kind of feedstock (or at most a family of similar feedstock) with constant properties throughout the year. As a result, significant value chains are not exploited or under-exploited because of seasonal variation or unavailability of adequate quantities of sufficiently uniform feedstock at any given time of the year.

Scope: Proposals should develop innovative biorefinery technologies enabling the establishment of new efficient year-round operation biorefinery concepts and bio-based value chains through the conversion of different types of biomass feedstocks, including underutilised seasonal feedstocks. Proposals should aim to significantly increase the efficiency, yield and cost-effectiveness of technologies enabling the production of cost-competitive bio-based products in a cascading approach. Technologies might include:

- Fractionation and separation technologies to simplify the disintegration of biomass into its basic components;
- Advanced technologies to mildly extract or separate components while preserving their functionalities and minimising the degradation of other components to enable their further valorisation;
- Bio-chemical or chemo-catalytic technologies to convert bio-based components into high added value products;

Proposals should fit in a cascading concept aimed at the integral use of the feedstock. Proposals should take into account feedstock availability and flexibility throughout the year, with the goal of producing bio-products (chemicals, materials) that can be cost-competitive with fossil counterparts and/or feature new or improved properties. A life cycle oriented approach should be carried out in order to evaluate the environmental and socio-economic performances of the new concepts in comparison with their current alternatives. Strong weight will be put on industrial leadership to fully exploit the developed products/processes.

It is considered that proposals with a total eligible budget in the range of EUR 2-5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- A 20 % increase of conversion efficiency (product/ton of biomass in input) over state of the art comparable technologies.
- Integrated processes leading to products with significant higher value than the current application of the biomass.
- A 20 % improvement in resource efficiency (consumption of energy and water) over state of the art comparable technologies.
- Year round operation due to smart combination, pre-treatment and storage of feedstock.
- Achieving technological validation of one or more of the following products: new building blocks based on biomass of European origin functionalised chemicals and materials with lower environmental footprint and societal benefits valorisation of proteins from plant residues; bio-based materials (e.g. such as specialty fibres, plastics, composites and packaging solutions); new 'consumer' products based on bio-based chemicals and materials; new biodegradable, compostable or recyclable bio based products and materials for short life application.

Type of action: Research and Innovation actions.

INNOVATION ACTIONS – "DEMONSTRATION" ACTIONS

BBI VC1.D1 - Lignocellulosic feedstocks into chemical building blocks and high added value products

Specific challenge: Lignocellulosic feedstock represents an important reservoir for the production of chemical building blocks and high added value products, which are now largely based on fossil resources or on the conversion of sugars extracted from food crops. *It can be derived from many different sources such as* agricultural and agro-industrial residues, forest or forest industry residues, woody crops and residues from existing biomass conversion plants. *Their use alleviates competition with food production and* increases income opportunities, especially in the agricultural and forest sectors. Technological solutions exist at pilot scale for the conversion of lignocellulosic feedstock into chemicals and high added value products. However, further technological development in terms of improving energy consumption and yields is needed with view to optimise the environmental impact and demonstrate their cost-competitiveness.

Scope: Demonstration of the techno-economic viability of the conversion of lignocellulosic feedstock into 2nd generation sugars and lignin in a cascading approach, and further into chemical building blocks or high added value products. Proposals should address one or both of the following applications:

- (i) Di-carboxylic acids from lignocellulosic sugars and their further conversion to end-products.
- (ii) High added value products from lignocellulosic raw materials like high value fermentation products, (fine) chemicals, polymers, food additives or pharmaceuticals.

Proposals should identify the most effective feedstock/process combinations and will address, where relevant, the presence of inhibitor compounds affecting the conversion processes. Products and processes should be benchmarked against fossil based alternatives and/or conventional biomass-based products in terms of cost-competitiveness, quality and sustainability. Proposals should include activities to assure economical and sustained access to sufficient sustainable raw material to set up the new value chain. In order to meet the market requirements, the verification and validation of safety, quality and purity of end products should also be considered. Proposals will assess product demand and will consider market pull related activities (e.g. standardisation, consumers' perception) aimed at facilitating the market uptake of the developed products. A life-cycle assessment on the environmental and socio-economic performances of the developed processes and products should be carried out. The leading role of relevant industrial partners is considered essential to achieve the full impact.

It is considered that proposals with a total eligible budget of up to EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Reducing the environmental impact and CO₂ footprint with respect to traditional processes (either fossil based and/or produced from conventional feedstock).

- Products that have a 2 - 3 times higher value than current products from these raw materials.
- Demonstrating of at least 2 bio-based products, showing favourable competition with their fossil-based counterparts with respect to cost-competitiveness, sustainability and performance.
- Improving process parameters (e.g. conversion, yield) as compared to currently available processes.

Type of action: Innovation actions – "Demonstration" actions.

BBI VC2.D2 - Innovative cellulose-based composite packaging solutions

Specific challenge: Cellulose-based packaging composite materials, consisting of new compositions of cellulose fibres and biopolymers, could be a viable fully bio-based alternative for fossil-based mouldable plastics (e.g. PET, PP, PE and EPS) meeting the high demands of the packaging market. Cellulose-based packaging products have already been successfully produced for many years; however, in order to enlarge their market potential to specific higher demanding applications, such as in food and electronics packaging, new solutions are needed to improve their mechanical properties and address contaminant control (dust, bacteria and other impurities). An additional challenge is to combine these requirements with meeting the specific features required for aesthetic packaging (e.g. surface finishing, printability and durability).

