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Call Topics for International Cooperation

in Horizon 2020

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Content

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Excellent Science

Horizon 2020 Pillar:	Excellent Science
Programme:	Future and Emerging Technologies
Call Title:	FET Flagships – Tackling grand interdisciplinary science and technology challenges
Call Identifier:	h2020-fetflag-2018-2020
Topic Title:	International Cooperation on Quantum Technologies
Topic Identifier:	FETFLAG-06-2020
Type of Action:	CSA Coordination and support action
Deadline(s):	13.11.2019 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/fetflag-06-2020

Specific Challenges: Quantum technologies is an emerging key enabling technology. In order to achieve its objectives, the Quantum Technologies FET Flagship could benefit from international cooperation activities with non-European partners having competences complementary to those or that are not available within Europe. Such activities will aim at providing a clear win-win situation for all parties involved. Target countries are the USA, **Canada** and Japan.

Scope: The action should deliver a roadmap for international cooperation that outlines where Europe's strengths are, the competences missing in Europe, and in which of the target regions those can be found. The action should map the corresponding national innovation strategies in the 3rd countries and the available funding schemes and involved funding agencies. The action should give concrete recommendations on international cooperation actions, including how these can be established applying the funding instruments available, and should identify target region in which areas there is a win-win. The analysis and recommendations derived from the roadmap should be based on a clear methodology taking also into account benchmarking activities currently conducted in the Flagship. Close coordination of the action with the existing Flagship Coordination and Support Action is regarded as key for the successful implementation.

The activities should include public consultations with the relevant stakeholders, workshops with the lead persons from science, industry and policymakers and fact-finding missions.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 500.000 and a duration of 36 months would allow this specific

challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts or durations.

Expected Impact:

- Increased effectiveness of the European Quantum Flagship by having a focused strategy on international cooperation.
- Increased networking between European and international stakeholders excelling in quantum technologies;
- Increased scientific and technical knowledge
- Improve competitiveness of European industry by opening up international cooperation possibilities and gaining access to future markets.

Cross-cutting Priorities: International cooperation

Horizon 2020 Pillar: Excellent Science

Programme: Future and Emerging Technologies

Call Title: FET Proactive – Boosting emerging technologies

Call Identifier: h2020-fetproact-2018-2020

Topic Title: Environmental Intelligence

Topic Identifier: FETPROACT-EIC-08-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 22.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/fetproact-eic-08-2020

Specific Challenges: new synergies between the distant communities of environmental modelling, advanced sensor research, social sciences, and artificial intelligence can lead to radically new approaches to creating and using dynamic models of the environment, including predictive modelling and scenario testing and tracking. The ultimate vision is to use the fusion and analysis of this rich, dynamic data coming from a variety of sensing modalities and their characteristic locations to build a deeper understanding of the socio-environmental inter-relationships, for example, by testing and validating complex theoretical models.

Scope: Proposals are expected to have their main focus in only one of the following sub-topics:

a. new techniques for creating and using dynamic models of environmental evolution that combine, analyse and interpret data provided by in-situ sensing technologies with satellite remote sensing/earth observation and other environmental data sources, including human behaviour and gender differences, and economics and social sciences. The focus is on a better understanding of the interplay dynamics of natural and societal systems, for example on how policies and economics modelling predict human behaviours' impact on the environment, how social norms interact with the environment evolution and exploitation, or how the decisions based on changes in the environment in turn affect the state of the natural environment and vice-versa.

b. radically novel approaches to resilient, reliable and environmentally responsible in-situ monitoring. In-situ sensing technologies (physical, chemical, biological, behavioural) for environmental monitoring, in particular

favouring sensors for parameters and environments that are currently under-sampled but at the same time critical for improving predictive models for understanding environmental processes. Proposals should look for ground-breaking concepts of affordable sensor deployment, spanning maintenance, communication and retrieval, possibly based on concepts like self-deployment, self-awareness, self-repair and controlled decomposition; or using new concepts from micro-robots to optimise sensing or increase monitoring frequency. Advanced research on the networking aspects is not addressing this sub-topic.

Projects are to focus on one or a few critical resources (e.g., water, air) and to establish fundamental advances on the most critical challenges that will underpin a step improvement in monitoring, analysis and management of important social/environmental processes for improving quality of life and environmental sustainability (possibly including aspects of waste, noise, …). Citizen involvement, for example for prioritizing resource challenges, data collection, raising awareness towards environmental issues or better understanding of behavioural change in relation to environmental sustainability, is encouraged, in line with the discussion on Responsible Research and Innovation (RRI) in the introduction to this FET work programme. The collected and simulated data should adhere to the FAIR data principle and be compliant with European Standards.

Selected projects under this topic will be expected to collaborate, jointly aiming at delivering a blueprint for a full-fledged system for environmental intelligence.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 4 million and with a duration of up to 4 years would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts or project duration.

Expected Impact:

- Enabling new approaches to monitoring, analysis and management of critical resources in Europe;
- Availability of reliable data and models at multiple levels of granularity for environmental policy making;
- Reduced environmental footprint for environmental ICT;
- Increased local and citizen awareness of environmental impacts.

Delegation Exception Footnote: This topic is part of the European Innovation Council (EIC) Enhanced Pilot (Horizon 2020, 2019-2020).

Cross-cutting Priorities: EIC Pilot, Socio-economic science and humanities, **Blue Growth**, Gender, RRI

Horizon 2020 Pillar:	Excellent Science
Programme:	Research Infrastructures
Call Title:	Integrating and opening research infrastructures of European interest
Call Identifier:	h2020-infraia-2018-2020
Topic Title:	Integrating Activities for Starting Communities
Topic Identifier:	INFRAIA-02-2020
Type of Action:	RIA Research and Innovation action
Deadline(s):	17.03.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/infraia-02-2020

Specific Challenges: European researchers need effective and convenient access to the best research infrastructures in order to conduct research for the advancement of knowledge and technology. The aim of this action is to bring together, integrate on European scale, and open up key national and regional research infrastructures to all European researchers, from both academia and industry, ensuring their optimal use and joint development.

