Bio-based Industries Consortium

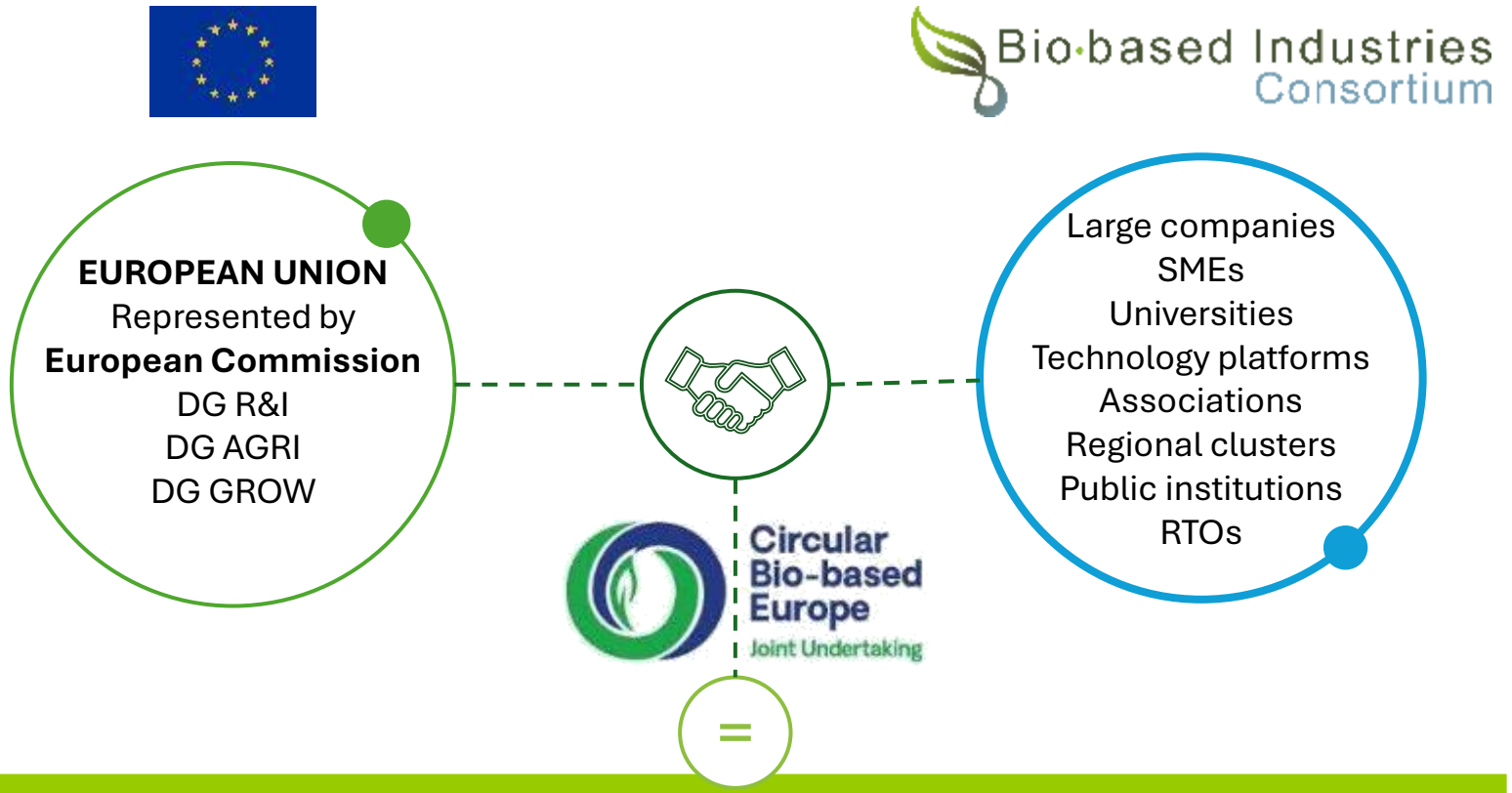
CBE JU Call for proposals Topics 2025

Samuele Ambrosetti

Programme and Innovation Manager

