

CBE JU AWP2023:

Topics' scope and
expected outcomes



Type of Action: IA-Flag	Topic Budget: 17 M€
end TRL: 8	EU contribution per project: 17 M€

HORIZON-JU-CBE-2023-IAFlag-01: Optimised and integrated wood-based value chains

Scope: Establish a symbiotic and flexible woody biomass processing system involving the **cooperation of several actors** to maximise the cascading use of feedstock and the use of residues for high value added circular products. Identify **recycled materials, and sidestreams** between economically feasible way.

Expected outcomes

- Deployment of competitive, replicable, regional models
- Improved circularity and resource efficiency of wood-based resources
- Significant improvement in environmental sustainability across the value chain against specified fossil-based and/or bio-based benchmarks

Other elements: Wood from certified forests. **Multi-actor approach** mandatory. **SSbD assessment** recommended

The topic focuses on **woody biomass**. Bark, branches and leaves can be considered in scope as residual streams from wood-based operations but berries, mushrooms and the like are not in scope

HORIZON-JU-CBE-2023-IAFlag-02: Expansion and/or retro-fitting of biorefineries towards higher-value bio-based chemicals and intermediates

Scope: Integrate **innovative and sustainable conversion** (currently producing a conventional and/or narrow range of the value chain, also integrating, if applicable, dismissed or d

New products can **replace or complement** current biorefinery products

Expected outcomes

- Deployment of competitive, replicable, regional/local, circular inclusive bio-based business models centred on biorefineries
- Availability of a broader range of biorefinery processes for bio-based feedstock and by-products to added value biobased materials/products
- Large scale implementation of (environmentally and economically) sustainable biorefinery processes

Other elements: **Multi-actor approach** mandatory. **SSbD assessment** recommended

Type of Action: IA-Flag	Topic Budget: 17 M€
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HORIZON-JU-CBE-2023-IAFlag-03: Bio-based packaging materials with improved properties: barrier, food contact, forming, printability, safety, recyclability /circularity-by-design

Scope: Upscale production technologies and deploy the materials with improved functional properties. Focus on **properties**. **Innovation** can focus on one or more **properties**. Verify the **regulatory status** of the new product (important in food packaging) and for the environment.

At least **95% of organic carbon content** from bio-based sources

Surface properties can be conferred by a **specific surface layer or treatment** as well as by **intrinsic properties of the bulk material**

Expected outcomes

- Improved barrier properties (e.g., oxygen, grease and/or water, depending on application) with respect to existing fossil and/or bio-based benchmarks
- Improved durability also in unfavourable environments (e.g. high humidity, high or low temperatures depending on the application) with respect to existing fossil and/or bio-based benchmarks
- Improved sustainability and circularity with respect to existing fossil and/or bio-based benchmarks

Other elements: Multi-actor approach mandatory. **SSbD assessment** recommended

Type of Action: IA-Flag	Topic Budget: 10 M€
end TRL: 8	EU contribution per project: 10 M€

HORIZON-JU-CBE-2023-IAFlag-04: Valorisation of aquatic biomass waste and residues

Scope: Demonstrate the suitability of small scale, decentralised biorefineries to extract value from **residuals and side streams from aquaculture, fisheries and food processing**. Demonstrate the selection, extraction or production of specific compounds and their conversion into products for further value-added applications in the chemical industry, pharmaceuticals, and animal nutrition. Proposals may address more than one feedstock and production process.

Microalgae out of scope.
Macroalgae residues in scope.

Any (combination of) product(s) in scope of CBE is eligible.

Expected outcomes

- Industrial competitiveness, strategic autonomy and resource independence of bio-based value chains
- Improved circularity and resource efficiency
- Income and business opportunities diversification for stakeholders and actors (including fisheries and aquaculture)

Other elements: **Multi-actor approach** mandatory. Link with the e R&I Mission 'Restore our Oceans and Waters by 2030'

Type of Action: IAs	Topic Budget: 15 M€
end TRL: 6-7	EU contribution per project: 7.5 M€

HORIZON-JU-CBE-2023-IA-01: Small scale biorefining in rural areas

Scope: Demonstrate the technical suitability and economic viability of **small scale decentralised biorefinery concepts**, which may include modular and mobile units. Add value to **locally available resources** (underutilised biomass; by-products; residues; solid, liquid and gaseous waste and residual streams). Small-scale biorefineries offer diversification opportunities for local rural stakeholders by:

- processing their biomass directly at source, and/or
- providing additional sources of income with biorefinery products based on circular use of local resources.

