Inhaltsverzeichnis

Inhalte

BMWK Forschungs- und Entwicklungsprojekte kleiner und mittlerer Unternehmen zwischen Deutschland und Kanada, Frist: 15. Dezember 2023

Kanada und Deutschland veröffentlichen hiermit eine Ausschreibung für gemeinsame Forschungs- und Entwicklungsprojekte (FuE-Projekte) zur Entwicklung innovativer Produkte, Verfahren oder technischer Dienstleistungen aus allen Technologie- und Anwendungsbereichen. Es wird erwartet, dass die Antragsteller marktreife Lösungen für Produkte, Dienstleistungen oder Verfahren entwickeln, die über ein großes Marktpotenzial verfügen.
Förderfähige Projektpartner aus Deutschland und Kanada finanzieren ihre Projektkosten aus den jeweiligen nationalen Förderprogrammen (ZIM in Deutschland und NRC-IRAP in Kanada) und bringen den notwendigen Eigenanteil selbstständig auf
Die zu erwartenden Projektergebnisse müssen zu marktwirksamen Innovationen (neue kommerzielle Produkte, Verfahren und/oder Dienstleistungen) führen, die sich am internationalen Stand der Technik orientieren. Projektvorschläge müssen die folgenden Leitlinien berücksichtigen:
- Das Konsortium muss aus mindestens einem Unternehmen aus Deutschland und einem Unternehmen aus Kanada bestehen, die nicht gesellschaftsrechtlich miteinander verbunden sind. Die Mitwirkung weiterer Unternehmen (und Forschungseinrichtungen in Deutschland) als Projektpartner/Unterauftragnehmer entsprechend der nationalen Förderrichtlinien sind möglich.
- Das Projekt soll einen ersichtlichen Vorteil und Mehrwert aufgrund der Kooperation aller Teilnehmer erzielen (beispielsweise eine verbesserte Innovationskraft, Marktführerschaft, Zugang zu FuE-Infrastrukturen, neue Anwendungsbereiche etc.).
- Die Projektlaufzeit sollte zwei Jahre nicht überschreiten und kann nach ausreichender Begründung in beiden Ländern auf ein drittes Jahr ausgeweitet werden.
Jeder Partner, dessen Kooperationsprojekt die hier aufgeführten Anforderungen erfüllt, kann im Einklang mit den nationalen Gesetzen, Regelungen und Richtlinien einen Antrag einreichen.
Weitere Informationen:
https://www.zim.de/ZIM/Redaktion/DE/Artikel/International/kanada.html

HORIZON EUROPE Quantification of the role of key terrestrial ecosystems in the carbon cycle and related climate effects, deadline: 05. March 2023 17:00 Brussels time

A comprehensive assessment and quantification of the role of terrestrial biogeochemical dynamics and the role of vegetation in the carbon cycle, compared to the pre-industrialisation situation, building on dedicated in situ data collection, novel satellite data development, and advanced carbon cycle modelling.
Project results are expected to contribute to all of the following outcomes:
- Enhanced understanding and characterisation of the terrestrial carbon pools and fluxes, including through taking account of hydrological exchanges, with unprecedented accuracies and spatial scales, building on the advent of a new generation of satellite missions (e.g., ESA's BIOMASS, FLEX, Sentinel missions, NASA's NISAR, GEDI, ICESat-2 etc…), that radically change the way the terrestrial carbon cycle can be observed.
- Improved methods for the monitoring of key ecosystems state in Europe, regarding terrestrial carbon, including e.g. forestry, croplands, peatlands, inland water, extensive grasslands, tundra, tidal marshes, seagrass, and mangroves, and tackling key gaps in observations, e.g. age-structure, species richness, canopy structure (including use of Terrestrial Laser Scanning), observations of wood density, interaction with hydrology and exchange with the atmosphere in particular observations of biological volatile organic compounds, CO2, CH4, N2O, and black carbon/particulates emissions.
- Improved handling of anthropogenic management practices (land use including forestry) in terrestrial carbon modelling, including lateral transfers of carbon (notably in the form of harvested biomass including exports, imports, and use as well of land-water exchange).
- Improved understanding of impacts on the carbon cycle of extreme events (wind throw, drought, pest outbreaks, fire), and of the impacts of anthropogenic disturbance including degradation and behaviour and recovery of forest post-disturbance.
- Improved consistency between top-down methods such as atmospheric inversions and bottom-up approaches based on land-surface models, in-situ and satellite observation, flux measurements, and national and global statistics.
- Assessment of the consistency of observation and advanced models through benchmarking activities at multiple scales including point measurements, and satellite observations at multiple temporal and spatial resolutions.
- Novel monitoring frameworks combining remote and proximate sensing techniques with machine learning and edge com-

puting.
The main challenge of this topic is to develop an enhanced capacity to better characterise and reduce uncertainties of the carbon cycle related to key terrestrial European ecosystems as a function of anthropogenic emissions, environmental forcing conditions, and management practices. In order for this challenge to be met, actions should be performed at spatial resolutions required to represent the mechanisms by which human interventions necessary to move towards net-zero carbon balance, can be quantified. Further, the dynamics and response of vegetation to climate change, short- and long-term stress, natural dynamics (e.g. fire), and especially change in frequency, form and severity of extreme events, need to be better understood and quantified.
Proposals should address the above challenges through:
- Coordinated European effort to expand dedicated campaigns to collect in situ-data, including from citizen observations, on land cover, land use and related changes, and on the main processes caused by these, to support the modelling of these changes based on current and historical trends, and to develop empirically based scenarios connecting land use and land cover change to carbon emissions, and sequestration potential.
- Advances in land surface and carbon modelling supported by high-performance computing capacity, allowing models to be run at unprecedented resolutions, and accuracy, through improved data assimilation workflow from remotely sensed data and vegetation models. The emphasis should be on area wide effect of the ecosystem's microbiome, and consistency across spatial and temporal resolution and with satellite observation processes.
- Extending and complementing satellite observations with elements linked to the LUCAS survey of Eurostat, to the EU Soil Observatory (EUSO) initiatives on integrated soil monitoring systems, and to research infrastructure e.g. eLTER and ICOS, as well as through comparison with past data and through coordination with Earth observation efforts (spectral signature characterisation, biophysical and biogeochemical observations commensurate with satellite resolutions, aircraft / unmanned aerial vehicle campaigns).
- Specific efforts to develop carbon and land surface models consistent with specific variables or outputs that can be directly interfaced or compared with satellite observations e.g. above ground biomass, soil moisture, solar induced fluorescence, disturbance dynamics e.g. fire, and inclusion of additional key processes (coupling with Nitrogen and Phosphorus cycles and water, CO2 fertilisation, assimilation of photosynthesis rates from global observation for direct gross primary production estimation).
- A significant coordination effort and collaboration with the relevant activities of major international scientific groups (e.g., IPCC, Global Carbon Project), the Copernicus Atmosphere Monitoring Service and the ESA Carbon Science Cluster.
This topic is part of a coordination initiative between the European Space Agency (ESA) and the EC on Earth System Science. Under the EC-ESA Earth System Science Initiative, both institutions aim at coordinating efforts to support complementary collaborative projects, funded on the EC side through Horizon Europe, and on the ESA side through the ESA FutureEO programme as part of the ESA Carbon Science Cluster.
Proposals should address the collaboration with ongoing or future ESA projects, including those that will be funded through dedicated coordinated invitations to tender, and should towards this end include sufficient means and resources for effective coordination.
Applicants should ensure coordination with complementary projects funded under the ESA Carbon Science Cluster of the FutureEO programme including relevant ESA activities related to the use of the novel BIOMASS and FLEX missions and potentially the Copernicus CO2M mission in the future.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d1-01-07?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Enhanced quantification and understanding of natural and anthropogenic methane emissions and sinks, deadline: 05. March 2024 17:00 Brussels time

This activity is expected to foster and enhance collaboration between the modelling and observing (satellite, ground-based, airborne) communities and advance towards an enhanced global and regional assessment of the methane sources and sinks from land and the ocean, their short and long-term evolution as well as the related natural and anthropogenic processes and impacts on atmospheric chemistry and dynamics and on Earth radiation budgets. The expected outcomes hereafter are complying with the recommendations formulated by the user community during the ESA ATMOS-2021 conference.
Project results are expected to contribute to all of the following outcomes:

- A significant European effort to develop an enhanced methane assessment capacity including extensive advanced in situ data at multiscale and from multi-platforms, novel satellite observations, and enhanced modelling efforts to quantify and understand hotspots and background for natural and anthropogenic methane emissions with unprecedented resolution in space and time.
- An increased coordination of in-situ observations of methane emissions including enhancing communication and networking between the relevant observation communities.
- Enhanced science base in Europe to perform global and regional (European) scale high-resolution assessment of the methane sources and sinks in relevant environments, their short and long-term changes, the related natural and anthropogenic sources, and impacts on atmospheric chemistry and dynamics.
- Clear policy advice on current and future climate contributions of methane on global and regional (European) scale, including elaboration on effective mitigation options.
- Provision of a significant contribution to IPCC and related scientific efforts regarding reducing methane emission uncertainties similar to those of the Global Carbon Project.
- Contribution to achieve the goals of the COP26 Glasgow agreement on methane emission reductions and to the EU methane strategy.

The challenge of this topic is to further quantify and understand natural and anthropogenic methane emissions based on carefully selected European land sites and European sea sites with unprecedented resolution in space and time that should leverage the latest advances in observations from satellite, ground-based, and airborne, together with advances in reconciling inverse and bottom-up modelling approaches.

The proposal will address this challenge through:

- Deploying large coordinated in situ, ground-based and airborne observation monitoring campaigns over different Earth's ecosystems (terrestrial, terrestrial-aquatic continuum, and marine sub-seafloor) and key anthropogenic sources (e.g. agriculture, waste, mining, oil and gas industry) with comparable and scalable measurement approaches.
- Running these campaigns during an extended period of time and planning them beyond the duration of the projects, building on existing measurement infrastructures and initiatives, in order to support the validation of satellite products, but as well to support the development of new and enhancement of existing models and data assimilation techniques.
- Evaluating temporal change in methane release over centuries at selected, relevant sites from existing long-time series.
- Advancing towards an integrated methane observing system (on "facility scale") that capitalises on the latest advances in observations from satellite, in situ, ground-based remote sensing and airborne instruments as well as results from citizen observations.
- Advancing the capacity of models and data assimilation techniques, related to methane emissions through specifically exploiting novel medium and high-resolution satellite data (e.g. GHGSat, PRISMA, Sentinel-2, Landsat-8/9, Worldview-3).
- Delivering inverse modelling to separate methane sources and sinks and to attribute inverse modelling estimated fluxes to specific processes building on sufficient spatial resolution to identify the origin, for instance, of large local emissions.
- Advancing towards an enhanced spatially and temporary high-resolution global and regional assessment of the methane sources and sinks and its dynamics over time, the related natural and anthropogenic processes, and impacts on climate.

This topic is part of a coordination initiative between the European Space Agency (ESA) and the EC on Earth System Science. Under the EC-ESA Earth System Science Initiative, both institutions aim at coordinating efforts to support complementary collaborative projects, funded on the EC side through Horizon Europe, and on the ESA side through the ESA FutureEO programme as part of the ESA Atmosphere Science Cluster and relevant ESA activities related to the use of the TROPOMI and other relevant missions.

Proposals should address the collaboration with ongoing or future ESA Atmosphere Science Cluster projects, including those that will be funded through dedicated coordinated invitations to tender, and should towards this end include sufficient means and resources for effective coordination.

ESA will contribute to this effort by providing a dedicated Earth observation satellite scientific component to complement, collaborate and coordinate with this activity. In particular, ESA will contribute with dedicated set of complementary scientific activities with special focus on exploring and exploiting the new capabilities offered by TROPOMI in combination with other relevant European and international satellite missions including novel very high-resolution observations.

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. In particular, beneficiaries are strongly encouraged to publish results data in open access repositories 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.

Projects should take into account, during their lifetime, relevant activities and initiatives for ensuring and improving the quality of scientific software and code, such as those resulting from projects funded under the topic HORIZON-INFRA-2023-

EOSC-01-02 on the development of community-based approaches.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d1-01-01?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Paleoclimate science for a better understanding of the short- to long-term evolution of the Earth system, deadline: 05. March 2024 17:00 Brussels time

The projects funded under this topic will assess climate variability building on past climate and environmental datasets.
Project results are expected to contribute to all of the following expected outcomes:
- Better process understanding of past climate changes, their variability and interactions with ecosystems, leading to improved Earth system models based on paleoclimate data.
- Assessment of driving and feedback mechanisms (e.g., the carbon cycle evolution and water cycle process), and precise timing and dynamics of deglaciation and glaciation.
- Future climate change scenarios produced in light of documented past changes in climate and ice sheets, in particular warm climates/high sea-level situations, and abrupt transitions.
- Strengthened Earth system models integrating paleoclimate data, e.g. models of ice sheet, ocean, ecosystem and atmospheric components, enabling understanding of future climate.
- Identification of thresholds in Earth system components, including the biosphere, and feedbacks that may be responsible for non-linear behaviour of the climate system to certain forcings.
- Development, review, and improvement of indicators of abrupt changes, or early warning signals, and tipping points within paleoclimate records.
- Synthesis of climate variations that will serve as fundamental bases for IPCC future assessment and benchmarks for model inter-comparisons.
The geological and ice-core records provide long-term information on the conditions and processes that can drive physical, ecological, and social systems during interglacial periods, deglaciations and abrupt climatic events. The challenge of the research under this topic is to test Earth system models over selected past climate scenarios, outside the range of variability recorded over the past centuries.
This challenge will be tackled through the following activities:
- Producing and aggregating in databases high-resolution, well-dated, interoperable paleoclimatic records on climate changes from the past (e.g., temperature, GHG concentrations, sea level, ocean circulation variability, seasonality, and precipitation).
- Using paleo-archives at high resolution to extend the instrumental time series for better understating of the proxy records and for improved quantification of their uncertainties.
- Development of Earth system models with outputs that allow a more direct comparison to paleo-data, modelling climate variability, thresholds, and impacts across timescales from years to millennia (e.g., isotope-enabled general circulation models with dynamic ice sheet components that represent relevant feedbacks).
- Describing short- to long-term climate evolution using quantitative reconstructions from different proxies of past climate periods that are of particular relevance with respect to the current climate change scenario.
- Identification of climate tipping points, cascading effects, and environmental limits using paleo data and model experiments.
- Comparing changes in marine, terrestrial and glacier settings to evaluate ocean–land–cryosphere interactions.
- Documenting and quantifying the natural climate variability, in terms of amplitude, time (onset, duration, frequency) and space (location, extension).
- Allowing for consistent integration of large-scale and more regional/local factors to be reproduced by climate models using natural forcings.
Synergies with projects resulting from the topic HORIZON-CL5-2023-D1-01-02: Climate-related tipping points should be established.
The projects should rely on paleoclimatic data from scientific drilling campaigns, and other appropriate sources.
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. 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.
Further Information:

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d1-01-03?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Inland ice, including snow cover, glaciers, ice sheets and permafrost, and their interaction with climate change, deadline: 05. March 2024 17:00 Brussels time

Actions are expected to contribute to all of the following expected outcomes:
- Advanced knowledge on the impacts of climate change and different natural and socio-economic drivers on inland ice and permafrost, and its global repercussions, including climate-ecosystem interactions, which is relevant to international initiatives, such as the World Climate Research Programme (WCRP)'s Climate and Cryosphere Project, or the IPBES.
- Further developed and improved climate and Earth System Models (ESMs) that inform the international climate assessments (e.g. CMIP models, CORDEX) and support the development of "digital twins" under the Destination Earth Initiative and the evolution of Copernicus.
- Advanced provision and use of observations, including in-situ, of complex processes with focus on dynamic and vulnerable regions that may lead to high impact changes.
- Supported climate change adaptation strategies including, where relevant, the development of solutions to enhance the resilience of local communities.

Snow cover, ice sheets and glaciers affect not only the Earth radiation balance and the global climate, but also continental climate systems, the weather of circumpolar regions and their terrestrial and oceanic carbon dynamics, ecosystems, and sea level. Snow and ice cover regulate the properties of the ground underneath and are interlinked with permafrost in areas where average ambient air temperature is below 0°C.

The research actions should contribute to observing, modelling, and projecting the characteristics, volume, and dynamic of inland ice and permafrost in relevant regions, impacting regional and global climate, taking inter-seasonal, annual, decadal, as well as long-term (centuries) changes into account.

The actions should enhance the understanding of the ice sheet or glacier dynamics and evaluate reversibility or irreversibility of changes on multi-decadal to centennial timescales. Furthermore, actions should quantify other impacts caused by the thawing of the inland ice or permafrost at regional or global levels, like the contribution to sea level rise and stratification or impact on biogeochemistry and ocean currents.

Actions should assess the impact of changing land ice, snow cover, or permafrost on local or regional water cycle and economic supplies and services, evaluate the impact of ice processes on human livelihood and cultures, and identify imminent, medium and long-term potential impacts on ecosystem shifts at local and regional scale.

The actions should provide data, tools, and assessments relevant at regional and local scales to support climate change adaptation and explore, identify and verify ecosystems management techniques to allow better adaptation and maintenance of ecosystem services in a changing land-ice landscape.

International cooperation is strongly encouraged.

Actions should build upon and cooperate with relevant Horizon funded projects (e.g., Arctic PASSION, OceanIce, PolarRES, CRiceS, iCUPE), the EU Polar Cluster, the Copernicus Climate Change Service, the Copernicus Marine Environment Monitoring Service, the Copernicus Land Monitoring Service and the GEO initiative.

This topic is part of a coordination initiative between the European Space Agency (ESA) and the EC on Earth System Science. Under the initiative, both institutions aim at coordinating efforts to support complementarities between the Horizon Europe and ESA FutureEO programme.

ESA will contribute to this topic with existing and planned projects focused on improving the observation, understanding and prediction of inland ice, including snow cover, glaciers and ice sheets and permafrost thaw, and their interaction and feedbacks with the Earth and climate system. Relevant ESA activities will be implemented under the Polar Science Cluster. Proposals should address the collaboration with ongoing or future ESA Polar Science Cluster projects, including those that will be funded through dedicated coordinated invitations to tender, and should towards this end include sufficient means and resources for effective coordination.

