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Infoday Horizon Europe 2024

Biodiversity and Environment



Cluster 6 – Biodiv and Zeropollution

21/04/2023



Agenda



- ▶ Horizon Europe : qu'est-ce que c'est ?
- ▶ Présentation du programme de travail 2024 :
 - 👉 Cluster 6, Destination "Biodiversity and ecosystem services"
 - 👉 Cluster 6 : Destination "Zeropollution"

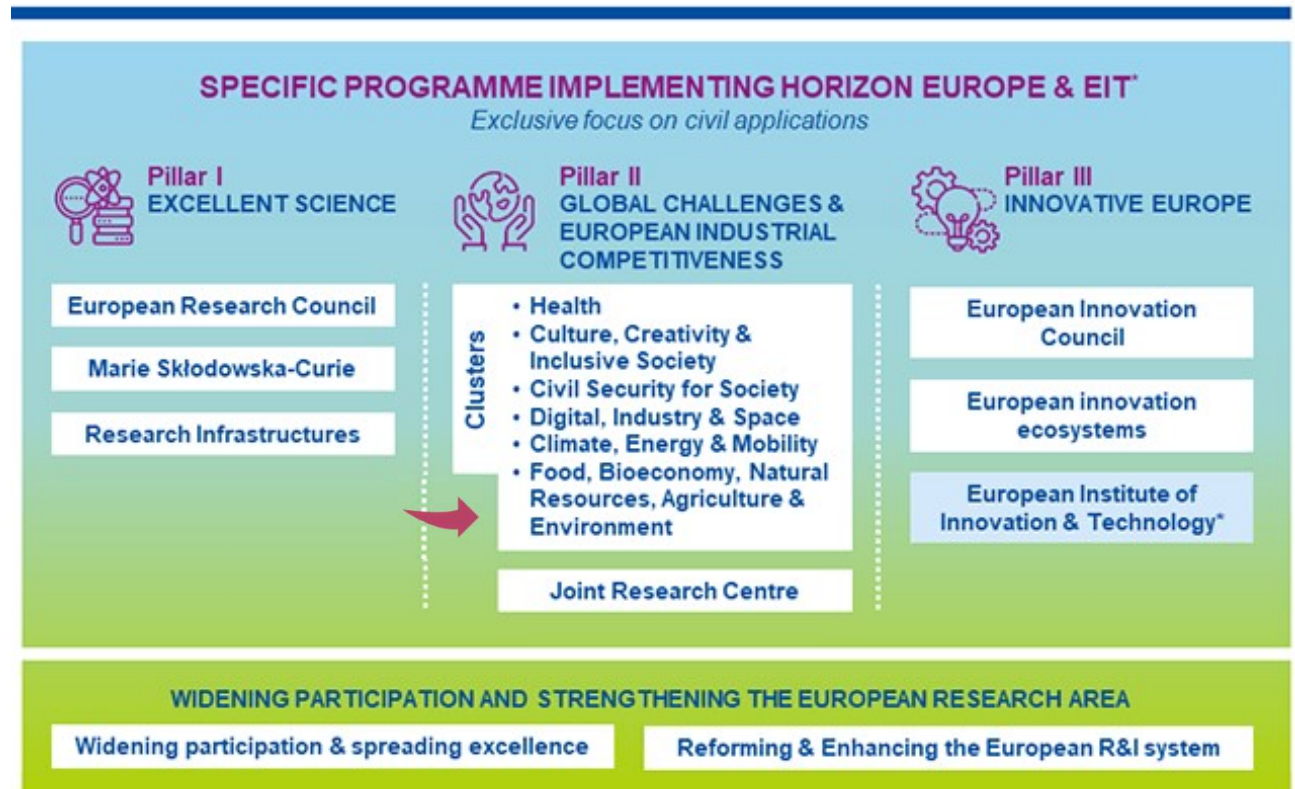
Horizon Europe: le programme UE de R&I

- ▶ €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*)



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Calls - Biodiversity and ecosystem services