Bio-based Industries Consortium

CBE JU

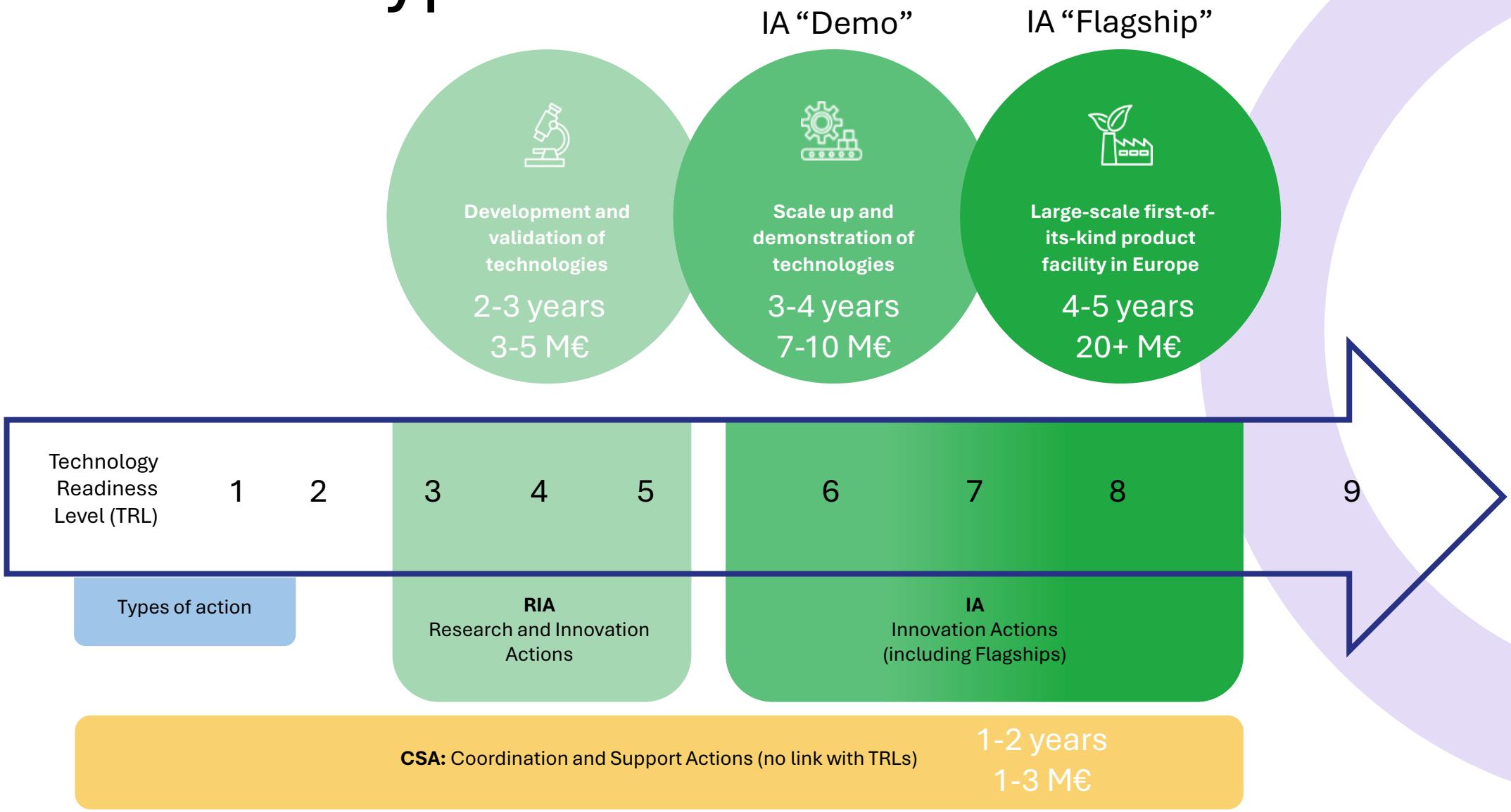


Advisory bodies: States Representatives Group; Scientific Committee; Deployment groups

What is CBE?

