



Infoday Horizon Europe 2024

Circular economy and bioeconomy sectors



Cluster 6 – CirBIO

21/04/2023



Agenda



- ▶ Horizon Europe : qu'est-ce que c'est ?
- ▶ Présentation du programme de travail 2024 :
 - 👉 Cluster 6 : Destination " Circular economy and bioeconomy sectors"

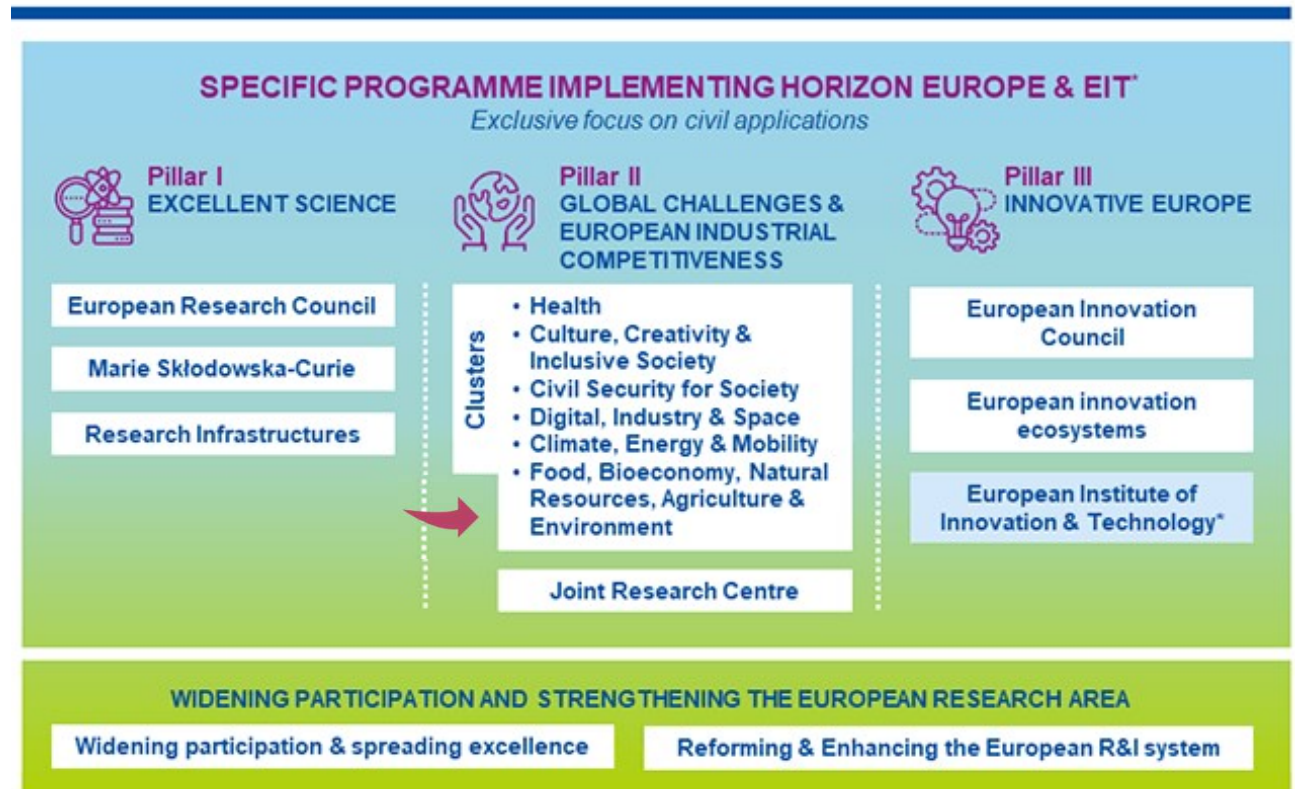
Horizon Europe: le programme UE de R&I

- ▶ €95.5 milliards d'€ (2021-2027)
- ▶ Pour les entreprises, universités et acteurs publics dans leurs activités de recherche et d'innovation

HORIZON EUROPE



- 👉 no net emissions of greenhouse gases by 2050
- 👉 economic growth decoupled from resource use
- 👉 no person and no place left behind