BIODIV

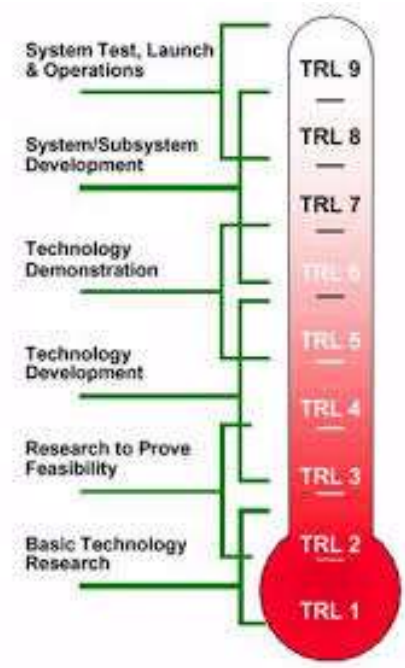
- ▶ **Understanding and addressing the main drivers of biodiversity loss**
 - ▶ 1 topic 2024
- ▶ **Biodiversity protection and restoration**
 - ▶ 1 topic 2024
- ▶ **Mainstreaming biodiversity in society and the economy**
 - ▶ 4 topics 2024 (2 TS)
- ▶ **Biodiversity friendly practices in agriculture, forestry and aquaculture**
 - ▶ 5 topics 2024 (1 TS)
- ▶ **Biodiversity and health**
 - ▶ 1 topic



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**
- 12.04.23
- 📄 4 → **NB PROJETS FINANCÉS**
- 🌡️ 3-5 → **TRL TECHNOLOGY READINESS LEVEL**





Calls - Biodiversity and ecosystem services

BIODIV

- ▶ Understanding and addressing the main drivers of biodiversity loss
- ▶ Biodiversity protection and restoration
- ▶ Mainstreaming biodiversity in society and the economy
- ▶ Biodiversity friendly practices in agriculture, forestry and aquaculture

HORIZON-CL6-2024-BIODIV-01-1: Invasive alien species

Scope

- ☞ **Invasive alien** species are one of the **five main direct drivers** of biodiversity loss
- ☞ Rate of new introductions of invasive alien species **↑** in recent years
- ☞ Climate change and land-use changes → the spread / establishment of many alien species ⇒ opportunities to become invasive
- ☞ Regulation (EU) 1143/2014 on invasive alien species (IAS) → a **list** of Invasive Alien Species of Union concern
- ⇒ **Develop models** (dynamic data) accessible to end users → **prioritise** species, sites most vulnerable
- ⇒ **Develop methods** → **identification, early detection and surveillance**
 - sensors for biophysical signals (sounds, ultrasounds, volatile organic compounds, thermal etc.), DNA-based including barcoding and application of environmental DNA, artificial intelligence, sentinel plants in ports, airports, railway stations, and logistics platforms. The use of robotics (both aerial and non-aerial)

Expected outcomes

- ⇒ The establishment of alien species is **minimised** and where possible **eradicated**
- ⇒ **Early warning systems** → inform about the introduction of invasive alien species EASIN (European Alien Species Information Network)
- ⇒ Invasive alien species introduction → effectively **prevented + management of** established ones
- ⇒ **Public awareness, literacy and engagement** on invasive alien species monitoring and management
- ⇒ Contribution to 50% reduction in the number of **Red List species threatened** by invasive alien species



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HORIZON-CL6-2024-BIODIV-01-2: Digital for nature

Scope

- Growing amount of collected environmental data **not optimally used** - mismatch growing volume of raw measures acquired for ecological studies ↔ our ability to process and analyse this multi-source data and to derive conclusive ecological insights
- ⇒ to facilitate the **access to data**, encourage the usage of **automated/robotic/space** data collection systems for data collection, encourage community approaches for the **exchange good practices** (in particular for data processing).
 - Interoperability/ Cost-effective tools/ data hosting/processing/ tutorials/

