CBE JU AWP2024: Topics’ scope and expected outcomes
HORIZON-JU-CBE-2024-IAFlag-01 Bio-based value chains for valorisation of sustainable oil crops

**Scope:** Demonstrate large scale cultivation of low-ILUC-risk oil crops, providing environmental gains and enhanced ecosystem services at local scale. Demonstrate innovative biorefinery processes at large scale to convert oils from the targeted crops into bio-based SSbD chemicals and materials.

**Expected outcomes**

- Establishment of oil crop production systems at large scale not interfering with (and where applicable establishing synergies with) food value chains through sustainable cultivation practices compatible with the objectives of biodiversity protection and restoration.
- Oil yield, quality and purity meeting biorefinery processing requirements.
- Significantly improved sustainability, strategic autonomy, resilience and competitiveness of the European bio-based industry while reducing the dependence on imported feedstock.

**Other elements:** Multi-actor approach and SSbD assessment mandatory. Link with the Mission ‘A Soil Deal for Europe’

The scope covers the industrial use of plant oil crops, including cascading use of their side-streams/residues. Algae is out of scope, as well as biofuel applications. Respecting the ‘food first’ principle, multipurpose oil crops are in scope. The feedstock in scope can include established oil crops as well as promising ones (already proven at least at TRL 6). Proposals may also include a limited amount of activities at lower final TRL, e.g. small field trials, on crop breeding approaches.

**Scope:** Demonstrate cost-effective, sustainable and resource-efficient large scale production processes for obtaining one or more bio-based dedicated platform chemicals. Both upstream and downstream process aspects are in scope. Validate (end TRL: 5 and above) the further conversion and integration of produced chemicals into final products.

**Expected outcomes**

- Sustainable, large-scale production of bio-based platform chemicals with dedicated* chemical structures
- Significantly improved sustainability, strategic autonomy, resilience and competitiveness of the European chemical industry and with cascading impact in other downstream sectors.
- Reduce the fossil feedstock dependence of chemicals production and/or minimising biomass imports dependencies of the bio-based industries.

**Other elements:** Multi-actor approach and SSbD assessment mandatory.
HORIZON-JU-CBE-2024-IAFlag-03 Bio-based value chains for valorisation of sustainable natural fibre feedstock

**Scope:** Developing and deploying sustainable climate-positive natural fibre feedstock is essential for supporting numerous existing bio-based value chains as well as for potentially creating new ones. Sustainable agricultural and forestry practices can deliver feedstock meeting industry requirements (such as fibre yield, quality) while ensuring all aspects of sustainability. Both long and short fibre applications are in scope. Natural fibres (including modified fibres) are in scope, while synthetic bio-based fibres are excluded.

**Expected outcomes**

- Implementation of (environmentally and economically) sound value chains for biorefinery applications based on sustainable bio-based fibre feedstock, enabling diversification of business opportunities and income sources for all actors in the bio-based sectors via cooperation between primary producers and bio-based industries.
- Availability of bio-based products (based on fibres) meeting market requirements, including via application testing.
- Contribution to revitalization of European rural areas.

**Other elements:** Multi-actor approach and SSbD assessment mandatory. Link with the Missions ‘A Soil Deal for Europe’ and ‘Restore our Oceans and Waters by 2030’
HORIZON-JU-CBE-2024-IA-01: Bio-based materials and products for biodegradable in-soil applications

**Scope:** Demonstrate and deploy innovative production processes for SSbD bio-based products for biodegradable in-soil applications, addressing the problem of (micro)plastics release in soil and their further dispersion in runoff water. This topic focuses on **products used in soil**, e.g. mulch films, tarpaulins, geonets, geotextiles, geomembranes, etc. **and plastics applications in agriculture**, e.g. greenhouses, pheromones dispensers, clips, pots etc; **select one or more product categories** based on the relevance of products in the actual market.

**Expected outcomes**

- Availability of safe and sustainable by design bio-based solutions aiming at zero waste and zero pollution, with decreased environmental on soil, biodiversity and climate.
- Improved circularity and resource efficiency.
- Innovative manufacturing processes to enable the safe biodegradation of bio-based materials and products according with the environmental conditions and time frame for specific applications.