Scope: A 'Starting Community' has never been supported for the integration of its infrastructures under FP7 or Horizon 2020 calls, in particular within an integrating activity.

An Integrating Activity will mobilise a comprehensive consortium of several key research infrastructures in a given field as well as other stakeholders (e.g. public authorities, technological partners, research institutions) from different Member States, Associated Countries and other **third countries**[1] when appropriate, in particular when they offer complementary or more advanced services than those available in Europe.

Funding will be provided to support, in particular, the trans-national and virtual access provided to European researchers (and to researchers from **Third countries** under certain conditions[2]), the cooperation between research infrastructures, scientific communities, industry and other stakeholders, the improvement of the services the infrastructures provide, the harmonisation, optimisation and improvement of access procedures and interfaces. Proposals should adopt the guidelines and principles of the European Charter for Access to Research Infrastructures.

To this extent, an Integrating Activity shall combine, in a closely co-ordinated manner:

(i) Networking activities, to foster a culture of co-operation between research infrastructures, scientific communities, industries and other stakeholders as appropriate, and to help develop a more efficient and attractive European Research Area;

(ii) Trans-national access or virtual access activities, to support scientific communities in their access to the identified key research infrastructures;

(iii) Joint research activities, to improve, in quality and/or quantity, the integrated services provided at European level by the infrastructures.

All three categories of activities are mandatory as synergistic effects are expected from these different components.

Access should be provided only to key research infrastructures of European interest, i.e., those infrastructures able to attract significant numbers of users from countries other than the country where they are located. Other national and regional infrastructures in Europe can be involved, in particular in the networking activities, for the exchange of best practices, without necessarily being beneficiaries in the proposal.

The research infrastructures of a 'Starting Community' usually show a limited degree of coordination and networking at present. The strongest impact of an integrating activity is expected typically to arise from a focus on networking, standardisation and establishing a common access procedure for trans-national and/or virtual access provision.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), Integrating Activities should, whenever appropriate, pay due attention to any related international initiative (i.e. outside the EU) and foster the use and deployment of global standards.

Integrating Activities should also organise the efficient curation, preservation and provision of access to the data collected or produced under the project, defining a data management plan, even when they opt out of the extended Pilot on Open Research Data. Data management (including ethics and privacy issues), interoperability, as well as advanced data and computing services should be addressed where relevant. To this extent, proposals should build upon the state of the art in ICT and e-infrastructures for data, computing and networking, and ensure connection to the European Open Science Cloud.

Integrating Activities should, when relevant, contribute to fostering the potential for innovation, including social innovation, of research infrastructures by reinforcing the partnership with industry, public administrations and/or other stakeholders, through e.g. transfer of knowledge and other dissemination activities, activities to promote the use of research infrastructures by industrial researchers or policy-makers, involvement of industrial associations and other stakeholders in consortia or in advisory bodies.

Integrating Activities are expected to duly take into account all relevant ESFRI and other world-class research infrastructures to exploit synergies, to reflect on

sustainability and to ensure complementarity and coherence with the existing European Infrastructures landscape.

Proposals should include clear indicators allowing the assessment of the progress towards the general and specific objectives, other than the access provision.

As the scope of an integrating activity is to ensure coordination and integration between all the key European infrastructures in a given field and to avoid duplication of effort, at most one proposal per field is expected to be submitted.

Further conditions and requirements that applicants should fulfil when drafting a proposal are given in part D of the section "Specific features for Research Infrastructures". Compliance with these provisions will be taken into account during evaluation.

Integrating activities for starting communities range across all areas of science and technology. Proposals should not restrict their services to too narrow research fields and should address the wider scientific communities, even multidisciplinary ones, which can be served by the involved sets of research infrastructures.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 5 million would allow this topic to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Researchers will have wider, simplified, and more efficient access to the best research infrastructures they require to conduct their research, irrespective of location. They benefit from an increased focus on user needs.
- New or more advanced research infrastructure services, enabling leading-edge or multidisciplinary research, are made available to a wider user community.
- Operators of related infrastructures develop synergies and complementary capabilities, leading to improved and harmonised services. , . Economies of scale and improved use of resources across Europe are also realised due to less duplication of services, common development and the optimisation of operations.
- When applicable, innovation is fostered through a reinforced partnership of research infrastructures with industry.
- A new generation of researchers is educated that is ready to optimally exploit all the essential tools for their research.
- Closer interactions between larger number of researchers active in and around a number of infrastructures facilitate cross-disciplinary fertilisations and a wider sharing of information, knowledge and technologies across fields and between academia and non-academic stakeholders, including industry.
- The integration of major scientific equipment or sets of instruments and of knowledge-based resources (collections, archives, structured scientific information, data infrastructures, etc.) leads to a better management of the continuous flow of data collected or produced by these facilities and resources.

- When applicable, the integrated and harmonised access to resources at European level can facilitate the use beyond research and contribute to evidence-based policy making.
- When applicable, the socio-economic impact of past investments in research infrastructures from the European Structural and Investment Funds is enhanced.

Cross-cutting Priorities: International cooperation, Gender, **Blue Growth**, Socio-economic science and humanities, Open Science

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[1] See the Eligibility and admissibility conditions for this call.

[2] See part D of the section "Specific features for Research Infrastructures".

