Technological Centre

Circular Biobased Europe

EXPERTISE IN CALLS
& TOPICS | 31/05/2022

CIRCULAR BIOBASED EUROPE DEADLINE 22/09/2022

TOPIC
CBE-2022-R-01 High performance bio-based polymers for market applications with stringent requirements
CBE-2022-R-02 Bio-based coatings, barriers, binders, and adhesives
CBE-2022-R-03 CBE Circular-by-design bio-based materials to improve the circularity of complex structures
CBE-2022-R-04 Proteins from alternative and unconventional sources
CBE-2022-R-05 Green fibres biorefineries feedstock
CBE JU2022.IA1. Biogenic carbon capture and use (CCU) for circular bio-based products
CBE JU2022.IA2. Cooperative business models for the valorisation of agricultural residues, by-products, and waste in rural areas
CBE JU2022.IA3. Cost-effective production routes towards bio-based alternatives to fossil-based chemical building blocks
CBE JU2022.IA4. Co-processing of mixed bio-based waste streams
CBE JU2022.IAFlag1. Maximum valorisation of sustainably sourced bio-based feedstock in multi-product, zero-waste, zero-pollution biorefinery
CBE JU2022.IAFlag2. Alternative sources for high added value food and/or feed ingredients
CBE JU2022.S1. Developing and validating monitoring systems of environmental sustainability and circularity: collection of best practices and benchmarks

Circular Bio-Based Europe

High performance bio-based polymers for market applications with stringent requirements

TOPIC CODE	**CBE JU2022.R1**
TOPIC DEADLINE	**22/09/2022**
BUDGET PER PROJECT	**4.5 M€**
TOTAL BUDGET / EXPECTED NUMBER OF PROJECTS	**9 M€ / 2**
TYPE OF ACTION	**RIA (TRL 5)**

Lignocellulosic materials expertise:

- Lignin and/or nanocellulose as polymer additives and as alternative to matrix components (lignin modification through oxypropylation, amination, sulphometilation, etc.) (similar to DICKENS project)

Polymers and coatings expertise

- Development of biobased thermoplastic and thermoset composites through the use of biomatrixes, biofillers and bioadditives from renewable sources.
- Use of non-edible oils such as camelina, jatropha or waste frying oil to obtain alternatives to conventional fossil polymers throughout epoxidation, hydroxylation, acrylation and ciclocarbonation reactions.
- Chemical and mechanical recycling of polyolefins and polyurethane and inclusion of recyclates on optimized polymeric formulations.

Previous projects:

- LIGNOPRIZED
- NOVACELL
- LIGNOSPREAD
- INUPIPE
- DICKENS
- POLIAC
- PE-WASTE

Specific equipment:

- High pressure homogenizer (lab and pilot scale)
- Pulper and ultraturrax (lab scale)
- Spray dryer (pilot scale)
- Non-pressurized reactor (lab and pilot scale)
- Pressurized reactor (lab scale)
- Universal testing machine
- Tensile and flexion specimen molds
- Peel off, cross cut and aging tests
- Mini and pilot plant extruder and microinjection

Circular Bio-Based Europe

Bio-based coatings, barriers, binders, and adhesives

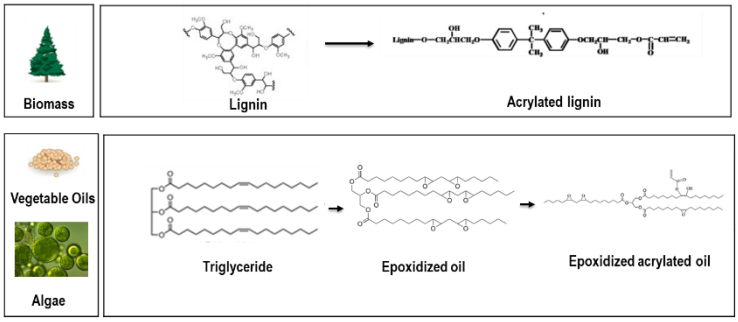
TOPIC CODE	CBE JU2022.R2
TOPIC DEADLINE	22/09/2022
BUDGET PER PROJECT	4.5 M€
TOTAL BUDGET / EXPECTED NUMBER OF PROJECTS	9 M€ / 2
TYPE OF ACTION	RIA (TRL 5)