Expected outcomes

- ⇒ to understand **drivers of biodiversity decline** + mainstream biodiversity, ecosystem services
- ⇒ A better **monitoring** (species and habitats, more exhaustive territory coverage, more frequent in time, more accurate and cost-effective) **of biodiversity** by high-throughput methods (environmental DNA, sound/image/spectral analysis, mobile platforms, space technologies, etc.)
- ⇒ A better **understanding** of **state of nature** and of **drivers of biodiversity loss** (<- human activity, climate change, etc...) and of the **state of conservation** of nature through a **better usage of existing data** and
 - ⇒ therefore **to reverse biodiversity loss and to restore and protect ecosystems**.
- ⇒ A more **complete view** of the state of nature and its evolution → to support policy implementation and policy making



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HORIZON-CL6-2024-BIODIV-01-3: Dependence of society and the economy on pollinators

Scope

- 👉 The **importance of pollinators** for humankind = common knowledge (sciences, popular culture and arts)
- 👉 well-known benefits provided by pollinators such as crop pollination are still **inadequately understood**.
- ⇒ to address fundamental **knowledge gaps in functional roles** of pollinators in natural (natural plant-pollinators networks) and human-modified ecosystems (e.g. agro-ecosystem), and building on that
 - i) advance research on **consequences of their decline** and scenario planning and
 - ii) develop and disseminate **tools that enable systematic mainstreaming** in key sectors.

Expected outcomes

- ⇒ Better **understanding of dependences** (direct/indirect) of our society and the economy on pollinators + quantification
- ⇒ **Monetary and non-monetary valuation** of ecosystem services provided by pollinators
- ⇒ Better **understanding of risks** of reversible and irreversible cascading effects in ecosystems due to pollinator decline, and their impacts on human wellbeing + forecast + integration into models for participatory scenario planning
- ⇒ **Tools for mainstreaming pollinator conservation** into the food, health, energy, materials and land management sectors are developed, tested and promoted with public authorities, businesses and the general public



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HORIZON-CL6-2024-BIODIV-01-4: Biodiversity, economics and finance: Understanding macro-financial risks associated with biodiversity loss

Scope

- ☞ The decline of ecosystem services → physical risks for economic and financial actors that depend upon those services
- ⇒ Improve the state-of-art knowledge on the **relationships between biodiversity, economy and the financial system** including better understanding of the nature and degree of risks associated to biodiversity loss, + interaction + evolution over time.
- ⇒ Expand the **evidence base on the dependence of the EU economy and its financial sector on nature**, - macroeconomic indicators, e.g., share of EU GDP and employment that depends on nature and evaluate implications of biodiversity loss
- ⇒ Develop scenarios tailored to financial risk assessment, - identification of assets under highest risk
- ⇒ Co-design methods → a more comprehensive and robust environmental **risk management in the financial sector** + develop methodologies to support risk assessment that can **better capture the specificities of nature** and ecosystems => Policy recommendations

Expected outcomes

- ⇒ help **unlock financial flows** needed for **reversing biodiversity loss**, and contribute to mainstreaming biodiversity, ecosystem services
- ⇒ Enhanced **understanding and quantification** of the **macroeconomic significance** of biodiversity and implications of its loss ⇒ more coordinated and better **responses** by key economic actors and institutions

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Information, tools and metrics to better integrate biodiversity and its loss into mainstream macro-financial analytical frameworks



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HORIZON-CL6-2024-BIODIV-01-6: Promoting pollinator friendly farming systems

Scope

- ☞ The production of many crops ↔ **on pollinators**.
- ☞ Measures needed → causes of pollinator decline + enhance crop pollination + promote pollinators in agriculture
- ☞ Many crops have specific traits → to enhance crop-pollinator interactions.
- ⇒ ↗ **understanding** of the crop-farming system-pollinator relationship (interaction crop x environment x management)
- ⇒ Crop qualities → ↗ crop-pollinator interactions ⇒ development of **pollinator-friendly varieties** (breeding activities)
- ⇒ Test farming systems → temporal and spatial diversification of crops, landscape features ⇒ match pollinators needs

Expected outcomes

- ⇒ promote a **pollinator friendly agriculture**, contribute to the transition to **more sustainable practices** in agriculture, and support biodiversity in agroecosystems
 - **Farming systems** are more pollinator-friendly and support (agro)biodiversity
 - Pollinator-friendly **varieties**, rotations and combination of crops
 - Raise **awareness** of the importance of pollinator-specific planning and measures available to enhance pollination services
 - **Breeding sector** is adapted to develop varieties adapted to pollinator-friendly farming.