Scope: Demonstration of the techno-economic viability of a cellulose-based composite packaging enabling a reduction in weight and providing tailored shaped-to-purpose packages for various goods. Mechanical and functional properties (e.g. wet resistance) must be assessed against competing fossil-based products and relevant regulations, in particular when considering packaging for food products. Proposals should include activities to assure economical and sustainable access to sufficient raw material to set up the new value chain. Projects should produce a sufficient amount of composite packaging units in order to validate commercial viability of the process. Proposals will assess market demand and will address the validation and verification of the end products in terms of safety, quality and customer satisfaction. The integration of the developed approaches into a biomass cascading use should be demonstrated. Proposal will consider market pull related activities (e.g. standardisation, consumers' perception) aimed at facilitating the market uptake of the developed products. Moreover, a life-cycle assessment should be carried out in order to evaluate the environmental and socio-economic performance of the developed products. The leading role of relevant industrial partners is considered essential to achieve the full impact.

It is considered that proposals with a total eligible budget of up to EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Delivering a safe 100% bio-based and biodegradable product. Products are expected to be at least 10% lighter than the fossil alternatives at the same functional properties and show a radically improved environmental footprint over the product lifecycle;
- More than 50% CO₂ emission reduction compared to a competing fossil-based packaging material;

- Opening up new applications and markets and increase the competitiveness of the European pulp, board and paper making industries, additionally showing high potential in terms of job creation in rural areas, moreover showing high potential for replicability in Europe.

Type of action: Innovation actions – "Demonstration" actions.

BBI VC3.D3 - Production of bio-based elastomers from Europe-grown feedstock

Specific challenge: Bio-based elastomers already represent a considerable market share, especially considering applications where they cannot be fully substituted by synthetic counterparts (e.g. rubber and latex) due to their superior mechanical properties. However, currently available feedstock, such as Hevea Brasiliensis (rubber tree), is mainly, if not only, of non-European origin and often accompanied by debatable sustainability issues related to deforestation and conflict with food crops. In order to reduce Europe's dependence on imports, it is necessary to explore alternative bio-based sources and crops able to build fully European value chains for the production of bio-based elastomers.

Scope: Demonstrate the techno-economic viability of new Europe-based value chains for the production of bio-based elastomers, e.g. rubber, from alternative feedstock and/or crops. Proposals should take into account the whole chain from agronomics (i.e. selection and growth of suitable EU-based crops) to conversion to the final product, via innovative cascading processes, which overcome known limitations of currently available extraction processes and enabling valorisation of all plant fractions. The envisaged process should provide the material in the suitable form for its final application. A life-cycle assessment should be carried out taking into account the valorisation of the biomass residues. Safety, quality and purity of the end products should be verified and validated. Produced materials should be tested regarding their mechanical performances following relevant industrial standards. Proposals will assess product demand and will consider market pull related activities (e.g. standardisation, consumers' perception) aimed at facilitating the market uptake of the developed products. Proposals should demonstrate access to sufficient (European) biomass when the technology is scaled-up to commercial scale. The leading role of relevant industrial partners is considered essential to achieve the full impact.

It is considered that proposals with a total eligible budget of up to EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Demonstrate economic sustainability in view of future developments of large size plants.
- Demonstrate cultivation of suitable feedstock with low or zero Indirect Land Use Change (ILUC), addressing where applicable the issue of remediation of marginal land, with positive impact on the creation of green jobs and revitalisation of rural areas.
- Mechanical and functional properties of the elastomer will be comparable (90% or better) in comparison to conventional counterparts, and preferably with additional functionalities for new market segments.

- Reduced environmental impact of the extraction process, in particular regarding use of water and treatment of effluents.
- Improved separation and valorisation of other fractions of the crop e.g. lignocellulosic and/or resins;
- Process yield of at least 5 kg elastomer from 100 kg of raw material input.

Type of action: Innovation actions – "Demonstration" actions.

BBI VC3.D4 - High purity bio-based intermediates and end products from vegetable oils and fats

Specific challenge: Vegetable oils and fats represent a promising feedstock for the production of added value products. They can be used as a substrate for biopolymers, both for replacing their petrochemical counterpart, but also to deliver improved or completely new functionalities, opening up the possibility of new applications and markets. In addition, fatty acids derived from vegetable oils are used in high demanding applications such as cosmetics and nutraceuticals. However, the challenge is posed by the high temperature conversions processes currently used which cause the presence of undesired impurities - that can only be removed by costly purification steps, and which affect the cold stability of products. Also the lack of high efficiency purification and separation processes enabling an integral recovery of products is hinders the cost-efficiency and sustainability of the whole value chain.

Scope: Demonstration of techno-economically viable processes for the conversion of vegetable oils and fats in a cascading approach into one or more of the following products segments:

- (i) Chemical building blocks using olefin chemistry for the production of tailor made biopolymers for applications such as surfactants, detergents, cosmetics, paints, lubricants, resins and high-value plastics;
- (ii) High purity intermediates and end products, used in high demanding applications such as cosmetics and nutraceuticals with improved nutritional properties, through the use of innovative and reproducible conversion technologies (e.g. biotechnological or thermal) coupled with high efficiency separation and purification steps.