Horizon 2020 Pillar: Excellent Science

Programme: Research Infrastructures

Call Title: Implementing the European Open Science Cloud

Call Identifier: h2020-infraeosc-2018-2020

Topic Title: Integration and consolidation of the existing pan-European access mechanism to public research infrastructures and commercial services through the EOSC Portal

Topic Identifier: INFRAEOSC-03-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 22.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/infraeosc-03-2020

Specific Challenges: The phase of integration and consolidation of e-infrastructure platforms initiated under the Research Infrastructures Work Programme 2016-2017 (in particular, through the EOSC-hub) as well as the work carried out by other EU funded projects and initiatives[1], has set the ground for the development of the EOSC Portal. Through its main components, the EOSC website, catalogue of services and marketplace[2], researchers and other users can find and use research-enabling services and resources, get technical support, integrated solutions from the EOSC providers, participate in co-design, and be informed about and engaged with, the EOSC vision and policy initiatives.

Building on this work, the challenge is now to consolidate and scale up the EOSC Portal and its underlying service platform in order to:

1. strengthen the EOSC Portal so that it continues to provide an increasing portfolio of high quality standard compliant and interoperable services of proven user interest and scientific relevance from a wide range of national, regional and institutional public research infrastructures in Europe as well as from commercial service providers in its catalogue;
2. reinforce the role of the marketplace as the access channel to integrated, composable and reliable services;
3. attract more users, within the research community and beyond, by enhancing the user experience and seamlessly accommodating their needs; and
4. ensure its long-term sustainability taking into account all the relevant governance and business frameworks.

Scope: Building on the outcomes of the projects awarded under topics EINFRA-12-2017[3], INFRAEOSC-06-2019 (a), INFRAEOSC-05-2018 (a), INFRAEOSC-04-2018 and other relevant EU funded projects and initiatives[4] (including the thematic clouds), proposals should address the following activities all together:

a. Operation, maintenance and enhancement of the EOSC Portal (the website, the catalogue of services and the marketplace)
   - Enhance operational aspects of the EOSC Portal: proposals should include tools and activities to ensure the basic functionalities underpinning the portal, such as the support, quality, security, reliability and traceability of services, effective monitoring of usage and evaluation of performance, messaging and usage accounting. A user-friendly interface, offering integrated information on the EOSC vision and process, should be also ensured, encouraging constant learning and alignment in all disciplines and Member States.
   - Engage with the supply side of EOSC: proposals should provide a framework to interact with all service and resources providers[5], in order to ensure that their services are integrated into the catalogue of services and, where appropriate, the marketplace. They should also ensure the alignment of the providers with future EOSC principles, standards and values including compliance with the Rules for Participation and FAIR principles[6] and the reduction of the complexity barrier to users. Consortia should address issues related to the adoption of common standards by all suppliers, the implementation of Application Programming Interfaces (APIs), the automatic collection and exchange of information related to service updates, the mechanisms for reporting usage, the support for virtual access accounting mechanisms[7], etc.
   - Interact with the EOSC end users and provide a highly usable service platform: proposals should foresee the necessary feedback mechanisms (including a user panel) and user behaviours' analysis within the EOSC Portal environment to allow for constant improvement of the features of the different EOSC Portal components and their usability easing the way users can interact and evaluate the service. The analysis should include gender sensitive issues, when relevant. Proposals should also put in place the necessary mechanisms to elicit users' needs requiring new services (including commercial ones).

b. Fostering and enabling secure service composability

   To allow for a higher level of service integration within the EOSC marketplace, proposals should take due consideration of the need for secure composition of services and resources from different providers. Researchers and other EOSC end users should be able to discover services and combine them to compose new, more complex services, tailored to their specific needs. By enabling EOSC users to compose reliable, secure and scalable services, the EOSC marketplace will become more flexible and adaptable, maximising its impact and benefit for the research community.

   In this context, proposals should provide a framework, including specific pilot scenarios, for exposing, integrating and managing a wide-range of standard

and policy compliant cross-domain and domain-specific research enabling services and resources from pan-European horizontal and thematic research infrastructures as well as from commercial providers. In particular, they should:

- Allow for user friendly discovery, access and re-use of major public research outputs (e.g. publications or datasets) and data processing capabilities, analytical tools or any other added-value quality service from various providers;
- Provide and evolve service management tools that support the provider's participation to the EOSC federation;
- Foster secure composability of services and interoperability of datasets and other outputs by supporting the use of common interfaces, standards, ICT specifications and best practices that not only allows for services to be reused in multiple service compositions but also ensures the reliability, flexibility and scalability of those services.

c. User enhanced experience using Artificial Intelligence (AI) techniques

Proposals should describe how the EOSC Portal would be enhanced with AI-based services in order to exploit usage patterns and to advise researchers and other EOSC users on the most suitable EOSC services according to their research profiles and needs. In this way, researchers that have completed their EOSC user profile (including their affiliation, research interests and needs) can get suggestions based on what services other EOSC users with similar interests and access rights have used to address their research needs. The advice will have to be continuously updated, based on the actual activity of the users at the EOSC Portal enhancing quality and improving predictive response to cover evolving needs and ensure engagement. The quality of the advice of such AI-based services should improve with the increase of the number of EOSC users and services available.

d. Widening the EOSC user base

Proposals should include strategies and well-defined structures for gathering needs from potential new user communities and propose methods outlining the operational requirements to be satisfied by the EOSC Portal to effectively attract and integrate new users. This includes the possibility of federating and/or integrating heterogeneous and hybrid research clouds into the EOSC Portal.

In order to enable users from non-research communities to access EOSC services through the EOSC Portal, the AAI[8] federated architecture implemented in the EOSC Portal should be fully aligned with the legal and interoperability framework set by the eIDAS Regulation[9].

Proposals shall include the development of APIs or any other necessary feature that allow third parties such as Open Data Initiatives or other initiatives under the European Common Data Space to become users of the EOSC services and to access the available services in the EOSC Portal from their own environments.