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HORIZON-CL6-2024-BIODIV-01-7: Reintroduction of landscape features in intensive agricultural areas

Scope

- ↳ EU biodiversity strategy for 2030 → “10% of agricultural area should be brought back under high-diversity landscape features, including, inter alia, buffer strips, rotational land, hedges, non-productive trees, terrace walls, and ponds” => ↗ carbon sequestration, prevent soil erosion and depletion, filter air and water, and support climate adaptation
- ⇒ **valuation** (monetary and social benefits) of ecosystem services of landscape features /on existing R&I projects
- ⇒ possible **business models** which can combine the reintroduction of landscape features with rewarding economic activities including possibly recreational
- ⇒ the **decision-making process** of land owners/managers → to the reintroduction of landscape features in areas of intensive agriculture and analyse enabling mechanisms

Expected outcomes

- ⇒ to develop and improve **practices in agriculture** → support sustainable **use of biodiversity** and a wide range of ecosystems services
 - Better identification of **drivers and challenges** for **re-introduction of landscape features** in intensive farming
 - **Strategies** to reintroduce landscape features in intensive agricultural areas for national/ regional policymakers (> 10%)
 - Solutions for **climate change adaptation** and to provide **ecosystem services**, in particular carbon sequestration, are developed for areas of intensive agriculture.

The ground for possible future demonstration

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HORIZON-CL6-2024-BIODIV-01-8: Conservation and protection of carbon-rich and biodiversity-rich forest ecosystems

Scope

- ↳ rapidly changing climate => more fragile to biotic and abiotic damages and do not provide ecosystem services
- ↳ Limitations of assisted migration
 - ⇒ Analyse directions of assisted tree migration to **maximize dynamic gene** conservation
 - ⇒ Assess the risk for **biodiversity loss** and develop **protection strategies** that consider the larger landscape / regional context to allow for **natural species and community migration**.
 - ⇒ Develop **guidelines** for forest managers in a context of forest ecosystem migration and map scenarios of potential forest ecosystem migration routes.

Expected outcomes

- ⇒ support the **protection of biodiversity-rich forest ecosystems**, at high risk of collapse in rapidly changing climate
- ⇒ Improved **knowledge** on the cross-impacts between **biodiversity and climate change**:
 - drivers of biodiversity loss; impacts of climate change → forest biodiversity/ forest species migration; and links between forest species diversity/resilience to climate change.
 - implementation of ecosystem **protection and restoration** methods and tools → resilient, carbon rich and biodiverse forests.
 - Better understanding of **drivers and barriers for natural co-migration** of forest communities and development of approaches and guidelines to foster co-migration.
 - Improved tools and indices for the **joint monitoring of biodiversity and climate aspects on forests**.



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HORIZON-CL6-2024-BIODIV-02-1-two-stage: Demonstrating Nature-based Solutions for the sustainable management of water resources in a changing climate, with special attention to reducing the impacts of extreme droughts

Scope

- ☞ **changing climate** ⇒ many European regions facing more frequent, severe, and longer lasting **droughts**
- ☞ **cascading effects**; e.g., ↘ water levels in rivers and ground water, crop growth, ↗ pest attacks, favour the occurrence of sand drifts and storms and fuel wildfires
- ☞ NBS utilise an understanding of the structure and functioning of local ecosystems over time to address water quantity/quality, both in surface waters and in ground water