**Other elements:** Multi-actor approach and SSbD assessment mandatory. Link with the Missions ‘A Soil Deal for Europe’ and ‘Restore our Oceans and Waters by 2030’
HORIZON-JU-CBE-2024-IA-02: Sustainable micro-algae as feedstock for innovative, added-value applications

**Scope:** Demonstrate optimised production, harvesting, and product extraction from micro-algae, cyanobacteria and/or other phototrophic bacteria, including aspects related to automation and control when applicable, including a specific focus on downstream separation and purification (quality and purity) of end products depending on final application requirements. Products in scope are those ingredients and intermediates in the medium price range, for which process technologies exist but are currently not cost-competitive enough to meet market demands.

**Expected outcomes**
- Implementation of (environmentally and economically) sustainable micro-algae-based biorefinery processes.
- Availability of a broader range of micro-algae-based products meeting market requirements.
- Decreased energy, water, nutrients and in general resource requirements.
- Improved environmental impact.

**Other elements:** Multi-actor approach and SSbD assessment mandatory. Link with the Mission ‘Restore our Oceans and Waters by 2030’
HORIZON-JU-CBE-2024-IA-03: Enlarging the portfolio of commercially produced bio-based SSbD solvents

**Scope:** Demonstrate sustainable and efficient production process(es) for obtaining bio-based solvents which can be then applicable as SSbD alternatives in one or more of:
- production processes and/or
- recycling, decontamination or pollution control processes;
- formulation of ingredients/additives.

**Expected outcomes**

- Availability of a broader range of bio-based safe and sustainable by design (SSbD) solvents meeting market and technical performance requirements
- Significantly improved sustainability, safety, strategic autonomy, resilience and competitiveness
- Reduce the fossil feedstock dependence of chemicals production and/or minimising biomass imports dependencies of the bio-based industries

**Other elements:** Multi-actor approach and SSbD assessment mandatory.
HORIZON-JU-CBE-2024-IA-04: Circular and SSbD bio-based construction & building materials with functional properties

**Scope:** Demonstrate bio-based products with tailored functional properties for large-scale applications in construction and renovation of buildings. Products (e.g., acoustic and thermal insulation panels, façade structures, window frames). Assess compatibility with the built environment and compliance with the relevant regulatory framework.

**Expected outcomes**

- Uptake of circular bio-based solutions in construction and renovation of buildings, with possible spillovers to other large volume markets (e.g., transport and furniture).
- Bio-based materials performance meeting market and regulatory requirements.
- Improved environmental and health & safety profile compared to current equivalent, conventional products.

**Other elements:** Multi-actor approach and SSbD assessment mandatory.
HORIZON-JU-CBE-2024-IA-05: Selective and sustainable (co)-production of lignin-derived aromatics

**Scope:** Demonstrate the efficient, cost-competitive and sustainable production of aromatic bio-based chemicals from lignin, including phenols, alkylphenols, BTX (Benzene, toluene and xylenes) and/or other aromatics. Address the **upstream** processing of lignocellulosic biomass and the **downstream** processing of lignin to obtain targeted aromatics, demonstrating high yield and selectivity for the targeted aromatics. Test and validate (end TRL: 5 and above) the bio-based aromatics for their **further conversion or integration** further down the value chain.

**Expected outcomes**

- Scaling-up the cascading use of lignocellulosic biomass with improved atom economy, upcycling lignin. Significantly contributing to divesting from fossil resources, also considering the aromatics platform.
- Improved sustainability, strategic autonomy, resilience and competitiveness of the European chemical industry while reducing the fossil feedstock dependence in other downstream sectors.

**Other elements:** Multi-actor approach and SSbD assessment mandatory.
HORIZON-JU-CBE-2024-IA-06: Innovative bio-based adhesives and binders for circular products meeting market requirements

**Scope:** Demonstrate the cost-competitive and resource efficient production of SSbD bio-based adhesives and/or binders, as alternatives to conventional fossil-based chemicals posing environmental and health & safety concerns. Demonstrate that they meet target performances, such as shelf life and durability, load-bearing, fire resistance, resistance to chemicals and temperature, mechanical strength etc.

**Expected outcomes**

- Diversification of the bio-based adhesives and binders product portfolio and increase of their range of application
- Product performance meeting market and regulatory requirements
- Improved sustainability and circularity compared to existing market counterparts.
- Improved health and safety profile compared to existing market products.