Proposals should include an outline of the legal, technical and business processes to be implemented through contractual agreements between the EOSC Portal and user institutions that are interested in providing increased accessibility to EOSC services and resources to their affiliated members.

e. Widening the service offer with commercial services

Proposals should address both of the following activities:

- Proposals should incorporate commercial services into the EOSC marketplace and expand it, by building further on the work carried out under the topic INFRAEOSC-01-2018[10] and under the EOSC-hub project. In particular, proposals should

  1. through the EOSC Portal feedback mechanisms[11], aggregate the various needs of EOSC users for commercial services that are complementary to the services offered by public infrastructures,
  2. procure preferably green[12] innovative commercial services addressing the aggregated user demand and
  3. make available the purchased services to EOSC users.

  Proposals will make the procured capacity available for access - together with other capabilities of interest - through the portal access channel. Service capacity shall be allocated to projects and initiatives through a selection process that ensures excellence, fair distribution across scientific communities and removal of digital divides across communities and countries. The procurement mechanism should be compatible with the Green Public Procurement initiative[13]. Examples of commercial services that could be incorporated include commodity type commercial digital services that are necessary for interdisciplinary research activities or secure Earth Observation commercial services stemming from the use of Copernicus open data, etc. The inclusion of such added-value commercial services will enrich the existing catalogue, generate positive impact on cross-disciplinary research activities in the EOSC environment and improve user experience with the overall EOSC service offering. A maximum amount of EUR 10 million of the total budget for this sub-topic is foreseen for this procurement activity.

- Building on the work of the EOSC-hub project, proposals should collaborate with private sector entities, in particular with SMEs, in the context of digital innovation hubs initiatives, in order to stimulate an ecosystem of innovation and knowledge transfer that fosters the development of commercial services to continuously cover the needs of EOSC users[14].

f. Support activities

Proposals shall also cover all the following activities aiming at boosting the impact and outreach of the EOSC Portal:

i. Outreach and skills
   Leveraging on existing networks and actions for training on and outreach

of the EOSC and in strong collaboration with the awarded grants under topic INFRAEOSC-07-2020, proposals should include activities to:

- Foster the EOSC initiative's uptake and spread both geographically and across scientific disciplines and communities (including long tail of science). Moreover, proposals should include measures and dissemination activities for closing the gap between European countries with higher and lower EOSC uptake, including the EU candidate countries and the Western Balkans.
- Develop the necessary skills of EOSC users for sharing resources, managing data and applying the FAIR principles in the context of the EOSC Portal, by e.g. providing researchers and data practitioners with consolidated cross-infrastructure training packages for data skills, data science and data stewardship.

ii. Support to the **Research Data Alliance**'s contribution to the EOSC:
- Proposals retained for funding should directly support the contribution of RDA to the EOSC initiative and, in particular, in the context of the EOSC Portal.
- Proposals should also provide financial support to third parties wishing to engage and participate in the **Research Data Alliance** processes and activities, including RDA outputs adoption fostering the interoperability and service composition in the EOSC Portal[15].

Grants awarded under this topic will be complementary to the actions awarded under topic INFRAEOSC-07-2020. The main purpose of the collaboration agreements referred to in Article 41.4 of the Model Grant Agreement is to describe the terms and conditions for the provision of services through the EOSC Portal.

Grants awarded under this topic will be complementary to the action awarded under topic INFRAEOSC-06-2019 (a) and should conclude a collaboration agreement.

For grants awarded under this topic, beneficiaries will be subject to the following additional obligations aiming at ensuring exploitation of its results: proposals must necessary state the participants' commitment to: a) use open source software, b) make tools, standards, specifications and all other relevant outputs generated in the action available, through a well-defined mechanism, to the EOSC governance and any other institution responsible for the continuity of the EOSC Portal beyond the lifespan of the Grant Agreement.

Grants awarded under this topic are expected to carry out an analysis regarding energy consumption and environmental impact of technologies used in the context of the project. The analysis should include an action plan in order to limit the carbon and energy footprint with a specific reference to the standard EN 50600-4[16] together with a timeline for implementation of the defined milestones and KPIs.

As the scope of this activity is to consolidate a single EOSC Portal, at most one single proposal covering all the described activities (a. to f. included) is expected to be funded.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 40.9 million and a 30 months duration would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts and durations.

Expected Impact:

- Provide pan-European access to state-of-the-art secure, interoperable and scalable EOSC services and resources enabling the emergence of genuine Open Science, enhancing data skills and boosting data intensive research in Europe.
- Enable researchers and other users to compose secure and scalable services that respond to actual and evolving needs, in a secure, flexible and scalable environment.
- Build an agile EOSC and increase the uptake of its services by public and private sectors stakeholders, across Europe, exploiting solutions and technologies for the benefit of all areas of economy and society.
- Reduce the burden for research organisations and other service users to engage in complex procurement processes, support cross-analysis of data from heterogeneous sources and create market opportunities for innovative research data services.
- Increase the overall value of open research data and ensure that EOSC contributes to the global playing field of open FAIR data.

Cross-cutting Priorities: Gender, Open Innovation, Open Science

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[1] In particular, those mentioned in the SWD for the Implementation Roadmap of the EOSC Commission Staff Working Document, SWD(2018) 83 final.

[2] The EOSC marketplace is conceived as a platform integrated into the EOSC Portal where users are able to access, order and compose different services and resources: https://marketplace.eosc-portal.eu/

[3] http://www.eosc-hub.eu/, https://www.openaire.eu/, and https://eosc-portal.eu/

[4] In particular, those mentioned in the Implementation Roadmap of the EOSC Commission Staff Working Document, SWD(2018) 83 final.