- Institutionalised Partnership under Horizon Europe
- Funding Research and Innovation projects up to TRL 8 (*unicum!*)
- 6 annual calls for proposals, from 2022 to 2027
- Budget: € **1 billion of public funding** + € 1 billion industry investment

CBE JU – Type of actions



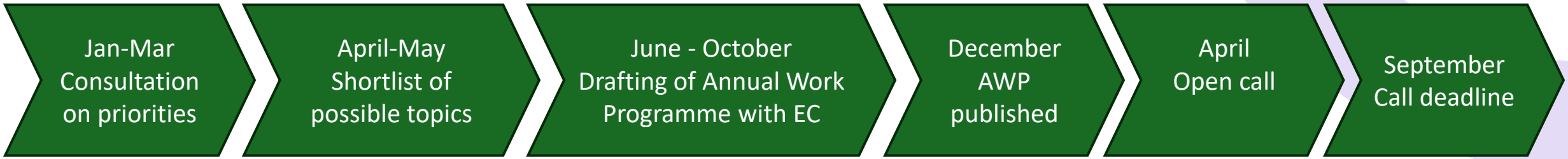
CBE JU – the role of BIC members

Each Industry Member has a seat in the **Programming Working Group**. The PWG:

- Provides initial input about priorities for the CBE AWPs (short term and medium-long term)
- Gives mandate to BIC staff to discuss the AWP with the EC
- Contributes with topic-specific input in the framework of AWP preparation

Each Associate Member has a seat in the **Associate Members Working Group**. The AMWG:

- Provides initial input about priorities for the CBE AWPs (short term and medium-long term)
- Contributes with topic-specific input in the framework of AWP preparation
- The PWG meets regularly (3-4 times a year), usually in Brussels. The AMWG usually meets online.
- Every calendar year is dedicated to the formulation of the AWP for the following year.



CBE = Circular **AND** bio-based

Only bio-based feedstock (including biogenic CO_2). **No** fossil-based (including atmospheric CO_2)

Bio-based feedstock category	Examples of bio-based feedstock
Agri-food feedstock	• Side streams and residual streams (or residues) from agriculture and horticulture. • Food and feed waste: bio-waste[106] and side streams from the food and feed production/processing. • Non-edible biomass fractions of food crops. • Perennial grasses, fibre crops or other industrial crops. • Residues of lignocellulosic fraction of industrial crops. • Surplus streams from agricultural biomass processing such as carbohydrates or oils, respecting the "food first" and "cascading use" principles.
Forest-based feedstock	• Damaged and/or contaminated wood. • Residues from lignocellulosic biomass and wood from woodlands and the forest-based industry. • Certified lignocellulosic biomass or certified woody biomass harvested from sustainably managed forests.
Aquatic biomass	• Aquatic biomass and residual streams (or residues) from aquatic biomass cultivation, processing, and from fisheries. • Industrial biomass grown in open ponds and/or closed systems.

Bio-based feedstock category	Examples of bio-based feedstock
Industrial and municipal bio-based residues and waste (other than food waste)	• Bio-waste (other than food waste from production; including post-consumer waste). • Sewage and wastewater sludge. • Used cooking oil. • Residues and by-products from the bio-based industry. • Recycled bio-based products. • Other residues and waste that can be used in bio-based processes.
Biogenic gaseous carbon	• Carbon in gaseous emissions from biomass-based industrial ecosystems and biorefineries or any other bio-based operation.
Other / new feedstock	• Microbial biomass (including microorganisms). • Insects and fungi. • Residues from nature and landscape management (bio-waste other than food and post-consumer waste). • Products derived from multifunctional forestry practices (other than wood).