Proposals should include activities to ensure economical and sustainable access to optimal raw material sufficient to set up the new value chain. Proposals should aim to maximise the yield and purity of the developed chemical building blocks, intermediates and end-products. Safety, quality and purity of the developed products should be verified and validated. Proposal will assess products demand and will consider market pull related activities (e.g. standardisation, consumers' perception) aimed at facilitating the market uptake of the developed products. A life-cycle assessment should be carried out in order to evaluate the environmental and socio-economic performance of the developed products, including land use. Proposals are expected to target suitable scale for demonstration and to show a credible path for the subsequent scale up into a first of its kind commercial process. Proposals should seek synergies with existing EU funded projects on oil crops. The leading role of relevant industrial partners is considered essential to achieve the full impact.

It is considered that proposals with a total eligible budget of up to EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Demonstration of at least 3 new fatty acids and oil based products.
- Demonstrate new processes along the whole value chain with the following advantages with respect to existing ones:
 - Cost reduction and increased process efficiency for the products in the range of 50%.
 - Reduction of more than 50% in energy consumption.
 - Reduction of 15% in water consumption.
 - Reduction of unwanted by-products or pollutants in intermediates to a fraction below 5% in weight.

Type of action: Innovation actions – "Demonstration" actions.

BBI VC3.D5 - Valorisation of agricultural residues and side streams from the agro-food industry

Specific challenge: Agricultural residues and side streams from the agro-food industry are currently underutilised: agricultural residues such as leaves, weeds and grass are often left to rot on the land, releasing nitrogen and phosphorus into the soil, of which only a small fraction is taken up by new plants. At the same time, side streams of fruit, vegetables and crop processing industries are commonly used as feed or fertilisers, while having significant opportunities for further valorisation in new applications and markets. Several technologies exist, at different level of maturity, to fractionate and convert the raw materials into new products: however, building industrially feasible and efficient value chains still requires to overcome the following challenges: (1) In order to be attractive for farmers, the related processes need to be relatively simple so they can be readily deployed locally at farm level or small industrial scale (2) Since many of the higher added value compounds in these residues are present in low amounts, their cost-effective exploitation requires the development of cascading processes able to fully valorise all components of the side streams (3) To achieve new functionalities and application markets for these products in new value chains.

Scope: Demonstrate the techno-economic viability of the valorisation of agricultural residues or side streams of the agro-food industry into valuable bio-products. Proposals should demonstrate an integrated cascading concept including pre-treatment, extraction and separation technologies, as well as chemical and/or biochemical conversion, modification technologies and downstream processing where applicable. Proposals should include measures to achieve operation throughout the whole year, e.g. processes able to handle multiple feedstock types at different times of the year. The feasibility of integrating the proposed concept into existing industrial processing chains should also be considered where applicable. A life-cycle assessment should be carried out in order to evaluate safety, as well as the environmental and socio-economic performances of the developed products. Safety, quality, functionality and purity of the end products should meet legal and commercial requirements. Proposals should include activities to assure economical and sustained access to sufficient raw material to set up the new value chain and proper management of residues and concerns about preservation of soil quality and soil carbon content including respect of residue

incorporation/extraction rates based on latest research or expertise. Involvement of end-users is required to ensure the viability of the developed concepts in the value chain. Proposal will assess market demand for the developed products and will consider market pull related activities (e.g. standardisation, consumers' perception) aimed at facilitating the market uptake of the developed products. The leading role of relevant industrial partners is considered essential to achieve the full impact.

It is considered that proposals with a total eligible budget of up to EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact

- Demonstration of a complete new value chain leading to higher added value products for new markets.
- Improvement of environmental performance and cost efficiency of resulting products as compared to state of the art benchmarks.
- Demonstration of an integrated process with more than 40% of the raw material to be valorised into high added value additives.
- Demonstration of products with a 2-5 times higher value than the current applications of the raw material, leading to a significantly higher total valorisation of the agricultural crops so contributing to rural development and employment in rural areas.

Type of action: Innovation actions – "Demonstration" actions.

BBI VC4.D6 - Organic acids from Municipal Solid Waste (MSW)

Specific challenge: The biodegradable fraction of MSW, mainly consisting of food residues and other organic materials, could be an economical and sustainable feedstock for biorefining purposes, while at present posing environmental challenges. The potential for exploiting this resource for conversion into chemical building blocks requires the demonstration of new technologies to arrive at novel viable solutions in terms of product's cost and quality. Organic acids are considered a promising product segment, which requires further investments with view to achieve their cost-effective production. In particular the following challenges need to be addressed: (1) maximising the use of biodegradable resources by applying an efficient cascaded conversion (2) improving biotechnology-based processes yield and concentration of organic acids in reaction mixtures (3) an additional challenge for unsorted MSW, lies in the efficient separation of the biodegradable fraction of unsorted MSW.

Scope: Demonstration of the techno-economic viability of the conversion of the biodegradable fraction of MSW into organic acids in a cascading concept, leading to high conversion rates and high recovery of the biodegradable part along the whole waste value chain. Proposals dealing with unsorted MSW could include the demonstration of an efficient sorting and separation technology for the biodegradable fraction of MSW achieving also a sufficient cleanliness of the non-biodegradable by-products enabling further processing and recycling. Proposals will assess product demand and will consider market pull related activities (e.g. standardisation, consumers' perception) aimed at

facilitating the market uptake of the developed products. A Life Cycle Analysis should be carried out in order to evaluate the environmental and socio-economic performance of the developed process. Proposals should assure economical and sustainable access to sufficient raw material to set up the new value chain. The leading role of relevant industrial partners is considered essential to achieve the full impact.

