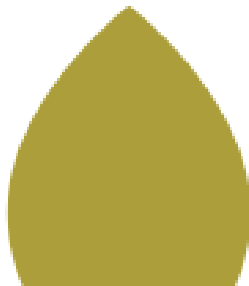
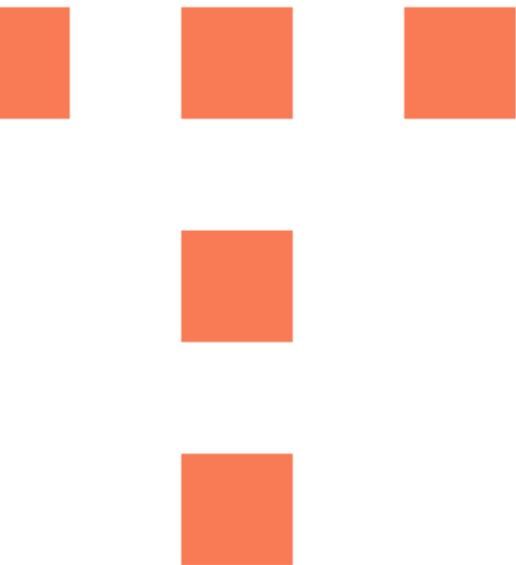


Technological Centre

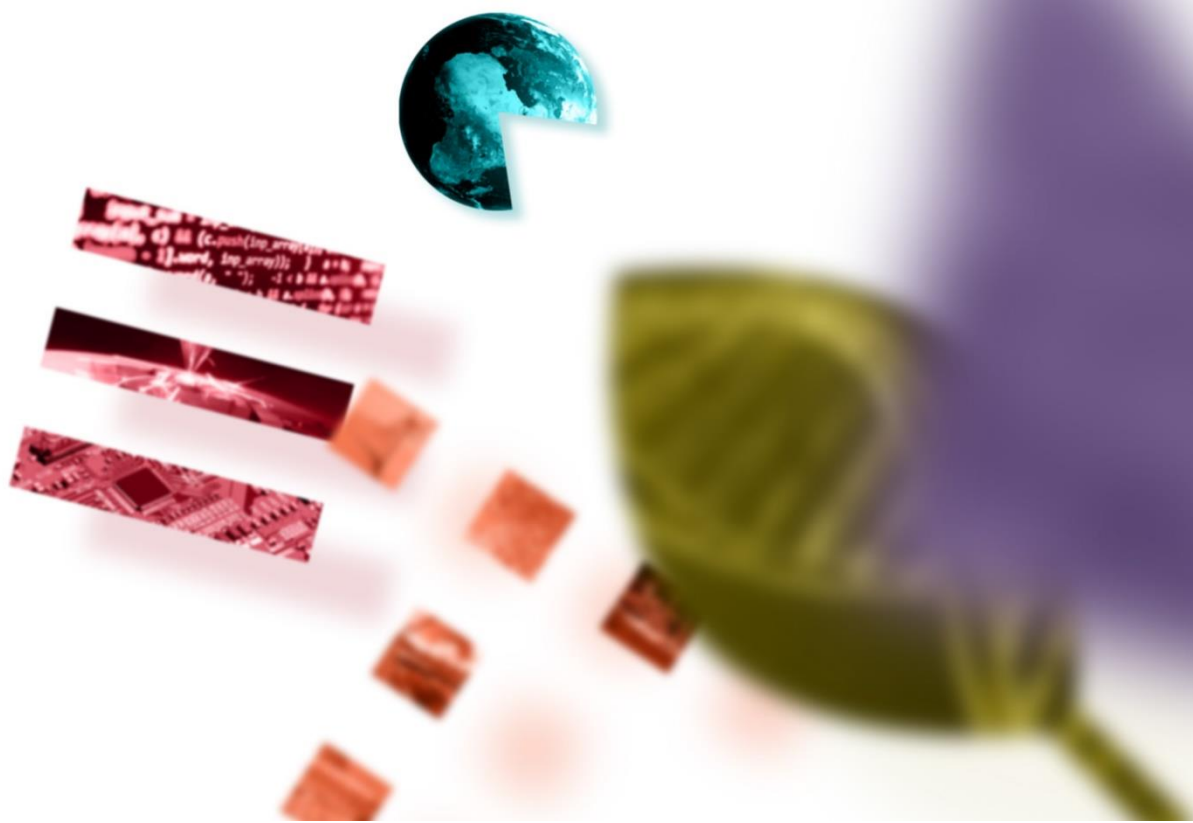
Capabilities Horizon Europe

HORIZON-CL HORIZON-CL6-2023



Content

HORIZON-CL6-2023-BIODIV-01-2 Impact of light and noise pollution on biodiversity (RIA).....	3
HORIZON-CL6-2023-BIODIV-01-7 Demonstration of marine and coastal infrastructures as hybrid blue-grey Nature-based Solutions.....	3
HORIZON-CL6-2023-CircBio-01-4 Land-based bioprospecting and production of bioactive compounds and functional materials for multiple bio-based value chains (RIA).....	3
HORIZON-CL6-2023-Circbio-01-8 Eco-friendly consumer products – low-toxicity/zero pollution construction bio-based materials (IA).....	4
HORIZON-CL6-2023-Circbio-02-2-two-stage Novel, sustainable and circular bio-based textiles (IA).....	5
HORIZON-CL6-2023-Circbio-02-3-two-stage Non-plant biomass feedstock for industrial applications: processes to convert non-lignocellulosic biomass and waste into bio-based chemicals, materials and products, improving the cascading valorisation of biomass (RIA).....	6
HORIZON-CL6-2023-ZEROPOLLUTION-01-1 Knowledge and innovative solutions in agriculture for water availability and quality (RIA).....	7
HORIZON-CL6-2023-ZEROPOLLUTION-02-1-two-stage Optimisation of manure use along the management chain to mitigate GHG emissions and minimize nutrients/contaminants dispersion in the environment (RIA)..	8
HORIZON-CL6-2023-ZEROPOLLUTION-02-2-two-stage Safe-and-sustainable-by-design bio-based platform chemicals, additives, materials or products as alternatives	8
HORIZON-CL6-2023-CLIMATE-01-7 Enhancing the sustainable production of renewable energy at farm level	10



HORIZON-CL6-2023-BIODIV-01-2 Impact of light and noise pollution on biodiversity (RIA)

TOPIC DEADLINE 28/03/2023	BUDGET PER PROJECT 4 M€	TOTAL BUDGET 7 M€	EXPECTED NUMBER OF PROJECTS 2	TYPE OF ACTION RIA
------------------------------	----------------------------	----------------------	----------------------------------	-----------------------

