Inhaltsverzeichnis

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

HORIZON-CL5-2021-D1-01-02: Modelling the role of the circular economy for climate change mitigation

Specific conditions	
Expected EU contribution per project	The EU estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 15.00 million.
Type of Action	Research and Innovation Actions
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Beneficiaries will be subject to the following additional obligation regarding open science practices: • Open access to any new modules, models or tools developed from scratch or substantially improved with the use of EU funding under the action must be ensured through documentation, availability of model code and input data developed under the action.

Expected Outcome: Project results are expected to contribute to all of the following expected outcomes:

- Improve existing European and/or global climate mitigation models by better representation of basic industrial value chains (including reliable data) and potential mitigation technologies including the impact of circular economy.
- Improve the quantification of the impacts and potentials of the circular economy for climate change mitigation.
- Support the integration of the circular economy into climate action, policies and their evidence base, including externalities.
- Support the integration of the GHG emission reduction / mitigation in the circular economy criteria.

Scope: Projects are to advance the understanding and modelling of the current and future potential contribution of the circular economy in Europe to GHG emissions reductions. The scope of the modelling activities has to go beyond the state-of-the-art, in particular in terms

of sectors covered and their interrelations, be as comprehensive as possible (e.g. covering also the blue economy), and include citizen's behaviours and engagement.

This action should look beyond the specific measures needed to deliver a circular economy and propose a framework for revealing, demonstrating and quantifying the circular economy's potential contribution to climate goals, as well as improving the coverage of basic industry value and supply chains in models (or suites of models) used to analyse mitigation pathways. While focusing on the linkages between circular economy measures and climate goals, the action can also improve the understanding of the connections between climate action and other environmental areas and issues as well as social and health issues, in line with the systemic approach that the European Green Deal promotes.

Collaboration between the scientific community and policy- and decision-makers in order to integrate the circular economy into integrated assessment frameworks and other comprehensive climate policy visions is highly recommended. Actions should also ensure collaboration with industry stakeholders and civil society, including, for example, sharing best-practices, data, models and other knowledge required to analyse mitigation pathways to ensure the input of - and alignment with - the needs, values and expectations of society.

When dealing with models, actions should promote the highest standards of transparency and openness, as much as possible going well beyond documentation and extending to aspects such as assumptions, code and data that is managed in compliance with the FAIR principles[1]. In particular, beneficiaries are strongly encouraged to publish results data in open access databases and/or as annexes to publications. In addition, full openness of any new modules, models or tools developed from scratch or substantially improved with the use of EU funding is expected.

HORIZON-CL5-2021-D1-01-08: Restoration of natural wetlands, peatlands and floodplains as a strategy for fast mitigation benefits; pathways, trade-offs and co-benefits

Specific conditions	
Expected EU contribution per project	The EU estimates that an EU contribution of between EUR 6.00 and 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

[1] FAIR (Findable, Accessible, Interoperable, Reusable). Further information: https://www.go-fair.org/fair-principles/; and Final Report and Action Plan from the European Commission Expert Group on FAIR Data, "TURNING FAIR INTO REALITY" (https://ec.europa.eu/info/sites/info/files/turning_fair_into_reality_0.pdf)

Indicative budget	The total indicative budget for the topic is EUR 20.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).

Expected Outcome: Project results are expected to contribute to some of the following expected outcomes:

- Support the EU Nature Restoration Plan of the EU Biodiversity Strategy for 2030.
- Improved assessment of the added value of wetland, peatland and floodplain restoration approaches under different scenarios and monitor their benefits and trade-offs in terms of greenhouse gas (GHG) emissions and removals, climate change adaptation and disaster risk reduction, a wide range of ecosystem services and biodiversity.
- Improve the knowledge base on the status of European wetlands beyond the current state of the art on extent, location, condition, spatio-temporal trends, type of management and pressures (including climate change), as well as restoration potential to understand their capacity as carbon sinks or GHG sources to support climate mitigation and adaptation plans/solutions.
- Introduction of the quantified greenhouse gas abatement potential of wetland restoration in models and scenarios, for climate and biodiversity.
- Analyse the degree to which these approaches related to wetlands are affected by different scenarios of climate change (i.e. effectivity under global warming of 2°C and higher).
- Support the implementation of the Land Use, Land Use Change and Forestry (LULUCF) Regulation with respect to the inclusion of wetland restoration activities by developing robust and transparent methodologies, data provision and analysis.
- Contribute to the evidence on ecosystem services provided by restored wetlands and their long-term management as an investment with significant net societal benefits.
- Contribute to scientific assessments such as the IPCC, IPBES and International Resource Panel reports.