It is considered that proposals with a total eligible budget of up to EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact

- Achieving a yield in the range of 150 – 200 kg of organic acids per ton of organic waste.
- For proposals dealing with unsorted MSW: achieving a 90% separation rate of biodegradable fraction from unsorted MSW leading to reduced need for landfill or incineration, and valorisation of waste.
- Contributing to realising the objectives of Key Enabling Biotechnology under Horizon 2020 and dedicated EU policy in so far as to addressing the development of scientific and technological know-how in biotechnology and its translation into industrial products and solutions of societal challenges.

Type of action: Innovation actions – "Demonstration" actions

BBI.D7 - Overcoming low product yields from fermentation processes

Specific challenge: Fermentation processes have showed their efficiency for the production of a wide range of industrial products such as alcohols, acids, proteins, amino acids, and specialty carbohydrates. Although enabling milder processing conditions and the production of innovative molecules, their industrial uptake is hindered by the fact that actual yields at industrial scale are normally much lower than theoretical ones. Beyond strain capacities, industrial fermentation yields are strongly limited by factors like strain inhibitors (from upstream or from the fermentation), process set-up (including downstream processing of the produced molecules) and scale of the operations. Overcoming limitation of industrial process' yields is essential to improve the competitiveness of the processes and the target products, in particular for high added value products resulting from complex metabolic pathways.

Scope: Demonstration of the techno-economic viability of fermentation processes by showing a significant increase of yields for a specific molecule or categories of molecules. Proposals should address the specific limiting factors of the considered targeted value chain: renewable feedstock, microorganism, and product. Proposals will address the integration of the fermentation process with the subsequent downstream step and will consider process intensification strategies such as in-situ product recovery, strain recycling or continuous fermentation. Proposals could consider the demonstration of downstream processing (purification technologies) if required in view of the substance produced. A Life Cycle Analysis should be carried out in order to evaluate the environmental and socio-economic performance of the developed process. Proposal will assess products demand and will consider market pull related activities (e.g. standardisation, consumers'

perception) aimed at facilitating the market uptake of the developed products. The leading role of relevant industrial partners is considered essential to achieve the full impact.

It is considered that proposals with a total eligible budget of up to EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected Impact

- Higher process yields of at least 20% compared to the state of the art;
- Cost reduction of at least 15 % compared to conventional down-stream processing of the fermentation broth;
- Increasing the overall productivity will further lead to more economically feasible processes proved in demonstration scale.
- Contributing to realising the objectives of Key Enabling Biotechnology under Horizon 2020 and dedicated EU policy in so far as to addressing the development of scientific and technological know-how in biotechnology and its translation into industrial products and solutions of societal challenges.

Type of action: Innovation actions – "Demonstration" actions.

COORDINATION AND SUPPORT ACTIONS

BBI.S1 - Standards and regulations

Specific challenge: Existing bio-based industries and value chains have emerged often independently from each other. As a consequence, each has its own terminology in describing process parameters and properties of raw materials and products. This disparity in terminology and in standards hampers the integration of actors across sectors and hence the creation of new value chains. In addition, in spite of progress made by the European Committee for Standardisation (CEN) in the development of a coherent and harmonised standardisation frame for bio-based products, there is still a need to spread the use of the developed standards with a view to capitalise on their market pull potential. This calls for cooperation on the international level, especially with industrialised countries, e.g. by exchange of Best Practices and experiences in order to reach more coherent approach to bio-based products globally. Regulations governing the use of biomass in the various application sectors differ among the sectors and between the EU and the national levels. This may deter industries from investing in new facilities and even in research and innovation towards new products and applications. The specific challenge is twofold:

1. To boost the use of instruments, in particular common standards, reducing barriers to trade in bio-based products among value chains and across the EU and hence expand their market potential.

2. To address regulatory hurdles across sectors hindering investments into existing and new value chains, products and applications as well as the establishment of a level playing field for bio-based products.

Scope: Proposals should address the following elements:

- An evaluation of existing standards and regulations across the sectors and value chains, in order to identify conflicts and barriers to growth and to propose simple and applicable alternatives that facilitate investments in new value chains and products and increase the market uptake of bio-based products and processes.
- Analysis of EU, national and regional legislation, to identify legislative barriers that hamper integration of actors across sectors and value chains in their efforts to establish new value chains utilising biomass in a cascaded manner. Special attention should be given to legislation governing the industrial use of biomass, for example waste legislation. The analysis should also identify Best Practices in removing legislative barriers in the process towards a bioeconomy.
- Supporting the CEN work (TC411 and other Technical Committees) to optimise the industrial applicability and use of the developed standards in order to further specify bio-based products characteristics and communication thereof for the various application sectors. These will be of significant help in B2B and B2C communication.
- Build on and coordinate with other, on-going projects that address the same topic of standards and legislation, in particular those of Horizon 2020's Societal Challenge 2: Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy.
- Address needed regulations updates to reflect relevant new technological developments.

It is considered that proposals with a total eligible budget of up to EUR 1 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Contribute to more coherent policy environment, better interrelations between regional, national, EU and global bioeconomy policies.
- Contribute to the removal of barriers to investments to grow towards a bioeconomy, for example link to waste legislation.
- Specific proposals to amend existing regulations or for new regulations to promote the factual cooperation in joint projects by actors across sectors and value chains.
- Concrete support of CEN TC411 to improve horizontal aspects for better integration across boundaries.
- New standards providing increased commonality between different bio-based industrial sectors
- Commonly agreed vocabulary throughout value chains, from feedstock suppliers to biorefining to downstream actors in the application sectors.
- Increased use of standards and labels with positive long-term effects on the overall development of the European bio-based products market.