Assess the need and ability of specific measures to prevent negative impacts of light and noise on biodiversity, including monitoring.

Sensors to measure light and noise levels and collect data to train an AI model to automatically recognize the origin and monitor the pollution to reduce or avoid it.

Explore innovative solutions to prevent and mitigate the impacts of light and noise on biodiversity and ecosystem services. This should not be limited to technological solutions.

Nature based solutions including green facilities as barriers to mitigate the impact of light and/or noise while boosting other positive impacts.

HORIZON-CL6-2023-BIODIV-01-7 Demonstration of marine and coastal infrastructures as hybrid blue-grey Nature-based Solutions

TOPIC DEADLINE 28/03/2023	BUDGET PER PROJECT 5 M€	TOTAL BUDGET 10 M€	EXPECTED NUMBER OF PROJECTS 2	TYPE OF ACTION IA
------------------------------	----------------------------	-----------------------	----------------------------------	----------------------

Bio filtration and bio depollution

Selection of species in Nature Based Solutions to develop different coastal infrastructures increasing the capability of contaminants capture including metals, organic contaminants, oils etc.

Extreme events

Nature based solutions to prevent floods, rain gardens.

HORIZON-CL6-2023-CircBio-01-4 Land-based bioprospecting and production of bioactive compounds and functional materials for multiple bio-based value chains (RIA)

TOPIC DEADLINE 28/03/2023	BUDGET PER PROJECT 4 M€	TOTAL BUDGET 4 M€	EXPECTED NUMBER OF PROJECTS 1	TYPE OF ACTION RIA
------------------------------	----------------------------	----------------------	----------------------------------	-----------------------

Optimisation of production routes for bioactive compounds (hydroponic, bioreactors, biotechnology)

Scalation of bioprocesses from lab to pilot, optimisation of conditions for production of compounds by biotechnology (bacteria, fungi, etc.). Production of fertilizers.