Scope: Projects are expected to assess the current extent and state of European wetlands, their current and potential GHG profile (with or without protection/restoration measures) and their medium to long-term mitigation capacity through restoration or other measures. As a minimum, the assessment should take into account key greenhouse gases (CO_2, CH_4 and N_2O), the carbon value of services (such as production) in the baseline (e.g., food production) and restoration scenarios (e.g., paludiculture or non-productive uses, like agritourism) and estimate the abatement cost for different policy-relevant time periods. Assessments should therefore look at assessing any trade-offs of restoring wetlands

primarily for climate and biodiversity benefits with the delivery of their wide range of other services, and on methods to avoid, and if not possible, to mitigate them.

Projects are expected to develop or identify workable tools and approaches for the sound estimation of GHG performance as well as impacts on biodiversity and a wide range of ecosystem services. The GHG emission during restoration (e.g. due to disturbance of soils, dredging of sediments, methane from rewetting) should be considered, including trade-offs and benefits of passive restoration and following succession of water bodies. The evidence collected may contribute to the related policies, like LULUCF, and the implementation of the Biodiversity Strategy commitments.

Projects are expected to go beyond the state-of-the-art of the different restoration and management techniques and knowledge and provide guides and recommendations about the scaling up of the solutions. In particular, the projects should capitalise on the evidence provided by LIFE, Horizon 2020 and ERDF projects addressing wetland, floodplains and peatland restoration and protection.

Actions should envisage clustering activities with other relevant selected for cross-projects co-operation, consultations and joint activities on cross-cutting issues and share of results as well as participating in joint meetings and communication events. To this end, proposals should provide for a dedicated work package and/or task, and earmark the appropriate resources accordingly.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

HORIZON-CL5-2021-D1-01-09: The contribution of forest management to climate action: pathways, trade-offs and co-benefits

Specific conditions	
Expected EU contribution per project	The EU estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 18.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).

Expected Outcome: Project results are expected to contribute to some of the following expected outcomes:

- A comprehensive assessment of the climate mitigation potential of European forests and forest-based sector through modelling of different policy pathways, taking into account climate change related risks, physiological and biogeochemical responses to environmental change and management practices, adaptation needs, biodiversity goals, and the provision of other ecosystem services. The effects analysed have to include changes in carbon sequestration, forest health, productivity, substitution and biophysical factors, including the causes and time dynamics of these changes. The assessment of the potential and limits of forest-based products and biomass for energy in delivering climate benefits will inform public authorities on the most suitable approach to forest policy and forest bioeconomy.

- Development and improvement of robust and transparent methodologies for high-resolution monitoring and reporting of forest carbon pools and their interactions through a combination of in-situ data collection and remote sensing methods to be used to advance land use, land-use change and forestry (LULUCF) reporting under the UNFCCC and compliance under EU legislation. Methods developed under this action will additionally feed into the development of the Forest Information System for Europe (FISE).

Scope: Proposals under this topic should develop a comprehensive assessment of different pathways of the European forest GHG balance in view of the reviewed 2030 and 2050 climate targets and other relevant EU environmental legislation and objectives incorporating:

- Biodiversity goals consistent with the EU Green Deal objectives and Biodiversity Strategy 2030 goals. Issues considered include the use non-native tree species, intensive thinning, transition between intensive and close-to-nature silviculture, and strict protection of forests.

- Uncertainties related to climate change and natural disturbances risks.

- Adaptation needs of existing and future forests, including factors determining their adaptation potential.

- Mitigation potential of afforestation and other forest activities including their opportunity costs.

- GHG impact of forest bioeconomy, including substitution effect of forest-based products and energy against realistic counterfactuals and with appropriate time dynamics.

- Renewable energy targets and the needs of forest-based bioeconomy for sustainable domestically-sourced feedstock.

- Biophysical effects, including changes in air temperature and precipitation associated to changes in surface albedo, land-surface properties, emissions of biogenic volatile organic compounds, transpiration and heat flux.