Horizon Europe: Cluster 6



Horizon Europe: Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment

▶ 7 Destinations ~ expected impacts (Strategic Plan 2021 – 2024*)

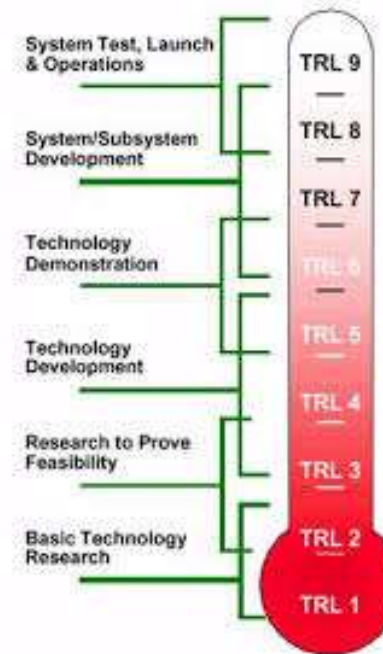
- ▶ Biodiversity and ecosystem services (*BIODIV*)
- ▶ Fair, healthy and environment-friendly food systems from primary production to consumption (*FRAM2FORK*)
- ▶ **Circular economy and bioeconomy sectors (*CIRCBIO*)**
- ▶ Clean environment and zero pollution (*ZEROPOL*)
- ▶ Land, ocean and water for climate action (*CLMATE*)
- ▶ Resilient, inclusive, healthy and green rural, coastal and urban communities (*COMMUNITIES*)
- ▶ Destination - Innovative governance, environmental observations and digital solutions in support of the Green Deal (*GOVERNANCE*)



Légende

RIA	RESEARCH & INNOVATION ACTIONS	100% funding
IA	INNOVATION ACTIONS	70% funding, Entreprises
		100% funding - non profit organisations
CSA	COORDINATION & SUPPORT ACTIONS	100% funding

- RIA → **TYPE D'ACTION**
- € → **BUDGET / PROJET**
- 6 M€
- 🕒 → **DEADLINE**
- 22.02.24
- 📄 4 → **NB PROJETS FINANCÉS**
- 🌡️ 3-5 → **TRL TECHNOLOGY READINESS LEVEL**





Calls - Circular economy and bioeconomy sectors

CirBIO

▶ Enabling a circular economy transition

▶ 4 topics: [22-Feb-24](#)

▶ 4 two-stage topics: [22-Feb-24](#) ---> [17-Sept-24](#)

▶ Innovating for sustainable bio-based systems, biotechnology and the bioeconomy

▶ 5 topics: [22-Feb-24](#)

▶ 2 two-stage topics: [22-Feb-24](#) ---> [17-Sept-24](#)

▶ Innovating for blue bioeconomy and biotechnology value chains

▶ 1 topic





Calls - Circular economy and bioeconomy sectors

CirBIO

▶ Institutionnels

- ▶ 1 topic: CSA – Finance

▶ Secteurs

- ▶ Textile
- ▶ Plastics
- ▶ Ameublement
- ▶ Electroniques
- ▶ Tourisme
- ▶ Eaux/eaux usées
- ▶ Biotech/biobased

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HORIZON-CL6-2024-CircBio-01-1: Circular Cities and Regions Initiative's project development assistance (CCRI-PDA)

Scope

- **Investors and lenders** need to gain **more confidence in investment projects** in the field of circular economy which are still **seen as risky**. European added value can be achieved where projects introduce innovation to the market regarding financing solutions minimising transaction costs and engaging the private finance community
- ⇒ Roll-out of innovative **financing solutions/schemes** at local and regional scale across Europe
- ⇒ **Delivery** of a series of sustainable circular economy projects;

Expected outcomes

- ⇒ To target **public and private project promoters** such as local and regional authorities or their groupings, public/private infrastructure operators and bodies, utilities and services, industry (including SMEs).
- ⇒ To **help project promoters develop their circular economy proposals** at local and regional scale by bringing together the technical, economic and legal expertise.
- ⇒ To **prepare and mobilise finance** for investment projects, such as feasibility studies, stakeholder and community mobilisation, business plans and preparation for tendering procedures or setting up a specific financing scheme/financial engineering.