Expected outcomes

- Deployment of sustainable, inclusive, and reliable biobased value chains in rural areas with a focus on fair economic returns at local (farm) level
- New skilled jobs opportunities and investments in the bio-based sectors in rural areas, particularly in regions with underdeveloped capacities, improved innovation capacities and product portfolio extension in primary production sectors and SMEs

Other elements: Multi-actor approach mandatory.

Type of Action: IAs	Topic Budget: 15 M€
end TRL: 6-7	EU contribution per project: 7.5 M€

HORIZON-JU-CBE-2023-IA-02: Production of safe, sustainable, and efficient bio-based fertilisers to improve soil health and quality

Scope: Demonstrate the technical validation and implementation of **bio-based fertiliser production from nutrient-rich waste and side streams** (such as agricultural/forest/aquatic residues and wastes, municipal waste, food waste, sludge, **bio-based fertilisers, including biodegradable fertiliser co-products (where applicable)**), ensuring their agronomic efficiency, safety and environmental properties compared to synthetic and mineral fertilisers.

The delivery system can be at a lower TRL than the fertiliser itself

Expected outcomes

- Enhanced availability of affordable and sustainable fertiliser in the EU
- Safe, precise, applicable and efficient bio-based fertilisers to support the transition towards a circular economy (including fertiliser industry) and agricultural production
- Replacement of conventional fossil and mineral fertilisers with bio-based alternatives

Other elements: **Multi-actor approach** mandatory. **SSbD assessment** recommended. Cooperation with H200, HorizonEU foreseen. Link with the Mission 'A Soil Deal for Europe'

Type of Action: IAs	Topic Budget: 15 M€
end TRL: 6-7	EU contribution per project: 7.5 M€

HORIZON-JU-CBE-2023-IA-03: Improve fermentation processes (including downstream purification) to final bio-based products

Scope: Demonstrate improved process design strategies to industrially relevant **fermentation processes considering both**

Target **non-volatile** as well as **thermally and/or chemically** downstream purification constraints

Expected outcomes

- Availability of new industrial biotechnology-based production sustainably sourced biomass;
- Improved productivity, yield, titre and selectivity of scaled up fermentation processes to bio-based products;
- Significant improvement of environmental performance across the value chain against specified fossil and/or bio-based benchmarks;

Other elements: Multi-actor approach and **SSbD assessment** mandatory.

The proposal must consider both upstream and downstream, but focus more on one depending on the use case (i.e, no need to

Volatile and stable **co-products** can be in scope

Type of Action: IAs	Topic Budget: 15 M€
end TRL: 6-7	EU contribution per project: 7.5 M€

HORIZON-JU-CBE-2023-IA-04: Recycling bio-based plastics increasing sorting and recycled content (upcycling)

Scope: Develop sorting and separation systems for isolated mixed bio-based and fossil-based plastics streams (where possible, of the bio-based polymer fraction). Develop, upscale and/or adapt, optimise and deploy existing ones for bio-based plastics in a **real operating environment**. Involve waste management facilities which are **not already recycled with the conventional**

If integration within the current processing line is not feasible, the demo unit should be on the same premises and run by waste mgt.

Target as much as possible the **same grade** of the original plastic, or **upcycling** to higher value products

Expected outcomes

- Improved circularity and resource efficiency via practical application of the circular (bio)economy concept in the bio-based plastics value chain
- Increased recycled content in new products from bio-based plastics
- Effective sorting and recycling schemes for bio-based plastic materials

Other elements: Multi-actor approach and **SSbD assessment** mandatory.

Type of Action: IAs	Topic Budget: 15 M€
end TRL: 6-7	EU contribution per project: 7.5 M€

HORIZON-JU-CBE-2023-IA-05: Development of scalable, safe bio-based surfactants, with an improved sustainability profile

Scope: Scale up production of (anionic and/or cationic, and/or non-ionic and/or microbial) bio-based surfactants. Both **dedicated and/or drop-in structures** to improve feedstock-sourcing sustainability to produce bio-based surfactants by replacing feedstock imported from outside the EU, with scaling up the valorisation of circular EU feedstock sources such as waste and residual streams, municipal waste, industrial food waste.