Lignocellulosic materials expertise:

- Development of nanocellulose coatings with antimicrobial, hydrophobic, oleophobic and/or barrier properties
- Development of lignosulfonate as coating with antifouling, antioxidant and/or antimicrobial properties
- Development of lignin and/or nanocellulose for binder or adhesives

Polymers and coatings expertise

- Development of biobased thermoset composites through the use of biomatrixes, biofillers and bioadditives from renewable sources.
- Use of non-edible oils such as camelina, jatropha or waste frying oil to obtain biobased adhesives, binders and coatings throughout epoxidation, hydroxylation, acrylation and ciclocarbonation reactions.
- Synthesis of free-formaldehyde adhesives using biomass for many applications related to the use of wood fiber and sawdust.
- Development of eco-sustainable super hydrophobic, icephobic, anti-corrosion / abrasion, antimicrobial, reinforced coatings from lignin and vegetable oils.



Biorefineries

Ex-ante sustainability assessment of the recycling processes developed in the project. Sustainability assessment of the bio-based materials, ecodesign and support of different metrics (circularity indexes, Life Cycle Assessment, etc) for the selection of chemicals and raw matters used in the development of novel complex materials.

Biobased technologies

Expertise in fermentation processes with industrially relevant microorganism strains (BIORECOVER) and in microalgae culture (NEOMEAT) for chemical production. Enzymatic treatment for breaking down biomass (REPACELL). Biocoating technologies – Possible collaboration with Biopolymer department.

Previous projects:

- PROTEX
- NOVACELL
- REDEFINE
- OCEAN KUBE
- LIGNO-PRIZED
- DICKENS
- POLIAC

Specific equipment:

- High pressure homogenizer (lab and pilot scale)
- Pulper and ultraturrax (lab scale)
- Non-pressurized reactor (lab and pilot scale)
- Pressurized reactor (lab scale)
- Coating equipment (lab scale)
- Universal testing machine
- Tensile and flexion specimen molds
- Peel off, cross cut and aging tests

Circular Bio-Based Europe

Circular-by-design bio-based materials to improve the circularity of complex structures

TOPIC CODE	CBE JU2022.R3
TOPIC DEADLINE	22/09/2022
BUDGET PER PROJECT	4.5 M€
TOTAL BUDGET / EXPECTED NUMBER OF PROJECTS	9 M€ / 2
TYPE OF ACTION	RIA (TRL 5)

Lignocellulosic materials expertise:

- Recyclability and circularity for multi-material products composed by cellulose and polymers by separation of both materials. Reuse of this cellulose to nanocellulose obtention. This nanocellulose can be use as intermediate layer in laminated paper for food to improve the recyclability of the material.

Polymers and coatings expertise

- Development of biobased thermoplastic and thermoset composites through the use of biomatrixes, biofillers and bioadditives from renewable sources.
- Use of non-edible oils such as camelina, jatropha or waste frying oil to obtain alternatives to conventional fossil polymers throughout epoxidation, hydroxylation, acrylation and ciclocarbonation reactions.
- Development of 100% bio-based flexible packaging formulations meeting the stipulated product requirements
- Development of new eco-designs in multi-material products and composites to facilitate sorting, cleaning, composting or recycling activities

Water and air treatment

Water circularity: Technologies for water and wastewater regeneration and reuse: membrane filtration (MF, UF, RO, FO…), electrochemical (electrodialysis, electrooxidation …), adsorption, disinfection (UV-LED, photocatalysis…). Membrane treatments as pre-treatment or product purification step.

Reference projects: LIFE GREEN SEWER, LIFE ULISES, LIFE PHOENIX

Biorefineries

Ex-ante sustainability assessment of the recycling processes developed in the project. Sustainability assessment of the bio-based materials, ecodesign and support of different metrics (circularity indexes, Life Cycle Assessment, etc) for the selection of chemicals and raw matters used in the development of novel complex materials.