Type of action: Coordination and Support Action.

BBI.S2 - Communication and awareness

Specific challenge: Enhancing the awareness of the broad public on bio-based products and applications and their benefits is essential for the public acceptance and the success of a bioeconomy. This requires a comprehensive and continuing communication programme with 'science-based' facts and figures and well-formulated key messages, which address capabilities and benefits as well as risk management of (new) bio-based products. The specific challenge is to communicate at the right moments, with the appropriate key messages on what bio-based products are and can be used for, their benefits for man and environment and the role of the bio-based industries, while also addressing the concerns of the society. This communication programme needs to closely cooperate with communications programmes within H2020 on bio-based products and to Regional activities addressing the same to achieve synergy.

Scope: Develop well-formulated, science-based facts and figures on bio-based products, key messages on benefits and risk management, addressing societal concerns. Develop case studies on practical solutions for end-users and involve organisations representing the society at large. A communication programme utilising the appropriate key messages for the target audiences should also include a feedback loop to incorporate citizens reactions and for continuous improvement of the programme. Other key messages should include the benefits of a bioeconomy, and the contributions the bio-based industries bring to communities at large in terms of jobs and economic growth, of welfare and wealth. Proposals should address the following elements:

- Case studies on specific practical solutions for end-consumers that cater to societal needs or concerns.
- Consultations with the involved stakeholders in order to ensure that the developed 'common language' for communicating across value chains is meaningful and will be accepted by the broader stakeholders' communities.
- Produce tailored communication tools, including workshops, conferences and exhibitions for the respective target audiences to maximise outreach and facilitate debate.
- Carry out market surveys to measure progress in consumers' engagement, market-uptake of bio-based products, public acceptance of the socio-economic and environmental benefits of bio-based industries. Survey results should be used to adapt priorities and communication key messages.
- Increase public confidence by providing clear information on the performance, (comparative) functionality and end-of-life options of bio-based products.
- Develop together with societal and research organisations and in cooperation with educational organisations teaching materials for use in educational systems at various levels (primary, secondary, vocational, university) across the EU.
- Explore possibilities for synergy with regional activities and EU initiatives (e.g. European Innovation Partnerships) that address similar needs.

- Build on and coordinate with ongoing Horizon 2020 projects dealing with communication and public consultation in the field of bio-based products a communication programme to overcome the lack of information on bio-based products and to mobilise engagement and raise awareness among citizens and various stakeholder groups.

It is considered that proposals with a total eligible budget of up to EUR 1 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another budget.

Expected impact:

- Measured increase of societal confidence related to (new) bio-based products and bio-based industries.
- Measured increase of awareness and acceptance of bio-based products by society.
- Increased engagement by end-consumers in a bioeconomy.

Type of action: Coordination and Support Action.

3.5. CALLS 2015 MANAGEMENT

3.5.1 Conditions for the 2015 calls

3.5.1.1 Conditions for the Flagship 2015 call

Call identifier: H2020-BBI-JTI-2015-01

Publication date: 19-05-2015

Deadline: 15-09-2015 17:00:00 (Brussels local time) - (single stage call)

Indicative budget: 100 Million Euros⁶

Estimated value of the in kind contributions by the members other than the Union or their constituent entities (BIC): Minimum 40 Million Euros

Topics called	Type of action	Indicative budget (million EUR)
BBI VC1.F1 - From lignocellulosic feedstock to advanced bio-based chemicals, materials or ethanol	Innovation Actions - "Flagship" actions	100
BBI VC2.F2 - Valorisation of cellulose into new added value products	Innovation Actions - "Flagship" actions	
BBI VC4.F3 - Innovative processes for sugar recovery and conversion from Municipal Solid Waste	Innovation Actions - "Flagship" actions	

⁶ This figure refers to the EU funding only.

(MSW)		
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- indicative timetable for the evaluation and grant agreement

Information on the outcome of the evaluation	Indicative date for the signing of grant agreements
Maximum 5 months from the final date for submission	Maximum 8 months from the final date for submission

3.5.1.2 Conditions for the RIA-DEMO-CSA 2015 call

Call identifier: H2020-BBI-JTI-2015-02

Publication date: 25-08-2015⁷

Deadline: 03-12-2015 17:00:00 (Brussels local time)⁸ - (single stage call)

Indicative budget: 106 Million Euros^{9 10}

Estimated value of the in kind contributions by the members other than the Union or their constituent entities (BIC): Minimum 65 Million Euros

Topics called	Indicative budget (million EUR)
BBI.VC1.R1 - Conversion of lignin-rich streams from biorefineries	28
BBI.VC1.R2 - Pre-treatment of lignocellulose with simultaneous removal of contaminants and separation of lignin and cellulosic fractions	
BBI.VC1.R3 – Bio-based functional molecules for coating and surface treatment	
BBI.VC1.R4 – Separation and extraction technologies for added value compounds from wood and forest-based residues	
BBI.VC2.R5 - Practices increasing effectiveness of forest management	
BBI.VC2.R6 - Sustainable cellulose based materials	
BBI.VC2.R7 - Tailoring tree species to produce wood designed for industrial processes	

⁷ The BBI JU Executive Director may decide to open the call up to one month prior to or after the envisaged date of opening.

⁸ The BBI JU Executive Director may delay this deadline by up to two months.