- **Biomass must be sourced from EU/EEA/EFTA or AC**
- **1G feedstock is eligible provided that it respects the "food first" principle**

No biofuel, bioenergy as main focus
No food, feed but **yes** food, feed ingredients (e.g. alternative protein sources; bioactives; specialties)
No pharma, medical but **yes** nutraceuticals

CBE 2025 topics

Open: 4 April **Deadline: 18 September**

Topic	N	Total M€
FLAG-01 Urban-industrial symbiosis for **biowaste** valorisation	1	20
FLAG-02 Bio-based **drop-ins/smart drop-in platform chemicals**, via cost-effective, sustainable and resource-efficient conversion of biomass	1	20
FLAG-03 Circular-by-design **fibre-based packaging** with improved properties	1	20
FLAG-04 **Retrofitting of industrial plants** towards higher-value bio-based products	1	20
IA-01 Sustainable **macroalgae** systems for innovative, added-value applications: cultivation and optimised production systems	2	14
IA-02 SSbD bio-based solutions to replace hazardous conventional chemicals for **textiles production**	2	14
IA-03 Scaling-up nutritional **proteins** from alternative sources	2	14
IA-04 Cost-effective and robust **continuous biotech** bio-based processes	2	14
IA-05 SSbD bio-based **polymers/(co)polymers** unlocking new market applications	2	14
RIA-01 **Valorisation of untapped forest biomass**	2	7
RIA-02 Bio-based and biodegradable **delivery systems** for fertilising products to reduce microplastics pollution & promote soil health	2	7
RIA-03 Alternative biomanufacturing routes for **natural and synthetic rubber**	2	7
CSA-01 **Develop and deploy new curricula** and knowledge exchange practices relevant to bio-based systems	1	1

CBE 2025 topics - FLAGSHIP

Topic	N	Total M€
FLAG-01 Urban-industrial symbiosis for **biowaste** valorisation	1	20
FLAG-02 Bio-based **drop-ins/smart drop-in platform chemicals**, via cost-effective, sustainable and resource-efficient conversion of biomass	1	20
FLAG-03 Circular-by-design **fibre-based packaging** with improved properties	1	20
FLAG-04 **Retrofitting of industrial plants** towards higher-value bio-based products	1	20

- Funding: **20 M€ for 1 project selected**. Funding rate: **60%** for companies, **100%** for non-profit entities
- IKOP threshold: at least **20% of eligible costs** of the project as a whole
- End **TRL 8** for the main stream of activities
  - Parallel activities at lower TRL are allowed to e.g. pave the way to next gen
- **Multi-actor approach**: see topic for specific actors to be involved
- **Links and complementarities** to previous / ongoing projects: see topic for specific projects
- **Contribution to CBE specific requirements**: see topic for specific details
- **Business plan: executive summary** (proposal Part B) **AND full business plan** (Annex to proposal)
  - Hearing to clarify business plan assumptions – no new information, just clarification
- **Environmental impact and SSbD assessment** required

CBE 2025 topics - FLAGSHIP

FLAG-01 Urban-industrial symbiosis for biowaste valorisation	
TRL	8
Scope (overview)	• Demonstrate **feasibility and viability of a full-scale biorefinery model converting bio-waste into added value products**. Synergies with existing waste management infrastructures and urban-industrial symbiosis approaches (up and/or downstream) are in scope. • Demonstrate production of **SSbD, added-value bio-based products**, minimising waste generation. • Address **logistics** influencing economic viability and social acceptance. In addition to CBE specific requirements: • Address **regulatory framework aspects** related to the use of bio-waste streams and their conversion to end products, with particular reference to the end of waste criteria. • Perform an assessment of **social involvement and benefits**. • **Identify regions/areas** in EU/EEA/EFTA countries and ACs **with high potential** for such the biorefinery model and include a task to replicate/adapt the concept in selected regions/areas NB: The main feedstock in scope for this topic is **separately collected urban bio-waste**, as defined under the Waste Framework Directive. According to the specific targeted conversion routes, **bio-based residues and waste from other sources can be used as supplementary feedstock**