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 principles11. 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. Projects should take into account, during their lifetime, relevant activities and initiatives for ensuring and improving the quality of scientific software and code, such as those re-

sulting from projects funded under the topic HORIZON-INFRA-2023-EOSC-01-02 on the development of community-based approaches.
Synergies and complementarities should be ensured with the HORIZON-CL6-2024-CLIMATE: Closing the research gaps on Essential Ocean Variables (EOVs) in support of global assessments, HORIZON-CL6-2024-CLIMATE: Ocean models for seasonal to decadal and local to regional climate predictions, and HORIZON-CL6-2024-ZEROPOLLUTION: Tackling human and climate change induced pollution in the Arctic - building resilient socio-ecological systems.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d1-01-02?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE The role of climate change foresight for primary and secondary raw materials supply, deadline: 05. March 2024 17:00 Brussels time

The successful proposal will support the transition to a digital and low carbon society in the context of the European Green Deal with a particular emphasis on climate change and raw material value chains. In particular, it should contribute to all of the following expected outcomes:
- Short-, medium-, and long-term scenarios of changes in the type, origin and quantity of raw materials (metals/minerals) required for the twin transition.
- Geo-referenced projections for the changes to the greenhouse gas and energy footprint associated with the supply of these primary and secondary raw materials with a view to facilitating their use in integrated assessment models.
- Models and data contributing to the development of the European Commission's Raw Materials Information System.
- Inputs to international scientific assessments such as reports by IPCC, the International Resource Panel and IPBES.

Achieving enhanced digitalisation and a low carbon society will involve a change in the type and quantity of the raw materials required by the economy. This can result in geopolitical shifts in extraction and processing, as well as an increase in the extraction, processing, and recycling of many minerals and metals, including ones that have so far been only marginally important. Materials are likely to be extracted from increasingly lower grade ores and hostile environments, from mining wastes, as well as through recycling. Ceteris paribus, this would involve a general increase in the energy required to supply raw materials, as well as associated greenhouse gas emissions and changes in some other environmental impacts (such as related to transport and land take for mineral extraction and waste disposal). It will also involve changes in technologies and substitution to materials with lesser environmental impact, some of which not sufficiently well understood. This can include consideration of substitution and circular use of materials.
This action will improve knowledge concerning the options, and challenges, in the short, medium, and long-term associated with the provision of raw materials required for the twin transition with a focus on interlinkages with climate change.
Sectors, technologies and material value chains to be analysed will be selected on a justified basis. The project will analyse changes to the carbon footprint associated with supply options for a justified selection of primary and secondary raw materials for short, medium and long-term time horizons. Options analysed will relate to raw materials likely to have large changes in supply due to the twin transition, where important geopolitical and technological changes are likely in relation to the twin transition and circularity.
The analyses should build on established life cycle assessment and product environmental footprint requirements, as relevant, and contribute to their further development. Modelling should be detailed to account for geo-political/site-specific changes in supply, technologies, and e.g. energy consumption. Scenarios will build on, as far as available, existing demand scenarios from European Commission modelling activities, and are expected to take into account the relevant EU policies (Fit-for-55 package, carbon neutrality by 2050). Scenarios are expected to account for the foreseen variation and innovation advances in extraction, processing, recovery, recycling and other technologies along the value chains, including changes to the energy mixes involved at specific locations.
The proposal will include the involvement of experts for the different technologies related to the primary and secondary raw material options selected as well as representatives of the integrated assessment modelling community.
This action will develop state-of-the-art knowledge (models and databases) in relation to climate change and the implications of different options associated with the twin transition and the related increases in supply of some raw materials.
The action will build on existing modelling work for the supply and demand of primary and secondary raw materials and expand them to reflect typical transition pathways, to highlight the implications on climate change.
The action will align to established requirements of existing methodological and data frameworks such as for life cycle

assessment and product environmental footprint.
While focusing on selected technologies and site-dependent modelling, conclusions should provide insights related to opportunities and challenges for sectors associated with the twin transition.
Proposals should consider the involvement of the European Commission's Joint Research Centre (JRC) whose contribution could consist of interacting in relation to the EC's Raw Materials Information System and its underlying sectorial value chain analyses in the contexts of geopolitical foresight, life cycle assessment, and circular economy.
Stakeholders are to be selected on a justified basis to be consulted at key steps to provide informed feedback on the modelling, data and analyses.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d1-01-06?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Improved toolbox for evaluating the climate and environmental impacts of trade policies, deadline: 05. March 2024 17:00 Brussels time

Project results are expected to contribute to all of the following outcomes:
- Enhance our knowledge and inform policy makers on the positive and negative impacts of trade and trade policy on the climate. Additionally, where relevant, broader effects on the environment, in particular biodiversity, pollution and natural resources depletion may also be considered.
- Improve and enlarge the toolbox of models and other research techniques as well as available data and its processing to analyse the impact of trade and trade policy on the climate.
Actions are expected to cover all of the following areas:
- Study and quantification of the effects of trade on the climate and the environment
- In-depth study/quantification of the technique and composition effects: in addition to the scale effect of increasing production, trade also has an impact on the sector composition of economies and the technologies used for production. The project(s) should quantify and decompose these effects, including their underlying mechanisms/causes.
- Growth projections of trade related emissions in developing countries and newly developed countries: it can be expected that most of future trade-related emissions will take place in these countries. The project(s) should therefore estimate and quantify these future emissions under different scenarios, including the extent to which this is related to pollution offshoring and pollution haven effects.
- Estimate the net effect of trade: clarify/quantify how much of trade related emissions would still take place in the context of the domestic economy without international trade. While trade-related emissions are an important part of total world emissions, not enough is known about the counterfactual, i.e. emissions profiles in the absence of international trade.
- Study the effects stemming from changes in the use of resources attributable to international trade, both in terms of efficiency gains (e.g. in energy and material use) and in terms of changes in the climate impacts associated with production and consumption, and whether externalities are likely to be internalised. For specific sectors, the action should look into emissions linked to the production in different countries versus transport emissions in trade to those countries.
- Study trade-related climate and environmental impacts in key sectors like agriculture and livestock, including linkages to regional land use change, water resources and differences in agricultural production techniques worldwide. Specific tools and methodologies for agriculture and livestock should also be proposed and refined to be able to give sector-specific advice to policy makers.
- Study the public perception vs. the reality of trade impacting on the environment and climate: while in the public debate trade is often associated with increased emissions related to the scale effect, technique and composition effects point to positive impacts in certain cases. Case studies should also include concrete examples of cases where public perception of trade effects on emissions and real effects diverge.
- Study and quantification of the effects of trade policy on the climate and the environment
- In-depth study/quantification of trade creation and trade diversion effects in relation to the climate and the environment: trade liberalisation affects trade flows through the diversion of such flows as well as inducing additional trade. The project(s) should study the net effect of these phenomena on the climate and the environment.
- Impact of environmental/climate regulation on trade and competitiveness: it can be assumed that in some cases tightened environmental legislation can lead to compliance costs and competitiveness effects. It should be empirically studied to what extent this assumption is correct and to what extent the so-called 'Brussels Effects' impacts these cost and competitiveness

effects.
- What do the expansion of global value chains, offshoring and their fragmentation (and a possible reversal of such trends) mean for the climate and climate-related trade policy: the project(s) should analyse the effectiveness of climate and trade policies in such an international economic context.
- Effects of openness to trade on environmental and climate policy: trade and international exchanges lead to the diffusion of technology and ideas. To what extent do these effects influence emissions and global climate/environmental policies?
- The role of trade policy as a tool to address the free rider problems in climate policies: since addressing climate change is a global public good, free-rider problems persist. To what extend can trade incentives and the trade policy toolbox help overcoming these?
- Analyse the coherence between trade policies, climate policies and other policies such as nutrition-food, resources policies and development policies that affect the impacts on the climate and the environment. Analyse how these policies affect the trade-off between food security and conservation of natural resources (such as forests and water resources).
- Methodology and toolbox related aspects
- Impact of trade and foreign direct investment (FDI) on the productivity of sectors (do more productive sectors/producers tend to be cleaner?): the project(s) should endogenise (Global Trade Analysis Project (GTAP) sector productivity to trade beyond a Melitz-type of framework, including the separation of energy efficiency effects among the productivity effects. Currently since, technological change is mostly exogenous or only roughly calibrated in Computable General Equilibrium (CGE) models, technique effects on carbon leakage cannot fully be captured.
- Impact of trade on land use (overall and composition), in particular on deforestation: the project(s) should study methodologies that can be used to better understand the effects of trade and trade policy on land use. Actions should also create/update a trade induced land use/land use change matrix for GTAP sectors.
- Transport-related pollution: the project(s) should create a transport mode matrix for GTAP sectors per countries and their related emissions.
- Enlarge/split the GTAP sectors list for emission-intensive sectors: the project(s) should create/improve the GTAP sector matrix for emission-intensive sectors.

Actions are also encouraged to explore and promote synergies between the use of modelling approaches in international trade analysis and in comparable macroeconomic modelling in climate policy, for example, in Integrated Assessment Modelling.
International cooperation with research clusters, which have specific knowledge in areas of this call, is encouraged.
The project should also include dissemination and capacity-building for the findings and tools created among policy makers at the EU and Member States/Associated countries level.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d1-01-04?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE ERC CONSOLIDATOR GRANTS, deadline: 12. December 2023 17:00 Brussels time

Objectives
The ERC Consolidator Grants are designed to support excellent Principal Investigators at the career stage at which they may still be consolidating their own independent research team or programme. Principal Investigators must demonstrate the ground-breaking nature, ambition and feasibility of their scientific proposal.
Size of ERC Consolidator Grants
Consolidator Grants may be awarded up to a maximum of EUR 2 000 000 for a period of 5 years. The maximum size of the grants is reduced pro rata temporis for projects of a shorter duration. (This does not apply to ongoing projects).
Additional funding up to EUR 1 000 000 can be requested in the proposal to cover the following eligible costs when these are necessary to carry out the proposed work: (a) "start-up" costs for Principal Investigators moving to the EU or an Associated Country from elsewhere as a consequence of receiving the ERC grant and/or (b) the purchase of major equipment and/or (c) access to large facilities and/or (d) other major experimental and field work costs, excluding personnel costs.
Additional funding is not subject to pro rata temporis reduction for projects of shorter duration.
All funding requested is assessed during evaluation.
Profile of the ERC Consolidator Grant Principal Investigator
The Principal Investigators shall have successfully defended their first PhD at least 7 and up to 12 years prior to 1 January 2024. Successful defence of PhD between 1 January 2012 and 31 December 2016 (inclusive).

The eligibility period can be extended beyond 12 years in certain properly documented circumstances.
For further information, please see the ERC Work Programme 2024.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/erc-2024-cog?tenders=false&forth
%202027&frameworkProgramme=43108390&sortBy=startDate&pageSize=50&pageNumber=2

HORIZON EUROPE Demonstration of improved intermediate renewable energy carrier technologies for transport fuels, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to all of the following expected outcomes:
- Support de-risking the technology, boost scale-up of flexible intermediate bioenergy and synthetic renewable energy carriers and contribute to their market up-take.
- Respond to short- and medium-term needs for renewable fuels in transport.
- Increase flexibility, reliability and security of renewable energy supply in the transport sector.
- Increase available options for better integration of the energy system linking renewable energy production, storage and use via renewable energy intermediates.

Demonstration of technologies for the production of advanced intermediate bioenergy and synthetic renewable energy carriers from biogenic residues and wastes, microalgae, biogenic CO, CO2 or nitrogen and renewable hydrogen and all forms of renewable energy with reduced cost and GHG emissions above the state of the art. Proposals are expected to demonstrate that conversion technologies have already reached pilot scale TRL 5. The finished quality is expected to be suitable so that the intermediates can be either directly upgraded in existing refinery infrastructures and/or further purified and processed in existing chemical infrastructures to drop-in liquid and gaseous advanced biofuels and synthetic renewable fuels, or directly used for shipping propulsion or in other off-road transport. 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 through chemical, biochemical, thermochemical, biological, electrochemical pathways, as well as synthetic renewable analogues. The integration of these intermediates in transport and their application in hard to electrify transport sectors should be presented. The logistics for transportation and storage of the intermediates should be addressed. The sustainability and GHG reduction should be addressed on a life-cycle assessment basis. Proposals should provide information and assessment about the economic feasibility and the potential of scaling-up the technology at commercial scale as appropriate. The exploitation plans should include preliminary feasibility study and business plan also indicating the possible funding sources to be potentially used (such as private equity, the InvestEU, the EU Catalyst Partnership and the Innovation Fund).
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-03?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Demonstration of innovative pumped storage equipment and tools in combination with innovative storage management systems, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to all of the following expected outcomes:
- Increased availability of innovative hydropower storage, in combination with innovative storage management systems.
- Maintain and increase technology leadership, competitiveness and technology export potential of European hydropower storage technology industry.
- Enhanced sustainability of innovative hydropower storage technologies, taking fully into account circular economy, social, economic and environmental aspects in line with the European Green Deal priorities.
- Reduced cost and improved efficiency of hydropower storage installations and the underlying technologies.

Demonstration of innovative pumped storage equipment and digital tools linking the mechanical storage with innovative storage management systems. The latter may involve hybridisation with storage technologies to reap the full potential of pumped hydro storage under new market conditions Solutions should deliver innovative hydropower technologies adapted to unconventional storage schemes, including e.g. low-head locations or former coal mines and/or harsher operation conditions,

e.g. using salt water, while minimising CAPEX, OPEX and improving life time and circularity of components. For the storage management system, digital tools for strategic and operational management should address current developments for energy storage, considering markets, variable renewable production and effects of climate change, and including novel approaches to energy. Demonstrated storage solutions should respond to the highest standards of environmental sustainability which is underpinned by a LCA and involve Citizens and Communities during all phases of the project activities, respectively. An analysis of innovative storage potential and impact should be performed.
Proposals should provide information and assessment about the economic feasibility and the potential of scaling-up the technology at commercial scale as appropriate. The exploitation plans should include preliminary feasibility study and business plan also indicating the possible funding sources to be potentially used (such as private equity, InvestEU, EU Catalyst Partnership and the Innovation Fund).
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-16?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortI

HORIZON EUROPE Development and integration of advanced software tools in SCADA systems for High, Medium and Low voltage ACDC hybrid systems, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to at least three of the following outcomes:
- Optimised connection between power system design, preoperational planning and real-time monitoring and control.
- Measures and strategies for stability management of the future HVDC/MTDC power system connecting renewable energies (more specifically onshore wind farm).
- Measures and strategies for stability management of the future AC/DC hybrid power system with a high share of Power Electronic Interfaced Devices (PEID).
- Real-time capable algorithms and tools that enables optimal operation of the hybrid AC/DC system (e.g., avoidance of circular flows) and to support security analyses.
- Innovative ancillary services (e.g., frequency control, mitigation of periodic frequency fluctuations, voltage regulation and reactive power control).
- The possibilities offered by fast DC control in terms of islanding, black-start capability, firewalling for fault impact minimisation/avoidance, support for fault identification and return to safe, normal operation.
- Increased security of supply through firewalling cascading effects due to faults or cyberattacks by segmentation of the grid with a DC link.
Projects are expected to implement the activities in (1), the practical demonstration (2) and the recommendations for grid codes (3) for a realistic use case, at one or two voltage levels or at system level including all three voltage levels as described below:
- Development of methodologies, technologies, algorithms and software tools, involving at least three of the activities listed below.
- Development of innovative technologies, algorithms and analysis modules for multi terminal HVDC system Software tools for analysing stability compatibility between DC and AC power system (e.g., Grid forming Vs. DC voltage stability)
- Development of innovative algorithms and software tools for analysing and controlling the system of mixed, hybrid AC/DC grids. Integration of these tools into the control room software.
- Scalable and flexible software framework for operation of hybrid AC/DC power systems supporting various vendor-dependent systems and component models, e.g., more accurate and wider representation of connected systems, power flow calculations.
- Vendor independent hybrid DC/AC network SCADA/Energy Management System and upper-level control of voltage source converters (multi-vendor, multi-terminal), including changing active power set points, voltage/reactive power control set points and changing controller parameters.
- Development and management of small signal and dynamic stability in a hybrid AC/DC power system with high penetration of inverter-based resources.
- Development of a robust online real-time estimation and calculation of the system state of the AC, DC and hybrid system.
- Development of safety and reliability analysis of the system state, analysis of possible failure situations as well as curative measures for the failure event, e.g., transient and dynamic stability, coordinated risk management.
- Development and integration of cyber secure resilient ICT platforms and communication for data exchange.

- Development of a DC link for firewalling the grid from cascading effects due to faults or cyberattacks.
- Demonstration, test and validation of the activities developed in (1) for a fully automated decision support system for control centres in at least two pilots in different EU Member States/Associated Countries.
- Recommendations for changes in grid codes, which can facilitate the deployment of the technology and ensure the full exploitation of the assets.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-17?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Improvement of light harvesting and carbon fixation with synthetic biology andor bio-inspiredbiomimetic pathways for renewable direct solar fuels production, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to at least 3 of the following expected outcomes:
- Availability of disruptive and sustainable solar fuel technologies in order to accelerate the replacement of fossil-based energy technologies with more efficient use of primary solar energy in solar fuel production.
- Reduced cost and improved efficiency of solar-based renewable fuel technologies and their value chains by addressing rate-limiting steps in the solar fuels value chain.
- Increase technology leadership, competitiveness and technology export potential of European industry in possibly game-changing solar fuel and synthetic biological technologies.
- Enhanced sustainability of solar fuels, taking fully into account circular economy, social, economic and environmental aspects in line with the European Green Deal priorities.
- Reinforced European scientific basis and European export potential for renewable energy technologies through international collaborations (e.g., the AU-EU Climate Change and Sustainable Energy partnership, the missions and innovation communities of Mission Innovation 2.0).
- Increasing the European energy security and reliability by improving the solar fuel conversion efficiency as well as maintaining and fostering the European global leadership in affordable, secure and sustainable solar fuel technologies.
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. The aim is to achieve a significant improvement of components of both, light harvesting and carbon fixation, which are rate limiting for the conversion of solar energy to renewable fuels. Proposals are expected to include case studies for analysing the potential and impact of the technology for future application at scale and analyse possible interfaces with other solar fuel technologies, with a particular focus on socioeconomic and environmental sustainability including circular economy, social, economic and environmental aspects and cost-effectiveness. All relevant aspects of safety of the technology are expected to be addressed. Hydrogen as a fuel and end-product is excluded.
Projects are expected where possible to collaborate with and contribute to the activities of the Coordination and Support Action funded under the topic HORIZON-CL4-2021-RESILIENCE-01-16
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-04?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Next generation of renewable energy technologies, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to all of the following expected outcomes:
- Available breakthrough and game changing renewable energy technologies enabling a faster transition to a net-zero greenhouse gas emissions EU economy by 2050.
- Knowledge and scientific proofs of the technological feasibility of the concept including the environmental, social and economic benefits to contribute to R&I strategy and policy forecast.
- Establishing a solid long term dependable European innovation base.