[5] Including with service providers in the grant awarded under topics INFRAEOSC-02-2019, INFRAEOSC-04-2018 and the thematic clouds developed under other parts of the Horizon 2020 programme.

[6] See for reference: SWD(2018) 83 final – Implementation Roadmap for the European Open Science Cloud.

[7] See description of Virtual access activities in part D of the section "Specific features for Research Infrastructures".

[8] Authentication and Authorization Infrastructure. Based on the work of AARC, AARC2 and the EOSC-hub projects.

[9] Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market.

[10] OCRE project: https://cordis.europa.eu/project/rcn/219198/factsheet/en

[11] See point a1) on user feedback.

[12] For more information about the green public procurement initiative: http://ec.europa.eu/environment/gpp/index_en.htm

[13] http://ec.europa.eu/environment/gpp/index_en.htm

[14] See point a1) on user feedback.

[15] In line with the conditions set out in part K of the General Annexes. A maximum amount of EUR 1M is foreseen for the total financial support to third parties under this point while the maximum amount per third party may not exceed EUR 60 000.

[16] EN 50600-4: Information technology: Data centre facilities and infrastructures. For the link to the latest published version, tools and resources regarding the standard, check: https://ictfootprint.eu/en-50600-4-factsheet-0

Industrial Leadership

Horizon 2020 Pillar: Industrial Leadership

Programme: Leadership in enabling and industrial technologies (LEIT)

Call Title: Transforming European Industry

Call Identifier: h2020-nmbp-tr-ind-2018-2020

Topic Title: Upcycling Bio Plastics of food and drinks packaging (RIA)

Topic Identifier: CE-BIOTEC-09-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 12.12.2019, 14.05.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ce-biotec-09-2020

Specific Challenges: The European Strategy for Plastics in a Circular Economy acknowledges the usefulness of plastics for the economy and our daily lives, but points out that plastics' use fails to capture the economic and environmental benefits of a more 'circular' approach. The progressive substitution of consumer products derived from fossil fuels, at all steps along the industrial value-chain, is crucial to successfully decarbonise our society. Most plastic (>98%) is produced from non-renewable sources. This is more than 400 million tonnes globally, which could become 900 million tonnes by 2050, i.e. 20% of oil consumption. The majority of plastic cannot be recycled and contains toxic additives. Some plastics are bio-based; however not all are recyclable, reusable or biodegradable.

Annually, Europe produces 78 million tonnes of plastics, 40% of is used for packaging and mainly for packaging food, drinks and other consumer products with a short shelf-live. Packaging that cannot be recycled ends up in landfills or is burnt in, a process that releases large amounts of CO2 and toxic chemicals into the atmosphere.

The challenge is to develop technologies to deal with the upcycling of plastics for food and drinks packaging. Upcycling in this context means transforming them into new materials or products of better quality or for better environmental value, ensuring that micro-plastics are avoided. This will allow the sustainable recycling or biological degradation in accordance with existing and novel technologies, standards and certification schemes.

Scope: Proposals will address as many as possible of the following aspects:

- Expand the potential of current technologies and materials for the manufacturing and design of bio-plastics that are recyclable and/or bio-degradable;
- Exploit known or develop new biotechnologies, based on enzymes or enzyme combinations and microorganisms, for improved recycling or biodegradation of plastics;
- Develop novel standards and certification schemes applicable to packaging materials made from recyclable and biodegradable bio-plastics;
- Include Social Sciences and Humanities (SSH) elements and gender aspects to improve consumer attitude and behaviour with respect to purchasing and recycling food and drink packaging;
- Take a systemic approach and involve cooperation among actors in the supply chain, from producer to final consumer, and from research to policy makers.

Projects should perform an analysis of the state of the art to avoid duplications and overlaps with past or ongoing research, including projects funded by the Bio-based Industries Initiative[1] and the Circular Economy calls under H2020.

Clustering activities to capitalise on synergies with relevant projects selected under this topic and topic CE NMBP 26-2018 is encouraged.

Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Activities should start at TRL 3 and achieve TRL 6 at the end of the project.

The Commission considers that proposals requesting a contribution from the EU between EUR 6 and 8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- 60% food and drink packaging is upcycled by 2030;
- A viable roadmap to prove that by 2030 60% of the plastics still to be used for packaging of foods and drinks with short-shelf life will be produced from renewable sources;
- Contribute to the increase in new and upgraded waste recycling facilities designed to facilitate recycling via biotechnological or biochemical methods;
- Increased awareness among European citizens of products and materials upcycling capacity;
- Novel standards and certification schemes to be applied together with market pull measures such as public procurement and tax exemptions;

Indicators and metrics, with baseline values, including demonstration activities should be clearly stated in the proposal.

This topic is in support of the European Strategy for Plastics in a Circular Economy[2]. Projects selected under this topic as well as projects selected under other topics[3] in H2020 supporting the Plastics Strategy are strongly encouraged

to participate in joint activities as appropriate. These joint activities could take the form of clustering of projects, participation in workshops, common exploitation and dissemination etc. The proposals are expected to demonstrate support to common coordination and dissemination activities without the prerequisite to define concrete common actions at this stage.