CBE 2025 topics - FLAGSHIP

FLAG-02 Bio-based drop-ins/smart drop-in platform chemicals, via cost-effective, sustainable and resource-efficient conversion of biomass	
TRL	8
Scope (overview)	• Demonstrate cost-effective, robust, sustainable, large-scale production processes for obtaining **bio-based drop-in (including smart drop-in) platform chemicals** at **end TRL: 8**. Exclude substances of very high concern (SVHCs). • Target resource efficiency, minimisation of process waste and process safety aspects. Cascading valorisation of secondary biomass and residual streams is also in scope. • **Demonstrate the further conversion and integration of produced chemicals into market relevant products (reaching an end TRL 6 or higher).** In addition to CBE specific requirements: • Address **compliance with regulatory frameworks**, considering the targeted platform chemical(s) and related impurities type and concentration

CBE 2025 topics - FLAGSHIP

FLAG-03 Circular-by-design fibre-based packaging with improved properties	
TRL	8
Scope (overview)	• Scale-up (TRL 8) production technologies and deploy the complete value chain to **fibre-based packaging materials with improved or novel properties** (over specified bio-based and/or non-bio-based benchmark) addressing relevant market applications. Consumer / industrial **primary, secondary and/or tertiary packaging** products are in scope. Fibre-derived packaging is also in scope . • Demonstrate (at end TRL: 8) the application of targeted fibre-based materials into **end packaging products, proving to meet market requirements**. The use of bio-based add-ons (e.g., additives, coatings, adhesives, etc…) is also in scope - proven that they are not hindering targeted EoL and that fibre-based materials is the main component of the packaging; • **Design the packaging products for circularity** and validate their sustainable **end-of-life at relevant scale** (TRL 6 and above). Recycling, reuse and/or remanufacturing are all in scope. In addition to CBE specific requirements: • Consider **end-users/consumers** perception, behaviour and preferences across the different steps of products' lifecycle: product design, use and end-of-life • Include a task to address the **regulatory status** of the demonstrated packaging product(s) and their safety for the intended use

CBE 2025 topics - FLAGSHIP

FLAG-04 Retrofitting of industrial plants towards higher-value bio-based products	
TRL	8
Scope (overview)	• **Retrofit an existing industrial facility** with innovative and sustainable biomass conversion process(es) yielding more valuable product(s) than the one(s) produced with the old process(es). • Demonstrate the production of **bio-based chemicals and materials** (reaching end TRL 8) and their further **conversion into end products** (end TRL 6 or higher) to be validated in market-relevant application(s). Moreover, proposals should also address cascading valorisation of residual streams across the value chain. **Food/feed ingredients are not in scope.** In addition to CBE specific requirements: • Establish the **full value chain** including biomass supply and logistics, with the appropriate involvement of biomass providers, fostering the creation or enhancement of a local/regional ecosystem centred around the biorefinery. • Design and test a **training programme(s) for upskilling/reskilling** the (bio)refinery and related ecosystem workforce. NB: Existing **biorefineries** and **fossil-based industrial plants** on brownfield are in scope of this topic as a target of the retrofitting action. Greenfield implementation is out of scope

CBE 2025 topics – Innovation Actions

Topic	N	Total M€
IA-01 Sustainable **macroalgae** systems for innovative, added-value applications: cultivation and optimised production systems	2	14
IA-02 SSbD bio-based solutions to replace hazardous conventional chemicals for **textiles production**	2	14
IA-03 Scaling-up nutritional **proteins** from alternative sources	2	14
IA-04 Cost-effective and robust **continuous biotech** bio-based processes	2	14
IA-05 SSbD bio-based **polymers/(co)polymers** unlocking new market applications	2	14