The proposal is expected to address high-risk/high return technology developments for game changing renewable energy technologies. It could cover catalyst development, dedicated renewable energy storage systems, integration of renewable energy technologies into a single energy generation system, heating & cooling systems, fuels production systems, solar driven chemical processes, hybrid electricity generation solutions between different renewable energy sources, direct utilization of renewable energy sources.
The following areas are excluded from the scope of the topic as they fall within the scope of partnerships or other calls:
- Hydrogen production through electrolysers.
- Fuel cells.
- Material research is covered under cluster 4 topics.
- Batteries as being covered in Destination 2.
The proposal is expected to validate its concept to TRL 3 or TRL 4 through a robust research methodology and activities. It should establish the technological feasibility of its concept, consider transfer developments in sectors other than energy whenever relevant, as they may provide ideas, experiences, technology contributions, knowledge, new approaches, innovative adapted materials for energy and skills.
Whenever the direct use of biogenic waste is considered, it will be taken into account from the design stage.
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, better resource efficiency (materials, geographical footprints, water, etc…), issues related to social acceptability or resistance to new energy technologies, related socioeconomic and livelihood issues. Comparison with current commercial renewable energy technologies and/or solutions is expected. Impacts will be assessed through a quantified based Life Cycle Analysis. Considerations should be given to the regulatory frameworks for their adequate integration.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-10?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortI

HORIZON EUROPE Energy Management Systems for flexibility services, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to all of the following expected outcomes:
- Contribute to the use of smart buildings and smart industrial sites for the integration of renewables in the energy system in an efficient way.
- Demonstrate aggregation of multiple (building or industrial) energy management systems to provide flexibility services (wholesale market price signals, demand response, flexible production, smart charging, balancing & frequency services, congestion management) to the electricity network.
- Demonstrate interoperability and data exchange technologies to aggregate data from different sources and in different formats through cooperation between aggregators and energy management system developers.
- Piloting and demonstration of flexibility pool operations at the local and regional levels.
The selected projects should propose recommendations how current products, markets and market processes for flexibility should be adapted to accommodate these new services and/or fully benefit from the potential these improved energy management services will bring.
Projects are expected to:
- Develop solutions to aggregate flexibility from different (types of) energy consumers that use different energy management systems to develop interoperable solutions to optimise the energy management systems and valorise its flexibility in wholesale markets and for balancing and/or congestion management services).
- Define and demonstrate the type of flexibility services that clusters of smart buildings and smart industrial sites can provide.
- Cooperate with (one or more) TSOs and/or DSOs, preferably making use of day-to-day operational flexibility markets (i.e. not R&I projects or regulatory sandboxes).
- Include at least 3 different energy management systems in case of industry, or 5 in case of buildings, developed by different technology providers and that use different protocols/standards/proprietary solutions for the energy management system.
- Involve at least 3 different energy system management service companies in case of industry, or 5 in case of buildings.
- Include at least 2 aggregators to ensure that developed solutions are based on standards and to avoid proprietary solutions.
- Include at least 1 home appliances producer in case of buildings. To ensure interoperability and integration into the grid,

specific demonstrators will make use of operational end-to-end architectures, digital platforms and other data exchange infrastructure for the energy system being developed under ongoing Horizon 2020, Horizon Europe as well as under other EU programs such as the Digital Europe Program. Preferably semantically interoperable interactions, as enabled by the ETSI SAREF ontologies, are used.
Design and demonstrate appropriate concepts for acquiring and activating flexibility (implicit and explicit) that allow to maximally benefit from the potential of these new services. The project should demonstrate or recommend how the coordination and cooperation between TSO and DSO has to be organized to adopt the different concepts for services, products and markets.
The selected projects are expected to contribute to the BRIDGE initiative, actively participate to its activities and allocate up to 2% of their budgets to that end. Additional contributions to the 'Alliance for Internet of Things Innovation' (AIOTI) and other relevant activities (e.g. clusters of digital projects and coordinating actions) might be considered, when relevant
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-12?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Low-power PV, deadline: 16. January 2024 17:00 Brussels time

Energy autonomous applications capable of generating their own energy by harvesting ambient energy from the environment to completely eliminate the need for a power source or at least assist it, have gained significant interest in recent years. Photovoltaic energy conversion is a viable choice for energy harvesting due to its high conversion efficiency and compatibility with low lighting conditions.
Consequently, project results are expected to contribute to the following expected outcome:
- Increase the potential of PV for low power, low irradiation applications (harvesting energy in low light intensity and/or artificial light conditions).

Photovoltaic energy harvesting in low light conditions such as indoors, or under artificial or diffuse light can be used to power sensors, as well other low-power electronics. Efficient energy harvesting combined in an energy system with storage unit and low power electronics, can enable a wide range of applications, integrating new functionalities, for example autonomous sensors, domotics, remote monitoring, variable transmission applications and portable devices in general.
Proposals are expected to validate novel and low-environmental impact PV materials, PV architectures and suitable substrates for the specific low power applications that take into account the light intensity, light spectrum and application itself. PV system performance is expected to be tailored to meet the application-specific power and energy requirements and application – related standards. Proposals should include a clear definition of the use case and lifecycle considerations, e.g. business models, circularity by design aspects, certification, etc.
Applicants can seek possibilities of involving the EC JRC. The JRC may provide characterisation, validation and certification of the performance of photovoltaic solar devices. It may also perform pre-normative research to develop appropriate characterisation methods for such devices as a precursor to the adoption of international standards as well as addressing stability, lifetime and environmental issues. This task shall be performed within the European Solar Test Installation (ESTI) an accredited ISO17025 calibration laboratory for all photovoltaic technologies.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-02?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Development of carbon fixation technologies for biogenic flue gases, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to all of the following expected outcomes:
- Availability of disruptive sustainable bioenergy technologies with negative carbon dioxide emissions.
- Increase technology leadership, competitiveness and technology export potential of European industry.
- Reduced cost and improved efficiency of sustainable bioenergy technologies and their value chains.
- Enhanced sustainability of bioenergy, taking fully into account circular economy, social, economic and environmental as-

pects in line with the European Green Deal priorities.
Development of biological and chemical solutions to use the effluent gases from bioenergy combustion systems and upgrade biogenic carbon emissions for the production of renewable energy carriers with renewable hydrogen for later reuse as feedstock for energy needs and achieving carbon circularity. This requires system components (e.g. catalysts), which are cost-effective and robust to flue gas toxicity and interface with the underlying bioenergy combustion system without compromising system performance in respect of technical efficiency and sustainability.
The effluent fixing solution has to be implemented in the conditions of the bioenergy combustion system and provide an integrated structure at the TRL requested. The reuse of the biogenic emissions should be addressed. The assessment of the combustion gas upgrading should be done at pilot scale and cost analysis of how this is a beneficial carbon capture and use solution should be provided.
Socio-economic aspects including SDGs and impacts when applying such solutions in regions in transition from coal or other fossil fuels should be analysed and illustrated in the proposal.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-05?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Condition & Health Monitoring in Power Electronics (PE) - Wide Band Gap PE for the energy sector, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to all the following outcomes:
a. Condition and Health Monitoring:
- Capability to anticipate failures of Power Electronics (PE) in wind farms and converters of the DC grid to prevent downtime.
- Techniques to set the equipment in limp mode to enable to withstand the stress until next maintenance.
- Demonstration of Condition and Health Monitoring (C&HM) for converters of wind turbines generators and HVDC converter stations or MVDC converters (solar energy).
b. Wide Band Gap and Ultra-Wide Bandgap PE:
- Development of new semiconductor power device technologies, in particular Wide Bandgap (WBG) and ultra-wide Bandgap (UWBG) semiconductors
- Availability of more efficient Power Electronics components for the development of new generation of inverters, converters and other power equipment in the energy sector.
- Reduced space occupancy aiming mainly at offshore applications.
- Improved cost efficiency of power devices and semiconductor fabrication processes.
Projects are expected to implement both the activities in (1) and the practical demonstration (2) as described below:
1. R&I, methodologies and tools involving the activities listed below. These can be developed/complemented with others pertinent to each sub-topic.
A. Condition and Health Monitoring (C&HM):
- Estimation of junction temperature Tj based on TSEPs (thermo-sensitive electrical parameters). Here especially big challenge present SiC MOSFETS and Schottky diodes because the TSEPs sensitivity is lower, non-linear and depends on the built technology. Further issues are calibration, circuit drift, influence of PWM and other.
- Development of new and evaluation/further development of already existing unconventional techniques to measure temperature and estimate degradation (such as for example, but not limited to, Kelvin connection or acoustic based methods).
- Development and evaluation of new or already existing techniques for generating the lifetime models based on big-data analysis and by utilisation of soft computing techniques.
- Combination of (big) data-driven and physics-of-failure driven approaches in C&HM.
B. Stress Steering:
- Successful business case realisation requires co-operation and communication between different partners:
- Manufacturers of power electronics components (for example to integrate sometimes-necessary sensors).
- System designer (to provide access to the data such as measured load cycles and general mission profiles).
- Companies responsible for operation and maintenance of the systems. Currently those companies are especially for offshore wind parks developing their own C&HM systems, which are operating, based on sometimes-scarce available data.
- Optimisation is possible when already initial products would be designed to obtain data/measurements needed in C&HM. For power electronics modules, the most valuable data seems to be Tj (junction temperature):

- Careful estimation of the costs of maintenance for specified applications (it seems they are currently underestimated).
- Investigation of different costs models (e.g., the final costs for C&HM can be absorbed by the producers especially when it is also responsible for maintenance, or it can be transferred to the final user whenever the final user can provide safer and more reliable service).

C. Wide Band Gap and Ultra-Wide Bandgap PE:
Improvement of WBG and UWBG semiconductors for integration in HVDC and MVDC components. Work should focus on improving wide bandgap semiconductor devices, packaging and their integration in converter submodules:
- Improved WBG and UWBG power devices with better performance metrics, e.g., lower conduction losses, higher blocking voltage, better surge current capability, higher switching frequencies and better short-circuit capability.
- Advanced control circuits for WBG and UWBG based bridges.
- Improved packages featuring high-voltage insulation, high temperature operation, robustness, and low eddy currents.
- New submodule topologies for HVDC converters and/or new converter topologies for MVDC converters with WBG and UWBG semiconductors and better performance metrics, e.g., reduced losses, higher reliability, lower volume / weight, less costs.
- Implementing WBG and UWBG semiconductor devices for DC protection devices, e.g., DC breakers.
- Improved cost efficiency of components based on WBG semiconductors.

2. Demonstration, test and validation of the activities developed in (1) (A, B and C) in at least two pilots (all activities A, B and C developed for each pilot) in different EU Member States/Associated Countries.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-14?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Africa-EU CO-FUND action, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to all of the following expected outcomes:
- Strengthening of the joint EU-AU Climate Change and Sustainable Energy Collaborative Partnership efforts, with emphasis on improving the visibility of EU Science Diplomacy actions in Africa.
- Acceleration of the achievements of the African continent's targets of the Paris Agreement.
- Establishing technologies for a sustainable energy system that meets the needs of different parts of society, in different geographical locations (urban and rural) and different economic sectors.

Following the EU commitments under the Paris Agreement, Agenda 2030 on Sustainable Development and the post-Cotonou Agreement, the renewed objective to evolve current forms of cooperation into equal footing partnership between Africa and Europe, the current research and innovation cooperation between Europe and Africa in the field of renewable energy needs to be further strengthened and developed.
The action should contribute to the implementation of the strategic and joint research and innovation action roadmaps implemented under Pilar 1 of the project LEAP-RE. The range of activities supported are expected to address the broad range of elements and technologies identified in LEAP-RE, in particular its six multi-annual roadmaps and should include a well-balanced set of research projects, demonstration projects, and technology transfer projects. Inclusiveness of a broad range of MSs/ACs and African partners will be considered an asset.
The proposal should envisage clustering activities with other relevant on-going EU-funded projects for cross-projects co-operation, consultations and joint activities on cross-cutting issues. Synergy is also to be considered with the projects to be funded by the end of 2022 through the Joint Undertaking Clean Hydrogen topic HORIZON-JTI-CLEANH2-2022-05-05? "Research & Innovation co-operation with Africa on hydrogen". To this end, proposals should provide for a work package and/or task dedicated to clustering activities and earmark the appropriate resources accordingly. The clustering activities should also consider and implement a joint programme of activities focussed on communication (participation in joint meetings and communication events), dissemination and exploitation.
It is expected that the action will organise joint calls on an annual basis and will consider ample time for the implementation and closure of the co-funded projects.
The proposal should also provide support to the operation of the Climate Change and Sustainable Energy collaborative action of the AU-EU High Level Policy Dialogue on Science, Technology and Innovation.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-

09?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortI

HORIZON EUROPE AI Testing and Experimentation Facility (TEF) for the energy sector – bringing technology to the market, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to all of the following expected outcomes:
- Large-scale reference testing and experimentation facilities (TEFs) will offer a combination of physical and virtual facilities, in which technology providers can get support to test their latest AI-based software and hardware technologies in operational environments.
- This will include support for full integration, testing and experimentation of latest AI-based technologies to solve issues/improve solutions in the energy sector, at national as well as at local level, including validation and demonstration.
- The TEF is open to all the sites in Europe and equipped with the right equipment (Infrastructure, computing capacity & latest AI innovations).
- The TEF is a "long term investment". There should be a business model to guarantee self-sustainability.
The TEF is a technology infrastructure that has specific expertise and experience with testing in real conditions in the energy sector. They should build on existing infrastructures, facilities.
TEF should become common resources open to all the players, especially end users who should closely be involved. TEFs seek to support technology providers, but we also expect TEFs to include end-users of the technologies to ensure co-creation (in particular end-users can be involved in defining testing scenarios, protocols and metrics.
The TEF has the scope to then bridge the gap between lab and market due to lack of in-depth testing of AI technology in the real environment to fully validate them before the deployment.
Energy AI TEF will aim at testing AI–based technologies and solutions that have already been tested in the labs and have to be tested in operational environments.
Energy AI TEF will aim at optimising the deployment of AI-based solutions for a greener, smarter, more resilient, and more flexible energy system. For instance, it can investigate, how electricity grids respond to stimuli or shocks (e.g. RES integration, cyber-attacks, micro-grids development), making use of digital twins of the electricity grid at local level. Energy AI TEF can also target distribution grid optimisation, integrating both (decentralised) supply and demand-side, taking into account energy data coming from buildings, local storage, DER, electrical vehicles
TEFs can also support regulatory sandboxes by setting up a dialogue with competent national authorities for supervised testing and experimentation under real or close to real conditions.
The TEF can also support the development of new standards and ontologies for AI-Software for energy sector and common interoperability framework.
Energy AI TEF should give regions a further boost in attracting funding to upgrade its facilities and also attracting innovative players to collaborate with its own champions. In addition, TEF will contribute to more trustworthy AI made in Europe.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-11?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortI

HORIZON EUROPE Development of hydropower equipment for improving techno-economic efficiency and equipment resilience in refurbishment situations, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to at all of the following expected outcomes:
- Keeping the availability of the existing hydropower fleet with an important role in the future power market as flexible power suppliers.
- Increase technology leadership, competitiveness and technology export potential of European hydropower industry.
- Reduced cost and improved efficiency of refurbished hydropower installations.
- Enhanced sustainability of refurbished hydropower, taking fully into account and balancing between circular economy, social, economic and environmental aspects in line with the European Green Deal priorities including energy and climate targets and biodiversity.
Development of hydropower equipment for improving techno-economic efficiency and equipment resilience in refurbishment

situations of existing hydropower plants, which are outdated in respect of efficiency, power market interfacing, climate change adaptation and environmental sustainability, in particular also in respect of biodiversity. In scope are novel technologies, which improve the efficiency and economic parameters of existing hydropower plants during refurbishment without requiring substantial modification of the hydraulic system and by implementing circularity by design, e.g., low-friction and resistant materials and technical solutions that can minimize tear and wear in future operation modes. Solution should positively affect CAPEX and OPEX per kWh and also be compliant with improving the water quality of the underlying water body and in particular positively affect biodiversity. Socio-economic and environmental sustainability including SDGs, circular economy, social, economic and environmental aspects should be addressed on a life cycle basis.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-07?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Demonstration of sustainable wave energy farms, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to all of the following expected outcomes:
- De-risking wave energy technology development and increased bankability/insurability of wave energy.
- Increased availability and improved market confidence in the technology.
- Increased knowledge on positive and negative impacts of ocean energy on its environment and in the case of negative impacts to protected habitats and species proposals for necessary mitigation measures.
- Publicly available data collected from the demonstration/pilot structure including support structure.

Demonstration of sustainable wave energy pilot farms (minimum 2.0 MW installed capacity and at least 4 devices) in full operational conditions for long periods of time is essential to advance this sector. It is the way to bridge the gap from technology development to market development while reducing costs, reducing risks and attracting investors for future commercial projects. The farms should be composed of several devices of the same type.
The wave energy farms have to be connected to the electricity grid. To focus on the technologies with the greatest chances of success, the single wave energy device to be used in the array deployment is expected to be satisfactorily demonstrated at full scale before, with limited changes to incorporate the learnings. Any change on the wave energy device may be incremental but should not involve fundamental changes to the device design or composition. The innovation component should mainly lie on the pilot farm systems and supporting industrial manufacturing activities that enable a cost-effective and high-performance pilot farm. Where established, stage-gate processes can help ensure that this approach is followed.
The project is expected to deploy a wave energy farm with a minimum capacity of 2 MW and operate the farm at least 2 years in the lifetime of the project. After the project it is expected that the farm will continue to be operated for at least 8 years. The project should develop and execute an effective operation and maintenance programme.
Proposals are expected to address also all the following for both the supporting infrastructure for the farm and for the individual devices themselves:
- Industrial design and manufacturing processes including set up of an industrial supply chain, circularity of (critical) raw materials, sustainability, scalability, installation methods, transport, operation & maintenance, supply chains and the related digital infrastructures.
- 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. Environmental monitoring data should be open source and be shared with EMODNET and the IEA OES environmental task.
The project has to include a clear go/no go moment ahead of entering the deployment phase. Before this go/no-go moment, the project has to deliver the detailed engineering plans, a techno-economic assessment, including key performance indicators based on international recognized metrics, a complete implementation plan and all needed permits for the deployment of the project., The project proposal is expected to present a clear and convincing pathway to obtaining necessary permits for the demonstration actions and allow for appropriate timelines to achieve these. The project is expected also to demonstrate how it will get a financial close for the whole action. For this the use of other EU/national/regional support mechanisms can be considered. Independent experts will assess all deliverables and will advise for the go/no-go decision.
The exploitation plans should include preliminary plans for scalability, commercialisation, and deployment (feasibility study, business plan, financial model) indicating the possible funding sources to be potentially used (in particular the Innovation

Fund).
Data from the pilot structures should be collected to understand the performance and behaviour of the structure and the surrounding environmental condition to optimise the concept and understand the environmental impact of wave energy harvesting.
The selected projects are expected to contribute to the BRIDGE initiative, actively participate to its activities and allocate up to 2% of their budgets to that end. Additional contributions to the 'Alliance for Internet of Things Innovation' (AIOTI) and other relevant activities (e.g. clusters of digital projects and coordinating actions) might be considered, when relevant.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-08?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE Innovative applicationsintegration of geothermal heating and cooling in industry, deadline: 16. January 2024 17:00 Brussels time

Project results are expected to contribute to all of the following expected outcomes:
- High integration of geothermal heating and/or cooling in different industry sectors with operation flexibility considering start-up time and ramp-up rate, and maximum cascaded use of thermal energy.
- Increased industry, region, city and citizen trust and acceptability for geothermal energy.