Covering the environmental, climate and safety/health impacts of the developed ingredients or processes, using Life-Cycle Assessment (LCA) methodologies based on available standards, certification, and accepted and validated approaches.

Implementation of eco-design and Safe & Sustainable-by-design strategies to bioactive materials, chemicals, and processes. Health, Safety and Risk assessment of novel processes and materials.

Sustainability Assessment of processes and products comprising the three pillars involved (environmental, economic, and social); Life Cycle Assessment (LCA), Life Cycle Costing Assessment (LCC) and Social Life Cycle Assessment.

Assessment of biodegradability (water, soil, compost...) and recyclability tests to assess sustainability and safety of novel product's end-of-life.

HORIZON-CL6-2023-Circbio-01-8 Eco-friendly consumer products – low-toxicity/zero pollution construction bio-based materials (IA)

TOPIC DEADLINE	BUDGET PER PROJECT	TOTAL BUDGET	EXPECTED NUMBER OF PROJECTS	TYPE OF ACTION
28/03/2023	5 M€	10 M€	2	IA

Bio-based feedstocks as materials for the construction sector developing innovative building solutions

The expertise of CETIM is focused on developing new materials and building solutions aimed at **reducing energy consumption and GHG emissions caused by HVAC** (Heating, ventilating, and air conditioning) systems, promoting sustainable criteria and moving towards a green economy through the design of novel solutions for zero-emission buildings.

Innovative precast and modular system for green roofs including two components.

CETIM can design and develop a modular green roof system formed by **two thermos-compressed layers**: (a) an **impermeable and anti-root thermosetting bio-based polymer**, moulded to be tongue-and-groove assembled, and (b) an **insulating and drainage biobased composite** (based on porous biochar-alginate composite) as the substrate of the vegetal layer.

Novel sandwich panel for ETICS based on bio-based materials.

CETIM can develop different materials as a part of a sandwich panel for ETICS:

- An improved **natural insulation** panel with compressed **rice straw or textile** with lignin-based additives to improve fire resistance.
- **Bio-mass-ash-based fibreboard** for the external layers of the insulation

- An innovative **biobased adhesive mortar**, for installing the sandwich panel to the existing wall or substrate, based on an alkali-activated binder with bio-mass ash, and a novel **lignin-based resin**.

Novel sandwich panel for interior insulation solution.

CETIM can develop **different external layers for an insulation panel** (same as ETICS) for installing as **interior insulation**:

- Vapour control layer based on a novel clay-based mortar.
- Thermal coating mortar based on air lime and biomass-ash.

Formulations targeting: composites, insulation materials and adhesives and development of bio-based additives

Modified lignin by phosphorylation and/or esterification reactions to confer fire retardant properties to the selected bio-based materials.

Lignin based resins as binders.

HORIZON-CL6-2023-Circbio-02-2-two-stage Novel, sustainable and circular bio-based textiles (IA)

TOPIC DEADLINE 28/03/2023	BUDGET PER PROJECT 7 M€	TOTAL BUDGET 14 M€	EXPECTED NUMBER OF PROJECTS 2	TYPE OF ACTION IA
---------------------------------	-------------------------------	-----------------------	-------------------------------------	----------------------

Valorisation of under-utilised (primary or secondary) biomass

Extraction (organosolv, kraft...), purification and derivatization of lignin, hemicellulose and cellulose from lignocellulosic materials (paper pulp by-products).

Design for circularity, enabling thus material design for durability, end-of-life recyclability, re-use and upcycling (including usability of waste fibres), with attention to the final application(s)/end use of textiles.

Mechanical/Physical/Chemical treatments to obtain lignin microparticles and its functionalization by several methods such as cationization, amination, phosphorylation, sulphomethylation, etc. to develop different additives with properties:

- Functionalized lignin to be used as **carrier for textile dyes**.
- Modified (micro)lignin and/or nanocellulose to give **fire resistance properties** to the textile.
- Nanocellulose as textile **structure reinforcement**.
- Modification of **nanocellulose for textile coating** with **superhydrophic and antimicrobial properties**.