- Funding: **14 M€ for 2 projects selected**. Funding rate: **60%** for companies, **100%** for non-profit entities
- IKOP threshold: **at least 15% of eligible costs** of the project as a whole
- End **TRL 6-7** for the main stream of activities
  - Parallel activities at lower TRL are allowed to e.g. pave the way to next gen
- **Multi-actor approach**: see topic for specific actors to be involves
- **Links and complementarities** to previous / ongoing projects: see topic for specific projects
- **Contribution to CBE specific requirements**: see topic for specific details
- **Quantified business case** and **proposed business model** including potential for upscaling (proposal Part B)
- **Environmental impact and SSbD assessment**

CBE 2025 topics – Innovation Actions

IA-01 Sustainable macroalgae systems for innovative, added-value applications: cultivation and optimised production systems	
TRL	6-7
Scope (overview)	• **Select and optimise macroalgal feedstock focusing on applications with high market potential**. In line with the EU Algae Initiative, **harvesting macroalgae from the wild is excluded, as the topic focuses on cultivation**. • Demonstrate **cultivation in suitable and scalable sustainable systems**, aiming at high biomass yield, optimised production parameters. **Cultivation in open environment and in closed systems** are both in scope. **Multitrophic and mixed cultivation approaches** (e.g. multiple algae species, algae and fish/shellfish farming etc) are also in scope, as well as algae-mediated remediation and the use of nature-based solutions • Demonstrate **further biomass processing and conversion steps** into bio-based products. In addition to CBE specific requirements: • Ensure **environmental safety** and **avoidance of environmental risks, incl. monitoring and mitigation measures**. *Environmental assessment must include: biodiversity protection/and possible enhancement, avoidance of invasiveness, zero toxicity, carbon sequestration and carbon mass balances. Any risks to ecosystems should be assessed and avoided.* NB: for the sake of this topic, **marine plants such as seagrass are also considered in scope**

CBE 2025 topics – Innovation Actions

IA-02 SSbD bio-based solutions to replace hazardous conventional chemicals for textiles production	
TRL	6-7
Scope (overview)	• Demonstrate SSbD **bio-based alternatives to hazardous conventional chemicals used in the production of textiles**. Bio-based solutions applicable to bio-based and/or fossil-based textiles production are both in scope. Chemicals in scope for replacement include both those that are currently only used in production processes and also those that are included in the end-product(s). SSbD bio-based solutions in scope are: ○ **chemicals (organic and/or inorganic compounds)** AND/OR ○ **processing routes, removing the need for chemical-to-chemical substitution .** • Ensure **compatibility** of the innovative chemicals and/or processes with textile manufacturing equipment and practices • Test the **impact of the alternative bio-based chemical(s) and/or process on the end-product(s),** based on available standards.

CBE 2025 topics – Innovation Actions

IA-03 Scaling-up nutritional proteins from alternative sources	
TRL	7
Scope (overview)	• Demonstrate innovative processes for the **extraction/production of proteins for application as nutritional food** starting from alternative sources. The scope covers proteins from **plants, invertebrates, microorganisms, fungi, aquatic biomass, fermentation of bio-based feedstock (including biogenic gaseous carbon).** • Proposals should **target nutritional proteins for food**; the co-production of nutritional proteins for feed is also in scope by adopting cascading approach, to ensure full valorisation of residual biomass. **Pure proteins, protein-rich mixtures and protein-enriched ingredients** are in scope • Address efficient and cost-effective **downstream separation and purification** processes (when applicable), to meet the targeted quality and stability for final applications. • Demonstrate **nutritional adequacy** of the proteins and their effect on food formulations. Additional properties are also in scope depending on the application In addition to CBE specific requirements: • Test the safety of developed proteins and formulations in line with EU regulatory requirements and EFSA guidelines. Identify potential regulatory gaps and provide recommendations to overcome potential bottlenecks.