Based on geothermal energy, the following is expected to be achieved: explore new heating and/or cooling concepts for industrial sectors which have to decarbonise their production lines using renewable systems. enable the smart use of thermal grids with emphasis on flexible supply of resources, adapted to different source temperatures and varying demand; and position geothermal utilisation (including underground storage) as a crucial pillar for the (heat and/or cold) transition of industrial energy systems. Projects should consider the application of cascading residual geothermal waste heat to neighbouring industries or the built environment and should include the integration of geothermal and heat pump systems, energy piles, or energy sheet pile walls, consider the use of alternative cycle working media.
Activities related to geothermal heat for industry and agriculture, underground thermal energy storage (UTES) including high-temperature storage, innovative and multiple uses for geothermal energy and side-products, balneological systems, and design and operation of geothermal doublets can be considered.
Activities are required to assess the environmental sustainability of geothermal heating and/or cooling applications. The applied technologies should not significantly harm the environment (Do No Significant Harm principle). 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.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-06?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortl

HORIZON EUROPE HVAC, HVDC and High-Power cable systems, deadline: 16 January 2024 17:00 Brussels time

Project results are expected to contribute to at least three of the following outcomes:
- High Voltage (HV), Extra High Voltage (EHV) or High Power/superconducting cable systems, including dynamic AC – DC cables.
- Development of not only better performing, but also more environmentally friendly materials for cable and accessory insulation.
- Improved tools for remote monitoring, repair and maintenance of equipment.
- Assessment of the feasibility of new cable system technologies.
- Increased reliability of HVDC or High-Power cable systems, through improved cable accessory design and/or ageing studies and/or use of cable condition monitoring techniques.
- Reduced cost of HVDC or High-Power cables, which increases feasibility of implementation in smaller projects, reducing the visual impact and improves social acceptability compared to AC overhead lines.

- Reducing the environmental impact of HVDC or High-Power cable systems through use of component designs with smaller climate footprints such as gas-free accessories or through conversion and reuse of existing infrastructure to increase power transfer capacity.
- When power demand increases and the ampacity of the power line is reached, the replacement of HVAC overhead lines with HVDC or with High-Power cable systems can avoid building new lines or reinforcing the grid.
- Increased power transfer over the same corridor and same or smaller right of ways.
- Methodology development of the OHL conversion from AC to DC with minimal line outage
- Contribution to the emergence of standards for DC OHLs in Europe
- Benefits of power dense technology options and avoidance of grid reinforcement.

Projects are expected to implement at least three of the activities in (1) for one or more subtopics (A, B, C) or (2) for one or more subtopics (D, E, F) and the practical validation in (3) as described below:

1. R&I, methodologies and tools involving the activities listed below. These can be developed/complemented with others pertinent to the topic.

A. Innovation in cable systems

- Development of new insulating materials for dry type accessories for high temperature and above 525 kV
- Optimisation of newly developed high electrical resistivity insulating materials for use above 525 kV in cable and/or accessories.
- Development of new network components with reduced environmental impact such as EHV/HV cables without lead, application of superconductors, AC, DC cables/gas insulated lines for voltages above 525 kV.
- Development of larger conductor cross sections.
- Development of smaller conductor cross sections and leveraging higher current superconductors - greater power density benefits.
- Increase of maximum insulation operating temperature, such as for high load urban areas where available space for power transfer is limited.
- Further improvement of different types of extruded insulation materials (e.g., AC, DC-XLPE, Polypropylene) cables, and render recyclability of the materials feasible by refining the procedure of separation of the many components of the cable – insulation, wires, tapes, sheaths, etc. – from each other. Establishment of procedures for recycling and related possible products.
- Feasibility study for use of superconducting cables for submarine connections to determine their environmental benefits e.g., extremely low heat emittance, since they do not emit any heat, zero magnetic field benefits to marine fauna, smaller cable corridors for higher power densities, smaller landfall space requirements, etc.
- Simulation and design of innovative dynamic cable systems to meet the needs of the growing floating offshore applications.

B. Predictive models for cable system ageing (fraction-of-life lost, remaining life), life and reliability

- Modelling of space charge phenomena (as well as other relevant phenomena) in newly developed insulating materials, in full size cables and accessories.
- Modelling of its effects on cable system aging taking advantage of advanced experimental space charge measurement techniques.
- AI methods for managing a cable fleet angle.
- Impact of water absorption on ageing of lead-free wet-design HVDC or High-Power cables.
- Ageing of cable systems, including effect of contaminants, humidity and temperature, and its implications for space charge accumulation and lifetime estimations. Test methods to quantify ageing in a DC environment, such as voltage form for DC-specific breakdown testing.

C. Monitoring and fault location systems

- Continuous temperature and acoustic monitoring of long cable system lengths.
- Accurate and instantaneous fault location systems for long cable system lengths.
- Further development and improvement of on- and off-line diagnostics and condition monitoring techniques for HVDC or High-Power cable systems such as PD and leakage current measurements for online and space charge and dielectric permittivity and loss factor measurements for offline.
- Innovative technological solutions such as fibre-based and/or robotic technologies for data collection and maintenance in in all type of location (easy-to-access and inhospitable).
- Development of procedures for optimised maintenance and repair concepts of offshore stations using BIM and 3D-Models.

2. Investigation and development of potential replacement of HVAC overhead lines with HVDC or High-Power cable solutions to increase capacity transfer without the need of building new infrastructures but reusing existing right of ways.

D. Cost-Benefit Analysis for different options of HVAC OHL conversion

- Mapping of the potential use cases for replacement of HVAC with HVDC or High-Power solutions (buried or overhead)

supported by a Cost-Benefit Analysis.
- Cost-Benefit Analysis for conversion of HVAC OHL to HVDC, High Power OHL or buried High-Power cable solutions.
- Resilience and reliability analysis of different HVAC OHL conversion options – underground cable, HVDC OHL and buried High-Power cable solutions.
E. Technical innovations and design methodologies of hybrid HV AC/DC overhead lines
- Insulation coordination and clearances calculation methodologies, for HVDC and hybrid HV AC/DC overhead lines.
- Electrical field and ion current density calculation methodology under hybrid HV AC/DC OHLs ion flow field.
- Operation, control and protection of hybrid AC/DC overhead lines.
- Management of long-distance mixed cable and OHL HV corridors.
F. Pan-European grid studies and unification of voltage level of the converted OHLs from HVAC to HVDC
- Proposal of a unified DC voltage level of the converted lines considering the standard towers and line designs of HVAC OHLs (220 kV, 400kV) in the European network to provide a general conversion approach, compatible with minimum operation downtime.
- Perform pan-European grid studies to propose a unified strategy toward an overlaying HVDC grid based on the converted HVAC OHLs and existing corridors with minimized environmental impact, link downtime and implementation time.
- Dynamic grid studies to demonstrate the impact of the HVAC OHL conversion to HVDC.
- Develop identification criteria for the candidate HVAC OHL corridors (to be converted in HVDC).
3. Test and validation of the activities developed in (1) consisting of at least one of the activities described in each subtopic A, B, C or (2) consisting of at least one of the activities described in each subtopic D, E, F in at least two validation tests in different EU Member States/Associated Countries.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-15?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&sortI

HORIZON EUROPE Technologies for processing and refining of critical raw materials (IA), deadline: 07. February 2024 17:00 Brussels time

Projects outcomes will enable achieving the expected impacts of the destination by increasing access to primary raw materials and secondary raw materials, in particular critical raw materials for EU industrial value chains and strategic sectors.
Projects are expected to contribute to the following outcomes:
-Increase recovery rates of valuable raw materials, particularly critical raw materials from low grade or complex ores and/or from extractive waste;
-Significantly increase economic performance in terms of higher material-, water-, energy- and cost-efficiency and flexibility in minerals processing and metallurgical processes;
-Significantly improve the health, safety and environmental performance of the operations throughout the whole life cycle which is considered, including a reduction in waste, wastewater and emissions generation and a better recovery of resources from generated waste;
-Improve responsible supply of raw materials to Europe in line with the EU principles for sustainable raw materials, which are a non-regulatory set of principles based on the EU acquis. They set out requirements for sustainable raw materials and extraction and processing in Europe in terms of social, environmental and economic performance. Actions are expected to contribute to the implementation the EU action plan on Critical Raw Materials.
Actions should demonstrate new or improved systems integrating relevant processing and refining technologies for better recovery of raw materials from low grade and/or complex ores from extractive wastes, less waste, higher energy efficiency. The action could also reduce the content of toxic elements or compounds in the resulting material products. The actions should target minerals and metals, particularly critical raw materials.
The solution proposed should be flexible enough to adapt to different or variable primary and secondary raw materials grades and should be supported by efficient and robust process control. Where relevant, any solution proposed for the reduction of the content of toxic elements or compounds in the resulting materials should also include the appropriate management of the hazardous substances removed.
Actions should develop intelligent and innovative production systems which better utilise natural resources by minimising losses during waste-rock separation in an optimised and energy-efficient process and by minimising use of water
Recycling of end-of-life products is excluded from this topic, though joint processing of waste streams originating from

end-of-life products recycling could be included and has to be duly justified.
Actions should envisage clustering activities with other relevant selected projects 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 foresee a dedicated work package and/or task, and earmark the appropriate resources accordingly.
Actions should facilitate the market uptake of solutions developed through industrially- and user-driven multidisciplinary consortia covering the relevant value chain and should consider standardisation aspects when relevant. The action should also include the analysis of financial opportunities ensuring the market exploitation and replication of the circular business model behind the developed solutions as new processes, products and/or services.
Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination. For TRLs 6-7, a credible strategy to achieve future full-scale deployment in the EU is expected, indicating the commitments of the industrial partners after the end of the project.
In this topic the integration of the gender dimension (sex and/or gender analysis) in research and innovation content is not a mandatory requirement, however, should you consider it to be of relevance for your specific proposal, you are strongly encouraged to do it.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-resilience-01-04?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Addressing due diligence requirements in raw materials supply chains. (CSA), deadline: 07. February 2024 17:00 Brussels time

Projects outcomes will enable achieving the expected impacts of the destination by increasing access to primary raw materials and secondary raw materials, in particular critical raw materials for EU industrial value chains and strategic sectors.
Projects are expected to contribute to the following outcomes:
-Improve responsible sourcing of raw materials and responsible business conduct initiatives with regard to raw materials;
-Equip the raw materials sector with tools to enable implementation of relevant regulatory initiatives;
-Identify and address gaps in the raw materials supply chains due diligence;
- Improve responsible supply of raw materials to Europe in line with the EU principles for sustainable raw materials, which are a non-regulatory set of principles based on the EU acquis. They set out requirements for sustainable raw materials and extraction and processing in Europe in terms of social, environmental and economic performance.
Actions are expected to contribute to the implementation the EU action plan on Critical Raw Materials.
Responsible sourcing and due diligence are growing in importance throughout the raw materials value chain, highlighting the need to address possible risks of adverse impact to human rights and the environment in corporate behaviour. Consumers and investors increasingly expect supply chain transparency where due diligence obligations are an important part. Recent regulatory initiatives are underway for responsible sourcing and supply chain due diligence.
Knowledge in the area supply chain due diligence needs to be strengthened to limit complexity and enable a level playing field for responsible sourcing of raw materials.
The proposal should build on the state of the art in sustainable raw materials traceability and on the experience of existing EU projects on international responsible sourcing and contribute to strengthening responsible sourcing agenda.
Actions should envisage clustering activities with other relevant selected projects 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 foresee a dedicated work package and/or task, and earmark the appropriate resources accordingly.
Actions should facilitate the market uptake of solutions developed through industrially- and user-driven multidisciplinary consortia covering the relevant value chain and should consider standardisation aspects when relevant. The action should also include the analysis of financial opportunities ensuring the market exploitation and replication of the circular business model behind the developed solutions as new processes, products and/or services.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-resilience-01-10?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Technologies for extraction and processing of critical raw materials (IA), deadline: 07. February 2024 17:00 Brussels time

Projects outcomes will enable achieving the expected impacts of the destination by increasing access to primary raw materials and secondary raw materials, in particular critical raw materials for EU industrial value chains and strategic sectors.
Projects are expected to contribute to the following outcomes:
-Strengthen EU cooperation with resource rich countries;
-Provide new relevant life cycle inventory data sets based on requirements for Environmental Footprint compliant datasets and in line with the 2021 Recommendation on the use of the Environmental Footprint methods, particularly focusing on the existing knowledge gaps (e.g., new technologies for open pit and underground mining).
-To evaluate the environmental performance of the technologies a Product Environmental Footprint (PEF) study will be produced.
-Improved industrial viability, safety and environmental impacts of the operation in a way that leads to measureable improvements;
-Improved diversification EU sourcing of critical raw materials from third countries;
-Improved responsible supply of raw materials to Europe in line with the EU principles for sustainable raw materials, which are a non-regulatory set of principles based on the EU acquis. They set out requirements for sustainable raw materials and extraction and processing in Europe in terms of social, environmental and economic performance.
Dissemination and exploitation of projects outputs is tailored for organisations and industry dealing with raw materials in the EU and project partner countries in resource rich countries;
In order to achieve the expected outcomes, international cooperation with partners established in resource rich countries with which the EU has strategic partnerships on raw materials is strongly encouraged.
Actions are expected to contribute to the implementation the EU action plan on Critical Raw Materials.
The actions in this call should also be pursued with a view on developments in the call "HORIZON-CL4-2023/2024-RESILIENCE-01-02: Innovative technologies for sustainable and decarbonised extraction" in terms of industrial viability, safety and environmental impacts.
Actions are expected to develop and demonstrate extraction and processing technologies to facilitate exploitation of the primary raw critical raw materials (minerals and metals only) for the EU to strengthen the EU supply chains.
Actions have to collaborate with Canada or Ukraine, following the strategic partnership on raw materials established in 2021 between the EU and Canada and with Ukraine. The consortia should contain raw materials industry from at least one of the partner countries and raw materials users from the EU. Technology should be demonstrated on the resources of the partner country.
Actions should envisage clustering activities with other relevant selected projects 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 foresee a dedicated work package and/or task, and earmark the appropriate resources accordingly.
Actions should facilitate the market uptake of solutions developed through industrially- and user-driven multidisciplinary consortia covering the relevant value chain and should consider standardisation aspects when relevant. The action should also include the analysis of financial opportunities ensuring the market exploitation and replication of the circular business model behind the developed solutions as new processes, products and/or services.
Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination. For TRLs 6-7, a credible strategy to achieve future full-scale deployment in the EU is expected, indicating the commitments of the industrial partners after the end of the project.
In this topic the integration of the gender dimension (sex and/or gender analysis) in research and innovation content is not a mandatory requirement, however, should you consider it to be of relevance for your specific proposal, you are strongly encouraged to do it.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-resilience-01-11?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE 'Innovate to transform' support for SME's sustainability transition (CSA), deadline: 07. February 2024 17:00 Brussels time

Projects are expected to contribute to the following outcomes:
- Support objectives of the European Green Deal and of the EU SME Strategy for a sustainable and digital Europe;
- Increased resilience of SMEs, by fostering technological and social innovation in SMEs to support their transition to more sustainable business models and more resource-efficient and circular processes and infrastructures;
- Increased competitive sustainability of SMEs through the uptake of advanced technologies;
- Stronger innovation support ecosystems supporting the green, social and economic transition of SMEs, by leveraging synergies between existing EU networks and SME support initiatives.

Achieving European Green Deal objectives, and notably a climate neutral and resource efficient economy, requires the full mobilisation of SMEs. The COVID-19 pandemic has also led to companies redesigning their supply chains and facing a new industrial revolution, brought on by a new generation of advanced technologies, which are underpinning the potential for competitive sustainability of SMEs.

The action will build on and further connect existing EU specialised business support networks and centres – such as the Enterprise Europe Network, the European industry clusters registered under the European Cluster Collaboration Platform, Centres for Advanced Technologies for Industry. They will work in complementarity and close interaction with Open Innovation Test beds, European Digital Innovation Hubs, Start-up Europe etc., but also with academia, social partners and other social innovation actors.

This action will consist in:

A. Advisory services

Dedicated innovation and capacity building support will be provided to SMEs, to assess their ability to transform their business models and increase their resilience.

This will consist of an assessment of SMEs' innovation and sustainability practices, elaboration of recommendations, notably in view of the uptake of advanced technologies and/or social innovations.

Based on these recommendations, SMEs could receive further advisory services according to their level of preparedness such as help and advice on proof of concept, investment readiness, intellectual property (in cooperation with EU funded IP support), technology transfer, adaptation to standards, adaptation to environmental rules, design management, skill development, partner search (including social partners). SMEs will receive targeted assistance for the uptake of advanced technologies.

Social innovation should be recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

This action will also include the set-up of a community, building on the SME Alliance projects, in which best practices should be exchanged and SMEs could benefit from dedicated peer-learning activities in order to learn from leaders (SMEs or larger corporates) of their own sector. Incentives for leaders to share their best practices with peers should be identified in the context of EU support to industrial ecosystems.

B. Financial support in the form of 'Third party financing'

As a result of the advisory services and initial assessments, SMEs will receive financial support through calls for SMEs, to implement the elaborated recommendations.

This should support amongst other activities the financing of a feasibility study, prototyping, pilot testing, demonstrating, procurement of further specialised consultancy services and coaching services that cannot be provided directly by the project partners, adaptation of business processes, free access and support to use testing facilities, introduction of new IT solutions etc.

The Commission estimates that at least half of the budget should be allocated to financial support to SMEs in the form of third party financing.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Proposals can consider the involvement of the European Commission's Joint Research Centre as an associated partner providing its expertise in industrial innovation and dynamics.

Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-resilience-01-41?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Development of safe and sustainable by design alternatives (IA), deadline: 07. February 2024 17:00 Brussels time

Projects are expected to contribute to the following outcomes:
- European industry will have access to safer and more sustainable innovative alternatives of chemicals and materials with reduced substitution barriers (e.g., performance, cost and supply demand);
- Industry will be able to test and demonstrate the applicability of the Safe and Sustainable by Design framework to develop innovative chemicals or materials to substitute substances of concern;
- The EU climate ambitions will be supported by contributing to a decrease of greenhouse gas emissions through a more sustainable production and use of Safe and Sustainable by Design chemicals and materials;
- The EU strategies/policies and regulation, such as the proposal for the Ecodesign for Sustainable Products Regulation, the EU Ecolabel, REACH or CLP will be supported with safe and sustainable alternatives of chemicals and materials;
- The proof of concept of developing new Safe and Sustainable by Design chemicals or materials will bring evidence for new skills needed to apply the Safe and Sustainable by Design framework;
- Market uptake of the Safe and Sustainable by Design chemicals and materials will be encouraged by citizens better understanding their benefits.

The Commission initiative for Safe and Sustainable by Design sets a framework for assessing safety and sustainability of chemicals and materials and which should be considered as a reference in the proposal.
Proposals should develop one or more new chemical substances or materials to replace existing substances of concern with surfactant, flame retardant or plasticising functionalities for a chosen application. Proposals should address at least one industrial application. The new substances or materials shall be aligned with the Safe and Sustainable by Design framework, and demonstrate improved sustainability and a contribution to lower the impact on climate. The selected industrial application(s) should be in areas where substitution with safer and more sustainable solutions is not yet in place, or in progress.
Proposals should address all of the following:
- Proof of concept of the Safe and Sustainable by Design framework. The developed substances or materials will have to comply with the Safe and Sustainable by Design framework. Findings from the selected projects will be considered for the further refinement of the defined framework, if applicable;
- The selection of the chemical/materials to be developed should be justified with a technology and socio-economic analysis;
- Proposals should involve all relevant actors along the value chain;
- Identify the substitution barriers for the selected applications and propose a driving mechanism for a maximal substitution in the targeted value chains;
- Identify and address challenges for the adaption of existing production lines;
- Explore collaboration with existing Open Innovation Test Beds (OITBs), where relevant;
- Interoperability for data sharing should be addressed across the entire value chain;
- Communication actions to all stakeholders and specifically citizens about the benefits of the developed Safe and Sustainable by Design chemicals and materials.

Proposals should indicate to which chapters of the Strategic Research and Innovation Plan for chemicals and materials they will contribute.
Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination.
Proposals should involve appropriate expertise in Social Sciences and Humanities (SSH), in particular in the socio-economic analysis of the relevant substance or application.
Projects should build on or seek collaboration with existing projects and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms. For example, with projects resulting from the topic, HORIZON-CL4-2021-RESILIENCE-01-08 as well as other relevant projects from the topic HORIZON-CL6-2023-ZEROPOLLUTION. Proposals should allocate the necessary resources for collaboration with other relevant projects.
Synergies with Horizon Europe missions as relevant are encouraged.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-resilience-01-24?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Exploration of critical raw materials in deep land deposits (RIA), deadline: deadline: 07. February 2024 17:00 Brussels time

Projects outcomes will enable achieving the expected impacts of the destination by increasing access to primary raw materials and secondary raw materials, in particular critical raw materials for EU industrial value chains and strategic sectors.
Projects are expected to contribute to the following outcomes:
-Develop innovative technologies for exploration of critical raw materials in deep land deposits in the EU and non-EU countries;
-Increase the resources and reserves of various primary critical raw materials within the EU and non-EU countries;
-Accelerate development of EU domestic critical raw materials exploration projects integrating innovative technologies;
-Strengthen EU autonomy and ethical sourcing of raw materials by developing socially and environmentally acceptable means of discovery of primary raw materials.
-Improve responsible supply of raw materials to the EU in line with the EU principles for sustainable raw materials, which are a non-regulatory set of principles based on the EU acquis. They set out requirements for sustainable raw materials and extraction and processing in Europe in terms of social, environmental and economic performance.
-Promote the utilisation of UNFC (United Nations Framework Classification for Resources) and UNRMS (United Nations Resource Management System) in the raw materials sector.
Actions are expected to contribute to the implementation of the EU action plan on Critical Raw Materials.
Actions should map Europe's primary raw materials potential and raw materials production, using geoscientific approaches and refining capacities in a harmonised form, using UNFC (United Nations Framework Classification for Resources) and UNRMS (United Nations Resource Management System).
-Develop and deploy new or improved highly efficient, sustainable exploration technologies, such as UAV assisted geological exploration in remote areas, geophysics, 3D modelling, new drilling techniques, models of whole mineral systems related to critical raw materials, high resolution laboratory techniques, artificial intelligence and data processing to identify deep seated mineral deposits of critical raw materials.
Actions should also contribute to improving the awareness of the general public across the EU about:
-The importance of raw materials for a successful transition to a climate-neutral and digitised economy and society; and
-The ensuing need for a secure, sustainable, and responsibly-sourced supply of raw materials, including from domestic sources to strengthen EU open strategic autonomy and reduce over-dependence on third countries.
Actions should envisage clustering activities with other relevant selected projects 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 foresee a dedicated work package and/or task, and earmark the appropriate resources accordingly.
In this topic the integration of the gender dimension (sex and/or gender analysis) in research and innovation content is not a mandatory requirement, however, should you consider it to be of relevance for your specific proposal, you are strongly encouraged to do it.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-resilience-01-01?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Manufacturing as a Service: Technologies for customised, flexible, and decentralised production on demand (Made in Europe Partnership) (RIA), deadline: deadline: 07. February 2024 17:00 Brussels time

Expected Outcome:
- Easy access to flexible and decentralised manufacturing and remanufacturing capacities, especially for SMEs, reducing the required investments for manufacturers while enabling them to use more sustainable and circular facilities.
- Availability of automation, emerging and digital technologies for the servitisation of manufacturing assets assuring optimal performance, fast reconfiguration and upgrade with minimal downtime, remote monitoring and predictive maintenance via trusted, secure and interoperable cross-company data exchange.

- Improved value chain integration through the availability of technologies and models for securely exchanging and leveraging life-cycle data of servitised manufacturing assets, also in view of the reuse or recycle of assets, components, and materials. Manufacturing as a Service (MaaS) is a distributed system of production in which resources (including data and software) are offered as services, allowing manufacturers to access distributed providers to implement their manufacturing processes. The servitisation of manufacturing resources contributes significantly to production flexibility and responsiveness, enabling production on demand for many product categories. Suppliers of manufacturing systems and of integration technologies design and offer interoperable services in close partnership with manufacturing companies, while other providers in the value chain can offer additional services. Secure, real-time data exchange between the companies involved enables quick response times.
This topic aims at further developing and integrating the technologies needed for the successful implementation of MaaS allowing to manufacture "on demand" a large choice of customised products, with high flexibility and short lead time, by using distributed facilities as a service and exploiting unused production capacities, also by rapid re-purposing of manufacturing machines. The objective will be achieved through platforms for fast data exchange and seamless, data-driven, standards-based automation of inter-company processes beyond the factory boundaries.
Integration with digital design, development of design libraries and workflow templates, and advanced technologies such as digital twins, real-time AI-based decision support systems, and next-generation Manufacturing Execution Systems should also be considered where appropriate, with the objective to optimise the entire life-cycle of the product in terms of circularity, sustainability and reusability, using product life cycle assessments whenever appropriate.
Interoperability is a core requirement for MaaS; for this reason, research will build on existing standards or contribute to standardization where relevant, taking also into account the contributions of upcoming EU initiatives like the Digital Product Passport or the Manufacturing Data Spaces.
Results should be demonstrated through at least two realistic use cases, based on different supply chains or industry sectors. Proposals should explain how the proposed approach contributes to the competitiveness of industry and the sustainability and circularity of production and logistics, through measurable targets.
Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination.
This topic implements the co-programmed European Partnership "Made in Europe".
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-twin-transition-01-03?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Breakthroughs to improve process industry resource efficiency (Processes4Planet partnership) (RIA), deadline: 07. February 2024 17:00 Brussels time

Projects outcomes will enable achievement of the objectives of Processes4Planet partnership by designing processes for maximum resource efficiency.
Projects are expected to contribute to several of the following outcomes:
- Achieve a step change in the process industry's green transformation by improving by at least 30 % the industrial processes resource efficiency compared to the state of the art;
- Enable the techno-economic feasibility of novel technologies and processes, demonstrated and validated at suitable scale against current industrial processes to produce the same products;
- Overall positive environmental and if relevant health and safety impact demonstrated;
- Reduce the CO2 intensity of the process industry and contribute to the climate neutrality goal;
- Enable the increase of the competitiveness and resilience of the European process industry.
Process industries will greatly benefit from radically new approaches that will lead to a much higher resource efficiency (including higher selectivity), producing less low-value by-products and waste and enabling the handing of a higher feedstock variability, and ultimately leading to lower level of GHG emissions linked to the process industries. To reach ambitious targets regarding resource efficiency, disruptive process technologies must be developed in addition to process efficiency options for existing technologies.
Proposals should:
- Develop disruptive process technologies to improve resource efficiency, such as those based on: process intensification (e.g., 3D printed processes equipment, coupling of process steps, new processes that integrate multiple reaction steps, activation

of molecules using renewable energy via alternative processes e.g. microwave, plasma); or to prevent and minimise waste generation by, e.g. processes that adjust in real time to feedstock changes or that have tighter processing control solutions to ensure higher yields from complex and fluctuating raw material feeds;
- Where relevant advanced process technologies and their combinations need to be developed and supported by advanced materials innovation and the implementation of enabling digital technologies including advanced concepts on process control and data driven Artificial Intelligence.
The proposals should include energy efficiency, techno-economic and life-cycle assessments considering the overall process. This should also include the assessment of possible societal and environmental impact and the effects on the workplaces (skills, organisational change, and others).
Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination.
Research must build on existing standards or contribute to standardisation. Where relevant interoperability for data sharing should be addressed.
All proposals should build on or seek collaboration with existing projects and develop synergies with other relevant European, national or regional initiatives, funding programmes
This topic implements the co-programmed European partnership Processes4Planet.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-twin-transition-01-41?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Technologiessolutions to support circularity for manufacturing (Made in Europe Partnership) (RIA), deadline: 07. February 2024 17:00 Brussels time

Manufacturing industry should benefit from the following outcomes:
- Assessing the environmental impact of their products, including the flow of products after their use to reduce product and raw material waste with the support of digital technologies;
- Achieving a considerable net reduction of the environmental impact through the use of innovative modelling and simulation software that allows transport and manufacture monitoring, ultimately driving the decarbonisation of the manufacturing industry;
- Facilitating the development and uptake of digital tools/platforms such as the EU Digital Product Passport, to increase traceability and characterisation of materials and products (e.g. at analytical research infrastructures), including environmental footprint and quality;
- Removing barriers in the uptake of the digital tools from the market will be addressed and the workforce will be empowered through new skills.
Manufacturing plays a key role in achieving the twin transition goal through enhancing circularity, facilitating decarbonisation whilst enhancing competitiveness. A broad range of digital technologies and engineering tools can be employed to achieve the systemic circularity of the European manufacturers.
Data pooling and sharing among sectors and across the whole value chain, as well as the use of external environmental impact data such as LCA-data, would facilitate recycling and remanufacturing, by modelling and monitoring the life cycle of products and components. Such data pooling would enable a better insight into the environmental footprint, including the CO2-footprint, of products and components. To achieve that, there is a need to build trust by ensuring data exchange and interoperability across industry sectors and relevant stakeholders, while also focusing on aspects like data quality, cybersecurity, reliability, and accessibility. The forthcoming Sustainable Product Framework (SPI)[1]that has been announced as part of the Circular Economy Action Plan 2.0 in 2020 is proposing the Digital Product Passport to electronically register, process and share product-related information amongst supply chain businesses, authorities and consumers, therefore the manufacturers should be prepared for its implementation.
The transition to the circular manufacturing requires a new mindset and expertise. All the technological improvements of the manufacturing process should always support the human aspect in order to uptake these improvements through upskilling and reskilling of the manufacturing workforce. The workforce should be engaged in the realization of circular approaches and the new manufacturing technologies.
Proposals should cover all of the following aspects:
- Develop new approaches of Artificial Intelligence to forecasts the environmental impact, also considering the quantity and

state of products after their use;
- Develop innovative simulation and modelling software or built on existing solutions fostering new manufacturing capabilities with a view to a more efficient and more sustainable product design. This optimization process should consider the various steps of the value chain focusing on the environmental impact. Additional ecological impacts arising from the use of the modelling or simulation software should be considered;
- Develop digital platforms/ tools build on existing interoperability architectures (such as the Asset Administration Shell), that will enable the manufacturers to implement the Digital Product Passport initiative. The proposals should focus on gathering relevant data, material and product tracking and tracing, certification protocols for secure re-used materials and components among sectors;
- Enhance the human involvement in the development of the circularity aspects and new technologies.
Links may be established with relevant cases emerging from the CSA project HORIZON-CL4-2023-RESILIENCE-01-39.
International cooperation is encouraged, especially with Japan, S. Korea, US, Canada, and Australia.
Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination.
Proposals should take into account relevant international standards and activities supported under the Digital Europe programme, e.g. in the area of Manufacturing Data Spaces.
Research must build on existing standards or contribute to standardisation. Interoperability for data sharing should be addressed, leveraging on existing ontologies and metadata and though the implementation of the FAIR data principles.
All projects should build on or seek collaboration with existing projects and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms. Collaboration with EIT Manufacturing is encouraged, in particular on the development of skills.
This topic implements the co-programmed European Partnership Made in Europe.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-twin-transition-01-05?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Renewable hydrogen used as feedstock in innovative production routes (Processes4Planet Partnership) (RIA), deadline: 07. February 2024 17:00 Brussels time

Projects outcomes will enable achievement of the objectives of Processes4Planet partnership by developing new processes integrating renewable hydrogen that can replace fossil feedstock-based processes, enabling the full potential of renewable energy sources, and ensuring process flexibility (related to P4Planet operational objectives 1 and 2).
Projects are expected to contribute to the following outcomes:
- Enable the technical and economic feasibility of innovative production routes using hydrogen as feedstock demonstrated and validated at suitable scale against current state of art of industrial processes;
- Enable the efficient use and integration of hydrogen as a feedstock in innovative industry processes, considering also fluctuation of availability;
- Support the increased utilisation of renewable energy sources combined with digital technologies in the process industries, thereby contributing to the independency on fossil fuel and fossil fuel imports as put forward in the REPowerEU Plan;
- Contribute to EU Climate neutrality goal by proving the effectiveness of the GHG emission avoidance in the targeted process;
- Support Mission Innovation 2.0 NZEID on 'Net-zero Industries' and its ambition via networking and dissemination activities.
Hydrogen produced from renewable energy sources does not lead to direct carbon dioxide emissions when used and it can offer solutions to decrease GHG emissions in industrial processes. Hydrogen is thus an important enabler for meeting the 2050 climate neutrality goal. In the energy intensive process industries, hydrogen can be used either as feedstock (chemical or reducing agent) or as an energy carrier. The integration of renewable hydrogen into new production routes as a feedstock will lead to major GHG emission reductions across several European industry sectors.
Currently, hydrogen is largely used in industrial sectors such as the chemical industries and refineries. In addition to the current processes, there are different production pathways under development using hydrogen as a chemical feedstock in low-carbon industrial processes. Hydrogen could be used as reducing agent in the production and recovery of metals, biogenic and circular carbon optimisation or in new process routes to produce platform chemicals (e.g., carbon-based waste

and side streams or biomass). The proposals under this topic should:
- Develop innovative production routes using hydrogen as feedstock;
- Evaluate the efficient integration of the new production process into the processing line, including downstream and upstream;
- Design production process coupled/integrated with renewable hydrogen by making the best use of simulation, modelling and IT tools;
- Include energy efficiency, techno-economic and life-cycle assessments considering the efficient use of the hydrogen as well as the value of the by-products, and the value chain from hydrogen production, storage, distribution and usage.
The use of hydrogen as feedstock to produce fuels is out of the scope of this topic. Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination. Societal and environmental impact and implications for the workplace (such as skills, organisational change) should be outlined.
Proposals should build on or seek collaboration with existing projects and develop synergies with other relevant European, national, or regional initiatives and funding programmes and platforms. Where relevant, proposals could liaise with the Clean Hydrogen Joint Undertaking and are encouraged to contribute and participate to the activities of the TRUST database and the hydrogen observatory.
This topic implements the co-programmed European partnership Processes4Planet.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-twin-transition-01-34?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Turning CO2 emissions from the process industry to feedstock (Processes4Planet partnership) (IA), deadline: 07. February 2024 17:00 Brussels time

