

Cluster 5 (Climate, Energy, Mobility) topics relevant for Cluster 6

Destination 1 - Climate sciences and responses for the transformation towards climate neutrality

Apply: 12.09.2023 – 05.03.2024

Earth system science

- [HORIZON-CL5-2024-D1-01-01](#): Enhanced quantification and understanding of natural and anthropogenic methane emissions and sinks (RIA)
- [HORIZON-CL5-2024-D1-01-02](#): Inland ice, including snow cover, glaciers, ice sheets and permafrost, and their interaction with climate change (RIA)
- [HORIZON-CL5-2024-D1-01-03](#): Paleoclimate science for a better understanding of the short- to long-term evolution of the Earth system (RIA)

Climate change mitigation, pathways to climate neutrality

- [HORIZON-CL5-2024-D1-01-04](#): Improved toolbox for evaluating the climate and environmental impacts of trade policies (RIA)
- [HORIZON-CL5-2024-D1-01-05](#): Next generation low-emission, climate-resilient pathways and NDCs for a future aligned with the Paris Agreement (RIA)
- [HORIZON-CL5-2024-D1-01-06](#): The role of climate change foresight for primary and secondary raw materials supply (RIA)

Climate -ecosystem interactions

- [HORIZON-CL5-2024-D1-01-07](#): Quantification of the role of key terrestrial ecosystems in the carbon cycle and related climate effects (RIA)

Destination 2 - Cross-sectoral solutions for the climate transition

Apply: 07.12.2023 – 18.04.2024

A competitive and sustainable European battery value chain

- [HORIZON-CL5-2024-D2-01-01](#): Advanced sustainable and safe pre-processing technologies for End-of-Life (EoL) battery recycling (Batt4EU Partnership) (RIA)

Relevance for CI 6: Contribute to **circularity** of battery materials, where also non-metallic elements (electrolyte, solvent, salts and polymers) are recycled back to use (as raw materials or valuable chemicals).

- [HORIZON-CL5-2024-D2-01-03](#): Development of technical and business solutions to optimise the circularity, resilience, and sustainability of the European battery value chain (Batt4EU Partnership) (RIA)

Relevance for CI 6: Development of sustainable business methods for technical, economic, and **environmental evaluation** of cycle life options: retrofit, second life, and **recycling**. Innovations in battery design and architecture at all levels (system, pack, cell) supporting dismantling and **recycling** at the end of life.

- [HORIZON-CL5-2024-D2-01-04](#): Emerging energy technologies for a climate neutral Europe (RIA)

Relevance for CI 6: In developing its concept, the proposal should address low **environmental impact** (e.g., on climate change and pollution) quantified based on Life Cycle Assessment (LCA) framework.

Destination 3 - Sustainable, secure and competitive energy supply

Apply: 12.09.2023 – 16.01.2024

Global leadership in renewable energy

- [HORIZON-CL5-2024-D3-01-03](#): Demonstration of improved intermediate renewable energy carrier technologies for transport fuels (IA)

Relevance for CI 6: Examples are demonstration of production of bio-oils, raw alcohols, bio-liquids, biogas, syngas and thermally pre-treated solid biomass fuels from **biogenic residues and wastes and microalgae oils**.

- [HORIZON-CL5-2024-D3-01-04](#): Improvement of light harvesting and carbon fixation with synthetic biology and/or bio-inspired//biomimetic pathways for renewable direct solar fuels production (RIA)

Relevance for CI 6: Development of novel in-vivo or in-vitro biochemical and/or bio-inspired/biomimetic pathways for solar fuel production with increased efficiency in comparison to light and dark reactions of natural photosynthesis by **synthetic biological** and/or **bio-inspired/biomimetic** approaches. Take into account **environmental sustainability** including **circular economy**.

- [HORIZON-CL5-2024-D3-01-05](#): Development of carbon fixation technologies for biogenic flue gases (RIA)

Relevance for CI 6: Development of **biological** and **chemical solutions** to use the effluent gases from bioenergy combustion systems.

