



The catalyst for sustainable
bio-based industries in Europe



foreword



When in October 2015 I was appointed Executive Director of the Bio-based Industries Joint Undertaking (BBI JU), I felt truly honoured to be joining the most ambitious initiative ever launched in the EU to develop competitive and sustainable bio-based industries.

The BBI JU was created with the ambition to make a true impact: develop a bio-based industry in the EU that would allow investments to remain in Europe, thus creating new jobs – most of them in rural areas – and value for our citizens.

BBI JU's vision for a Europe leading the transition towards a post-petroleum society sets in motion the transformation of knowledge into innovative solutions that generate growth and value both for the economy and the people of Europe. By 2030 it is expected that bio-based chemicals and materials will replace 30% of fossil-based ones and consequently reduce greenhouse gas emissions by 50%.

The BBI JU has been granted the responsibility of funding Research and Innovation (R&I) actions with a budget of €3,7 billion, leveraging private investment through public funding. But while de-risking investment and reaching critical mass is crucial, at the same time it has a key role in connecting and mobilising the actors of this fragmented sector by aligning public and private strategies, thus providing incentives for both sides to cooperate and succeed.

I truly hope that BBI JU will not only play the role of catalyst in the creation of bio-based industries in the EU, but also succeed in communicating its achievements and benefits to EU citizens in the context of open science and open innovation.

On behalf of all of us in BBI JU I would like to invite you to join us in our effort to create a new sector that is 'made in Europe' and 'made for Europeans'!

A handwritten signature in black ink, appearing to read 'Philippe Mengal'.

Philippe Mengal
Executive Director
Bio-based Industries Joint Undertaking



The bio-based industries sector

THE BIOECONOMY COVERS the use of renewable biological resources and their conversion into food, feed, bio-based products and biofuels via a range of technologies.

Bio-based industries are a significant sub-sector of the bioeconomy. Bio-based industries use renewable and sustainably-sourced biological raw materials, called biomass, as the basic materials for producing intermediate and end-user products.

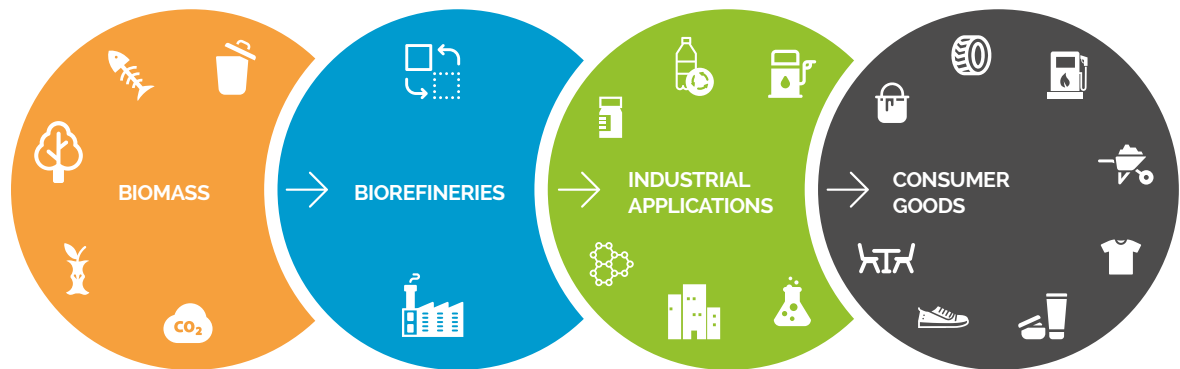
However, a distinct and coherent single European bio-based industry sector does not yet exist, and currently comprises a wide range of different industrial sectors, often working in isolation.