⁹ In case the budget of a given line cannot be consumed (totally or partially) the corresponding budget will be allocated to the topics under the other budget lines

¹⁰ This figure refers to the EU funding only.

and biorefining purposes	
BBI.VC3.R8 - Increasing productivity of industrial multi-purpose agricultural crops	
BBI.VC3.R9 - Valorisation of aquatic biomass	
BBI.R10 - Innovative efficient biorefinery technologies	12
BBI.VC1.D1 - Lignocellulosic feedstock into chemical building blocks and high added value products	64
BBI.VC2.D2 - Innovative cellulose-based composite packaging solutions	
BBI.VC3.D3 - Production of bio-based elastomers from Europe-grown feedstock	
BBI.VC3.D4 - High purity bio-based intermediates and end products from vegetable oils and fats	
BBI.VC3.D5 - Valorisation of agricultural residues and side streams from the agro-food industry	
BBI.VC4.D6 - Organic acids from Municipal Solid Waste	
BBI.D7 - Overcoming low product yields from fermentation processes	
BBI.S1 - Standards and regulations	2
BBI.S2 - Communication and awareness	

- indicative timetable for the evaluation and grant agreement

Information on the outcome of the evaluation	Indicative date for the signing of grant agreements
March 2016 (Maximum 5 months from the final date for submission)	July 2016 (Maximum 8 months from the final date for submission)

3.5.2. List of countries and applicable rules for funding

Part A of the General Annexes¹¹ to the Horizon 2020 Work Programme shall apply mutatis mutandis for the actions covered by this Work Plan with the following derogation:

Coordination and Support actions (CSA) and Research and Innovation	By way of derogation from Article 10(1) of Regulation (EU) No 1290/2013, with regard to the Bio-Based Industries Joint Undertaking only the following participants shall be eligible for funding from the Bio-Based Industries Joint Undertaking for actions in the area of bio-based industries other than
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¹¹http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-ga_en.pdf

Actions (RIA)	innovation actions: (a) small and medium-sized enterprises; (b) secondary and higher education establishments; (c) non-profit legal entities, including those carrying out research or technological development as one of their main objectives; (d) the Joint Research Centre; (e) international European interest organisations.
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3.5.3 Admissibility conditions for grant proposals, and related requirements

Part B of the General Annexes to the Horizon 2020 Work Programme shall apply for the actions covered by this Work Plan.

3.5.4. Eligibility criteria

Part C of the General Annexes to the Horizon 2020 Work Programme shall apply for the actions covered by this Work Plan.

3.5.5. Types of action: specific provisions and funding rates

Part D of the General Annexes to the Horizon 2020 Work Programme shall apply for the actions (i.e. Coordination and Support Actions, Research and Innovation actions and Innovation Actions) covered by this Work Plan with the following additions:

3.5.5.1. Research and innovation actions

R&I actions aim to fill the technological gaps within specific value chains. The impact for the whole value chain must be clearly shown.

3.5.5.2. Innovation actions

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

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.

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. 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, being it a new installation or a substantial modification of an existing facility, or reconversion of old or abandoned industrial facilities. 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.

3.5.5.3 Coordination and support actions

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

3.5.6. Technology readiness levels (TRL)

Part G of the General Annexes to the Horizon 2020 Work Programme shall apply for the actions covered by this Work Plan.

3.5.7. Evaluation

Part H of the General Annexes to the Horizon 2020 Work Programme shall apply for the actions covered by this Work Plan:

- with the following derogation:

The evaluation criteria are applied as follows:

Type of action	Excellence	Impact	Quality and efficiency of the implementation
Coordination and Support actions	<p>Clarity and pertinence of the objectives;</p> <p>Credibility of the proposed approach;</p> <p>Soundness of the concept;</p> <p>Quality of the proposed coordination and/or support measures;</p>	<p>The expected impacts listed in the BBI-JU annual Work Plan under the relevant topic;</p> <p>Effectiveness of the proposed measures to exploit and disseminate the project results, to communicate the project and to manage research data, where relevant</p>	<p>Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources;</p> <p>Complementarity of the participants within the consortium (if relevant)</p> <p>Appropriateness of the management structures and procedures, including risk and innovation management</p>
Research and Innovation actions	<p>Clarity and pertinence of the objectives;</p> <p>Credibility of the proposed approach;</p> <p>Soundness of the concept, including trans-disciplinary considerations, where relevant;</p>	<p>The expected impacts listed in the BBI-JU annual Work Plan under the relevant topic;</p> <p>Enhancing innovation capacity and integration of new knowledge;</p> <p>Strengthening the competitiveness and growth of companies</p>	<p>Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources;</p> <p>Complementarity of the participants within the consortium;</p> <p>Appropriateness of the management structures</p>

	<p>Extent that proposed work is ambitious, has innovation potential, and is beyond the state of the art (e.g. ground-breaking objectives, novel concepts and approaches);</p>	<p>by developing innovations meeting the needs of European and global markets and, where relevant, by delivering such innovations to the market;</p> <p>Any other environmental and socially important impacts (not already covered above)</p> <p>Effectiveness of the proposed measures to exploit and disseminate the project results (including IPR management), to communicate the project and to manage research data, where relevant</p> <p>Extent to which the proposed consortium contribution will help maximising the impact of the action</p>	<p>and procedures, including risk and innovation management.</p>
Innovation actions	<p>Clarity and pertinence of the objectives;</p> <p>Credibility of the proposed approach;</p> <p>Soundness of the concept, including trans-disciplinary considerations, where relevant;</p>	<p>The expected impacts listed in the BBI-JU annual Work Plan under the relevant topic;</p> <p>Enhancing innovation capacity and integration of new knowledge;</p> <p>Strengthening the competitiveness and growth of companies</p>	<p>Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources;</p> <p>Complementarity of the participants within the consortium;</p> <p>Appropriateness of the management structures</p>