Primary and secondary biomass is eligible, provided it shows improvement of sustainability profile compared to benchmark

Expected outcomes

- Reduction of feedstock imports dependency, including biomass imports, to produce biobased surfactants at EU level
- Improvement on feedstock sustainability and reduction of direct and indirect land use impact

Other elements: Multi-actor approach and **SSbD assessment** mandatory.

HORIZON-JU-CBE-2023-IA-06: Selective, sustainable production routes towards bio-based alternatives to fossil-based chemical building blocks

Scope: Demonstrate novel or improved production routes that are resource and energy efficient towards bio-based platform chemicals which have a large market potential. Both **dedicated and/or drop-in chemicals** are in scope. **Aromatics are excluded.**

Expected outcomes

- Reduced biomass feedstock imports dependency and land use impact
- Improved circularity and resource efficiency
- Significantly improved sustainability, strategic autonomy, resilience and competitiveness of the European chemical industry
- Reduction of direct and indirect emissions against available fossil-based and/or bio-based benchmarks

Other elements: Multi-actor approach and **SSbD assessment** mandatory.

Type of Action: IAs	Topic Budget: 15 M€
end TRL: 6-7	EU contribution per project: 7.5 M€

HORIZON-JU-CBE-2023-IA-07: High performance, circular-by design, bio-based composites

Scope: Demonstrate, at a relevant scale, the production of high performance products. **Natural and/or synthetic bio-based fibres and bio-based resins** in scope. Innovation can be in any area related to sustainability/circularity: end-of-life embedded in product design.

At least **95% of organic carbon content** from bio-based sources (measured using the C 14 method as defined in EN 16640:2017)

Technical requirements dictated by application

Expected outcomes

- Availability of sustainable and circular bio-based composites meeting mechanical performance requirements;
- Improved circularity and overall sustainability of downstream sectors taking into account production, use, and end of life

Other elements: Multi-actor approach and **SSbD assessment** mandatory.

Type of Action: RIAs	Topic Budget: 10 M€
end TRL: 5	EU contribution per project: 5 M€

HORIZON-JU-CBE-2023-RIA-01: Phyto-management; curing soil with industrial crops, utilising contaminated and saline land for industrial crop production

Scope : Cultivation and production of high-yielding and resilient **industrial crops** to restore **contaminated** lands or remediate **salt-affected** soils /**Case studies** assessing resource efficient pathways / Active **role of the farmers** in economic viable value chains

Expected outcomes

- Better knowledge **-on sustainable options** to extract, recover added value compounds, processing of the biomass into high value products – **on characteristics and quality of biomass grown** on contaminated and salt-affected soils.
- Improved environmental condition of post-industrial and other relevant areas affected by soil contamination or salinity, in view of their **future reconversion to other uses** (agriculture, recreation etc).

Other elements:

- The **high biomass yield (productivity)** is an important aspect of the topic
- Synergies with **soil Mission** including a dedicated task

Type of Action: **RIAs**

Topic Budget: **10 M€**

end TRL: **5**

EU contribution per project: **5 M€**

HORIZON-JU-CBE-2023-RIA-02: Optimised forest-based value chains for high value applications and improved forest management

Scope : Develop or upgrade non-invasive solutions for **forest health monitoring** and **wood quality**, taking into account the European and regional variety of forests. Better understanding of forest ecosystem and of the relation between growth conditions of the trees/forest ecosystems and the resulting woody biomass quality

Expected outcomes

- Improved **environmental impact of the forest management** practice
- Optimised application of the **cascading use of biomass** in regional industrial ecosystems
- Increase engagement and innovation capacity of **regional and local actors**, including bio-based industry, and in particular SMEs, as well as social impact in rural areas

Other elements:

- collaborate with relevant initiatives, including the **Forest Information System for Europe (FISE)**.
- **multi-actor approach** and ensure adequate involvement of all key actors in the rural value chains relevant for this topic.

Type of Action: **RIAs**

Topic Budget: **10 M€**

end TRL: **5**

EU contribution per project: **5 M€**

HORIZON-JU-CBE-2023-RIA-03: Robust and optimised industrial biotech and chemical/industrial biotech processes

Scope : improve industrial biotech process flexibility, robustness, techno-economic feasibility and environmental performance, developing **combined processes using biotech and chemical approaches synergistically** to optimise process and/or (bio)catalyst design for obtaining bio-based products.