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

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



BIO-BASED INDUSTRIES VALUE CHAIN



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

- (Pre-) treatment
- Transformation

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

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

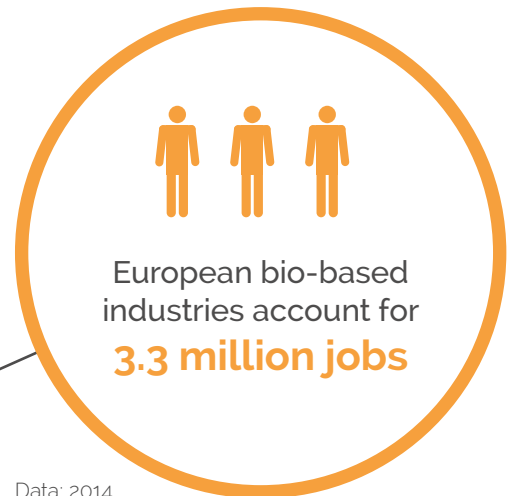
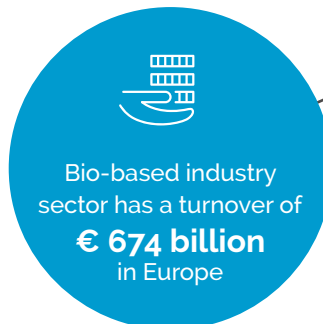


Challenges for the European bio-based industries

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

A strong European bio-based industrial sector will help to reduce Europe's dependency on fossil-based products, moving Europe more quickly towards the many socio-economic benefits of a post-petroleum society. To unlock their full potential, Europe's bio-based industries will need to make sustainable, resource-efficient and largely waste-free use of Europe's renewable materials to play an important role in spurring sustainable growth and boosting Europe's competitiveness.

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



Data: 2014





Who are we?

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

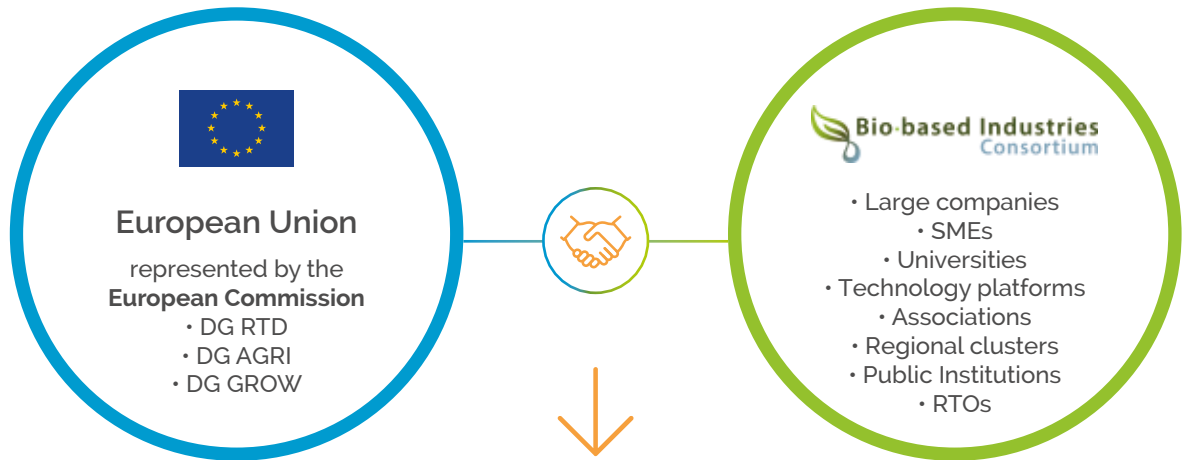
In 2012, as part of the impact assessment of the initiative, the European Commission conducted a public consultation. Respondents answered overwhelmingly in favour (over 94%) for the launch of an EU initiative for bio-based industries, and a large majority requested an institutional public-private partnership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

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

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



BBI JU GOVERNANCE



Bio-based Industries Joint Undertaking (BBIJU)

Governing Board (10 seats)

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



Executive Director

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



Programme Office

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

States Representatives Group

(28 Member States + 10 Associated Countries)

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



Scientific Committee

(15 seats)

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



The added value of BBI JU

BY BRINGING TOGETHER key stakeholders from across a diverse range of relevant industrial sectors, including large companies and SMEs, academia, regional and technological clusters, relevant knowledge is combined to achieve the sector innovation objectives, and to leverage significant private investment.

The BBI JU initiative's multi-sectoral approach creates cross-border collaboration at European level to help overcome market failures in the bio-based industries. No single company, industrial sector or Member State has the capacity to deal with the challenges and financial risks facing the industry and other stakeholders. BBI JU brings together bio-based activities under one pan-European structure, pooling national and regional assets, strengths and skills.