CSA



2 M€

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Circular Cities and Regions Initiative

Supporting Europe's circular economy at local and regional level



[Home](#)

[About](#)

[CCRI stakeholders](#) ▾

[Support materials](#) 

[Events](#)

[FAQs](#)



Papers and reports

Projects

Funding and financing

Tools and methods

Synergetic local policy plans

CCRI Documents

Webinars, e-learning and videos

Circular Cities and Regions Initiative

Supporting Europe's circular economy at local and regional level

HORIZON-CL6-2024-CircBio-01-2: Circular solutions for **textile** value chains based on extended producer responsibility (EPR)



Scope

- ☞ Textiles = fourth highest-pressure category ← primary raw materials and water
- ☞ = fifth for GHG emissions + source of microplastic pollution - production + use phases
- ⇒ to enable the optimal functioning of **EPR schemes** for textiles
- ⇒ to support the high-quality separate collection, preparation for treatment and treatment of used textiles and textile waste, thereby enabling the optimal functioning of EPR schemes in this sector.
 - ⇒ identify, develop and test innovative **labelling** of textile products (AI, blockchain or IoT)
 - ⇒ analyse how EPR schemes can **improve the circularity of textiles**, assess the material composition in a wide range of used textile products and waste with a view to targeted EPR schemes for **improved collection and recycling**, and test separate collection options for reuse or end-of-life treatment (↗via EPR schemes)
 - ⇒ novel solutions for **textile reuse**.

Expected outcomes

- ⇒ **Recommendations** on best innovative solutions → identification of **material composition** of used textiles/textile waste embedded in the design of textile products
- ⇒ **Recommendations** on **design for recycling for textile products** ⇒ allows Extended Producer Responsibility (EPR) schemes
- ⇒ **Recommendations** on **policy tools** to reach EU greenhouse gas reduction targets → 2050 (climate neutrality), including the 2030 target

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HORIZON-CL6-2024-CircBio-02-1-two-stage: Circular solutions for **textile** value chains through innovative sorting, recycling, and design for recycling

Scope

☞ Textiles

= fourth highest-pressure category / use of primary raw materials and water

= fifth for GHG emissions and a major source of microplastic pollution in production and use phases.

Proposals shall also demonstrate and deploy innovative solutions for **increased quality, non-toxicity and durability** of **secondary textile materials and their processing and treatments**.

⇒ **improved management of the end-of-life phase of textile products.**

⇒ Via facilitation of the disintegration of textile products through design,

⇒ Sorting (systemic digital solutions that facilitate traceability)

⇒ Recycling of textiles

⇒ ↘ the use of hazardous substances in processing and textile treatments

Expected outcomes (≥ 2)

⇒ ↗ systemic solutions for **textile sorting** via **digital technologies** (AI, robotics, IoT and blockchain);

⇒ ↗ feasible solutions for facilitated disintegration to be incorporated in product design → enabler for recycling

⇒ ↗ uptake of **mechanical recycling solutions** that deliver competitive, high-quality secondary materials;

⇒ ↗ **thermo-mechanical, chemical** and other (e.g., enzymatic) **recycling** solutions – sustainable, zero-pollution, circular material and energy efficient.



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HORIZON-CL6-2024-CircBio-01-3: Innovative circular solutions for furniture

Scope

- ✚ involvement of furniture companies in **CE practices** (concerning reuse and recycle) is **still marginal**, and very limited use of process and product certifications
- ✚ $\geq 4\%$ of the total municipal solid waste stream \rightarrow 80-90% is incinerated / landfill, with $\sim 10\%$ recycled.
- ✚ 6 keys: maintain/repair/reuse/refurbish/repurpose/recycle
- \Rightarrow demonstrate increased recovery, recycling and upcycling rates + demonstrate circular business practices + digital solutions + assessment methods + environmental, economic, social impact