Cross-cutting Priorities: Socio-economic science and humanities, **Blue Growth**

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[1] https://www.bbi-europe.eu/projects?field_project_year_tid=All&field_project_category_tid=63&field_project_classification_tid=All&combine=plastic&=Search

[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1516265440535&uri=COM:2018:28:FIN

[3] SC1-BHC-36-2020 Micro- and nano-plastics in our environment: Understanding exposures and impacts on human health; SFS-21-2020 - Emerging challenges for soil management; BG-07-2019-2020: The Future of Seas and Oceans Flagship Initiative: [C] 2020 - Technologies for observations; FNR-06-2020: Oceans Innovation Pilot for the Blue Economy; FNR-05-2020: Supporting the food safety systems of the future; CE-SC5-24-2020: Improving the sorting, separation and recycling of composite and multi-layer materials; CE-SC5-28-2020: Develop and pilot circular systems in plastics, textiles and furniture sectors; CE-SC5-25-2020: Understanding the transition to a circular economy and its implications on the environment, economy and society; CE-SC5-29-2020: A common European framework to harmonise procedures for plastics pollution monitoring and assessments; CE-SC5-30-2020: Plastics in the environment: understanding the sources, transport and distribution of plastics pollution ;

Horizon 2020 Pillar: Industrial Leadership

Programme: Leadership in enabling and industrial technologies (LEIT)

Call Title: Industrial Sustainability

Call Identifier: h2020-nmbp-st-ind-2018-2020

Topic Title: Materials for off shore energy (IA)

Topic Identifier: LC-NMBP-31-2020

Type of Action: IA Innovation action

Deadline(s): 12.12.2019, 14.05.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-nmbp-31-2020

Specific Challenges: The next generation of large offshore wind energy generators and tidal power generators will help to reach climate goals and CO2 reduction levels and are likely to secure Europe's technical and economic competitiveness. Accordingly, new challenges related to materials or multi-material architectures must be addressed, to increase operational performance and allow an appreciable reduction of the overall cost of offshore energy generation, taking into account capital expenditure as well as, running and maintenance costs.

The challenge is therefore to improve the operational performance of the next generation of offshore wind energy generators (larger than 8MW) and tidal stream power generators through better performance of their functional (e.g. wind energy generator rotor blades) and/or structural components (e.g. floating or bottom fixed base structure).

Scope:

- Develop new and/or improved material solutions or improvements by a combination of materials, technologies and design of structural and functional components. This should result in one or more of the following properties:
  - Increased durability and reliability and reduced maintenance requirements (e.g. self-cleaning and/or self-healing properties, increased corrosion and/or erosion resistance, increased fatigue resistance);
  - Smart material functionality and/or the possibility to use embedded sensors for online monitoring of performance and/or structural health monitoring (detection of environmental impact and/or structural and mechanical status);
  - Lightweight (mainly applicable to wind energy);

  - Increased recyclability with respect to current state-of-the-art;
  - Materials should be easy to repair.

- Consider advanced manufacturing technologies for the reduction of manufacturing costs applicable to already developed materials and take into account costs of (multi)-materials production as well as the design and manufacturability of the new system or product as a whole. Synergies with projects selected under topic DT-FOF-10-2020 Pilot lines for large-part high-precision manufacturing is encouraged.
- Develop and validate suitable models of predictive materials degradation (mechanical and/or environmental), including Life Cycle Assessment and an economic analysis to demonstrate the viability of the solutions.
- The materials solutions should profit from existing European advantages in the value chain, such as existing production of high-level materials and/or production technologies;
- Consider European standardisation and regulation.

Possible materials for wind generators include for example, polymer based fibre reinforced (glass, carbon aramid, etc.) composites, nanoparticle filled composites, materials with embedded superhard nanoparticles, metal-plastic systems, high strength steels, high strength lightweight alloys, (e.g titanium, aluminium etc.) with improved efficiency and cost.

Materials for the development of gearboxes and related parts of the powertrain are excluded from the scope of this topic, as well as Materials for wave energy generators.

Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Activities should start at TRL 4 and achieve TRL 6 at the end of the project.

The Commission considers that proposals requesting a contribution from the EU between EUR 5 and 7 million would allow this specific challenge to be addressed appropriately. This does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Significant reduction of life cycle costs while maintaining or improving other performance properties of the solution (e.g. obtained by significant reduction of maintenance cost);
- Development of materials with optimised materials cost and improved durability, reaching cost reductions for off shore energy production of about 40% of the current value (levelised cost of energy), with cost values;
- produced by wind energy system of clearly below 10 ct€/ kWh or
- produced by tidal stream generator system of 15 ct€/kWh;
- Reduction of environmental impact by 35% (based on life cycle assessment and eco design).

The performance levels and respective impact of the proposed solution(s) should be in line with those specified in the relevant parts of the SET plan (link to be integrated)

Relevant indicators and metrics, with baseline values, should be clearly stated in the proposal.

Cross-cutting Priorities: **Blue Growth**, Clean Energy

Horizon 2020 Pillar: Industrial Leadership

Programme: Leadership in enabling and industrial technologies (LEIT)

Call Title: Foundations for Tommorrow's Industry

Call Identifier: h2020-nmbp-to-ind-2018-2020

Topic Title: Safe by design, from science to regulation: multi-component nanomaterials (RIA)

Topic Identifier: NMBP-16-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 12.12.2019, 14.05.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/nmbp-16-2020

Specific Challenges: Complex multi-component, hybrid, functional nanomaterials and High Aspect Ratio Nanoparticles (NMs&HARNs), present both innovation potential and challenges in terms of assessing the risk in different environments. Concerns for these multi-component nanomaterials result from differing rates of degradation and toxicities of the separate and interacting components and their different interactions with biological and environmental systems. Previous projects on Safe by Design have developed risk assessment tools and strategies, however they were only implemented within the context of an example case study. The implementation of these tools and approach at scale is still remains to be achieved. The challenge is to develop and implement Safe by Design concepts for products incorporating such nanomaterials and to understand their impact on manufacturing processes, on product performance, and on the environment and on health.