Enzymatic and mechanical treatments to obtain cellulose nanofibers and its modification (silanization, cationization, phosphorylation, amination, etc)

Design for end-product quality, safety, and durability, with consideration of the sustainability and circularity of textiles value chains and the final application/end-use; this does include preventing micro- and nano- plastics/fibres release throughout the lifecycle of textiles.

Pilot facilities to demonstrate the scalability of materials production

CETIM has a pilot extrusion equipment (Lab-Compounder KETSE 20/40 from Brabender, 20 kg/h, with side and main feeders) which is designed to be a versatile solution for most of the compounding tasks because the adaptability of the machine configuration the different applications such as the production of fabrics or waste yarns.



Assessment of the environmental and social performance of the innovations as well as the Integration of Safe-and-Sustainable-by-Design (SSbD) framework

Implementation of eco-design and Safe & Sustainable-by-design strategies to bioactive materials, chemicals, and processes. Health, Safety and Risk assessment of novel processes and materials.

Sustainability Assessment of processes and products comprising the three pillars involved (environmental, economic, and social); Life Cycle Assessment (LCA), Life Cycle Costing Assessment (LCC) and Social Life Cycle Assessment.

Assessment of biodegradability (water, soil, compost...) and recyclability tests to assess sustainability and safety of novel product's end-of-life.

HORIZON-CL6-2023-Circbio-02-3-two-stage Non-plant biomass feedstock for industrial applications: processes to convert non-lignocellulosic biomass and waste into bio-based chemicals, materials and products, improving the cascading valorisation of biomass (RIA)

TOPIC DEADLINE 28/03/2023	BUDGET PER PROJECT 4 M€	TOTAL BUDGET 8 M€	EXPECTED NUMBER OF PROJECTS 2	TYPE OF ACTION RIA
-------------------------------------	-----------------------------------	-----------------------------	---	------------------------------

Experience working with different feedstocks in pre-treatment

Organic fraction of municipal solid waste, agricultural waste, waste from dairy industry by biological processes (enzymatic pre-treatment, acidogenic fermentation), selection of solvents for extraction. Novel separation processes for sugars, volatile fatty acids and other target compounds from residues.

Downstream conversion processes

Downstream processing for the obtention of high-value biobased products as alternatives to petrol-based chemicals and/or bio-based compounds currently obtained from food/feed crops.

Life-cycle assessment of sustainability, economic and social aspects of the proposed innovations

Development of continuous (ex-ante) sustainability assessment LCSA (Life Cycle Sustainability Assessment) as a supporting tool in the selection of the different conversion processes. LCSA will involve both the environmental (LCA), economic (LCC) and social (Social-LCA) of the NLBM biorefinery. Special focus will be made on the impact over GHG emission, changes in land uses and biodiversity, of the target building blocks portfolio, establishing a comparison with fossil-counterparts.

Techno-economic assessment will establish different NLBM biorefinery scenarios, involving the establishment of satellite-facilities for local pre-treatment of NLBM feedstock, and different scales to improve industrial competitiveness of the biobased bio-refinery.

HORIZON-CL6-2023-ZEROPOLLUTION-01-1 Knowledge and innovative solutions in agriculture for water availability and quality (RIA)

TOPIC DEADLINE 28/03/2023	BUDGET PER PROJECT 6 M€	TOTAL BUDGET 6 M€	EXPECTED NUMBER OF PROJECTS 1	TYPE OF ACTION RIA
-------------------------------------	-----------------------------------	-----------------------------	---	------------------------------

Smart sensors and artificial intelligence for water management

Development of sensors for consumption and **water quality monitoring** in case it is possible to reuse it in another application, including these technologies:

- Photonic sensors
- Systems of contaminant capture based in lignocellulosic materials based on chemical and/or physical interactions:
 - Molecular or ionic imprinted polymers (MIPs/IIPs) synthesis on demand of the interested chemicals such as emerging contaminants, heavy metals, toxins, pesticides, drugs, etc.
 - Enzymatic and mechanical treatments to obtain cellulose nanofibers and its modification (silanization, cationization, amination, etc) that can be used to capture chemicals as sorbent materials.