CBE 2025 topics – Innovation Actions

IA-04 Cost-effective and robust continuous biotech bio-based processes	
TRL	6-7
Scope (overview)	• Identify the **existing bottlenecks in the switch to continuous process(es)**, how the proposed innovative approach can overcome challenges of targeted processes, which are currently only operating in batch or fed-batch mode, and specify the advantages of switching to continuous. • Demonstrate **continuous biotech processes** (microbial, cell factories and/or enzymatic) for the sustainable production of bio-based chemicals/products addressing identified bottlenecks. • Together with addressing **continuous upstream** processing (encompassing biocatalysis optimisation), **demonstrate integration of efficient DSP** systems to achieve high purity, in compliance with final applications requirements, while also facilitating/not hindering the continuous upstream operation. Focus on one or more bio-based chemicals/products with high market potential. • Address resource efficiency and circularity by applying process intensification and by valorising upstream and downstream side-streams (e.g., water, fermentation media, exhausted cells, etc…)

CBE 2025 topics – Innovation Actions

IA-05 SSbD bio-based polymers/(co)polymers unlocking new market applications	
TRL	6-7
Scope (overview)	• Demonstrate the production of **bio-based (co-)polymeric structure(s)** with functional properties at least on par with fossil-based counterparts (if any) and/or higher than bio-based benchmarks (if any). Adding new functionalities compared to benchmarks is also in scope. • Address resource efficiency measures to achieve costs reduction and higher sustainability, as for example reduction of primary energy consumption, water recycling, (bio)-catalyst recycling, side-streams/by-products valorisation, etc. • Include a task to **validate (at minimum at end TRL 5) the targeted (co-)polymeric structure(s) into end products** proving to meet market requirements. Ensure (co)polymer(s) processability and compatibility with downstream conversion route(s) into end products. The development of bio-based composites is not in scope. Proposals should target **at least two application sectors**. • **Eco-design** the bio-based (co)polymeric structure and related end products to address sustainable EoL. Validate the selected EoL option(s) of the (co)-polymeric structure at minimum at TRL 5. Landfilling/incineration are not in scope as EoL options.

CBE 2025 topics - RIA

Topic	N	Total M€
RIA-01 **Valorisation of untapped forest biomass**	2	7
RIA-02 Bio-based and biodegradable **delivery systems** for fertilising products to reduce microplastics pollution & promote soil health	2	7
RIA-03 Alternative biomanufacturing routes for **natural and synthetic rubber**	2	7

- Funding: **7 M€ for 2 projects selected**. Funding rate: **100%** for companies, **100%** for non-profit entities
- IKOP threshold: **at least 5% of eligible costs** of the project as a whole **(NEW FOR 2025)**
  - Since the maximum funding rate is 100% for all, IKOP is obtained by voluntary reduction of the funding rate of (a subset of) BIC members in the proposal.
- End **TRL 4-5**
- **Multi-actor approach**: not mandatory unless specified in the topic
- **Links and complementarities** to previous / ongoing projects: see topic for specific projects
- **Contribution to CBE specific requirements**: see topic for specific details
- **Qualitative business case for investment** showing promise when upscaled
- **Environmental impact assessment** (based on preliminary data)
- **SSbD assessment** only when specified

CBE 2025 topics - RIA

RIA-01 Valorisation of untapped forest biomass	
TRL	5
Scope (overview)	• Develop **innovative planning tools and technologies for harvesting, storage, pre-treatment** of residual and/or low value, unused or underutilized forest biomass or lower volume or/and less homogeneous biomass. Adopt **decentralised approaches**, including small-scale, mobile, containerised units, that consider the unique challenges across different European regions and among large, medium-sized, and small companies. • Develop and test **the feasibility of conversion routes** to bio-based chemicals and compounds, materials, products, assessing the viability of new business models around these concepts. • Test the **local value chain** by optimising logistics, improving cost efficiency, and collaborating with central hubs for further processing and refining. Actively involve local forest owners, managers, and other primary sector operators to develop and test novel value chains in pilot areas. • Address the feasibility for different ownership types and cooperative structures to ensure alignment with value-chain cooperation. In addition to CBE specific requirements: • Provide recommendations for the development of EU carbon farming certification methodologies for the unused and underutilised forest biomass in long-lasting products • Go beyond the specific feedstock environmental sustainability requirements by actively preventing soil degradation and biodiversity and carbon loss