Expected outcomes

- ⇒ development of Nature-based Solutions (NBS) contributing to the **sustainable management of water resources**, with a special attention to ↘ the impacts of extreme droughts
 - **Cost-effective ways** of implementing NBS at large scale for integrated water management- widely replicated
 - **Consolidated evidence** of the contribution of NBS to sustainable water management and concerning the reduction of **impacts of droughts**
- ⇒ demonstrate innovative, systemic NBS, for the **management of catchment water resources** and the reduction of extreme drought risks - areas heavily impacted by temporary/ lasting water scarcity and increasingly exposed to this risk with the deepening of climate change.
 - Barriers/co-design and co-deploy/tools for replications/ecological performance and resilience of NBS



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HORIZON-CL6-2024-BIODIV-02-3-two-stage: Promoting minor crops in farming systems

Scope

- ☞ to shift production towards **lower input systems**, while continuing to ensure sufficient supplies of food and non-food products
- ⇒ ↗ access to minor crops engaging in breeding activities
- ⇒ Improve **agronomic management practices** for minor crops
- ⇒ **Effects and benefits** of minor crops and demonstrate the ecosystems services supported by farming system diversification
- ⇒ Promote the **uptake** of minor crops through development of **guidelines** and practical demonstrations (in ≠ farming systems, pedo-climatic conditions)
- ⇒ Support capacity building, training and education enabling farmers/growers

Expected outcomes

- ⇒ promote **diversification in agriculture** → to increase the resilience and sustainability of sector %challenging environmental, climatic and economic conditions
 - Increased evidence of the **environmental benefits** of minor crops
 - Farmers make **use of** a wider range of crops, and combination of crops
 - Integration of **minor crops in farming systems** promoting their environmental benefits
 - Increased resilience and climate adaptation of farming systems vis-a-vis biotic and abiotic stresses
 - **Feed and food industry** make use of minor crops

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Destination - Clean environment and zero pollution

ZEROPOLLUTION



- ▶ Halting pollution of air, soil and water
- ▶ Reducing the environmental impact and pollution in food systems
- ▶ Protecting drinking water and managing urban water pollution
- ▶ Increasing environmental performances and sustainability of bio-based processes and products



HORIZON-CL6-2024-ZEROPOLLUTION-01-1: Demonstrating how regions can operate within safe ecological and regional nitrogen and phosphorus boundaries

Scope

- ⇒ Respecting pre-established regional N/P budgets and applying N/P balancing practices → ensure air, water and soil quality
- ⇒ Implement a reliable **N/P budgeting methodology** → identify the **maximum allowable input of N/P** at regional scale - ensure good status for air, water and soil ecosystems.
 - N/P budgets - within safe ecological and regional **boundaries**, i.e. by respecting limit values of N/P in air, water and soil (EU legislation or scientific evidence)
- ⇒ Demonstrate region-specific **practices** that help **balance emissions** from N and P-based fertilisers in agriculture, ↗ soil health, ↘ eutrophication, water pollution, emissions to air
- ⇒ Showcase how innovative **governance models** ⇒ to foster sustainable use, recovery and exchange of N/P resources between urban/industrial/ rural environments
- ⇒ Test innovative **practices and technologies** to make use of secondary raw materials and produce **N and P-based fertilisers** recovered from organic waste and promote regional value chains.

Expected outcomes

- ⇒ to all actors involved in nitrogen (N) and phosphorus (P) emitting activities in a given region, **a demonstrated set of measures to limit N/P emissions and re-balance N/P flows** within safe ecological boundaries at regional and local scale, thereby contributing to restoring ecosystems



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HORIZON-CL6-2024-ZEROPOLLUTION-01-3: Environmental impacts of food systems