There is a need for sufficient funds for an integrated, continuous programme covering fundamental research, applied research and demonstration and flagship activities at EU level. BBI JU fosters a culture of collaboration across EU players, de-risks investments in the bio-based industries, and mitigates current market obstacles that are slowing down the transition from a petroleum-based economy to a bio-based economy.



BBI JU PROJECTS PARTICIPANTS



"The BBI JU programme is a standard bearer for a sustainable, post-petroleum era. Whilst stimulating innovation, it has the potential to boost investments, growth and job creation for European citizens."

Carlos Moedas

*Commissioner for Research,
Science and Innovation,
European Commission*



Benefits for European citizens

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

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

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

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

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

400.000 skilled jobs by 2020

rising to **700.000 skilled jobs by 2030**



80% of which will be in rural areas

BBI JU AIMS FOR:



+20%
biomass supply
by 2030

The aim is to
replace at least 30 %
of existing petroleum-
based products
with better, more
sustainable and
economically-viable
versions by 2030



"The need to do 'more with less' and to succeed in 'living well, within the limits of our planet' is set in recent policy initiatives, like the European Bioeconomy Strategy. The BBI JU is therefore crucial in helping reduce Europe's dependence on fossil resources. It is a tangible contribution on the ground to the building of a more circular, more sustainable economy."