Biobased technologies

Expertise in fermentation processes with industrially relevant microorganism strains (BIORECOVER) and in microalgae culture (NEOMEAT) for chemical production. Enzymatic treatment for breaking down biomass (REPACELL)

Previous projects:

- REPACELL
- NOVACELL
- PE-WASTE
- DICKENS
- POLIAC

Specific equipment:

- High pressure homogenizer (lab and pilot scale)
- Pulper and ultraturrax (lab scale)
- Spray dryer (pilot scale)
- Non-pressurized reactor (lab and pilot scale)
- Pressurized reactor (lab scale)
- Universal testing machine
- Washing and drying equipment for polymer
- Tensile and flexion specimen molds
- Peel off, cross cut and aging tests
- Mini and pilot plant extruder and microinjection
- FDM 3D Printer

Circular Bio-Based Europe

CBE JU2022.R5. Proteins from alternative and unconventional sources

TOPIC CODE	CBE JU2022.R4
TOPIC DEADLINE	22/09/2022
BUDGET PER PROJECT	4.5 M €
TOTAL BUDGET / EXPECTED NUMBER OF PROJECTS	9 M€ / 2
TYPE OF ACTION	RIA (TRL 5)

Water and air treatment

Separation of proteins by membrane filtration, liquid-liquid extraction or adsorption.

Biobased Technologies

Protein extraction and purification from novel sources to use for ingredients and food testing (NEOMEAT)

Circular Bio-Based Europe

Green fibres biorefineries feedstock

TOPIC CODE	CBE JU2022.R5
TOPIC DEADLINE	22/09/2022
BUDGET PER PROJECT	4.5 M€
TOTAL BUDGET / EXPECTED NUMBER OF PROJECTS	9 M€ / 2
TYPE OF ACTION	RIA

Lignocellulosic materials expertise:

- Related to "enable several possible end applications": development of novel natural and sustainable products based on green fibers valorization through obtaining nanofibers from different natural sources: hemp, viscose, fruit residues, etc. CETIM will be able to develop the whole obtaining process, from the different pre-treatments, homogenization to drying and testing in value-added applications. Lab and pilot scale.

Polymers & Coatings expertise:

- End applications focused on biobased composites using thermoplastic (PLA, PHB) or thermoset (epoxy or polyurethane from natural sources) matrixes. Extensive research related to compatibilization between polymer matrix and green fibers.

Biorefineries

LCA and Social Life Cycle Assessment of new fibres. Assessment of Social impact of new supply chains developed compared with conventional fibres in textile, composites and non-woven materials

Biobased Technologies

Expertise in fermentation processes with industrially relevant microorganism strains (BIORECOVER) and in microalgae culture (NEOMEAT) for chemical production. Enzymatic treatment for breaking down biomass (REPACELL)

Previous projects:

- PROTEX
- NOVACELL
- REPACELL
- FINE3DWOOD
- DICKENS

Specific equipment:

- High pressure homogenizer (lab and pilot scale)
- Pulper and ultraturrax (lab scale)
- Spray dryer (pilot scale)
- Non-pressurized reactor (lab and pilot scale)
- Pressurized reactor (lab scale)
- Universal testing machine
- Tensile and flexion specimen molds
- Peel off, cross cut and aging tests
- Mini and pilot plant extruder and microinjection
- Laboratory mill and mm and µm sieves
- FDM 3D printer

Circular Bio-Based Europe

Biogenic carbon capture and use (CCU) for circular bio-based products (IA)

TOPIC CODE	CBE JU2022.IA1
TOPIC DEADLINE	22/09/2022
BUDGET PER PROJECT	5 M€
TOTAL BUDGET / EXPECTED NUMBER OF PROJECTS	10 M€ / 2
TYPE OF ACTION	IA (TRL 6)

Water and air treatment

Electrochemical processes for CO_2 conversion into building blocks, such as CO_2 electrocatalysis in aqueous medium to produce ethanol. Membrane separation in carbon capture. Technologies for product separation and purification from liquid currents: selective adsorption, membranes,…

Biorefineries

Expertise on separation and adsorption of biogenic CO_2 from biological processes for gas upgrading (bioH2, bioCH4). CO2 conversion into building blocks using bioelectrochemical, biological and photocatalytic processes.