Projects outcomes will enable achievement of the objectives of Processes4Planet partnership by developing efficient CO/CO2 capture and purification technologies, in combination with valorisation routes; that will drive the partnership's innovation portfolio towards first of a kind demonstrator and de-risk investment (related P4Planet operational objectives 3, 4 and 9).
Projects are expected to contribute to the following outcomes:
- Master the capture, purification and conversion of CO/CO2 from process industry point sources and utilization of renewable energy at reasonable costs to pave the road to the production of a large range of chemicals and materials;
- Showcase the system effectiveness for the GHG emission avoidance in the process industries as well as the scalability and the cost efficiency of the proposed concept;
- Enable the economic viability of the entire unit to compete with the existing state of the art production of the same or equivalent products (e.g., fossil-based production of chemicals and materials);
- Prove the efficient integration and use of renewable energy sources, and where relevant account for their intermittency and the possibility to offer demand-response flexibility;
- Enable the increase of the competitiveness and resilience of the European process industry.
The proposals submitted under this topic are expected to demonstrate the economic viability of the efficient capture and utilisation of CO/CO2 streams from point sources (e.g., large and medium industrial installations such as steel, cement, refining and chemical plants) converting the streams into added value chemicals and materials in near to production size systems. The technologies proposed should support cross-sectorial concepts and sector integration.
The semi-industrial scale demonstrators proposed should:
- Process significant amounts of CO/CO2 containing emissions from energy intensive process industries;
- Demonstrate process and cost efficient environmentally friendly technologies for: capture and fit for purpose purification approaches while ensuring the maximum process efficiency;
- Demonstrate the cost efficient environmentally friendly conversion of CO/CO2 into chemicals and materials including any relevant auxiliary required for the process (such the formulation of reliable catalyst at the required scale) and if relevant process-integrated downstream products;
- Evaluate the energy efficiency for the overall CCU process and where relevant flexibility considerations for the efficient use of renewable energy for capture and conversion;
- Encompass the use of advanced monitoring and control techniques and integration of advanced digital technologies, which enable optimisation of the overall system;
- Contribute to an integration effort to realize fully integrated capture and utilization systems, including the optimization of

materials, process interfaces, and ultimately device architectures and to promote maximum energy efficiency;
- Include techno-economic analysis, including social and environmental impact.
The proposals will integrate technologies to make them practically and economically viable in the process industries optimising CAPEX and reducing CO2 abatement costs. This should be demonstrated through at least one realistic use case with demonstrable economic return developed in closed cooperation between CO2 industrial emitters, users and technology providers.
The inclusion of a GHG avoidance methodology is recommended and should provide detailed descriptions of baselines and projected emissions reduction.
Proposals submitted under this topic should include a strong business case and sound exploitation strategy, as outlined in the introduction to this Destination. As a project output a more elaborated exploitation plan should be developed including preliminary plans for scalability, commercialisation, and deployment (feasibility study, business plan and financial model) indicating the possible funding sources to be potentially used (e.g. Innovation Fund, InvestEU, ESIF).
Proposals should build on or seek collaboration with existing projects and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms and are encouraged to consider the use of their expected outcomes in a wider approach that might benefit the establishment of Hubs for Circularity.
Where synergies are possible with projects from topic HORIZON-CL5-2024-D3-02-11, cooperation activities are encouraged.
This topic implements the co-programmed European partnership Processes4Planet.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-twin-transition-01-35?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Optimisation of thermal energy flows in the process industry (Processes4Planet partnership) (IA), deadline: 07. February 2024 17:00 Brussels time

Projects outcomes will enable achievement of the objectives of Processes4Planet partnership by enhancing process industries energy efficiency, ensuring process flexibility and capturing the full potential of renewable energy (related to P4Planet operational objective 1).
Projects are expected to contribute to the following outcomes:
- Energy intensive industries will be enabled to increase their energy efficiency through optimisation of thermal energy flows between processes, minimizing losses and using all levels of energy;
- Demonstrate highly process-integrated solutions that offer better opportunities to increase energy efficiency and reduce investment cost of high temperature installations;
- Demonstrate a substantial increase in flexibility of the processes;
- Contribute to achieving EU Climate neutrality goal and becoming independent from fossil fuel and fossil fuel imports as put forward in the REPowerEU Plan;
- Enable the increase of the competitiveness and resilience of the European process industry.
More than 60% of the overall energy used in the process industry is process heating. The topic focuses on highly process-integrated technologies that allow heat recovery and use of high temperature installations. Heat storage, when needed, should be intermediary only. One example could be the adaptation and integration of heat pumps for high temperature (150-250 °C) applications for large thermal capacity (~1-20 MW), but not only – examples could also encompass the direct use of excess heat by e.g., the adaptation and integration of advanced heat exchangers.
The proposals under this topic should:
- Demonstrate the efficient integration and adaptation of heat exchanger or heat pumps into high temperature processes and equipment taking energy not only from air but also warm materials or liquid flows;
- Use high safety standard technologies and fluids with low environmental impact;
- Consider, where necessary, the use of advanced materials in the process development;
- Demonstrate the decrease of energy intensity of output level (intermediate, final product).
The inclusion of a GHG avoidance methodology is recommended and should provide detailed description of baselines and projected reductions.
The heat power generation is out of the scope of this topic. The proposals should include energy efficiency, techno-economic and life-cycle assessments considering the overall process.
Proposals submitted under this topic should include a sound business case and strong exploitation strategy, as outlined in

the introduction to this Destination. As a project output a more elaborated exploitation plan should be developed including preliminary plans for scalability, commercialisation and deployment (feasibility study, business plan and financial model). This should also include the assessment of possible societal and environmental impact and implications for the workplace (such as skills, organisational change).
Research must build on existing standards or contribute to standardisation. Where relevant, interoperability for data sharing should be addressed.
Proposals should build on or seek collaboration with existing projects and develop synergies with other relevant European, national, or regional initiatives, funding programmes and platforms.
This topic implements the co-programmed European partnership Processes4Planet.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-twin-transition-01-32?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE CO2-neutral steel production with hydrogen, secondary carbon carriers and electricity OR innovative steel applications for low CO2 emissions (Clean Steel Partnership) (RIA), deadline: 07. February 2024 17:00 Brussels time

The establishment of a clean steel market will be based upon decarbonisation of the steel making and production through the use of advanced and breakthrough technologies. The modification and change of production routes will have an impact onto the design of customised steel products and its applications in the market.
Projects outcomes will enable achieving the objectives of the Clean Steel Partnership (CSP) by contributing to one of the following two aspects:
- Enhance CO2-neutral steel production with hydrogen, secondary carbon carriers and electricity;
- Contribute to innovative steel applications for low CO2 emissions.
Projects related to the above point 1 are expected to contribute to one or more of the following outcomes:
- Introducing the use of secondary carbon sources, including waste and residues of biological origin in steelmaking processes to target improved sustainability and to allow a technically and economically feasible transition to reduce the use of fossil carbon as fuel or reducing agent;
- Combining the reduction of fossil carbon-related emissions obtained with technologies to reduce steelwork energy consumption with improvements in the materials and energy flows;
- Reduction of carbon footprint by incrementally adapting to the use of low-CO2 hydrogen to heat up steel for rolling, shaping, and heat treatment, considering also a coupling between hydrogen and/or electrical heating and fuel-flexibility concepts;
- Valorisation of non-conventional ores, e.g., in (photo)electrolysis processes;
- Substitution of fossil sources as carburiser and slag foaming agent by alternative materials in electric arc furnaces (EAF) and contribute to achieve low-CO2 steel production;
- Enhancing the handling of carbon-bearing residues and recovery of metal contents from low-value residues by pre-reduction or reduction smelting with hydrogen and/or electricity;
- Identify and analyse the amount of European existing technologies that could be efficiently retrofitted to CO2 neutral solutions (e.g. H2 DRI). Differentiate between incremental retrofits and retrofits allowing for production of carbon-free iron and steel. The final evaluation should provide a comprehensive overview of technical possibilities along with possible implementation timelines, and indicate on emission reduction stages and required financial investments. Projects awarded under this point are expected to involve among the consortium a balanced representation from academia, research centres and industry and to be developed in contact with the European Commission.
OR
Projects related to the above point 2 are expected to contribute to at least two of the following outcomes, which require designing steel alloys and products and validating their application for the clean steel market (related to the CSP specific objective 6, see also Building Block 12: Innovative steel applications for low CO2 emissions in SRIA):
- New or modified alloying concepts, downstream processing and manufacturing processes for new clean steel grades, as well as derivation of new test methods that are closer to reality into the industrial application;
- Manufacture steels with improved life cycle contributions to CO2 emissions reduction; this is the case for, but not limited to, the transport sector, which includes improved possibilities for re-use and re-manufacture; this includes also innovative

manufacturing technologies for steel grades supporting decarbonisation like, but not limited to, electric strip;
- Clean steel grades with improved in-use properties obtained by controlling the application properties (e.g., yield strength and/or high ductility steels, fatigue, embrittlement, internal and external corrosion and other properties relevant to service life in the application) supported by known or new techniques (e.g., machine learning (ML), metallurgical / thermodynamic simulations, multi-scale models, defect vs. structure vs. properties correlations, finite element methods (FEM), realistic and applied testing methods) to realise the desired steel grade characteristics;
- Innovative simulation methods and tools (e.g., Calculation of PHAse Diagrams (CALPHAD), crystal plasticity, artificial intelligence (AI), machine learning (ML), realistic and application-oriented testing methods, multi-scale modelling, and microstructure, defects and properties prediction tools, digital twins etc.) to accelerate the development processes of the mentioned clean steel grades and their manufacturing processes;
- Advanced grades of steel for use in efficient high temperature processes including, for instance, thermal reactors for waste recovery;
- Advanced grades of steel for use in the railway's systems of high-speed trains to assure high quality, good weldability, and very high mechanical properties, including high yield strength, metal-to-metal wear resistance, and high rolling contact fatigue resistance;
- High-performance structural steels (e.g., high-strength, high-pressure resistant, creep resistant, oxidation resistant, etc.) not containing critical strategic elements (such as, V, Nb, Ti, etc.) and/or characterized by increased tolerance to the content of contaminants in the scrap, such as for instance Cu;
- Steel grades with increased use of low-quality input materials (e.g., scrap, secondary raw materials, ores / dust, etc.) by new knowledge of the influences on the application properties of manufactured steel products tested under realistic operating conditions, taking into account the entire manufacturing process to identify the acceptance of buyers / users (incl. economic / ecological benefits, questionnaires, market research).

Proposals should aim at one of the following two aspects, corresponding respectively to the points 1) and 2) outlined under the expected outcomes section:
- Proposals should relate to metal reduction processes using hydrogen, renewable electricity, and/or secondary carbon carriers, and/or to replace fossil fuels and reductants in steelmaking and in downstream processing in steel plants. Proposals under this topic are expected to:
- Provide concepts addressing the modifications of the existing and new installations for steel production, such as:
- Blast furnace–basic oxygen furnace (BF-BOF);
- Electric arc furnace (EAF);
- Direct reduced iron (DRI) process: In this case, compare the feedstock's iron content requirements necessary for the direct reduction process in comparison with other alternative processes (e.g., electrolysis);
- Alternative reduction processes (such as electrolysis on non-conventional ores);
- Heating and treatment of semi-finished products.
- Such modifications could also concern the internal and external flows of energy and materials to re-use e.g., metallurgical gases (internal re-cycling) and to upgrade them with new sources, e.g., by replacement of fossil carbon, both as reducing agent, and heat sources with hydrogen and alternative carbon sources;
- Consider the integrated preparation (reforming, separation, heating, compression) of external carbon-lean gases or internally recycled CO/CO2 streams for efficient use as reducing agent, but not limited to or for use in heating process.

OR
- Proposals should address the conception and production of clean steel for use in established markets and/or in markets having specific demanding or harsh environments. Of interest are steels and steel grades capable to demonstrate for instance high level of yield strength, high level of fatigue, high resistance to pressure, heat, wear, cyclic loads, crash and to severe corrosion conditions. The scope also covers the maximisation of low-quality materials usage and their influence on the product quality. Where appropriate for the study proposed, analytical research infrastructures, such as but not limited to synchrotron and/or neutron facilities, should be considered as capable of providing large amount of statistically relevant data to validate chemistry and structure / morphology and solve challenges concerning hydrogen embrittlement and/or residual stresses. Proposals should demonstrate the CO2 reduction potential by conception along the advanced / breakthrough manufacturing routes and/or by the application of their innovative steel solution.

Research should contribute to pre-standardisation documents and technical reports to support achieving innovative industrial applications of advanced clean steel grades.

Specific budget needs to be allocated in the project for pursuing dissemination and exploitation activities with the Clean Steel Partnership (e.g. exchange of information, carbon reduction potential etc.).

This topic implements the co-programmed European Partnership on Clean Steel.

Further Information:

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-twin-transition-01-46?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Digital transformation and ensuring a better use of industrial data, which can optimise steel supply chains (Clean Steel Partnership) (IA), deadline: 07. February 2024 17:00 Brussels time

As mentioned in the Clean Steel Partnership (CSP) Strategic Research and Innovation Agenda (SRIA), digitalisation and social aspects are both addressed in the Building Block (BB) 10 because of their strong role of enabling the carbon neutral transition. In particular, digitalisation enables all the other BBs, as evidenced in Table 12 of the CSP SRIA. So, the optimal deployment of digitalisation implementing the integrated approach along the steel value chain must be provided according to outcomes and scopes defined below.
Projects are expected to contribute to one or more of the following outcomes:
- Increasing awareness and effectivity leading to total safety of steel manufacturing processes and CO2 reduction through digital transition with better use of industrial data;
- Extension of inline and real-time tools to monitor and control sustainability of the running process conditions, to set up countermeasures to stay into the optimal process window; this includes, but is not limited to, energy and (intermediate) product quality forecasting, online comparison between forecast and realisation, control of metal slag;
- Enhancement of the in-line classification of feedstock and intermediate products through the continuous analysis of composition and bulk properties by applying holistic soft sensor approaches considering the assembly of sensors, specific models, and advanced data processing according to SRIA (specifically see page 41, 42 of the SRIA);
- Increasing effective and secure data sharing in steel plants to realise the seamless digital integration of the value chain and the interoperability of systems and tools by implementation of existing and enhanced standardised protocols;
- Novel sensors and models for real-time process control (see page 41, 42 of the SRIA), such as, but not limited to, metal slag parameters (e.g., composition) and temperature measurement, slag analysis, off-gas analysis, energy forecasting to match demand and offered mix in the power grid considering energy generated from renewable sources; the latter could require cooperation between steel experts and electric power players in the market. The expected outcome is an enhanced merging of planning activities and approaches to run plant processes;
- Application of digital technologies such as, for example, Digital Twins and/or enhanced statistical analysis, machine learning (ML) algorithms, or artificial intelligence (AI) to develop decision-supported planning and process monitoring tools operable in offline or online modes;
- Traceability of materials and process information throughout the value chain to promote improved product quality, efficiency and process integration control (including multi-scale modelling of structure, and structure vs. properties correlations).
Multidisciplinary research activities should address one or more of the following topics:
- Novel sensors, soft sensors and related models and approaches to reduce the carbon footprint by merging the use of sensors and data processing capabilities for huge volumes of heterogeneous data streams; systems / tools enabling the transition from legacy into new architectures capable to supply data in a seamless way “when, where and what” including the development and testing of implementation guidelines. This should enable the traceability of materials and process information throughout the value chain to promote improved product quality, efficiency and integrated process control and management (including multi-scale modelling of structure, and structure vs. properties correlations);
- Statistics coupled with outstanding analytical capabilities to improve data quality and to help steel plant operators to increase the process yield and to improve the quality of intermediates and final steel products, while addressing the best approach to limit carbon emissions;
- The application of combinations of advanced digital technologies, such as but not limited to model-based, knowledge-based and data-based methods, artificial intelligence (AI), supercomputing, edge computing, cloud systems and internet of things (IoT) to develop decision-supported planning and process monitoring tools for clean steel manufacturing operable in offline or online modes;
- Involvement of operators and process experts in the design and development phases of digital technology integration, ensuring the uptake of human experiences and a user-friendly processing of results for easier industrial integration (see Table 12 row 3 of the CSP SRIA]). This may also include issues of skilling and standardisation and man-machine interaction by deploying Virtual and Augmented Reality techniques.
This topic implements the co-programmed European Partnership on Clean Steel.
Further Information:

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-twin-transition-01-44?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Hubs for circularity for industrialised urban peripheral areas (Processes4Planet partnership) (IA), deadline: 07. February 2024 17:00 Brussels time

Projects outcomes will enable achievement of the objectives of Processes4Planet partnership by demonstrating hubs for circularity (H4Cs) concepts, fostering circularity within and beyond process industries and driving the partnership's innovation portfolio towards "First of a kind" demonstrators to de-risk investment for subsequent roll-out. (P4Planet operational objectives 8 and 9).
Projects are expected to contribute to the following outcomes:
- Demonstrate zero urban waste in a near commercial scale environment through systemic resource recovery as alternative material feedstock; a decrease of GHG emissions is also expected by explicitly addressing the reduced flow of goods (due to geographical proximity);
- Reduce the freshwater consumption of the urban area by 50%, and re-use 90% of the solid waste generated by the water treatment;
- Citizens living in cities will benefit from a healthier environment through industrial/urban symbiosis by lowering emissions through circular and renewable energy sources and waste reduction;
- Use urban/industrial symbiosis and cross-sectorial cooperation to pave the way for achieving the EU Green Deal and "Fit for 55" package objectives: providing recommendations for optimized regional framework conditions by highlighting barriers and suitable innovation-oriented policies and looking for possible synergies with the cities selected by the Cities Mission.
Urban areas with high volumes of waste (household and end of life consumer waste) should closely interact with adjacent industries to jointly minimize their CO2 footprint and improve their waste management, thus contributing together to the valorisation of secondary materials and overall circularity. The hubs for circularity (H4C) concept is a pathway to exploit local synergies for the deployment of innovative solutions engaging regional resource management actors in strategic nodes where novel value chains valorising a significant part of end-of-life wastes could connect within and across regions.
The concept of Industrial-Urban Symbiosis (I-US) should be demonstrated at semi-industrial scale, by systemically re-integrating the flow of urban wastes in process industries and, where applicable downstream in manufacturing, construction, and other industries. Full attention should be paid on upcycling of secondary materials or products instead of downcycling.
Proposals are expected to address:
- A systemic solution for a H4C including technological and non-technological as well as regional and interregional aspects: closing circularity loops for mixed/combined materials streams based on upcycling and process-based approach to a range of recycling solutions including conversion and downstream, complex multi-material streams, valorisation of waste streams (urban mining);
- Proposals can address either materials, water or energy, or a combination of those. Management and processing of secondary resource streams through e.g., collection, disassembly, sorting, purification, concentration, recycling (including but not limited to chemical, metallurgical, or bio-based resources), logistics and trading for their valorisation for the use as feedstock for other plants and companies across sectors and/or across value chains. Connections with manufacturing industries are expected. The remaining non-recyclable fractions will be used to optimal energy recovery;
- Digital tool, recycling and sensor-based waste sorting, modelling tools, including material passport and information on material streams, as basis for resource management towards fully integrated LCA and Material Flow Analysis MFA (on diverse levels) and for creating transparency and matchmaking opportunities across hubs. Prepare for tagging/matrix for complex consumer products and innovative approach to end-of life materials;
- Establish IT infrastructures and tools that provide a secure basis for the integrated management and the preservation of confidentiality of sensitive data, it might not be in the same location as the demonstrator and serve the needs of multiple hubs;
- Consider when applicable the co-development of industrial decarbonization strategies with urban district heating networks, i.e., based on a socio-economic optimum in the cascading re-use of waste heat and using the district heating network to supply low temperature process heat;
- Use established reporting methodologies for the assessment of industrial symbiosis activities and exchanges, including Symbiosis Readiness Levels (SRLs) and best practices established by the European H4C Community of Practice (ECoP). In addition, interact with the ECoP for support, best practice and knowledge exchange on technological and non-technological

issues;
- Plan in detail the replication and adaption of the concept, including the simulation and the business case and exploitation strategy of the First of a Kind hubs, in two to three alternative locations in close cooperation with the relevant local actors. The replication cases should be part of the proposal. Include local and regional authorities in an active collaboration to create favourable and coherent place-based framework conditions;
- Favour participative management with the local community and study the evolution of the social impact of the hub, whilst also considering gender perspective and inclusiveness;
- Implement a social innovation action involving at least one of the local community actors and, additional actions to facilitate relations and to involve the local community actors e.g., exchanging knowledge with the educational establishments and developing flexible learning resources;
- Include a plan to extend the hub to additional players parties (especially waste management and associations, new market entries and other relevant stakeholders) who also should benefit and multiply the local/regional synergies in the co-implementation of the identified innovations and solutions within the next five years.
Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination As a project output a more elaborated exploitation plan should be developed including preliminary plans for scalability, commercialisation, and deployment (feasibility study, business plan and financial model) indicating the possible funding sources to be potentially used (e.g., Innovation Fund, LIFE, InvestEU, ESIF).
Relevant indicators and metrics, with baseline values, should be stated clearly in the proposal. Research must build on existing standards or contribute to standardisation. Interoperability for data sharing should be addressed.
Clustering and cooperation with other selected projects under this topic and other relevant topics in Horizon Europe (e.g., HORIZON-CL4-2023-TWIN-TRANSITION-01-42 or HORIZON-CL4-2023-RESILIENCE-01-05), with European initiatives (as for example: Circular Cities and Regions Initiative (CCRI) and European Circular Economy Stakeholder Panel (ECESP)), as well as building on existing projects is strongly encouraged (see also Industrial Symbiosis Report of March 2020).
This topic aims to support the goals of the smart cities mission by contributing to a healthier urban industrial symbiosis through waste reduction.
This topic implements the co-programmed European partnership Processes4Planet.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-twin-transition-01-38?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Enhanced assessment, intervention and repair of civil engineering infrastructure (RIA), deadline: 07. February 2024 17:00 Brussels time, 1. Stage