John Bell

*Director for Bioeconomy,
European Commission*

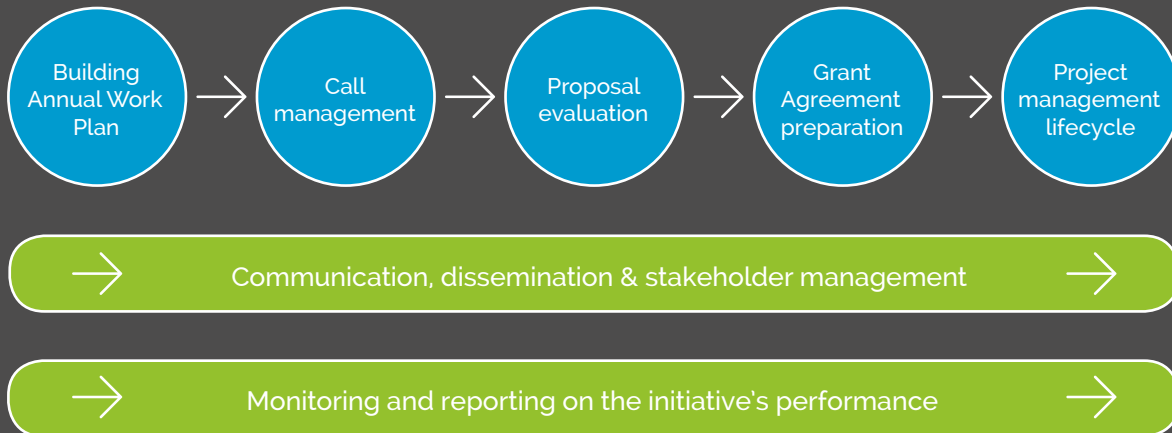


Our mission and common vision

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

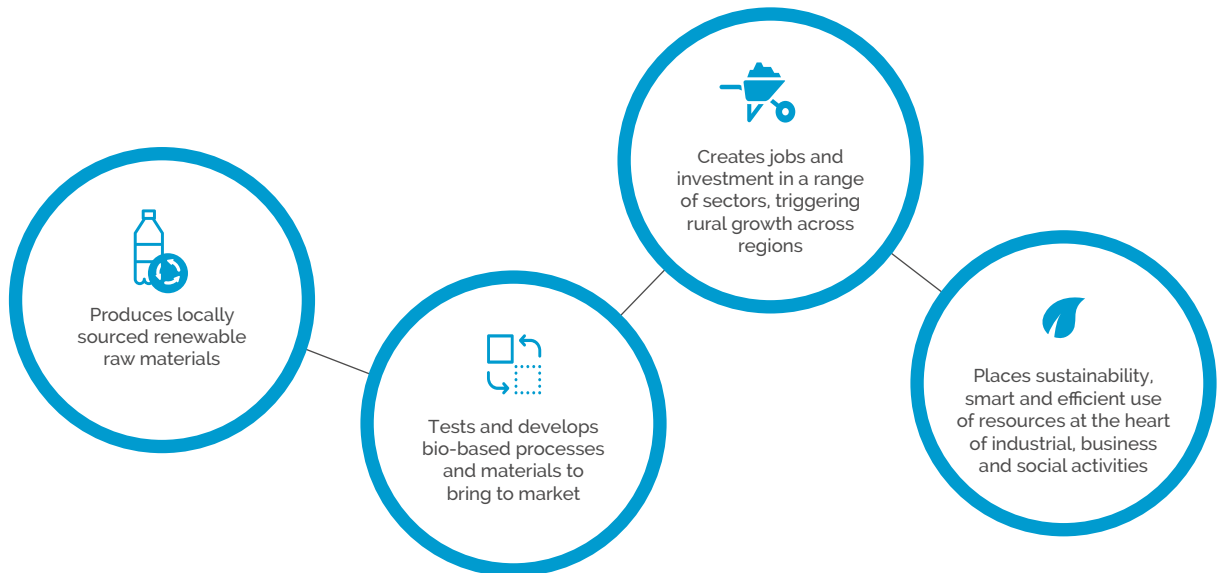
BBI JU organises yearly Calls for proposals to support research, demonstration and deployment activities enabling the collaboration between stakeholders along entire value chains, covering primary production of biomass, processing industry and final use.

The BBI JU Programme Office manages all aspects of the grant management lifecycle, including the promotion of annual Calls for proposals, the evaluation of proposals, and the Grant Agreement preparation process. It follows the whole project management lifecycle covering technical, scientific, legal and financial aspects. BBI JU also performs communication, dissemination & stakeholder management activities to raise awareness on bio-based industries, increase the visibility of BBI JU, and promote participation in the BBI JU programme.



BBI JU WILL REALISE THE COMMON VISION of the EU and BIC for a competitive, innovative and sustainable Europe leading the transition towards a post-petroleum society, while decoupling economic growth from resource depletion and negative environmental impacts.

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



"BBI JU is creating the systemic change and structuring effect needed by de-risking investment in new value chains across sectors which is speeding up the development of an innovative, sustainable and competitive European economy."

Mat Quaedvlieg

VP Strategic Business Projects, Sappi Chair, BBI JU Governing Board



Our objectives

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

- 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 value chain from supply of biomass via biorefinery plants to consumers of bio-based materials, chemicals and fuels, including the creation of new cross-sector interconnections and support of cross-industry clusters;
- 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 BBI JU programme successfully mobilises small enterprises in significant numbers which supports collaborative European entrepreneurship for bio-based industries."

Christophe Luguel

*Head of International Affairs, IAR Cluster
SMEs representative,
BBI JU Governing Board*



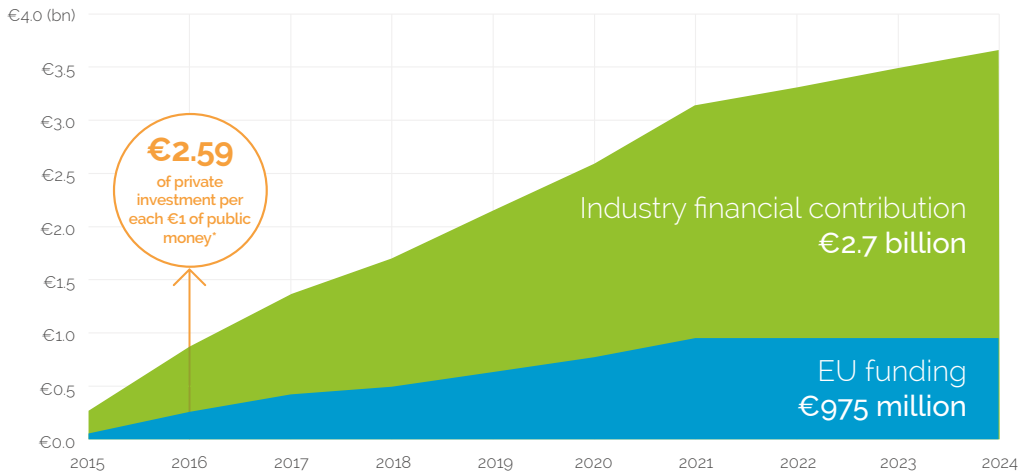
"Thanks to the BBI JU, the bio-based industry is again investing in innovation and production, creating growth and jobs in Europe. As an example, where BIC members had around € 2 billion of investments in Europe in the pipeline in 2014, this has increased to almost € 5 billion in 2017."