Use of **Artificial Intelligence** with predictive algorithms for optimization of water use and combination with **Digital Twins** to create simulation models or connect in real-time with the real model to make decisions based on sensor information that lead to optimization.

Use of satellite images to find **patterns in pesticide presence as a result of water transportation**.

Nature based solutions

Wetlands and systems to reduce the quantity of nitrates by the use of electrodes.

HORIZON-CL6-2023-ZEROPOLLUTION-02-1-two-stage

Optimisation of manure use along the management chain to mitigate GHG emissions and minimize nutrients/contaminants dispersion in the environment (RIA)

TOPIC DEADLINE 28/03/2023	BUDGET PER PROJECT 7 M€	TOTAL BUDGET 7 M€	EXPECTED NUMBER OF PROJECTS 1	TYPE OF ACTION RIA
------------------------------	----------------------------	----------------------	----------------------------------	-----------------------

Lifecycle assessment methods, models and equipment for the measurement and monitoring of GHG (CH₄, N₂O), atmospheric and air pollutants (NH₃, NO_x) at each stage of manure management practices, from feeding to field application.

Sustainability Assessment of processes and products comprising the three pillars involved (environmental, economic, and social); Life Cycle Assessment (LCA), Life Cycle Costing Assessment (LCC) and Social Life Cycle Assessment.

Assessment of biodegradability (water, soil, compost...) and recyclability tests to assess sustainability and safety of novel product's end-of-life.

Demonstrate and test the most efficient strategies and technologies to mitigate GHG emissions and air pollutants from manure at regional/local scale.

Biofermentation and other gas obtention processes to use and valorise the GHG, reducing the amount of gases emitted while producing H₂, CH₄ and biogas.

HORIZON-CL6-2023-ZEROPOLLUTION-02-2-two-stage Safe-and-sustainable-by-design bio-based platform chemicals, additives, materials or products as alternatives

TOPIC DEADLINE 28/03/2023	BUDGET PER PROJECT 4 M€	TOTAL BUDGET 8 M€	EXPECTED NUMBER OF PROJECTS 2	TYPE OF ACTION RIA
------------------------------	----------------------------	----------------------	----------------------------------	-----------------------

A wide range of chemicals and advanced for process development and testing, developing solutions with a diverse functional performance and outstanding benefits on safety and environmental performance.

- **Lignocellulosic chemicals:**

Extraction (organo solv, kraft...), purification and derivatization of lignin, hemicellulose and cellulose from wood sources to obtain chemical building blocks. From these specialties, additives for concrete and polymers, polymeric matrices, bio fillers, surfactants, absorbents, ... are developed.

- Lignin: oxyalkylation, amination, sulfomethylation, glyoxalation (with biobased dialdehyde), epoxidation, electrochemical oxidation to obtain → polymeric matrices, food, polymeric and

concrete additives (antimicrobial, antifungal, plasticizers, antioxidants, UV-blocking...). Micro lignin particles as filler/microcapsules of different substrates by mechanical processes.

- Cellulose: acid hydrolysis to obtain levulinic acid → levulinic esters, DALA, MTHF, diphenolic acid or levulinic acid-derived ketal to obtain substitute for bisphenol A in epoxy resins, precursor of acrylic acid for application in acrylic resins, pesticides, cetane improvers and cold-flow performers for diesel, additives for food.... Enzymatic and mechanical treatments to obtain cellulose nanofibers and additives (hydrophobic and antimicrobial).
- Hemicellulose: homogeneous catalyses to obtain furfural/furfuryl alcohol

- **Bio based polymers, coatings and adhesives formulations:**

Development of biobased thermoplastic and thermoset composites using biomatrixes, biofillers and bioadditives obtained from renewable sources: lignin (lignin modification through oxypropylation, amination, sulfomethylation, glyoxilation...etc by green chemical routes) and oils (camelina, jatropha or waste frying oil throughout epoxidation, hydroxylation, acrylation and cyclocarbonation reactions by green chemical routes) to obtain additives, micro and nano lignin particles as fillers and matrix components (thermoplastic (PE, PP, TPU...) and thermoset (PU, NIPUs, epoxy, formaldehyde based resins, acrylics, polyesters) of polymer formulations; cellulose (enzymatic and mechanical treatments to obtain nanocellulose fibres and their chemical modification) to obtain nano fibres for polymer, coatings, binders and adhesives.