	<p>Coverage of the value chain (raw materials, equipment and technology suppliers and end-users);</p> <p>Extent that proposed work is ambitious, has innovation potential, and is beyond the state of the art (e.g. ground-breaking objectives, novel concepts and approaches);</p>	<p>by developing innovations meeting the needs of European and global markets; and, where relevant, by delivering such innovations to the markets;</p> <p>Any other environmental and socially important impacts (not already covered above)</p> <p>Effectiveness of the proposed measures to exploit and disseminate the project results (including IPR management), to communicate the project and to manage research data, where relevant</p> <p>Extent to which consortium contribution, including additional investments, will help maximising the impact of the action</p>	<p>and procedures, including risk and innovation management.</p> <p>Soundness of the business case and business plan</p> <p>Readiness of the technology for the implementation of the pilot phase, demonstration or flagship¹²;</p>
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Unless otherwise specified in the call conditions:

(a) Evaluation scores will be awarded for the criteria, and not for the different aspects listed in the table of Part H of the General Annexes to the Horizon 2020 Work Programme. For full proposals, each criterion will be scored out of 5. The threshold for "excellence" and "implementation" criteria will be 3, whereas for the "impact"

¹² Applicants should demonstrate the readiness of the technology for the implementation of the pilot phase. In particular, for flagships applicants must demonstrate that by the time of the submission of their application they have been operating relative demonstration scale plants at a significant production capacity (justification shall be provided in the proposal).

criterion the threshold will be 4. The overall threshold, applying to the sum of the three individual scores, will be 11.

(b) For Innovation Actions, to determine the ranking, the score for the criterion "impact" will be given a weight of 1.5.

- with the following addition:

Applicants can provide during the electronic proposal submission up to three names of persons or organisations that should not act as an evaluator in the evaluation of their proposal for potential competitive reasons.

Only for the Flagship 2015 call (H2020-BBI-JTI-2015-01): As part of the panel review, the BBI-JU may organise hearings with applicants of proposals with consensus scores above the individual and overall thresholds, and identical overall score.

3.5.8. Budget flexibility

Part I of the General Annexes to the Horizon 2020 Work Programme shall apply for the actions covered by this Work Plan.

3.5.9. Financial support to third parties

Part K of the General Annexes to the Horizon 2020 Work Programme shall apply for the actions covered by this Work Plan.

3.5.10. Consortium agreement

The legal entities wishing to participate in a project shall form a consortium and appoint one of its members to act as its coordinator. They will conclude a Consortium agreement among themselves prior to the signature of the Grant agreement.

4. HORIZONTAL AND SUPPORT ACTIVITIES

4.1. POLICY AND COMMUNICATION

The main objective of policy and communication is to ensure political and public awareness, ongoing projects and overall activities of the BBI JU, in order to gain acceptance and support from various audiences at European and national level.

For that reason, the role of the stakeholders will be essential, especially the State Representatives Group, as interface towards Member States, national and regional policies and programmes. In order to achieve these objectives, a communication strategy, including a short and long-term plan for the BBI JU, will include specific actions in order to ensure outreach to both stakeholders and public.

For that reason, it will be important to:

- Raise awareness of the BBI among key stakeholders across Europe especially in those Countries where participation in the bio-based field is still low. This objective will require work meetings and site visits in targeted regions as well as an established network among the European regions through the European Regions Research and Innovation Network, the Committee of Regions and policy makers.
- Promote stakeholders' engagement along and across the value chains in order to facilitate cooperation and knowledge exchange. This objective will require the organization of fora, conferences on specific topics of the value chains as well as the use of a partnering platform for internal information flow.
- Promote BBI JU within the EU Institutional arena. This objective consists of gaining political support for BBI from the EU institutions and EU Member States through the promotion of BBI JU, its objectives and achievements. Target audience for this objective includes the European Parliament and/or the Council and Policy makers in EU Member States. This objective will require the organization of events inside the European Parliament, the participation in visibility events such as exhibitions, Open Days, publications/ presentations of key achievements.
- Establish and develop a media network of press and media contacts in order to achieve considerable visibility in both specialized and general media. This network could be useful for producing real-time press releases and specific articles for publication.

- Pro-actively publish communication material in regards to external events, meetings, etc. related to BBI. A broad dissemination of factsheets, leaflets, etc. will enhance the visibility of BBI towards other stakeholders, including the general public.
- Mobilise applicants for BBI Calls across Europe. This objective aims at expanding the population of applicants for future BBI calls. In this context particular attention will be paid to facilitate networking among potential applicants, for instance by improving the BBI Partnering Portal tool as well as by attracting multiple participants especially from Countries with low participation.
- Manage the website in order to stimulate the public interaction on key issues and improve public awareness on BBI activities.

The BBI will leverage the following main channels in order to reach its goals:

- Both internal and external events (Conferences and Forums)
- Website
- Partnering Platform
- Newsletter
- Media (articles etc)
- Publications of factsheets, leaflets
- Info Day

4.2. OTHER SUPPORT ACTIVITIES

BBI JU's operations in 2015 will be focused on:

- concluding grant agreements following the evaluation of the 2014 Call for proposals;
- recruiting and training the first and second waves of staff members;
- publishing the second call for proposals;
- drafting the reference documents;
- establishing the accounting system and the necessary IT tools;
- putting in place the internal control framework.