Dirk Carrez

*Executive Director,
Bio-based Industries Consortium*

A MAJOR PUBLIC AND PRIVATE EFFORT

Leveraging capital markets and additional private & public funds



* BBI JU leverage effect calculated as at the end of 2016 was €2.59, compared with target value of €2.35



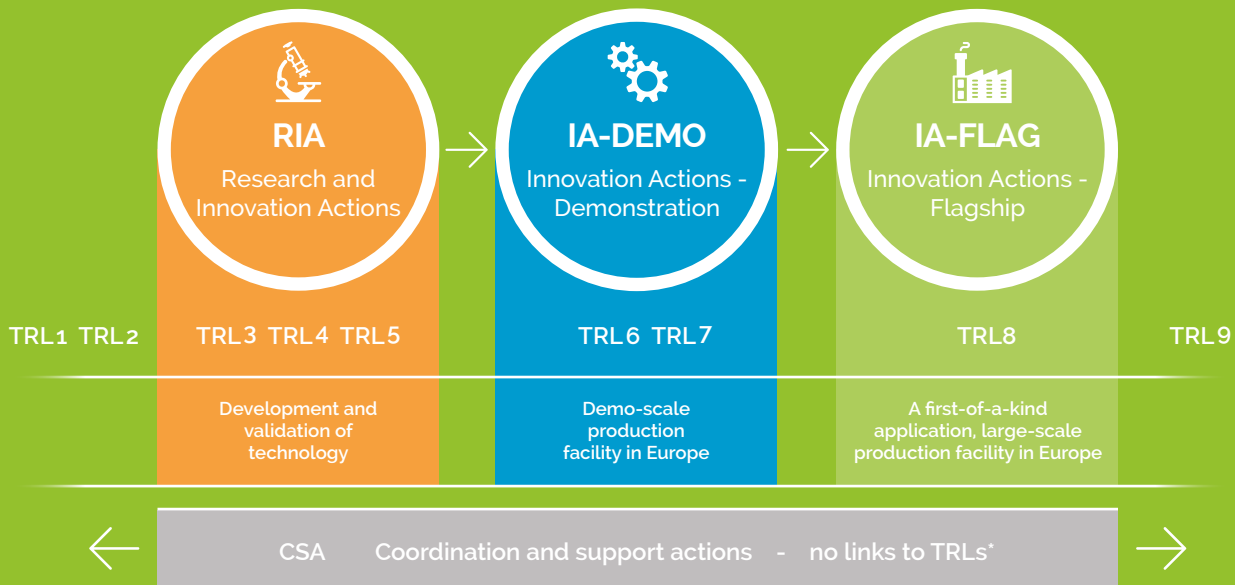
Our annual Calls and types of actions

BBI JU IMPLEMENTS open Calls for proposals supporting research and innovation actions which operate under Horizon 2020 rules and procedures.

BBI JU Calls are open to private & public 'for-profit' and 'not-for-profit' organisations, including large

enterprises and SMEs, research and technology organisations (RTOs), universities, associations, and any other type of legal entity interested in BBI JU activities.

BBI JU FUNDS PROJECTS WITHIN THE FOLLOWING TYPES OF ACTION:



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

Research & Innovation Actions (RIA)

Research & Innovation Actions aim to fill the technological gaps within specific value chains, leading to the development of new knowledge or a new technology. RIAs cover actions with a TRL 3 - 5 by the end of the project.

Innovation Actions – Demonstration Actions (IA-DEMO)

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

Innovation Actions - Flagship Actions (IA-Flagship)

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

Coordination & Support Actions (CSA)

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



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