Expected outcomes

- \Rightarrow \nearrow deployment and demonstrated **benefits of advanced digital solutions** (e.g., through AI, robotics, IoT, blockchain) in **circular businesses** including waste management and recycling
- \Rightarrow Emergence of **new value chains** using upcycled, recycled and/or biobased; through industrial symbiosis (SMEs)
- \Rightarrow \nearrow recycling **rates** and upcycling to new higher-value products
- \Rightarrow \nearrow uptake of recycled and/or renewable material;
- \Rightarrow \nearrow deployment and market uptake of **circular design**, + design for easy maintenance, repair, remanufacturing and recycling;
- \Rightarrow \nearrow diffusion of **new circular business practices** - repair, reuse, refurbishment and remanufacturing;
- \Rightarrow \nearrow **resource efficiency** along and across value chains, \rightarrow measurable \searrow GHG, microplastics, environmental pollution, and in the use of hazardous substances + \nearrow carbon removals.



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HORIZON-CL6-2024-CircBio-02-2-two-stage: Increasing the circularity in **plastics value chains**

HORIZON-CL6-2024-CircBio-02-3-two-stage: Increasing the circularity in **electronics value chains**

Scope

- ✎ plastics / ICT = one of the four particularly important material and product streams with regard to their **circularity potential** and their **environmental footprint**.
- ✎ lack of
 - ✎ of **trust** in secondary raw materials;
 - ✎ of control over **supply chains**;
 - ✎ of focus on material efficiency and design for circularity; unsustainable product lifetimes;
 - ✎ of repair services;
 - ✎ of secondary material **markets**;
 - ✎ of **communication** along the lifecycle between manufacturers and recyclers
 - ✎ of involvement and empowerment of citizens
- ✎ **price gap** between primary and secondary material
- ✎ insufficient **collection and sorting** systems
- ✎ unpredictable input quality for recycling
 - ✎ insufficient **information** about quality and quantity of materials - knowledge about possible microplastics pollution and substances of concern,



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HORIZON-CL6-2024-CircBio-02-2-two-stage: Increasing the circularity in **plastics** value chains

HORIZON-CL6-2024-CircBio-02-3-two-stage: Increasing the circularity in **electronics** value chains

Expected outcomes

- ⇒ ↗ of advanced **digital solutions** (e.g., through AI, robotics, IoT and blockchain) in **waste management + recycling**
- ⇒ Emergence of **new value chains** using upcycled and/or recycled resources, e.g. through industrial symbiosis;
- ⇒ ↗ upcycling and recycling rates for the targeted material streams
- ⇒ ↗ **uptake** of recycled material and **upcycling** to **new higher-value** products
- ⇒ ↗ **resource efficiency** along and across value chains, → measurable ↘ GHG emissions / environmental pollution
- ⇒ ↗ diffusion of new circular **business practices** - in the uptake of repair, reuse and remanufacturing

HORIZON-CL6-2024-CircBio-02-4-two-stage: New circular solutions and decentralised approaches for water and wastewater management

Scope

- ☞ **Decentralised** water and wastewater systems → has the potential for a **sustainability transition of the water supply and sanitation sector** by **treating wastewater close to its source**
- ☞ **Integration** of decentralised and centralised systems for water supply and sanitation
 - ☞ particularly needed in highly urbanised areas, → better water services - increasing water demand and new quality standards in an economic and sustainable manner + energy efficiency
 - **Risk analysis** → integrated design and operation of **multiple source water supply systems** + digital technologies and solutions.
 - Potential **regulatory, financial and socioeconomic** bottlenecks ⇒ long-term **business models** in PPP

Expected outcomes

- ⇒ Demonstrate the **benefits of decentralised approaches** for **water and wastewater treatment** in various geographic, climate and economic conditions and create a **decision framework** to **help policy makers** to decide where a decentralised vs centralised
- ⇒ Improve **co-design and co-creation processes** between all relevant stakeholders and enhance **public engagement** to speed up the **market uptake** of decentralised and/or semi-decentralised solutions.
- ⇒ An enhanced **systemic circular economy approach** along the water cycle by using process integration, ⇒ ↘ water pollution, water consumption and the environmental footprint (including energy use) and ensure water **security**

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HORIZON-CL6-2024-CircBio-01-4: Systemic circular solutions for a sustainable tourism

Scope

- Circular tourism should consider waste and water management, batteries and vehicles, electronics and ICT, packaging, plastics, construction and buildings, GHG emissions of local and long-distance mobility, accommodation and food services.