Scope

- ☞ Around **one third** of human-caused GHG emissions worldwide originate **from food systems**
 - primary food production + **post-production** and **post-harvest** processes along food supply chains
- ☞ ⚠ significant amount of food is wasted
- ☞ **More information is needed to understand these impacts** ← pollution stemming from food processing, manufacturing, packaging, distribution, trade, consumption, food waste and end of life practices
- ⇒ Collect relevant **qualitative and quantitative data** on **environmental and climate impacts** - water, air and soil pollution, biodiversity losses, climate change and negative impacts on human health, + data on freshwater consumption, soil erosion, resource and energy efficiency
- ⇒ Increase the data accessibility
- ⇒ **Identify and map opportunities and innovative solutions** - existing good practices.
- ⇒ **Promote** the **uptake** of sustainable food production and/ or food supply practices - consumption practices with minimum impact

Expected outcomes

- ⇒ ↗ **knowledge/understanding** of **environmental and climate impacts** from food systems
 - ⇒ direct /indirect soil, water and air pollution → biodiversity losses, soil erosion, climate change and → negatively affect human health
- ⇒ ↗ capacity to ↘ environmental and climate impacts of food systems (pollution)
- ⇒ **Support** through new available knowledge/ existing data on environmental and climate impacts

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International
cooperation

HORIZON-CL6-2024-ZEROPOLLUTION-02-1-two-stage: Holistic approaches for effective monitoring of water quality in urban areas

Scope

- ↳ Water management in urban areas – facing water quality issues
 - Urban runoffs, water leakages, water quality deterioration
- ↳ need to develop an integrated and **harmonised approach to monitor** all sources of surface and groundwater pollution and their impact - micro-pollutants, micro-plastics, pharmaceuticals + mixtures
- ⇒ An advanced **monitoring and control system**, going beyond the conventional pollutants, integrating risk management approaches and exploiting digital solutions to support urban water quality management
- ⇒ Appropriate **modelling tools and scenarios** to forecast the long-term impacts of future changing socio-economic and climatic conditions on water quality.
- ⇒ Recommendations for the **standardisation** of monitoring and identification of contaminants

Expected outcomes

- ⇒ to protecting **water quality** by managing urban water pollution, and ⇒ also protecting biodiversity and quality of aquatic ecosystems
- ⇒ integrated urban **water quality monitoring management plans** → **guidance** for policy making and prioritisation
 - ⇒ **urban water quality** ↗
- ⇒ novel holistic monitoring methods + digital solutions + modelling ⇒ sound, safer and risk-based urban **water quality management plans**
- ⇒ Increase **uptake of digital tools** to support water management decisions

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HORIZON-CL6-2024-ZEROPOLLUTION-02-2-two-stage: Innovative technologies for zero pollution, zero-waste biorefineries

Scope

- ✦ To develop solutions for **preventing and controlling pollution** from bio-based industries
- ⇒ **Design** integrated technical solutions → **reducing exhaust flows** through innovative technologies of extraction, recirculation, fractionation and conversion of such flows
- ⇒ Replace hazardous substances with **safe bio-based ones** (in the processes)
- ⇒ **Design** the biorefinery operations
 - ⇒ to re-circulate any process flows such as process air and water and to **increase energy efficiency** - heat recovery
 - ⇒ to reduce noise emissions
- ⇒ **Design** circularity of any processes - through symbiosis between industrial installations → to reach the zero-waste
- ⇒ Case-study of integrated zero-pollution technical solutions → scaling-up
- ⇒ Pilot and validate **digital innovation** enabling the zero-pollution and zero-waste biorefinery ambition.
 - ⇒ **data sharing** platforms for the management of supply and value chains, industrial symbiosis operations between biorefineries, industrial hubs, etc.;

Expected outcomes

- ⇒ to improve the **environmental performances and circularity** of bio-based systems in industrial sectors
- ⇒ Integrated **pollution prevention** and control in bio-based systems targeting **soil, water and air quality, noise**

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Calls - Biodiversity and ecosystem services BIODIV

Call – Clean environment and zeropollution ZEROPOL



► Textes complets des appels disponibles

► Site web NCP-Wallonie: <https://www.ncpwallonie.be/secteurs/climate-environment/>

► Portail EU: [HE Cluster 6 – BIODIV](#)

[HE Cluster 6 – Zeropollution](#)



Merci pour votre attention

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