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

**Type of Action:** IAs

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HORIZON-JU-CBE-2024-IA-07: Innovative conversion of biogenic gaseous carbon into bio-based chemicals, ingredients, materials

**Scope:** Demonstrate the efficient capture and further conversion of biogenic gaseous into ingredients, chemicals and polymers and/or materials within the scope of the CBE. Different conversion routes are in scope. Address: i) flexible and economically viable systems for capture and/or purification of the gaseous stream ii) efficient recovery and purification of obtained ingredients/chemicals/materials proving the fulfilment of requirements for targeted applications

**Expected outcomes**

- Industrial symbiosis in the bio-based sector to reduce GHGs emissions.
- Improved environmental performances and resource efficiency of bio-based processes.
- Improved and upscaled CCU technologies in the bio-based systems

**Other elements:** Multi-actor approach and SSbD assessment mandatory.
HORIZON-JU-CBE-2024-RIA-01 Valorisation of polluted/contaminated wood from industrial and post-consumer waste streams

**Scope:** - Develop innovative, flexible, sustainable and efficient technologies for separating wood content from impurities/pollutants/contaminants and describe the latter will be safely and sustainably isolated and treated. - Develop routes to valorise decontaminated wood waste into bio-based intermediates/chemicals/materials/products. - Develop routes to valorise decontaminated wood waste into bio-based intermediates/chemicals/materials/products. - Target at least 2 applications/sectors, considering economic viability and environmental sustainability. - Assess environmental impact and circularity of the developed treatment of the selected wood waste streams. - Consider the safety of both end-users and operators. • Analyse the regulatory framework related to the management and valorisation of wood waste at EU level and provide recommendations to address bottlenecks.

**Expected outcomes**

• New systems combing sorting, cleaning and valorisation of post-consumer and industrial wood waste into eco-designed, sustainable bio-based products.

• Cross-sectoral and multidisciplinary approach fostering the development of innovative circular business models.

• Decreased wood waste treated with unsustainable EoL practices and the associated environmental impacts.

**Other elements:**

• When applicable, assess & develop treatment and valorisation processes for the isolated contaminants.

• Multi-actor approach and integrating assessment based on the SSbd framework are mandatory.

• In addition to EU funded projects under H2020, HEU Cluster 6, BBI/CBE JU, also consider liaising with any relevant Processes4Planet projects and the NEB initiative.

Side-streams of the forestry sector and pulp& paper industries: not in scope.
HORIZON-JU-CBE-2024-RIA-02 Biotech routes to obtain bio-based chemicals/materials replacing animal-derived ones

**Scope:** - Develop biotech routes for sustainable bio-based alternatives to animal-derived products. - Test the biotech routes and subsequent downstream processes up to pilot scale. - Characterise the properties of the resulting bio-based material(s)/chemical(s) and address validation into final product(s). - Assess against regulations, including health& safety aspects, when considering consumer applications. - Perform socio-economic impact assessment, identifying challenges and opportunities across new and existing value chains. - Involve end-users early on to assess market acceptance. Involve consumers in the testing and validation phase.

**Expected outcomes**

- Novel, scalable and sustainable biotech production routes for bio-based, non-animal-derived chemicals and/or materials.
- Performance of bio-based chemicals and/or materials meeting end users’ requirements for final products.
- Availability of SSbD bio-based products.
- Positive socio-economic impacts along the value chain.
- Social acceptance of circular bio-based solutions and products.

**Other elements:**

- Focus is on bio-based materials and/or chemicals, yet co-production of other bio-based products (e.g. food/feed ingredients) is in scope, fulfilling the cascading use of biomass.
- Multi-actor approach and integrating assessment based on the SSbD framework are mandatory.

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HORIZON-JU-CBE-2024-RIA-03 Sustainable, bio-based alternatives for crop protection

**Scope:** - Develop and test innovative processes for obtaining safe and sustainable bio-based alternatives for crop protection. - Assess the potential risks and benefits of the chosen alternative(s), in view of safety and sustainability, and related to their manufacturing and placement on the market. Where applicable, a comparison with the fossil-based state-of-the-art counterparts should be provided. - Develop and test the effectiveness of alternatives, for selected crops, while covering a variety of climatic and soil conditions. - Address innovative solutions for product delivery on field, including precision farming approaches (through enabling digital technologies and/or formulation and optimisation aspects to ensure controlled release). - Implement a participatory approach, fostering the cooperation among farmers and bio-based industries, including exchange of knowledge and best practices, capacity building, training and education activities, thus enabling the adoption of alternative solutions.

**Expected outcomes**

- Increased availability of widely accessible, cost-efficient alternatives for improved environmental performance (reduced effects on non-target organisms).
- Low risk plant protection solutions to sustain crop productivity and food security in agriculture and/or forestry.
- Minimised pesticides impact on human and animal health, ecosystems, drinking water, soils and food chains.