Biobased Technologies

Use of macro- and micro- algae as biogenic CCU and as source of bio-based materials. Expertise in fermentation of processes with industrially relevant microbial strains and in microalgae culturing.
Ref: BIORECOVER, NEOMEAT. Possible collaboration with Construction to use biomass as insulation material.

CBE JU

Circular Bio-Based Europe

Cooperative business models for the valorisation of agricultural residues, by-products, and waste in rural areas

TOPIC CODE	CBE JU2022.IA2
TOPIC DEADLINE	22/09/2022
BUDGET PER PROJECT	5 M€
TOTAL BUDGET / EXPECTED NUMBER OF PROJECTS	10 M€ / 2
TYPE OF ACTION	IA (TRL 7)

Lignocellulosic materials expertise:

- Valorisation of agricultural residues as pruning waste by a biorefinery model. Production of lignin and cellulose/nanocellulose.

Biorefineries

Production of biopolymers and building blocks (PHB, PHB-HV, VFA..) from secondary resources from crop wastes, farming, and other rural wastes (crop processing, storage…).

Assessment of environmental impact of conventional management practices (soil amendment, burning.), and compatibility of new valorisation with conventional soil management techniques.

Previous projects:

- LIGNOSPREAD
- LIGNOPRIZED
- NOVACELL
- REPACELL
- DICKENS
- BIOVINO
- BIOPAGRO
- BIOGREEN

Specific equipment:

- High pressure homogenizer (lab and pilot scale)
- Pulper and ultraturrax (lab scale)
- Spray dryer (pilot scale)
- Non-pressurized reactor (lab and pilot scale)
- Pressurized reactor (lab scale)

CBE JU

Circular Bio-Based Europe

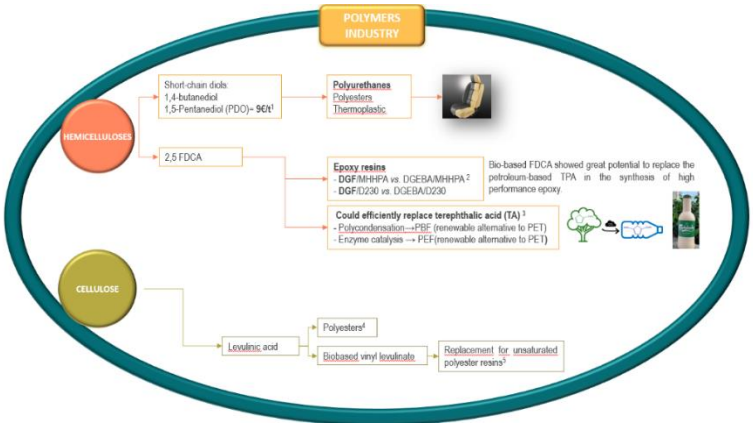
Cost-effective production routes towards bio-based alternatives to fossil-based chemical building blocks

TOPIC CODE	CBE JU2022.IA3
TOPIC DEADLINE	22/09/2022
BUDGET PER PROJECT	6 M€
TOTAL BUDGET / EXPECTED NUMBER OF PROJECTS	12 M€ / 2
TYPE OF ACTION	IA (TRL 6-7)

This is the proposal topic lead by lignocellulosic

Polymers & coatings expertise

- Development of biobased thermoplastic and thermoset composites through the use of biomatrixes, biofillers and bioadditives from renewable sources.
- Use of building blocks obtained from hemicellulose and cellulose for producing alternatives to conventional fossil polymers under green chemistry concepts.



Previous projects:

- LIBERATE
- LIGNOPRIZED
- DICKENS

Specific equipment:

- Pulper and ultraturrax (lab scale)
- Non-pressurized reactor (lab and pilot scale)
- Pressurized reactor (lab scale)
- Universal testing machine
- Tensile and flexion specimen molds
- Mini and pilot plant extruder and microinjection

Water and air treatment

Membrane treatments for pre-concentration or product purification (microfiltration, ultrafiltration…). In particular, Forward Osmosis for dewatering and water regeneration.