Expected outcomes

- ⇒ Diffusion of **circular tourism services**: ↘ generation of waste, use of energy, land and water is efficient
- ⇒ Deployment of innovative solutions and new, affordable technologies (**digital** technologies such as AI, robotics, IoT and blockchain) that support transformation towards circularity
- ⇒ Deployment of **replicable systemic solutions** for cities and regions
 - ⇒ practices among providers and users of tourism services
- ⇒ Creation of **jobs** that facilitate circularity for different sectors, → who are living in or visiting cities/ regions;
- ⇒ Uptake, replication and visibility of circular systemic solutions for sustainable tourism that contributes economically, socially and environmentally



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HORIZON-CL6-2024-CircBio-01-5: Programmed biodegradation capability of bio-based materials and products, validated in specific environments



Scope

- plastic littering ⚠ ⇒ soil, water quality and biodiversity ☠
- low level of recycling of many waste streams, including collected plastic waste
- ⇒ Biodegradability of materials and products for targeted applications may offer viable end-of-life solutions
- ⇒ Analyse those cases of **uncontrolled waste littering** in the open environment (- of plastic waste leading to pollution from nano- and micro-plastics) where biodegradation = safe and sustainable end-of-life options
- ⇒ Select applications for biodegradable bio-based materials and products
- ⇒ Develop **manufacturing technologies** - with targeted performances:
- ⇒ **Validate tests of biodegradability** – in both in controlled and in open environments
- ⇒ **Information and labelling** systems + improving the **societal acceptance** of bio-based innovation



Expected outcomes

- ⇒ Circular design of bio-based technologies and products: ↘ environmental impacts on soil, water, and air quality, biodiversity and climate, ↗ durability and suitability of products allowing for biodegradability.
- ⇒ **Innovative manufacturing processes** → **programming safe biodegradation** according to environmental conditions and time frame for specific applications.
- ⇒ Information and labelling of bio-based materials and products with biodegradability capacity for specific applications and end-of-life options.



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HORIZON-CL6-2024-CircBio-01-6: Digital information systems for bio-based products

Scope

- ⇒ circular economy needs improved **information of material flows** used in all economic sectors
- ⇒ Design solutions for the **digitalisation of information** from **bio-based products and their value chains**, e.g. such as digital passports, tagging and watermarks, etc.
 - ⇒ information on impacts on climate, carbon emissions/ carbon removals, environmental impacts on soil, water, and air quality and biodiversity, end-of-life options, safety control, technical performances, predictive maintenance, and programmed integrity/biodegradation
- ⇒ Design info to improve **societal readiness** adaptation in terms of acceptability, and uptake /society
- ⇒ Support the **harmonisation and interoperability** of digital information formats

Expected outcomes

- ⇒ Digitalisation of bio-based sectors → efficient, sustainable and climate neutral production processes and transparent information
- ⇒ Easily accessible by consumers and to support them in making responsible and **informed choices**;



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Calls - Circular economy and bioeconomy sectors

CirBIO

- ▶ **Enabling a circular economy transition**
 - ▶ 4 topics: 22-Feb-24
 - ▶ 4 two-stage topics: 22-Feb-24 ---> 17-Sept-24
- ▶ **Innovating for sustainable bio-based systems, biotechnology and the bioeconomy**
 - ▶ 5 topics: 22-Feb-24
 - ▶ 2 two-stage topics: 22-Feb-24 ---> 17-Sept-24
- ▶ **Innovating for blue bioeconomy and biotechnology value chains**
 - ▶ 1 topic

HORIZON-CL6-2024-CircBio-01-10: Targeting aquatic extremophiles for sourcing novel enzymes, drugs, metabolites and chemicals

Scope

- ☞ **Extreme environments** with huge bio-resources → enormous challenges for **exploration / sampling**.
 - ☞ Challenges = depth, pH, salinity, temperature, pressure ... ⇒ exploration technically difficult, risky, expensive.
- ⇒ with focus on **extremophilic organisms** capable of thriving/surviving in such extreme environments (e.g., deep hydrothermal vents, hypersaline lagoons, sub-seafloor sediments)
- ⇒ look for novel and highly efficient metabolites, drugs, enzymes and chemicals **for industrial application**