**Other elements:**

- Consider liaising with the Mission ‘A Soil Deal for Europe’, in particular with activities under the objectives ‘reduce soil pollution and enhance restoration’ and ‘improve soil structure to enhance soil biodiversity’.
- Multi-actor approach and integrating assessment based on the SSbD framework are mandatory.

Additional information:

- **Type of Action:** RIA
- **Topic Budget:** 10 M€
- **end TRL:** 4-5
- **EU contribution per project:** 5 M€
HORIZON-JU-CBE-2024-RIA-04 SSbD bio-based coating materials for applications under demanding and/or extreme conditions

**Scope:** - Develop innovative and efficient processes to obtain SSbD bio-based alternative(s) to (a set of) conventional coating(s) for applications under demanding and/or extreme conditions (e.g. high durability; resistance to fire, extreme temperatures, chemical agents, weather, fouling, corrosion) - Assess the functional properties of the developed coatings against application-driven parameters and involve end-users in the testing and validation. - Address the EoL of the targeted final product(s), ensuring that the bio-based coating is not hindering the circularity of the final product(s). - Perform a preliminary techno-economic feasibility analysis, including market considerations.

**Expected outcomes**

- Diversified portfolio of bio-based coatings with high technical performances.
- Increased range of applications of bio-based coatings into products used under demanding and/or extreme conditions.
- Improved sustainability and circularity, compared to existing (fossil-based) counterparts.
- Improved health and safety profile, compared to existing (fossil-based) counterparts.

**Other elements:**

- One or more relevant end-use sectors could be targeted, without limitation.
- Integrating assessment based on the SSbD framework are mandatory.
HORIZON-JU-CBE-2024-RIA-05 Innovative bio-based food/feed ingredients

**Scope:** -Develop innovative food and/or feed ingredients from sustainably sourced bio-based feedstock. Innovation can be related to i) **breakthrough processes** to obtain known food/feed ingredients, and/or ii) **novel food/feed ingredients**. -Besides **technical properties** (organoleptic, nutritional, prevention of intolerances/allergies), also consider **affordability**. -Pay particular attention to **environmental, social and economic sustainability** of the chosen production pathway. -Also consider the part of **downstream processing** to meet targeted quality, but also being aligned with safety and regulatory requirements. -**For circular solutions**, (e.g. residual biomass valorisation), adopt **monitoring solutions** to ensure that pathogens or contaminants are not injected back in the loop. -**Test the properties and safety** according to established testing procedures, and if applicable, their impact on product formulations. -**Address regulatory aspects relevant to the targeted end market(s)**, ensuring compatibility in view of potential future scale-up. -**Involve end-users** early on to assess market acceptance. When addressing consumer products, involve consumers to gain insight of their perception and future chances of market uptake.

**Expected outcomes**

- Increased availability of affordable bio-based functional food products.
- Increased safety and sustainability of food and feed value chains.
- Reduction of use of food and feed ingredients from unsustainable sources.
- New and better organoleptic & nutritional properties for healthy food products.

**Other elements:**

- Production of bulk proteins, fibres and carbohydrates as the main component is not in scope; however the development of complex food/feed formulations with innovative functional ingredients working in synergy with them is in scope.
- **Multi-actor approach** is mandatory.

(!) Ingredients in scope: bioactive compounds, antioxidants, prebiotics, probiotics, vitamins, peptides, oligosaccharides, fats, emulsifiers, <taste, texture, palatability and digestibility> enhancers, colourants, functional/’precision proteins’ (i.e. proteins obtained, for example but not only, from precision fermentation process), among others.
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HORIZON-JU-CBE-2024-CSA-01 New forms of cooperation in agriculture and the forest-based sector

**Scope:** - Assess feasibility and suitability of new forms of cooperation among primary producers to optimise harvesting, logistics, circular processing and valorisation of particularly secondary or underutilised, biomass. - Stimulate interactions between key actors against limiting factors such as seasonality of biomass, initial costs or high market competition. - Use of technologies and logistics in a symbiotic and resource-efficient way. - Identify and develop solutions to overcome barriers for the valorisation of underutilised biomass, considering the regional conditions as well as the perspective of primary producers and the industry. - Demonstrate the sustainable production of added-value bio-based products following the food first and cascading biomass use principles. - Provide benefits (e.g. education training, technical assistance,...etc.). - Underrepresented rural areas - Develop environmental impact assessment models to optimise the production along the value chain. - Identify bottlenecks and opportunities in existing regulatory environments, governance structures and stakeholder views.