- [HORIZON-CL5-2024-D3-01-06](#): Innovative applications/integration of geothermal heating and cooling in industry (RIA)

Relevance for CI 6: Activities related to geothermal heat for industry and **agriculture** can be considered. It must be ensured that negative impacts on **ecosystems** and **biodiversity**, including negative impacts on (or **pollution** affecting) **air, water** or **soil** quality, are addressed through mitigation policies.

- [HORIZON-CL5-2024-D3-01-08](#): Demonstration of sustainable wave energy farms (IA)

Relevance for CI 6: Projects are requested to demonstrate the technologies at sea while respecting existing **environmental regulatory framework**. Necessary mitigation measures should be integrated to **protect habitats and species**. Present an **environmental monitoring plan** to be implemented during the demonstration action.

- [HORIZON-CL5-2024-D3-01-10](#): Next generation of renewable energy technologies (RIA)

Relevance for CI 6: In developing its concept, the proposal is expected to address the following related aspects: lower **environmental impact**, minimising the impacts on **biodiversity** and **protected species** and **habitats**.

Apply: 17.09.2024 – 21.01.2025

Global leadership in renewable energy

- [HORIZON-CL5-2024-D3-02-03](#): Development of smart concepts of integrated energy driven bio-refineries for co-production of advanced biofuels, bio-chemicals and biomaterials (RIA)

Relevance for CI 6: Development of zero-waste and neutral or negative carbon emission energy-efficient biorefinery concepts for enabling the production of low-cost advanced **biofuels** through co-production of added value **bio-based products** and bioenergy. Assess the **feedstock** cost supply and mobilization patterns.

- [HORIZON-CL5-2024-D3-02-04](#): Critical technologies for the future ocean energy farms (RIA)

Relevance for CI 6: The innovative technologies should not significantly harm the **environment** (DNSH principle) and have low impact on ecosystem **biodiversity** and consider potential **mitigation measures**.

- [HORIZON-CL5-2024-D3-02-07](#): Resource Efficiency of PV in Production, Use and Disposal (CSA)

Relevance for CI 6: Contribute to reducing the **environmental footprint** associated to PV technology deployment across all the phases of the system lifetime (production, transport, installation and end of life). Define design and processing guidelines to optimally address **circularity** of PV systems.

- [HORIZON-CL5-2024-D3-02-08](#): Minimisation of environmental, and optimisation of socio-economic impacts in the deployment, operation and decommissioning of offshore wind farms (RIA)

Relevance for CI 6: Develop design tools for the planning of wind farms to minimize the overall life-cycle **environmental impacts (noise, impact on seabed, visual effect, effects on marine life and other species)**. Or, develop solutions to reduce the **environmental impact** of installation, construction and decommissioning.

- [HORIZON-CL5-2024-D3-02-09](#): Demonstrations of innovative floating wind concepts (IA)

Relevance for CI 6: Projects are requested to demonstrate the technologies at sea while respecting existing **environmental regulatory framework**. Present an **environmental monitoring plan** to be implemented during the demonstration action. Proposals are expected to address also **circularity of (critical) raw materials**.

- [HORIZON-CL5-2024-D3-02-10](#): Market Uptake Measures of renewable energy systems (CSA)

Relevance for CI 6: Issues related to acceptability of RES technologies due to **ecologic**, economic and social aspects are expected to be addressed.

Carbon Capture, Utilization and Storage (CCUS)

- [HORIZON-CL5-2024-D3-02-12](#): DACCS and BECCS for CO2 removal/negative emissions (IA)

Relevance for CI 6: Further the technological development of direct air carbon capture and storage (DACCS) and bioenergy carbon capture and storage (BECCS) and address the **environmental**, social and economic challenges and benefits. Address the **sustainability of biomass**.