4.3. IT TOOLS

For the 2015 call for proposals, the Commission H2020 IT systems will be used for the publication of the call, as well as for the submission, evaluation and negotiation of proposals.

4.4. ACCOUNTING SYSTEM – ACCOUNTING OFFICER

The European Commission's Accrual Based Accounting system (ABAC) will be used for accounting purposes. The accounting system will be put in place with the assistance of DG BUDGET. A formal request to DG BUDGET was made in this context. The setting-up of the BBI legal entity in ABAC is scheduled to be in place by Q3 2015.

Furthermore, the specific Financial Rules, adopted by the BBI JU Governing Board on 27 June 2014 and amended on 9 December 2014, define powers and responsibility of the BBI JU Accounting Officer, making explicit reference to the possibility that this function could be attributed to the EU Commission Accounting Officer.

5. PROGRAMME REPORTING AND CONTROL

5.1. ANNUAL ACTIVITY REPORT

The Annual Activity Report (AAR) will present the progress made by the BBI JU in each calendar year, in particular in relation to the Annual Work Plan for that year.

It will include information on the performed activities, the costs and the contribution of the BBI JU for any individual project, the participation of SMEs and any other activities during the previous year, with the corresponding expenditure.

The first AAR, together with the annual accounts and balance sheets, will be presented in 2015 to the Governing Board by the Interim Executive Director. Once approved by the Governing Board, it will be made public.

5.2. MANAGEMENT CONTROL AND INTERNAL CONTROL PROCEDURES

The BBI JU and its bodies shall avoid any conflict of interest in the implementation of the activities.

According to Article 26 of the Financial Rules, the internal audit function shall be performed by the Commission's internal auditor. The internal auditor shall advise the BBI JU on dealing with risks, by issuing independent opinions on the quality of management and control systems and by issuing recommendations for improving the conditions of implementation of operations and promoting sound financial management.

The BBI JU shall protect the financial interests of the members and implement anti-fraud measures. In particular, the BBI JU shall ensure that the financial interests of its members are adequately protected by carrying out or commissioning appropriate internal and external controls.

Furthermore, the Internal Control Standards from the Commission will be adapted for the purpose of the BBI JU and a Manual of Procedures will be drafted.

5.3. RISK MANAGEMENT BBI JU ANNUAL WORK PLAN 2015

The table below indicates the main risks associated with the programme activities and the financial administration of the JU, as well as the corresponding risk mitigation actions.

Process concerned	Risk Description	Mitigation action
Programme management	Conflicts of priorities may happen within industrial partners, or they may change their strategy.	Early warning capability through regular meetings and alert at Governing Board level. Propose re-orientations when needed and possible.
Programme management	Public and private partners may not agree on BBI priorities	Early warning capability through regular meetings. Alert at Governing Board level. Close collaboration between EC and BIC at every step of the Work Plan preparation.
Programme management	The BBI WP2015 do not reach sufficient level of innovation beyond the state of art	Adequate definition of topics in the Work Plan. The template for proposals has a dedicated chapter on the advancement beyond the state of art.
Programme management	The BBI WP2015 do not reach sufficient level of impact	Adequate definition of the impact section of topics in the WP, referring to the BBI strategic objectives
Call/Programme management	System for the Submission and evaluation of proposals (SEP) underperforms	Extensive testing before the publication of the call, including definition and testing of different scenarios and back-up solutions.
Call/Programme management	Taking into account the specificities of the BBI-JU calls and the expected higher number of proposals, there is a risk that an insufficient number of suitable evaluators is available in the H2020 experts database.	Proactive and timely, external communication (e.g. BBI and BIC websites, NCPs...) to promote the registration of experts with appropriate expertise in the H2020 database
Call/Programme management	Low response in RIA actions	Work Plan includes topics which are of interest to wider groups of stakeholders..

Call/Programme management	Low participation of industrial partners in RIA actions	Better communication and partnering events.Reinforcement of the impact part of the topics.
Programme management/ Communication activities	Low participation rate in the 2015 call	Definition of topics which are of interest to wider groups of stakeholders. Proactive and timely, external communication. Qualitative assessment of the participation rate.
Call/Programme management	Grant agreement is delayed or not signed due to disputes within the consortium	Availability and promotion of existing guidelines material on H2020 consortium agreements and use of IPR Help desk.
Call/programme management	Risk that the quality of proposals received in response to the call will be too low	Consortium Agreement prepared at the proposal stage.
Communication activities	Lack of adequate dissemination of result may result in vague information to the end-user/interested party and could compromise the JU impact.	Standardise the dissemination plans. Monitor the dissemination actions. BBI JU promotes the project results.
Administration	Organisational and resources constraints of the BBI JU Executive Office	EC to act on behalf of the JU until autonomy
Financial administration (Running costs)	The actual running costs under title I or title II exceed the budgeted running costs for this title.	GB to amend the budget when the actual total running costs do not exceed the total budgeted running costs.
Financial administration (Running costs)	Actual total running costs exceed the total budgeted running costs	Governing Board to amend the budget (increasing the total running costs budget); extra funding to be asked from industry.
Financial administration (Running costs)	Risk that EU/industry instalments on running costs are not received in due time	Setting early instalments' due dates and amounts