CBE 2025 topics - RIA

RIA-02 Bio-based and biodegradable delivery systems for fertilising products to reduce microplastics pollution & promote soil health	
TRL	5
Scope (overview)	• Develop circular and sustainable production processes for novel bio-based and biodegradable **delivery system(s) for fertilising products**. In addition, assess the applicability/adaptability of the delivery system(s) to **additional possible agricultural inputs** such as pesticides and seeds. • Validate the delivery system(s) for fertilising products (**lab-scale and/or small-scale field trials**), ensuring agronomic efficiency, safety, scalability and sustainability with similar or improved properties compared to conventional systems. • Assess the **long-term effect and biodegradability** of delivery system(s) when applied in natural soil conditions, applying standard tests, methods and protocols. Biodegradability-related aspects should also be monitored and assessed in fresh, estuarine or marine water (considering the risk of dispersion in water) In addition to specific CBE requirements: • In applying the **SSbD framework** consider the **delivery systems and their decomposition products** (**including microplastics**) and take into account **different farming systems** • As part of MAA, **engage with farmers** to develop and test the delivery systems **on demo/pilot farms,** and analyse the effects on plant development, soil health and water.

CBE 2025 topics - RIA

RIA-03 Alternative biomanufacturing routes for natural and synthetic rubber	
TRL	4-5
Scope (overview)	• Identify and characterise the suitable sources of rubber-bearing genetic backgrounds (e.g., plants, yeast, microbial hosts, etc…) which are suitable for optimisation for **natural and/or synthetic rubber biomanufacturing**. When targeting plant-based sources, proposals should focus on implementing low-ILUC solutions. • **Develop bio-based solutions** aiming at high yield of isoprenoid and/or other elastomers, e.g. by deploying the modern tools of biotechnology or other biomanufacturing approaches. • Advance EU/AC-based **production, extraction and/or processing methods**, to enable high productivity and quality of high molecular weight natural rubber and/or other bio-based elastomers. Test the suitability of the developed biomanufactured alternatives into end-products.

CBE 2025 topics - CSA

Topic	N	Total M€
CSA-01 **Develop and deploy new curricula** and knowledge exchange practices relevant to bio-based systems	1	1

- Funding: **1 M€ for 1 project selected**. Funding rate: **100%** for all participants
- Not related to TRL
- **Multi-actor approach**: not mandatory unless specified in the topic
- **Links and complementarities** to previous / ongoing projects: see topic for specific projects
- **Contribution to CBE specific requirements**: see topic for specific details

CBE 2025 topics - CSA

CSA-01 Develop and deploy new curricula and knowledge exchange practices relevant to bio-based systems	
TRL	N/A
Scope (overview)	• Establish a **network of industry and universities/RTOs**. Ensure engagement of stakeholders from the '**Widening' countries** and make sure that their specificities and needs are incorporated in the development and testing of the curricula. Mutual learning from/to rural and coastal/blue bioeconomy, including primary producers, should also be considered. • **Mobilise the network to co-create a set of curricula** for education, training and retraining/reskilling/upskilling of students and professionals in the field of circular bio-based systems. Curricula should include **both STEM and SSH disciplines**. Capitalise on any best practices and success stories, available also at international level. • **Test the implementation of the developed curricula with pilot groups of students and professionals.** Some of the training methodologies that may be considered are laboratory practices, field work, internships, simulation, case studies, problem-based learning, supervised projects, vocational training, online classes/webinars etc