Destination 4 - Efficient, sustainable and inclusive energy use

Apply: 07.12.2023 – 18.04.2024

Industry

- [HORIZON-CL5-2024-D4-01-03](#): Alternative heating systems for efficient, flexible and electrified heat generation in industry (IA)

Relevance for CI 6: Make an analysis of the potential industrial deployment and related benefits (technical, economic, **climatic, environmental**) of at least one alternative heat source technology in three industrial sectors.

Apply: 17.09.2024 – 21.01.2025

Highly energy-efficient and climate neutral European building stock

- [HORIZON-CL5-2024-D4-02-02](#): Robotics and other automated solutions for construction, renovation and maintenance in a sustainable built environment (Built4People Partnership) (RIA)

Relevance for CI 6: Develop robotic and automated design and construction techniques that increase energy efficiency and reduce **greenhouse gas emissions** from construction and renovation works on-site. Develop approaches that use digitally assisted design to improve **resource efficiency** and **reduce waste**.

- [HORIZON-CL5-2024-D4-02-03](#): BIM-based processes and digital twins for facilitating and optimising circular energy renovation (Built4People Partnership) (IA)

Relevance for CI 6: Develop and integrate solutions based on Building Information Modelling (BIM) and Digital Twins to track buildings materials and construction products, and supporting cost-effective deconstruction and **reuse, recycling** and **recovery of building materials** at end of life.

- [HORIZON-CL5-2024-D4-02-04](#): Design for adaptability, re-use and deconstruction of buildings, in line with the principles of circular economy (Built4People Partnership) (RIA)

Relevance for CI 6: Improve the ease of **reuse** of construction elements and products from existing buildings, also facilitating **recycling** when reuse is not possible. Develop building elements and products from long-lived **bio-based materials and products**. Minimise negative impacts of **pollution** and **biodiversity loss** from construction.

- [HORIZON-CL5-2024-D4-02-05](#): Digital solutions to foster participative design, planning and management of buildings, neighbourhoods and urban districts (Built4People Partnership) (IA)

Relevance for CI 6: Digital solutions to analyse to-be-renovated buildings and neighborhoods in terms of energy use and generation, **life-cycle environmental impacts**. Address aspects of **climate-neutrality** and **climate-resilience**.

Destination 5 - Clean and competitive solutions for all transport modes

Apply: 07.12.2023 – 18.04.2024

Aviation

- [HORIZON-CL5-2024-D5-01-07](#): Accelerating climate neutral aviation, minimising non-CO2 emissions (RIA)

Relevance for CI 6: Increase the scientific understanding related to the impact of **aerosols** on **clouds** as well as the contribution of aviation **NOx emissions** to **climate change**. Avoiding **climate sensitive regions** has a large potential in reducing climate impact at relatively low costs without causing significantly more CO2 emissions.

- [HORIZON-CL5-2024-D5-01-09](#): Impact monitoring of EU Aviation R&I (RIA)

Relevance for CI 6: Deliver a toolbox, including preliminary impact assessments, that will be the reference choice for the definition and assessment of **environmental, climate** and competitiveness policy options of future European aviation R&I and regulatory measures.

Waterborne transport

- [HORIZON-CL5-2024-D5-01-13](#): Demonstration of Technologies to minimise underwater noise generated by waterborne transport (ZEWTP Partnership) (IA)

Relevance for CI 6: For example, take into account the **H2020 project SATURN** and the **LIFE+ project PIAQUO** to support the **development of standards** for the specification of noise levels. Increase the awareness of European ship owners of the **environmental impact** from underwater noise and the possibilities to reduce it.

Transport-related health and environment

- [HORIZON-CL5-2024-D5-01-18](#): Assessment of air pollutant emissions from low-carbon fuels in the heavy-duty, aviation, and maritime sectors (RIA)

Relevance to CI 6: The **air pollutant emissions** from combustion-based heavy-duty vehicles, aircraft and ships using alternative fuels, are measured and characterised according to real-life scenarios of use. **Emerging pollutants** resulting from the use of novel low-carbon fuels are identified and quantified.

Destination 6 - Safe, Resilient Transport and Smart Mobility services for passengers and goods

Apply: 07.05.2024 – 05.09.2024