Expected outcomes

- (Industrial) biotech or chemical/(industrial) biotech processing routes with improved efficiency compared to established routes, or completely new processing routes that are currently unavailable;
- Cost-competitive bio-based products;
- Improvement of the environmental performance of bio-based processes through resource efficient valorisation of sustainable biomass feedstock, while addressing pollution issues in production processes

Other elements: modifications and optimisation of the (physico)chemical steps to further optimize chemical/biotech tandem processes are also in scope

Type of Action: RIAs	Topic Budget: 10 M€
end TRL: 4-5	EU contribution per project: 5 M€

HORIZON-JU-CBE-2023-RIA-04: Development of novel, high-performance bio-based polymers and co-polymer

Scope : Develop polymers with improved or unprecedented properties by **polymerisation** of bio-based monomers with no fossil-based counterpart/**co-polymerisation** of (new or known) bio-based monomers to improve the properties of the copolymer with respect to (new or known) bio-based polymers to obtain materials with novel properties

Expected outcomes

- Unlocking new applications presently not covered by existing products meeting market requirements;
- Improved sustainability, safety and circularity when compared to fossil-based benchmark(s);
- Evidence of promising product and process performance for reference applications in view of subsequent upscaling;

No difference between **biopolymers** (directly obtained from biomass) and **bio-based polymers** (made from monomers produced from renewable feedstock). Target fully bio-based polymers; a small fraction (< 5%) of fossil-based may be allowed in the final formulation

Other elements: Proposals need to specify the **end applications sought and involve potential end users** to provide specific application requirements.

Type of Action: RIAs	Topic Budget: 5 M€
end TRL: 5	EU contribution per project: 5 M€

HORIZON-JU-CBE-2023-RIA-05: Pre-normative research to develop standards for biodegradability of bio-based products in controlled and in open environments (soil, marine, aquatic)

Scope : Identify **gaps and needs of existing methods and standards** to test the biodegradability of materials and certification schemes applicable to the bio-based material and products selected.

Expected outcomes

- Development and validation of the methodology to test the safe biodegradation of biobased materials and products both in controlled and in open environments
- Support to the development of standard(s) for biodegradability in controlled/open environments and clear labelling for end consumers and customers
- More responsible and informed choices in consumption/ social acceptance circular bio-based solutions

Other elements: the consortium should include a **standardisation body**, to monitor and be consulted on the development of the tests, to the development of the standards proposal, to participate in the consultations on the labelling systems. **An advisory board** including Bio-Based Industries Consortium and European Commission

Type of Action: CSAs	Topic Budget: 1.5 M€
	EU contribution per project: 1.5 M€

HORIZON-JU-CBE-2023-CSA-01: EU-wide network of pilot plants and testing facilities, improving SMEs and start-ups' access to scale-up

Scope Create an open database of such infrastructures (all EU countries) , turning it into a community. Establish assistance, training and support services for SMEs and startups

Expected outcomes

- Integration of pilot plants and test rigs, labs for testing and upscaling bio-based processes
- Capacity building for researchers including enabling access to research, testing and upscaling infrastructures and services
- Access to scale-up and testing facilities for SMEs and start-ups, as well as academia actors

Other elements: Proposals may involve **financial support to third parties** (maximum of € 50 000 per third party)to provide direct support (e.g. in the form of cascading grants) to (SMEs, SMEs cluster, local hubs, start-ups and spin-offs form universities and research organisations).

HORIZON-JU-CBE-2023-CSA-02: Supporting the capacity of regions in environmental sustainability assessment for the bio-based sectors

Scope : to support decision-makers to incorporate considerations of **ecological limits into their regional bioeconomy** strategies and roadmaps, when it comes to circular bio-based activities.

Expected outcomes

- Increased deployment of circular bio-based solutions in the regional settings, especially of the actors currently lagging behind, based on correct understanding of sustainability challenges and opportunities/benefits
- Improved resource efficiency of local resources and lowered environmental impact of the circular bio-based industrial activities in the regional and local scales
- Implement (i.e. integrate into regional/local policies) monitoring systems and assessment of the environmental impacts and circularity of bio-based systems for the EU single market and for international trade

Other elements: An **Advisory Board** shall be established by the project (BIC should be part it). Cooperation with macro-regional initiatives such as **BIOEAST** Initiative (and other international cooperation) is encouraged. Explore the possibility to collaborate with and/or provide inputs to the **European Commission Knowledge Centre on Bioeconomy**



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