Scope: The proposals should:

- Coordinate with the projects from NMBP-15-2019, and focus on filling the gaps in the current understanding of exposure and hazard characteristics of NMs&HARNs especially those arising from their unique properties, as well as assessing the extent of and rates by which variations of environment modify the nanoparticle properties and agglomeration rates;
- Use multiscale modelling approaches to identify how different patterns of release may influence physiological responses and how elements of multi-component nanomaterials interact with each other, with other NMs, and other chemicals leading ultimately to mixture toxicity;

Develop knowledge and tools for Safe by Design approaches that support the development of multi-component nano-enabled products with reduced persistence, exposure and hazard. This should be coupled with developing multi-scale modelling approaches to evaluate the effectiveness of the proposed safe-by-design strategies

Relevant indicators and metrics, with baseline values, must be clearly stated in the proposal and should be in line with previous efforts on Safe by Design. For this topic a parallel call scheme is envisaged with the USA-NNI. Resulting projects should establish close cooperation mechanisms. Therefore, proposals should foresee a dedicated work package for cooperation and earmark appropriate resources.

Activities should start at TRL 4 and achieve TRL 6 at the end of the project.

The Commission considers that proposals requesting a contribution from the EU between EUR 6 and 8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Implementation of validated safe-by-design strategies including enabling their uptake and utilization by SMEs;
- Recommendations on adaptation and improvement of current guidelines for exposure and hazard assessment of multi-component NMs as necessary;
- A categorisation scheme to cluster sector-specific multi-component nanomaterials by assessing nano-specific properties in real-life environments;
- Integration of specific characteristics of multi-component NMs, including the potential for mixture effects, in risk assessment and safe-by-design strategies.

Call information:

GOVERNANCE, SCIENCE-BASED RISK ASSESSMENT AND REGULATORY ASPECTS

Managing the risks of every emerging technology is of key importance for its societal acceptance and consequent possible success. The overall challenge is to establish a suitable form of nanotechnology risk governance and to ensure that beyond the state of the art technologies are accepted by stakeholders (civil society, industry, regulators).

This requires working on three different layers:

(i) a scientific research layer for sound foundations,

(ii) a regulatory research layer to validate and translate the scientific findings into appropriate regulatory frameworks and implementation, and

(iii) a market layer dealing with the daily management of risks and safety.

These three distinct layers should be integrated through actions for risk governance, risk assessment and safe by design. Notably nano-informatics approaches offer good chances for innovation. These will include the challenge of ensuring consistency in all EU Member States in terms of risk management.

The present convergence of several sciences and the rapid evolution of novel technologies in the healthcare sector create a need for fast advance in regulatory science in that sector. Development and adoption of reference methods and of technical standards should be based on solid scientific foundation, hence the need for additional activities within regulatory science for medical technology products.

In terms of resources, the regulatory layer should be jointly supported by Horizon 2020, Member States governments and industry whereas at market level, Horizon 2020 should support only the networking and coordination. Proposals in all layers can foresee modalities for integrating additional public or private funding or foresee specific calls for proposals funded by these additional sources. Costs for the organisation of the calls and coordination of the work can be foreseen in proposals' budgets. Such calls can also be used to foster international cooperation in nanosafety.

Proposals in this area should apply the Open Access and the Open Data Access policies and strongly support the activities of EU regulatory bodies and agencies, and of international organisations like ISO, CEN and OECD. To maximise overall synergy and joint impact, projects should take account of the strategy and roadmaps in place, respect and complement the established ontology and the data logging format (ISA-TAB-NANO[1]), contribute to the objectives of relevant platforms (such as the EU NanoSafety Cluster[2] or The Nanomedicine Translation Hub) and foresee the necessary resources to this effect.

Nanosafety issues are global and, therefore, international collaboration is strongly encouraged. In particular, all projects in this area are expected to collaborate with similar projects under the established scheme of Communities of Research with the USA NNI programme[3] and/or to include direct participation of relevant USA entities. In addition, participation from countries actively involved in the work of OECD -WPMN, the NanoSafety Cluster and the NANoREG[4] project (e.g. South Korea, Brazil, **Canada**, Australia, China, Japan, South Africa) is strongly encouraged.

Proposals should consider risk-assessment procedures for both men and women, where relevant, and enable a reduction of animal testing in the regulatory compliance.

Cross-cutting Priorities: Open Science, Open Innovation, International cooperation

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[1] http://enanomapper.net

[2] http://www.nanosafetycluster.eu

[3] http://www.us-eu.org

[4] http://www.nanoreg.eu

Horizon 2020 Pillar:	Industrial Leadership
Programme:	Leadership in enabling and industrial technologies (LEIT)
Call Title:	Competitive, low carbon and circular industries
Call Identifier:	h2020-low-carbon-circular-industries-2020
Topic Title:	ERA-NET on materials, supporting the circular economy and Sustainable Development Goals
Topic Identifier:	CE-NMBP-41-2020
Type of Action:	ERA-NET-Cofund ERA-NET Cofund
Deadline(s):	05.02.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ce-nmbp-41-2020

Specific Challenges: Maintaining Europe's position in research related to materials science and engineering requires concentrated action on common European research priorities in view of implementing joint initiatives.

The M-ERA.NET 2 network has successfully targeted the Low Carbon Energy Technologies addressed by the SET Plan. Now the scope should on one hand guarantee some continuation, and on the other hand become more ambitious and underline the commitment of the EU regarding the circular economy and Sustainable Development Goals.

The European Commission has adopted an ambitious new Circular Economy Package to help European businesses and consumers to make the transition to a stronger and more circular economy. Moreover, in 2016, the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development came into force. They aim to end poverty, protect the planet, ensure prosperity and tackle climate change. The EU is fully committed to be a frontrunner in implementing the 2030 Agenda and SDGs. Finally, the Commission launched the Battery Alliance initiative in 2017.

Materials research is a relevant field for addressing these overall challenges and for making substantial contributions to achieving the specific objectives.