Reference projects (Forward Osmosis): LIFE GREEN SEWER, LIFE ULISES

Biorefineries

Production of biopolymers, building blocks (PHB, PHB-HV, VFA..), from different organic wastes, by products and effluents from biobased processes. Focus on co-valorisation of different byproducts to obtain optimal substrates for biobased process and address seasonality

Integration of biological production of hydrogen or biomethane from waste streams of BB recovery.

Production and formulation of biofertilizers from different streams.

Reference projects: BIOVINO, BIOPAGRO, BIOGREEN

Circular Bio-Based Europe

Co-processing of mixed bio-based waste streams

TOPIC CODE	CBE JU2022.IA4
TOPIC DEADLINE	22/09/2022
BUDGET PER PROJECT	6 M€
TOTAL BUDGET / EXPECTED NUMBER OF PROJECTS	12 M€ / 2
TYPE OF ACTION	IA (TRL 6-7)

Water and air treatment

Membrane treatments for pre-concentration or product purification (microfiltration, ultrafiltration…). In particular, Forward Osmosis for dewatering and water regeneration. Selective adsorption for recovery of nutrients from the WW treatment plant

Reference projects (Forward Osmosis): LIFE GREEN SEWER, LIFE ULISES
Reference projects (selective adsorption): LIFE PHOENIX

Biorefineries

Production of biopolymers, building blocks (PHB, PHB-HV, VFA..), from different organic wastes, by products and effluents from biobased processes. Focus on co-valorisation of different byproducts to obtain optimal substrates for biobased process and address seasonality
Integration of biological production of hydrogen or biomethane from waste streams of BB recovery.
Production and formulation of biofertilizers from different streams.
Reference projects: BIOVINO, BIOPAGRO, BIOGREEN

Biobased technologies

Expertise in fermentation processes with industrially relevant microorganism strains (BIORECOVER) and in microalgae culture (NEOMEAT) for chemical production. Enzymatic treatment for breaking down biomass (REPACELL)

CBE JU

Circular Bio-Based Europe

Maximum valorisation of sustainably sourced bio-based feedstock in multi-product, zero-waste, zero-pollution biorefinery

TOPIC CODE	CBE JU2022.F1
TOPIC DEADLINE	22/09/2022
BUDGET PER PROJECT	14 M€
TOTAL BUDGET / EXPECTED NUMBER OF PROJECTS	14 M€ / 1
TYPE OF ACTION	Flag ship (TRL 8)

Lignocellulosic materials expertise:

- Development of biorefinery process at lab scale and pilot scale

Specific equipment:

- Non-pressurized reactor (lab and pilot scale)
- Pressurized reactor (lab scale)

Water and air treatment

Technologies for water and wastewater regeneration and reuse: membrane filtration (MF, UF, RO, FO…), electrochemical (electrodialysis, electrooxidation …), adsorption, disinfection (UV-LED, photocatalysis…)