Expected outcomes

- ⇒ ↗ the next generation of **sampling methods, technologies + legal frameworks**
- ⇒ expanding the **exploration of biodiversity hotspot regions**, e.g., deep-sea, polar regions;
- ⇒ to **harvest aquatic bioactive substances** in the most **environmental friendly manner**
- ⇒ **Green industrial bioprocessing** → more **sustainable** bio-based products via new biotechnology processes / applications
- ⇒ Expansion of **bioprospecting** from the screening for new chemicals into biological function;
- ⇒ ↗ **understanding** of **ecology** of marine or other aquatic ecosystems - water surface/ sediments/ internal cavity of sponges etc.;
- ⇒ ↗ commitment to conserve and sustainably **use the ocean's genetic diversity**



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HORIZON-CL6-2024-CircBio-02-5-two-stage: Circular design of bio-based processes and products

⊖ *food, feed, biofuels, bioenergy and cultural and recreation sectors NOT included* ⚠



Scope

- ☞ To improve **capacity of industrial bio-based sectors** - especially manufacturing sectors
- ☞ **Design** of bio-based **processes** and **products** → improve their circularity - re-use recycled materials in local market.
 - ☞ ↗ resources and energy efficiency, ↗ high-quality recycling technologies, ↗ durability and suitability to be safely re-used / re-manufactured, ↗ products end-of-life options, ↗ the safe recycled content in new products, etc.;
- ☞ **Safety, environmental sustainability and climate neutrality**
- ☞ **Economic and social aspects** of the improved production and consumption

Expected outcomes

- ⇒ **Circular design** of bio-based **processes** and **products**:
 - ⇒ ↗ resources and energy efficiency of **technologies**,
 - ⇒ ↘ their environmental impacts on soil, water, and air quality, biodiversity and climate,
 - ⇒ ↗ durability and suitability of **bb products** → safely re-used /re-manufactured ⇒ high-quality recycling
 - ⇒ ↗ safe **recycled content** in new products
- ⇒ **Product information systems** → circularity, safety, environmental sustainability
 - ⇒ of bio-based manufacturing sectors and
 - ⇒ of the use of products at consumers' level.



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HORIZON-CL6-2024-CircBio-02-6-two-stage: From silos to diversity – small-scale bio-based demonstration pilots



Scope

➤ Innovative **business models** and **technology options** in primary production sectors → **unlock the potential** of the bioeconomy in rural areas and to efficiently use **underutilised biomass** (side streams from agriculture and forestry) → for **high value applications** in small-scale bio-based demonstration pilots

- **New business models** for the economic-viable valorisation of local underutilised feedstock -by-products, residues, waste (land and livestock)
- **Demonstrate** suitable **processes and technologies** → high-value bb materials / products
- Improve **knowledge** on **quantitative and qualitative requirements**, harvesting, logistics, pre-treatment (e.g. mechanical, thermal) and conversion of the feedstock.
- **Environmental and socio-economic** performance + **Safety** standards.
- **Economic** feasibility - sufficient quantities of raw materials

Expected outcomes

- ⇒ **Promoting new business models for the green transition**
- ⇒ Replicable and scalable, innovative **production** and **business models** – involvement of primary producers
 - ⇒ **Feedstock availability** and **technology** options to better valorise underutilised biomass (agri/ forestry)
 - ⇒ Development of new materials, products, and services (low environmental impacts and higher value)
 - ⇒ Diversification and enhancement of **agricultural incomes** (organic and conventional farming).
 - ⇒ **Climate-neutral** land sector by 2035 and climate-neutral economy by 2050.

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IA



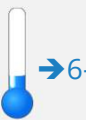
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Calls - Circular economy and bioeconomy sectors

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► Textes complets des appels disponibles

- Site web NCP-Wallonie: <https://www.ncpwallonie.be/secteurs/biotech-food/>
- Portail EU: [HE Cluster 6 - CircBIO](#)



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Merci pour votre attention

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