**Expected outcomes**
- Identified new forms of cooperation among primary producers and other rural actors, and between them and bio-based industries.
- Innovative cooperatives and circular bio-based business models for rural actors in different regions and pedo-climatic zones.
- Better awareness on added-value bio-based products with improved sustainability characteristics and their scaling up potential.
- Creation of ‘green’, fair and skilled jobs and new and local business opportunities with potential for replication across the EU.
- Improved circularity & resource efficiency of bio-based value chains.

**Other elements:** Multi-actor approach is mandatory.
HORIZON-JU-CBE-2024-CSA-02 Mobilize inclusive participation in bio-based systems and supporting the CBE JU widening strategy and its action plan

**Scope:**

- Foster **stakeholder engagement and collaboration**. Development of **joint projects** could be promoted.
- Develop **capacity building and raise awareness**, encompassing efforts focusing on attracting newcomers and industrial representatives.
- **creation/participatory/trust building approaches**, including in local and regional programmes in bioeconomy; ii) **recommendations** are needed for sector and for an increased engagement of all stakeholders, including **Promote synergies:** i) Analyse establishing **collaborations with relevant** funding programmes at EU, national or regional levels with a particular focus on ESIFs, the implementation of Recovery and Resilience Facility and the Just Transition Fund; ii) **Synergies with relevant EC funded projects**, considering the inventory of relevant projects in the CBE JU Widening strategy.

**Expected outcomes**

- Increased innovation capacity of bio-based stakeholders in countries and regions with less mature bio-based ecosystems.
- Greater participation of less represented countries and regions in the CBE JU widening strategy and its action plan of newcomers from industry, market operators, civil society and policy makers.
- Identified and improved connections among actors within local innovation ecosystems, promoting teaming and exchange of best practices across the EU.
- Full implementation of the CBE JU widening strategy at national and/or regional levels.
- **Synergies with other funding programmes at EU, national or regional levels.**

**Other elements:** **Multi-actor approach** is mandatory.

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Participation of stakeholders from other countries and regions is encouraged, if aimed at the exchange of best practices, capacity building and mutual learning.

Synergies with relevant regional networks such as the BIOEAST Initiative are encouraged.

Proposals may involve financial support to third parties in the form of grants. The maximum amount to be granted to each third party is EUR 60,000. A maximum EUR 300,000 of the EU funding can be allocated to this purpose overall.
HORIZON-JU-CBE-2024-CSA-03 Supporting the CBE JU Deployment Group on Primary Producers

**Scope:** - Put in place working modalities and tools to effectively maintain the Deployment Group (DEG) for at least 3 years. - Support the DEG in developing and updating an action plan, while considering specificities of the identified primary sectors, and provide the means and mechanisms to implement the action plan. - Facilitate the organisation of regular meetings, assisting the dialogue among stakeholders and sectors and prepare reports and conclusions. - Organise ad-hoc technical working groups to discuss specific topics, as needed to achieve tangible results. - Assist in preparation of outputs, such as policy reports, analyses, or recommendations for the CBE JU GB, but, also if needed, translated into other languages. - Identify and set-up efficient mechanisms to follow-up on challenges, bio-based solutions and innovations. - Develop collaboration structures and methods between primary producers and the industry, involving Bio-based Industries Consortium. - Perform additional activities to support the activities of the DEG, maximising its impact, including dissemination & communication activities in different languages and activities to enhance cooperation with the rest of stakeholders across the value chain. - Connect and build on existing initiatives and networks; proposing and implementing actions to ensure synergies. - Identify, in close cooperation with the DEG, areas for which analysis of past and ongoing R&I projects is needed. - Prepare a final report.

**Expected outcomes**
- Support the CBE JU Deployment Group of primary producers to meet objectives and carry out proposed tasks.
- Enhanced impact by means of implementing high-quality actions and delivering outstanding outcomes.
- Efficient, active, engaged, and well-coordinated DEG, maintained and at least for a period of 3 years.
- Improved organisation, communication and dissemination of DEG activities and their results at European and national level.
- Enhanced cooperation with existing initiatives/networks/projects relevant to the activities of the DEG of primary producers.

**Other elements:**
- The DEG will be composed by stakeholders representing the primary sector, including the agricultural; forestry; and fisheries & aquaculture primary sectors from different regions and pedo-climatic zones in Europe.

**Proposals may involve financial support to third parties in the form of grants. The maximum amount to be granted to each third party is EUR 60,000. A maximum EUR 300,000 of the EU funding can be allocated to this purpose overall.**