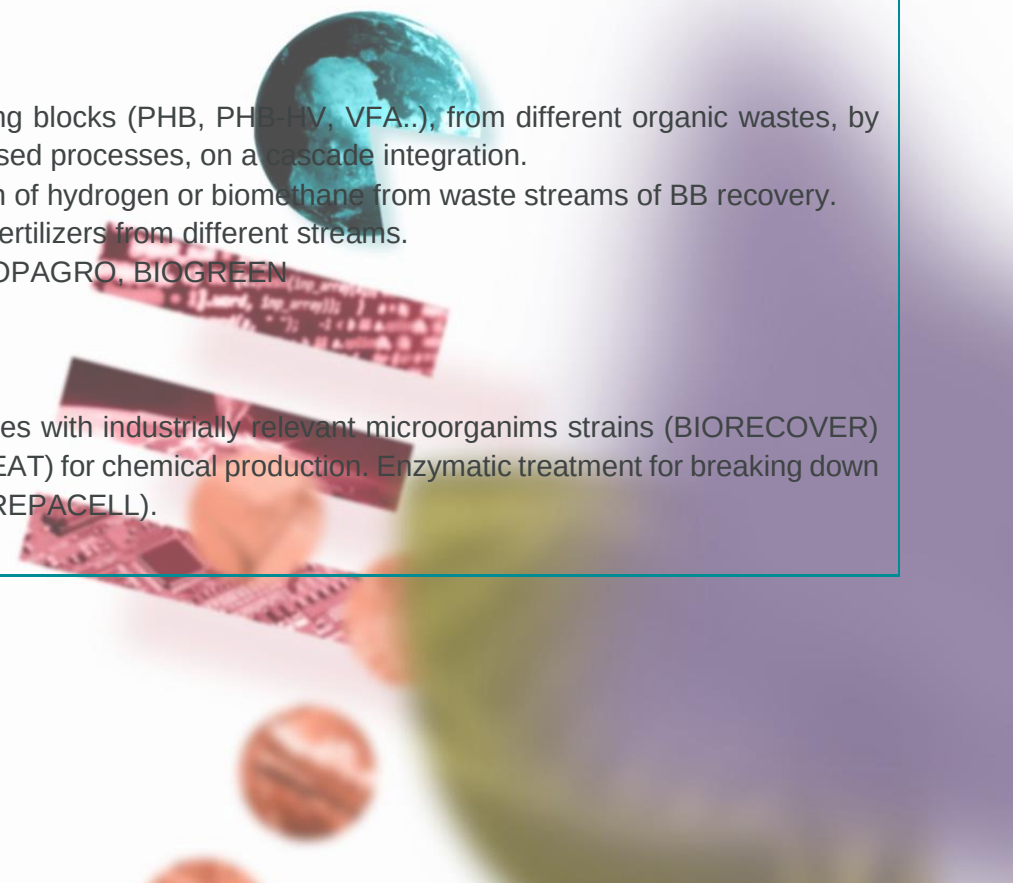
Reference projects: LIFE GREEN SEWER, LIFE ULISES, LIFE PHOENIX

Biorefineries

Production of biopolymers, building blocks (PHB, PHB-HV, VFA..), from different organic wastes, by products and effluents from biobased processes, on a cascade integration.
Integration of biological production of hydrogen or biomethane from waste streams of BB recovery.
Production and formulation of biofertilizers from different streams.
Reference projects: BIOVINO, BIOPAGRO, BIOGREEN

Biobased technologies

Expertise in fermentation processes with industrially relevant microorganims strains (BIORECOVER) and in microalgae culture (NEOMEAT) for chemical production. Enzymatic treatment for breaking down biomass and enzyme validation (REPACELL).



Circular Bio-Based Europe

CBE JU2022.F2. Alternative plant-based food ingredients

TOPIC CODE	CBE JU2022.F2
TOPIC DEADLINE	22/09/2022
BUDGET PER PROJECT	14 M€
TOTAL BUDGET / EXPECTED NUMBER OF PROJECTS	14 M€ / 1
TYPE OF ACTION	IA

Water and air treatment

Water circularity: Technologies for water and wastewater regeneration and reuse: membrane filtration (MF, UF, RO, FO…), electrochemical (electrodialysis, electrooxidation …), adsorption, disinfection (UV-LED, photocatalysis…). Membrane treatments as pre-treatment or product purification step.

Reference projects: LIFE GREEN SEWER, LIFE ULISES, LIFE PHOENIX

Biobased Technologies

Expertise in fermentation processes with industrially relevant microorganism strains (BIORECOVER) and in microalgae culture (NEOMEAT) for chemical production. Protein extraction and purification from novel sources to use for ingredients and food testing (NEOMEAT) Enzymatic treatment for breaking down biomass (REPACELL)

European Projects Office Contacts

Rebeca Varela
M: +34 627 285 739
rvarela@cetim.es

Pablo Frieiro
M: +34 630 006 839
pfrieiro@cetim.es

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