Expected Outcome:
- Extension of the service life of civil engineering infrastructure, which reduces the need to replace infrastructure, and ultimately in an overall lower CO-2 footprint for such infrastructure
- Faster and more accurate detection and analysis of maintenance and repair needs in existing infrastructure
- Reduction in time between the occurrence of infrastructure maintenance and repair-related problems and the on-site intervention
- Reduced risks to health and safety of workers in carrying out tasks linked to infrastructure maintenance and repair
- Cost savings in terms of both operational costs and deferred or avoided capital investment costs
Regular maintenance and repair of civil engineering infrastructure extends their service life, which in turn reduces the need for their demolition and replacement and the related negative economic, environmental and climate impacts. However, it can be difficult and cumbersome to identify and address maintenance or repair needs, especially in locations that are difficult to access such as large or tall structures, deep shafts, or where elements are hidden from view. Intervention for maintenance and repair can also involve unnecessary risks to health and safety of workers.
Proposals should:
- Develop new technologies and solutions that facilitate timely identification of maintenance and repair issues in existing civil engineering infrastructure. Examples may include structural weaknesses, unacceptable deformation and fatigue, issues related to moisture including mould growth and corrosion, the effects of weathering and of weather-related events, faults in technical systems, leaks of water or chemicals, or other issues.
- Develop new solutions to monitor and to quickly and accurately analyse and assess the need for intervention, for example

via digital twin and simulation technology
- Develop solutions that would intelligently recommend and prioritise relevant and timely action to address the identified maintenance and repair issues. This should include a risk assessment and application of state-of-the-art quality controls and documentation.
- Develop solutions that would carry out rapid, cost effective and safe intervention for maintenance and repair of infrastructure, for example using automated or remotely operated tools, or next generation egocentric AR solutions
- Address ways to reduce the risks involved with maintenance and repair, including the health and safety of workers
- Address ways to digitally record and continually update the maintenance and repair status of infrastructure assets and their component parts
- Build on existing standards or contribute to standardisation. Interoperability for data sharing should be addressed.
- Present a strategy for skills development, associating social partners where relevant, integrating SSH aspects and including relevant tools such as MOOCs (massive open online courses).
- Build on or seek collaboration with existing projects or solutions and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms, such as the New European Bauhaus.
- Seek to integrate insights from social sciences and humanities to maximise economic and social impact, including considering how workers carry out tasks and respond to safety issues.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-twin-transition-01-12?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Bio-intelligent manufacturing industries (Made in Europe Partnership) (RIA), deadline: deadline: 07. February 2024 17:00 Brussels time, 1. Stage

European manufacturing industries are reinforced through biological transformation; in particular
- Access to bio-intelligent production technologies and architecture;
- Technological advances and improvements in sustainability (in particular SDGs 11, 12 and 13) arising from the integration of bio-intelligent principles, functions, structures and technologies in manufacturing;
- Substitution of raw materials by bio-based materials, or implementation of bio-based or bio-intelligent manufacturing operations, and business models leading to regenerative production.
The biological transformation of industry is a pioneering frontier that the industry of the Union and Associated Countries can harness to enhance circularity and sustainability, while advancing production efficiency and competitiveness.
The biological transformation of industry involves the integration of bio-intelligent structures, processes, organisms or materials into technology by systematically applying knowledge from biology. This should lead to a necessary convergence of biotechnology with mechanical engineering, production technology and information technology with new possibilities for the flexible adaptation of production and value creation processes to requirements, especially in the context of sustainability.
The biological transformation of industries includes but is not limited to:
- Bio-inspired manufacturing processes (biomimicry, biomimetics);
- Development of bio-intelligent manufacturing systems or tools;
- Expanding opportunities of bio-intelligent and bio-based materials by substituting fossil-based raw materials and limiting the release of microplastics, e.g. in the textile industry;
- A systematic application of the knowledge of nature and/or natural processes aiming at optimising a manufacturing system through a convergence and the integration of technical and biological processes.
This transformation can also aid in reducing the carbon footprint of production and products, and foster circularity, while contributing to the competitiveness and digitalisation of the industry of the Union and Associated Countries.
Proposals need to demonstrate the development of digital and green technologies that facilitate the upscaled manufacturing of bio-based or bio-intelligent products in one manufacturing value chain. In addition, sustainable business models need to be developed for production and recycling of the products.
Proposals should address either advanced manufacturing techniques (e.g. additive manufacturing, extrusion, moulding etc.) to process bio-materials or bio-intelligent components for upscaled production; or bio-intelligent production technologies; or combinations of these two approaches.
The focus of this topic is on manufacturing. The development of materials beyond the manufacturing context is excluded.
Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction

to this Destination.
Research must build on existing standards or contribute to standardisation. Interoperability for data sharing should be addressed, leveraging on existing ontologies and metadata and though the implementation of the FAIR data principles.
Additionally, a strategy for skills development should be presented, associating social partners and civil society where relevant.
Collaboration with EIT Manufacturing is encouraged, in particular on the development of skills.
All projects should build on or seek collaboration with existing projects and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms, for example with Horizon Europe Cluster 6 and its Destination on Circular Economy and Bioeconomy sectors and/or its Partnership Circular Bio-based Europe (CBE).
This topic implements the co-programmed European Partnership Made in Europe.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-twin-transition-01-01?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Advanced biomaterials for the Health Care (IA), deadline: deadline: 07. February 2024 17:00 Brussels time, 1. Stage

This topic refers to the innovation market for Healthcare and Medicine, which affects many citizens and their needs. Several materials specifications and related innovations needs will support this topic such as renewable and recyclable materials, alternative active ingredients, design for circularity, lightweight materials. The topic should address several key policies of the European Union such as Circular Economy Action Plan, EU Chemicals strategy.
Projects are expected to contribute to the following outcomes:
- Develop the swiftly growing innovation market of medical applications, which is dependent on advanced biocompatible materials that can be printed or injected, including 4D materials that change their 3D structures following external impact (e.g. thermic, electric, mechanical or radiation treatment).
- Medical and/or surgical procedures will benefit from injectable materials for non-invasive surgical procedures.
- Some of their advantages include easy deliverability into the body, increased implantation precision, controllable release of therapeutic agents, antimicrobial properties and the possibility of monitoring or stimulating biological events.
Medical suppliers can commercialise injectable hydrogels, including those made of nanocomposite, natural and synthetic polymer-based biomaterials, bone cements, bio-ceramics and electronics.
Proposals should address at least four of the following activities:
- To enable a fast development of new advanced novel injectable biomaterials, digital tools such as modelling, simulation and characterisation techniques (including those provided by analytical infrastructures) assisted by advanced methods e.g. physics-based methods, machine learning or artificial intelligence.
- The innovation market of medical applications is fast growing and dependent on advanced biocompatible materials that can be printed or injected. The 4D materials will change their 3D structures after external impact such as thermic, electric, mechanical or radiation treatment.
- Proposals shall demonstrate new engineering strategies that present functional characteristics beyond bio-compatibility, and express properties that can be used to control the physiological environment (shape-memory, self-healing properties) and induce a response.
- Proposals shall address biomaterials with antibacterial properties contributing to the widespread bottleneck of antimicrobial resistance often encountered in clinical care
- Demonstrate the scaling of injectable hydrogels, including those made of nanocomposite, natural and synthetic polymer-based biomaterials, bone cements, bio-ceramics and electronics.
- The design for circularity has to develop, when relevant, bio-degradable or bio-absorbable biomaterials that are gradually eliminated by the body after fulfilling a purpose.
The biomaterials used should be safe and sustainable by design (SSbD), taking also into account any specific medical requirements.
Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination.
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. An early involvement of end users could be essential.

Projects should build on or seek collaboration with existing projects and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms.
Where relevant, proposals should seek links with and capitalise on the results of past and ongoing EU funded research projects, including the ones under Cluster 1 "Health" and Cluster 6 'Food, Bioeconomy, Natural Resources, Agriculture and Environment.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-resilience-01-36?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Biodegradable polymers for sustainable packaging materials (IA), deadline: 07. February 2024 17:00 Brussels time, 1. Stage

Projects are expected to contribute to the following outcomes:
- The packaging industry will have access to the next generation of biodegradable polymer materials, which will also be recyclable materials. Plastic materials producers will switch from PP, PE, and PET to bio-degradable materials with reduced GHG emissions along the value chain.
- The packaging industry will apply business model of circularity-by-design and sustainable end-of-life (EoL) solutions for plastic packaging materials. This has the potential to lead to a reduction in landfill waste volume of packaging materials; and to a reduction of littering of plastics, coherent with the ambition of the Horizon Europe Ocean and Waters mission, to reduce the plastic pollution of the oceans. Projects are expected to contribute to the Plastics strategy, the Single-use Plastics Directive and the EU Circular Economy Action plan (CEAP).
- Standards and labels for specific applications will be further defined based on the development of testing of biodegradability of plastics in open environments
Proposals should address at least four of the following activities:
- Develop new, demonstrate and scale-up novel advanced bio-degradable polymer materials and innovative processes that will allow the bio-degradable polymers to be produced at a large scale with a similar economy of scale to replace present production with PE, PP and PET, and with an improved sustainability profile compared to present production and EoL characteristics.
- Develop sustainable additives and catalysts to support the production of bio-degradable polymers.
- Provide evidence with life cycle and techno-economic assessment (LCA/TEA) that the cost for the novel advanced biodegradable polymer products are not significantly higher compared to existing polymer products (PE, PP, PET) on the market.
- Scale up the production of packaging materials at pilot level.
- Identify and test the biodegradability pathways in all environmentally relevant conditions (for the application of the developed material in relevant shape or form); and extensive quantified risk analysis from both a human and environmental perspective for all the different intermediate and end products of biodegradation, including quantification of the contribution to GHG emissions. Contribute to further defining standards and labels for specific applications. Model the lifetime of the developed polymers along the biodegradation pathway in environmentally relevant conditions, both in natural, (terrestrial and marine), and in waste processing environments.
- Demonstrate complete biodegradability in all relevant conditions and environmental compartments (e.g. landfill, compost site, litter in marine-freshwater-sediment-soil) within acceptable timeframes, determination of the main influencing environmental conditions; and assessment of the impact on the environment. Integrate a holistic sustainability assessment, accounting for the full life cycle (including sourcing of feedstock).
Develop and demonstrate circular business model for production at industrial level, where the release of GHG emissions is; and assess significantly reduced; and assess the potential of secondary raw materials as a feedstock (including from renewable sources) for the production of bio-degradable polymers.
To enable a fast development of new advanced materials, digital tools, such as modelling and simulation, and characterisation techniques (including those provided by analytical infrastructures) are under the scope, assisted by advanced methods, e.g. physics-based methods or artificial intelligence (including machine learning).
The future Commission initiative for Safe and Sustainable by Design will set a framework for assessing safety and sustainability of chemicals and materials and should be considered as a baseline in the proposal.
Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction

to this Destination.
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. An early involvement of end users could be essential.
Projects should build on or seek collaboration with existing projects (e.g. Open Innovation Testbeds) and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms. Where relevant, proposals should seek links with and capitalise on the results of past and ongoing EU funded research projects, including the ones under Cluster 6 'Food, Bioeconomy, Natural Resources, Agriculture and Environment' and Circular Bio-based Europe JU (CBE JU).
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2024-resilience-01-35?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE Call on Centres Of Excellence For Exascale HPC Applications, deadline: 09. January 2024 17:00 Brussels time

Centres of Excellence advancing specific Lighthouse Exascale Applications, at the frontier of technology and relevant for the communities of HPC users, that enable and promote the use of upcoming exascale and post exascale computing capabilities in collaboration with other High Performance Computer (HPC) stakeholders. They should implement concrete actions to increase the performance of applications and exploit these advanced computing capabilities. The goal is to develop or scale up existing application codes towards exascale performance, resulting into tangible benefits mainly for scientific challenges. Proposals for Centres of Excellence - Exascale Lighthouse applications will exploit existing federated resources around Europe, developing available competences, and ensuring multidisciplinary (combining application domain and HPC system, software and algorithm expertise).
This topic builds and complements the HORIZON-EUROHPC-JU-2021-COE-01-01: Centres of Excellence preparing applications in the Exascale era call.
Proposals should focus on the development of specific and clearly identified applications and codes, convincingly demonstrate their exascale capabilities and needs, and present a detailed software development plan with clear timeline for the implementation including quantitative KPIs, milestones and deliverables demonstrating the achieved improvements in the strong and weak scaling of each code with respect to the baseline and different system architectures. This includes codes and tools that support the analysis and assessment of academic or industrial applications with potential for performance optimisation that can exploit the current and future advanced computing capabilities. The software development plan, covering the identified applications and codes, should be central to the proposed work and most resources should be allocated to these activities. Research activities on the basis of use cases are not within the scope of the action and use cases should be limited to test runs required for development purposes such as regression tests.
Proposals for Centres of Excellence in Topic HORIZON-EUROHPC-JU- 2023-COE-03-01 must clearly identify one of the following the Exascale Lighthouse application areas:
- Personalised Medicine/ Digital twin of the human body
- Human Brain research & neurological disorders
Only one proposal will be selected per Exascale Lighthouse applications topic identified above. Proposals should also be able to articulate clearly the scientific grand challenge(s) which will be addressed by the applications and why the exascale performance is needed.
Targeted applications should be relevant for communities of HPC users as well as for future EuroHPC JU systems to be acquired. Proposals should be inherently committed to co-design activities to ensure that future HPC architectures are well suited for the applications and their users.
Requirements for CoEs:
- Clear identification of the targeted applications and all related codes that will be developed or used in the proposal, including their user basis and the global impact in their domain. The ownership and license of each code must be listed in the proposal. Only applications (software) which are owned or controlled by the consortium members are eligible. In addition, proposals should provide lists of all relevant codes and use cases. The JU provides a specific template for this purpose.
- Present a clear baseline to demonstrate the exascale suitability for all key applications, use cases and workflows considered in the proposal substantiated by corresponding strong and weak scaling plots. Regular deliverables with updated figures

should be provided according to the software development plan and at least every six months.
- Describe the European user communities of the targeted applications, the current and predicted use on EuroHPC infrastructure for the indicated codes as well as the impact of the planned developments on the European users.
- Demonstrable advances of the targeted HPC applications towards highly scalable, optimised flagship codes and exascale performance (both computing and extreme data). This includes developing, maintaining, porting, optimising (if needed re-designing) and scaling HPC application codes, addressing the full scientific/industrial workflow, particularly covering data aspects; testing and validating codes and quality assurance. This also includes horizontal tools and services that can be applied to parallel codes in any application domain to analyse and improve their performance.
- Addressing the exascale and post exascale related technical challenges, such as load balancing; resilience; heterogeneity programming models, in particular accelerator-based architecture programming; run-time systems; workflow management tools; development environments and production environments and how they are tackled.
- Involvement in co-design activities (hardware, software, codes), including the collaboration with HPC vendors and the identification of suitable applications relevant to the development of European HPC technologies towards exascale and collaboration with European initiatives (e.g. EPI, RISC- V, EuroHPC JU Pilots). This includes the expected impact of the applications on emerging HPC technologies and how the development of hardware is influencing the software development.
- Activities to improve the energy efficiency of applications, algorithms, methods, libraries and/or tools.
- Enlarging and expanding HPC applications development and use, in particular for new user communities in EU countries and countries associated to Horizon Europe that are members of the EuroHPC Joint Undertaking currently developing and advancing their HPC infrastructure and ecosystem.
- Federating capabilities and integrating communities around exascale computing in Europe.
- Include clear KPIs on the optimal employment of current and/or emerging HPC technologies, allowing the assessment of the progress towards the objectives, both in terms of outputs and ultimate impact.
- Coordinate within the European ecosystem, including Competence Centres, to address the skills gap in the targeted exascale applications and codes, by specialised training and capacity building measures to develop the human capital resources for increased adoption of exascale solutions.
- Coordinate with Competence Centres to ensure wider access to codes and foster their uptake by scientific user communities.
- Proposals should ensure the cooperation with complementary projects launched specifically in the area of the "EuroHPC-2020-01-a: Advanced Pilots towards the European Supercomputers" including also the need to establish from the beginning of this cooperation appropriate IP exploitation agreements and should provide preliminary benchmarking data on new and emerging HPC technologies.
In addition, proposals should ensure collaboration with other Centres of Excellence for HPC applications, and other national and EU funded activities that focus on similar or complementary objectives for HPC codes and applications, in order to maximise the synergies and optimise such codes and applications for current and future architectures of EuroHPC supercomputers. This includes participation in the common continuous integration and deployment platform developed by Centres of Excellence for HPC applications selected in call HORIZON-EUROHPC-JU-2021-COE-01 and HORIZON-EUROHPC-JU-2023-COE-01 and the associated Coordination and Support Action CASTIEL 2. Selected proposals are expected to accede the collaboration agreement between existing Centres of Excellence and CASTIEL 2. Proposals should also clearly demonstrate that all partners in the consortium have a significant and justified role, including appropriate deliverables under their responsibility which cover the specific contributions of each partner. Moreover, applications should include a well-balanced consortium with an appropriate distribution of resources and responsibilities, in line with the proposed work plan. Consortium members are expected to contribute to the project with a share of at least 5% of the total declared personnel resources.
The expected duration of this action is 30 months with a foreseen project start on 01/07/2024.
Further Infomation:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-eurohpc-ju-2023-coe-03-01?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=4310839

HORIZON EUROPE Excellence Hubs, deadline: 07. March 2024 17:00 Brussels time

Projects should contribute to the following outcomes:
- Excellent and sustainable place-based R&I ecosystems in Widening countries and beyond in relevant domains of cutting-edge science and innovation;
- Long term joint R&I strategies underpinned by concrete action plans of European relevance;

- Common investment plans for R&I including infrastructures leveraging national, regional and European funds as well as private capital in a synergetic manner;
- R&I pilot projects alongside a joint strategy and in line with regional and national strategies, notably regional innovation strategies for smart specialisation (RIS3) taking into account the new Innovation Agenda for Europe;
- New competencies and skills for researchers, entrepreneurs and professionals in R&I intensive domains;
- Strengthened linkages between science and business;
- Improved knowledge transfer and development of entrepreneurial skills;
- New business opportunities especially for SMEs, university spin-offs and start-ups, especially deep tech;
- Inclusion of emerging innovation ecosystems from rural areas, Western Balkans and Eastern Partnership countries including Ukraine by optional mentoring module;
- Contribute to EU-wide access to excellence, ERA Policy Agenda action 16.