- **Development of new eco-designs in multi-material products and composites to facilitate sorting, cleaning, composting or recycling activities**
- **Novel design in bio-based bitumen and bitumen emulsions for more eco-friendly asphalt mixtures:**

CETIM has the expertise to develop and characterise novel sustainable bitumen based on incorporating lignin and nanocellulose to partially substitute conventional bitumen, reducing its use and promoting the fossil-feedstock substitution by new bio-based materials.

- **Development of new bio-based thermal insulation materials/systems based on non-isocyanate polyurethane (NIPUs):**

CETIM can design and characterise new eco-friendly thermal insulation materials by using lignin or carbonated oils to avoid isocyanate's use, a harmful substance with significant carcinogenic potential.

- **Innovative design of sustainable air entraining additives based on modified lignin for develop alkali-activated lightweight mortars and concrete using CDW (construction and demolition waste).**

CETIM can develop and characterise new sustainable additives to improve thermal insulation performance of alkali-activated mortars and concrete by using innovative air entraining agents with modified lignin, which can replace current harmful substances used for these purposes.

- **Novel sustainable adhesive mortar composed of alkali-activated binder using CDW and bio-based epoxy resin using natural oils and modified lignin.**

CETIM has the expertise on designing, develop, and characterise epoxy adhesive bio-based resins through the incorporation of epoxidised oil and lignin to partially replace the harmful substances such as epichlorohydrin and bisphenol A di-glycidyl ether.

Safe-and-sustainable-by-design (SSbD) framework application

Implementation of eco-design and Safe & Sustainable-by-design strategies to bioactive materials, chemicals, and processes. Health, Safety and Risk assessment of novel processes and materials.



Sustainability Assessment of processes and products comprising the three pillars involved (environmental, economic, and social); Life Cycle Assessment (LCA), Life Cycle Costing Assessment (LCC) and Social Life Cycle Assessment.



Assessment of biodegradability (water, soil, compost...) and recyclability tests to assess sustainability and safety of novel product's end-of-life.



HORIZON-CL6-2023-CLIMATE-01-7 Enhancing the sustainable production of renewable energy at farm level

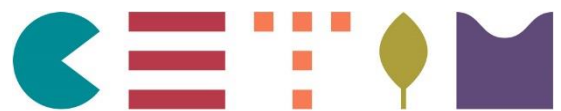
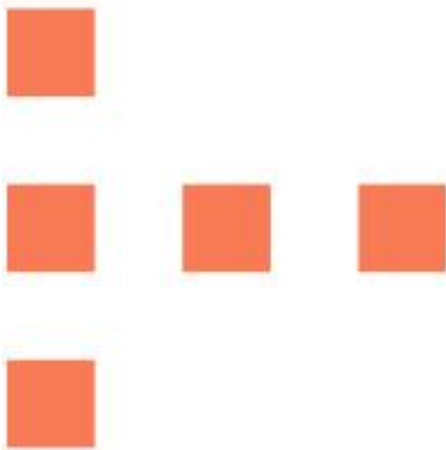
TOPIC DEADLINE	BUDGET PER PROJECT	TOTAL BUDGET	EXPECTED NUMBER OF PROJECTS	TYPE OF ACTION
12/04/2023	5 M€	5 M€	1	RIA

Options to deploy renewable energy installations on farms

Biofermentation and gas production systems from different waste (agricultural waste, manure, animal waste)

Assessment of environmental impacts (on climate change, biodiversity loss, pollution and natural resources depletion)

Sustainability Assessment of processes and products comprising the three pillars involved (environmental, economic, and social); Life Cycle Assessment (LCA), Life Cycle Costing Assessment (LCC) and Social Life Cycle Assessment.



CETIM Technological Centre

Parque Empresarial de Alvedro, calle H, 20.
15180 Culleredo, A Coruña, Spain

+34 881 105 624 | info@cetim.es | www.cetim.es