- Assessment of trade-offs and synergies between climate-oriented forest management, and other objectives, for example recreational and amenity values;

Having such models/assessment at their disposal and understanding their time dynamics, uncertainties and system boundaries, policy-makers will be better suited to incorporate forests in the design and evaluation of possible solutions and pathways for climate change mitigation and adaptation.

Monitoring and reporting on changes to forest carbon stocks is essential for policymakers (both national and European) in order to be informed of trends in the forest sink evolution and to develop annual approximated greenhouse gas inventories. Actions should support the use of higher tier (and higher accuracy) methodologies and geographically explicit land-use data in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories[2] and its 2019 Refinement[3]. Especially needed are actions to fill existing gaps resulting from inventory bias towards the most economically relevant tree species and carbon pools.

Proposals under this topic should therefore aim to develop knowledge, tools, models, databases and country- and region-specific values available to Member States and Associated Countries, where possible integrating with Integrated Assessment Models (IAMs) and climate models to improve monitoring and reporting of forest carbon pools. Remote sensing data sets can be helpful in estimating or verifying forest living biomass gains and losses, forest area changes, forest health status and in identifying carbon-rich old-growth forests or natural disturbances. Sample-based systems, on the other hand, should support mapping changes in other forest carbon pools such as soil organic carbon in mineral and organic soils, and dead organic matter. More robust estimation of fluxes among these forest carbon pools, which are often neglected in greenhouse gas inventories, will assist in estimating their importance as carbon reservoirs and the role that forest management can play in enhancing them, taking into account biodiversity needs and resilience. Considering biophysical effects will improve the understanding of trade-offs among climate objectives and their articulation with forest management practices.

The Joint Research Centre (JRC) may participate as a member of the consortium but is not eligible for funding.

Actions should envisage coordinating activities with other relevant actions, initiatives and programmes, including Horizon 2020 Work Programmes and the LIFE Programme, COPERNICUS and relevant research infrastructures to promote synergies, integration and co-operation. They should make use and contribute to knowledge exchange and networking European platforms and consider devising a novel decision-making platform to ensure effective dissemination of the results to the target stakeholders (i.e. policy-makers and relevant national competent authorities). Cooperation and planning for further exploitation of actions results during and after the project end is strongly encouraged.

Destination 3 – Sustainable, secure and competitive energy supply

HORIZON-CL5-2021-D3-02-16: Innovative biomethane production as an energy carrier and a fuel

Specific conditions

[2] https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html
[3] https://www.ipcc-nggip.iges.or.jp/public/2019rf/vol4.html

Expected EU contribution per project	The EU estimates that an EU contribution of around EUR 10.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 20.00 million.
Type of Action	Innovation Actions
Technology Readiness Level	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.

Expected Outcome: Biomethane is a renewable substitute of natural gas, which can provide energy storage capability and be a flexible renewable energy carrier to be fed to the existing gas grid if reaching quality standards at an affordable price.

Project results are expected to contribute to all of the following expected outcomes:

- Increase cost-effectiveness of the conversion in biomethane production.
- Diversify the conversion technology basis for biomethane production.
- Contribute to market up-take of biomethane related technologies in the gas market.
- Contribute to the priorities of the SET Plan Action 8.

Scope: Proposals will demonstrate cost-effective and innovative biomethane production through thermochemical, biochemical, chemical, electrochemical, biological pathways including sustainable biomass and biogenic wastes gasification, CO_2 effluents from anaerobic digestion or fermentation processes combined with renewable hydrogen or water. The biomethane production should be optimized to improve production efficiency, reduce cost, minimize GHG emissions and increase sustainability in a circularity approach for energy and material above conventional technologies of biogas upgrading to biomethane. All demonstrators should be fully and transparently documented, to ensure replicability, up-scaling and to assist future planning decisions. Demonstrating advanced technologies for efficient production at scale of biomethane will contribute to facilitate the market introduction of the biomethane technologies and the substitution of natural gas in the gas grid. This is the basis for penetration of biomethane in the energy and the transport energy systems, in particular for gas consuming sectors. It supports the European Green Deal and climate and energy targets for 2030 and the net zero greenhouse gas emissions by 2050, while supporting the EU goals for energy independence and competitive sustainable growth.