Excellence hubs are part of the European Excellence Initiative and complement the science-oriented schemes Teaming, Twinning, ERA Chairs and the European Excellence Initiative for universities by a dedicated innovation component. Excellence hubs will focus on innovation by allowing innovation ecosystems in Widening countries and beyond, to team up and create better linkages between academia, business, government and society. This will foster a real place-based innovation culture in Widening countries based on a strategic agenda aligned with regional or national smart specialisation strategies. In this context, synergies will be sought with the programme parts on European Innovation Ecosystems, EIC pathfinder and the European Institute of Innovation & Technology (EIT) as well as the initiative 'Partnerships for Regional Innovation' run by the JRC. The excellence hubs will be the basis in Widening countries of the pan-European Innovation Ecosystem of the new Innovation Agenda for Europe. The proposal should also demonstrate the win-win effects of the partnership established by the consortium and the benefits for employment and post crisis recovery.

This action responds to the third priority in the ERA communication on translating R&I results into the economy and will especially support R&I policies aiming at boosting the resilience and competitiveness of our economies and societies. This means ensuring European competitive leadership in the global race for technology based on excellence while improving the environment for business R&I investment, deployment of new technologies and enhancing the take up and visibility of research results in the economy and society as a whole. This action addresses regions as R&I actors since they are the place where the innovation and industrial ecosystems breathe and develop, making the links between Europe and business including SMEs and start-ups, research centres, innovation stakeholders as well as citizens. Regionally developed innovation ecosystems connected across the Europe Union will be the driver of new European strategic value chains.

Unlike Teaming projects that are centred around a single beneficiary Excellence Hubs are networks of place-based innovation ecosystems in Widening countries involving larger communities of actors in a regional context based on the quadruple helix principle (see below). Individual participants and ecosystems from other EU Member States, Associated Countries and international co-operation partners may join in duly justified cases e.g., given by a specific expertise needed or the involvement in a relevant value adding chain. The call allows to provide financial support to third parties in the form of grants, especially for the support of start-ups and SMEs. This call is also encouraging emerging innovation ecosystems from less developed regions in rural areas, the Western Balkans or countries participating in the Eastern Partnership notably Ukraine.

Projects should be established around a coherent and well proportioned package of the following core components:

- Cross-border joint R&I strategy aligned with regional smart specialisation strategies and/or European policy priorities such as the green and digital transition;
- R&I project consolidating academia business linkages and providing evidence for strategy building and investment: The research component should be developed by joint pilot research projects in a domain covered by the joint strategy that should facilitate long-term cross border and inter-sectoral collaborative links between partners notably academia and business and advancement in science and technology development with market potential. In particular R&I projects should serve the purpose to close knowledge gaps and develop evidence to underpin the development of the strategy and the investment plans. The description of R&I content should include a long-term vision beyond the state of the art of the chosen R&I domain;
- Action and investment plans for the implementation of the strategy including the development of business models for innovative products, service and processes to ensure the sustainability of the action beyond the project's life time, leveraging national, regional and European funds as well as private (venture) capital. Investment plans may include pertinent R&I infrastructures as well as demonstrators and pilots;
- Conceptual design and pre-planning for pilots and demonstrators (if applicable) in line with the strategy and if applicable based on the outcome of the R&I component. However, the realisation of such pilots and demonstrators must be financed by other sources in particular programmes co-financed by the ERDF, INTERREG, IPA or similar. The approach how to access such co-funding at a later stage should be sketched out in the proposal;
- Accompanying measures are complementary activities that may promote knowledge and technology transfer, visibility,

mutual learning and skills development especially in research and innovation management and entrepreneurship for creation of start-ups as well as citizen engagement. Mutual secondments and staff exchange within and between ecosystems should help to build trust and long-term collaborative links;
- Optional: Mentoring of an emerging place-based innovation ecosystem established in rural areas, Western Balkans or Eastern Partnership Countries including Ukraine. Legal entities from such countries and regions are encouraged to join the project as participants in order to benefit from mentoring, training, knowledge transfer even if their ecosystems are not yet developed to a full quadruple helix structure. This mentoring module does not count for the minimum condition of having at least two fully-fledged quadruple helix innovation ecosystems.
Ecosystems or individual partners from outside the Widening countries may participate in the consortium as long as they prove added value by facilitating access to excellence for the Widening countries. Proposals should convincingly demonstrate the relevance of the chosen scientific domain by its alignment with regional (in particular RIS3), national and/or European R&I strategies and policy priorities. Applicants may choose between a more regional orientation e.g., proven by a common denominator in their regional smart specialisation strategy and/or a more global orientation towards European policy priorities such as the green or digital transition.
Excellence hubs as a new action under the widening component are complementary but different to initiatives such as Digital hubs or the EIT regional innovation scheme (RIS) because of their strategic orientation, broader scope and alignment with widening eligibility criteria.
Proposals should illustrate quantitatively and qualitatively the expected potential impact of the project and its expected results in terms of new local and international research and innovation partnerships including business, institutional and/or R&I system changes (various levels), increased research and innovation intensity (i.e., new scientific publications directly linked to the project's area, protected intellectual assets, marketable products and solutions). Proposals are encouraged to choose any additional relevant indicators that will be used for measuring the impacts achieved.
The expected duration of the project is up to 4 years.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-widera-2023-access-07-01?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

HORIZON EUROPE ERA Chairs, deadline: 07. March 2024 17:00 Brussels time

Progress towards more and better links between research and innovation actors across the European Research Area and beyond is a requirement if Europe as a whole is to capitalise on excellence from across the continent. To foster brain circulation for researchers and innovators the intervention point of the ERA Chairs actions is attracting in a sustainable manner outstanding scientists and innovators to universities or research organisations in catching up countries and regions. This measure of "brain gain" and the creation of pockets of excellence has an impact on the culture and performance of host institutions.
The leadership of the ERA Chair holder and the creation of a permanent and excellent research group in the chosen scientific field will ensure excellence, visibility and better integration in the European Research Area, as well as fostering competitiveness in research funding and promoting institutional reforms aligned with ERA priorities.
Projects are expected to contribute to some of the following outcomes:
At system level:
- Increase in number of R&I talents moving to host organisations in Widening countries;
- Increase in international, interdisciplinary and intersectoral mobility of researchers and innovators;
- Encouraging institutional reforms in research institutions and in the national R&I system in Widening countries;
- Strengthening of Widening countries' human capital base in R&I with more entrepreneurial and better trained researchers and innovators;
- Better communication of R&I results to society;
- Better quality and capacity of research and innovation contributing to Europe's competitiveness and growth;
- Improved excellence capacity and resources in Widening countries and close the still apparent research and innovation gap within Europe.
At organisation level:
- Research excellence of the institution in the specific fields covered by the ERA Chair holder;
- Increased attractiveness of the institution for internationally excellent and mobile researchers;

- Creation of a permanent and excellent research group in the chosen scientific field with a spill-over effect on the institution;
- Improved capability to succeed in competitive research funding in the EU and globally, at least, in the fields of choice;
- Greater contribution to the knowledge-based economy and society.

Research organisations located in Widening countries interested in establishing an ERA Chair should submit a proposal with the prospective ERA Chair holder who should be an outstanding researcher and/or innovator in the chosen scientific domain. The scientific field can be any domain of research and innovation.
The research institution in the Widening country will be the coordinator and submit a proposal as a single applicant (monobeneficiary). ERA Chair holders can be citizens of any country in the world.
Proposals should include a Curriculum Vitae in Europass form of the future ERA Chair holder and detail the scientific and technical support she/he will provide to the coordinator and how the proposed activities will upgrade from the current situation. The CV should be uploaded as an additional document to the proposal.
Proposals should also describe any relevant investments of the coordinator in research projects, facilities and infrastructures and how those will be achieved and/or a better use of the installed research capacity (in particular of EU co-funded research infrastructures & facilities). Existing or foreseen arrangements for compliance with ERA priorities including the European Charter for Researchers & Code of Conduct for the Recruitment of Researchers are to be outlined in the proposal.
ERA Chair holders should be excellent researchers and/or innovators in the chosen field of research. They should establish a research team fully integrated in the coordinator's institution to significantly improve its research performance in the scientific domain of choice and to be more successful in obtaining competitive funding. The selection of personnel to the research team is to be conducted by an international recruitment panel leaded by the ERA Chair and outlined in proposals. The ERA Chair holder should also have a position within the organisation/university, allowing her/him to make appropriate resource allocation decisions, supervise team members and freely apply for research funding. When this is compatible with the nature of the coordinator, he/she is expected to take on some teaching duties.
To allow for the assessment of the commitment of the future ERA Chair holder and of the coordinator institution, proposals must include: 1) a letter signed by the prospective ERA Chair holder expressing his/her commitment to the proposal and willingness to take on the underlying tasks and obligations; 2) a letter from the head of the coordinator institution committing to the proposal and stating that the ERA Chair holder will receive adequate support to take on her/his tasks and duties including, for example, access to research facilities, supervision of researchers, teaching duties (if any) and capacity to apply freely to national and international funding.
The ERA Chair holders might move on a temporary or permanent basis to the coordinator's premises. To this end, secondments or any other legal arrangements (e.g., leave without pay, sabbatical licences) are possible including part-time work and multiple stays. All contractual arrangements and the timeline of ERA Chairs stays at the coordinator should be indicated in the proposal as well as the salary, travel and daily allowances and/or other perks to be offered. If, at any stage, the preferred option is an employment contract, the future contractual arrangements with the coordinator should be detailed.
To ensure the sustainability of the action, the ERA Chair research team should have conditions to thrive after the end of the Horizon Europe funding. This should be clearly demonstrated in the proposal and include the appointment of the leader of the newly created research group on a permanent basis within the coordinator organisation (to which the ERA Chair holder might apply) during the initial 3 years of the duration of the grant. This is to be conducted through an open recruitment procedure to be monitored by the European Commission.
Grants have an expected duration of up to 5 years and cover expenses related to the ERA Chair holder and a number of team members (e.g., their salaries, recruitment costs, administrative costs, travel and subsistence costs) and research costs up to 10% of the EU contribution. The grant should also state the measures aimed at introducing structural changes in the institution of the Widening country (e.g., costs for trainings, meetings, publications and managing Intellectual Property Rights (IPR).
Specific attention should be paid to gender equality objectives, in line with the organisations' commitments through their adopted gender equality plans, and in line with ERA objectives, as far as appropriate.
The ERA Chairs proposals should illustrate quantitatively and qualitatively the expected potential impact of the project. As such, the projects' expected results should be visible in terms of new local and international research and innovation partnerships, institutional and/or R&I system changes (various levels), increased research intensity (i.e., new scientific publications directly linked to the project's area, protected IPR) and best research management practices. Proposals are encouraged to choose any additional relevant indicators that will be used for measuring the impacts achieved.
Further Information:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-widera-2023-talents-01-01?tenders=false&forthcoming=false&closed=false&programmePeriod=2021%20-%202027&frameworkProgramme=43108390&s

Sonstige EU GREEN — Die europäische Hochschulallianz als Chance für gemeinsame Forschung: Cluster 4 "Education sciences for sustainable development", Termin: 10. November 2023 um 10 Uhr

Am 10.11.2023 führt von 10:00 Uhr bis 11:15 Uhr die Stabsstelle Forschungsförderberatung die Veranstaltung „EU GREEN — Die europäische Hochschulallianz als Chance für gemeinsame Forschung" durch.
Mit dieser Veranstaltung möchten wir Sie für unsere Vision einer europäischen Hochschule begeistern, die vor dem Hintergrund der Sustainable Development Goals der europäischen Union in den Bereichen Forschung, Innovation, Bildung und Gesellschaft gemeinsame europäische Strukturen aufbauen will.
Einen bedeutenden Teil dieser europäischen Hochschulallianz nimmt der Bereich der Forschung ein. Deshalb ist es uns als Forschungsförderberatung/EU-Hochschulnetzwerk besonders wichtig, Sie in diesem Change Prozess als Mitgestaltende im Bereich der Forschung zu gewinnen. Mit acht weiteren europäischen Universitäten verfügt EU GREEN über ein Netzwerk aus Forschenden, die motiviert sind, Ihre Expertise zu teilen und gemeinsam Projektideen zu entwickeln und umzusetzen. Als Mitarbeitende der OVGU möchten wir Ihnen deshalb die Vision von einer europäischen Hochschulallianz vorstellen und Sie über die unterschiedlichen Forschungsbereiche innerhalb von EU GREEN informieren und Ihnen die Möglichkeit geben, zum Thema „Education sciences for sustainable development" mehr zu erfahren. Insbesondere werden wir auf Kooperationsmöglichkeiten eingehen, die im Bereich Education sciences mit den Partneruniversitäten bestehen.
Die Agenda:
- EU GREEN im Überblick — Chancen und Challenges
- Forschung innerhalb der Allianz
- Mögliche Kooperationen

Die Veranstaltung findet im Tagungsraum der Universitätsbibliothek (Campus Universitätsplatz) in Magdeburg statt. Der Tagungsraum befindet sich im Foyer der Universitätsbibliothek, auf der linken Seite. Es gibt auch die Möglichkeit online an der Veranstaltung teilzunehmen. Falls Sie die Teilnahme über Zoom in Betracht ziehen, schreiben Sie gerne Frau Westphal. Der Link wird kurz vor dem Termin per E-Mail zu geschickt.
Kontakt:
Lisa Westphal
Telefon: +49 (0) 391 67 57593
lisa.westphal@ovgu.de
Anmeldung:
https://eveeno.com/171949312
Weitere Informationen:
https://www.ovgu.de/Forschung/Beratung/Forschungsf%C3%B6rderung/News/Veranstaltungen/EU+GREEN+%E2%80%94+Die+p-134340.html

Sonstige EU GREEN — Die europäische Hochschulallianz als Chance für gemeinsame Forschung: Cluster 5 "Sustainable tourism and natural heritage", Termin: 29. November 2023 um 14 Uhr

Am 29.11.2023 führt von 14:00 Uhr bis 15:00 Uhr die Stabsstelle Forschungsförderberatung die Veranstaltung „EU GREEN — Die europäische Hochschulallianz als Chance für gemeinsame Forschung" durch.
Mit dieser Veranstaltung möchten wir Sie für unsere Vision einer europäischen Hochschule begeistern, die vor dem Hintergrund der Sustainable Development Goals der europäischen Union in den Bereichen Forschung, Innovation, Bildung und Gesellschaft gemeinsame europäische Strukturen aufbauen will.
Einen bedeutenden Teil dieser europäischen Hochschulallianz nimmt der Bereich der Forschung ein. Deshalb ist es uns als Forschungsförderberatung/EU-Hochschulnetzwerk besonders wichtig, Sie in diesem Change Prozess als Mitgestaltende im Bereich der Forschung zu gewinnen. Mit acht weiteren europäischen Universitäten verfügt EU GREEN über ein Netzwerk aus Forschenden, die motiviert sind, Ihre Expertise zu teilen und gemeinsam Projektideen zu entwickeln und umzusetzen. Als Mitarbeitende der OVGU möchten wir Ihnen deshalb die Vision von einer europäischen Hochschulallianz vorstellen und Sie über die unterschiedlichen Forschungsbereiche innerhalb von EU GREEN informieren und Ihnen die Möglichkeit geben, zum Thema „Sustainable tourism for cultural and natural heritage" mehr zu erfahren. Insbesondere werden wir auf Kooperationsmöglichkeiten eingehen, die im Bereich sustainable tourism for cultural and natural heritage mit den Partneruniversitäten

bestehen. Der Blick wird ebenfalls für politische Themen und Forschungsbereiche geöffnet.
Die Agenda:
- EU GREEN im Überblick — Chancen und Challenges
- Forschung innerhalb der Allianz
- Mögliche Kooperationen

Die Veranstaltung findet im Tagungsraum der Universitätsbibliothek (Campus Universitätsplatz) in Magdeburg statt. Der Tagungsraum befindet sich im Foyer der Universitätsbibliothek, auf der linken Seite. Es gibt auch die Möglichkeit online an der Veranstaltung teilzunehmen. Falls Sie die Teilnahme über Zoom in Betracht ziehen, schreiben Sie gerne Frau Westphal. Der Link wird kurz vor dem Termin per E-Mail zu geschickt.
Kontakt:
Lisa Westphal
Telefon: +49 (0) 391 67 57593
lisa.westphal@ovgu.de
Anmeldung:
https://eveeno.com/185088263
Weitere Informationen:
https://www.ovgu.de/Forschung/Beratung/Forschungsf%C3%B6rderung/News/Veranstaltungen/EU+GREEN+%E2%80%94+Die+p-136342.html

Sonstige Contact Research Funding Advice of the Otto von Guericke University Magdeburg

For questions about funding opportunities, specific calls for proposals, help with submitting applications and project support, please contact the department for Research Funding Advice/EU-University Network of Otto von Guericke University Magdeburg.
Information on current events, funding structures and contact online at:
https://www.ovgu.de/en/ContactResearchFundingAdvice
https://www.euhochschulnetz-sachsen-anhalt.de/en/