Global challenges call for co-operation on a global scale to build capacity in science, technology and innovation (STI) at both national and international levels. A strategic and industrially relevant approach is needed that cover the entire research and innovation chain by pooling national research and innovation capacities, thereby mobilising European infrastructure networks as well as promoting education and training in materials research and innovation.

Scope: The proposed ERA-NET aims at coordinating the research efforts of the participating Member States, Associated States and Regions in the field of materials, continuing the activities started by M-ERA.NET, for materials research and innovation, especially targeting the circular economy and Sustainable Development Goals (such as Goal 7 – "Affordable and clean energy", by enabling electromobility through sustainable energy storage technology or Goal 9 "Industrial innovation and infrastructure", by enhancing scientific research and upgrading the technological capabilities of industrial sectors). Proposals should pool the necessary financial resources from participating national or regional research programmes by implementing a joint transnational call for proposals (resulting mainly in grants to third parties) with EU co-funding to fund multinational innovative research initiatives in this domain, including support to the large scale research initiative on future battery technologies launched under the H2020-LC-BAT-2019-2020 Call[1].

Proposers are also requested to implement other joint activities and, additional joint calls without EU co-funding. The proposal should demonstrate that these additional joint calls exclude any overlaps with related on-going actions co-funded by the EU under NMBP.

Proposals should demonstrate the expected impact on national and transnational programmes as well as the leverage effect on European research and competitiveness, and should plan the development of key indicators for supporting this.

Participation of legal entities from **third countries**, and/or regions including those not automatically eligible for funding in accordance with General Annex A is encouraged in the joint call as well as in other joint activities including additional joint calls without EU co-funding. Participants from countries not listed in General Annex A are eligible for EU funding under this topic and may request a Union contribution (on the basis of the ERA-NET unit cost) only for the coordination costs of additional activities.

The Commission considers that proposals requesting a contribution from the EU of EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. EUR 5 million of the requested contribution from the EU should be used as support to transnational projects, co-funded by the Commission, on future battery technologies, fostering synergy between European, national and regional initiatives and promoting broader partnerships between the European stakeholders in future battery technologies.

Expected Impact:

- synergies with international, national and regional programmes that support research and innovation;
- synergies but no overlap with the topics of Horizon 2020 and with related European Partnership initiatives and be open to adapt to future coming initiatives of Horizon Europe;
- leverage of national, regional and European funding;
- contribution to meeting Global Challenges through Better Governance: International Co-operation in Science, Technology and Innovation;

- relevant contribution to the SDGs, including sustainable battery based energy storage technology;
- relevant contribution towards a circular economy.

Cross-cutting Priorities: ERA-NET

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[1] http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-cc-activities_en.pdf

Horizon 2020 Pillar:	Industrial Leadership
Programme:	Leadership in enabling and industrial technologies (LEIT)
Call Title:	Foundations for Tommorrow's Industry
Call Identifier:	h2020-nmbp-to-ind-2018-2020
Topic Title:	Towards Standardised Documentation of Data through taxonomies and ontologies (CSA)
Topic Identifier:	DT-NMBP-39-2020
Type of Action:	CSA Coordination and support action
Deadline(s):	05.02.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/dt-nmbp-39-2020

Specific Challenges: Standardised data documentation with metadata based on an agreed ontology[1] across the domains covered by this work programme is critical for the widest use of data and, ultimately, reliable end-user products.

The challenge is for all relevant stakeholders to develop, test, validate and agree on data documentation to ensure consistency and interoperability of intra-and cross-domain specific taxonomies[2] and ontologies. The standardised data documentation should be developed with a global ambition through international cooperation.

Scope: The proposals should develop EU-wide standardised data documentation that ensures interoperability of data. The data documentation should take the form of an actionable ontology that consists of a top level ontology, adapted existing domain ontologies (such as manufacturing, materials processing, materials modelling, nano-safety, characterisation and life cycle sustainable analysis ontologies), complemented by new ontologies for other subdomains,.

In particular, the projects should:

- Network relevant stakeholders to collect input on existing data documentation;
- Develop and agree on a top level ontology to connect relevant subdomains of this work programme
- Harmonise existing ontologies with respect to the top level ontology.
- Develop and agree on new ontologies for relevant sub-domains of this work programme

- Deliver at least ten demonstrators on the use of ontologies (decision systems, innovation projects, workflows, quality assurance, guided AI and data parsing…)

Projects should liaise with the work done under the European Open Science Cloud, standardisation bodies, the **Research Data Alliance** and other relevant initiatives. Existing taxonomies and/or ontologies relevant for this part of the programme should be taken into account. Therefore, proposals should foresee a dedicated work package for this cooperation and earmark appropriate resources.

Proposals should guarantee the maintenance and further development of the ontology and data documentation after the project duration. The vast majority of the deliverables, including subsequent taxonomies and ontologies, should be public.

The Commission considers that proposals requesting a contribution from the EU around EUR 4 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Proposals must address all the following impact criteria, providing metrics to measure success where appropriate

- Enable a standardised and operational data documentation at intra- and cross-across domains covered by this work programme that meets the FAIR data principles;
- Enable a mechanism to allow practical and user-friendly re-usability of data across domains and industrial sectors;
- Enable a maintained and continuously developed ontology and data documentation to ensure long-term relevance and implementation;
- Facilitate uptake of new project results;
- Improved ability to build interoperable software solutions in materials, process and manufacturing;
- A better integrated materials, processes, and manufacturing development environment in Europe from networking academics, innovation hubs and industry.

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[1] An ontology consists of definitions of vocabulary, classes and relations between classes

[2] A taxonomy consists of definitions of vocabulary and classes

Horizon 2020 Pillar: Industrial Leadership

Programme: Leadership in enabling and industrial technologies (LEIT)

Call Title: Space 2018-2020

Call Identifier: h2020-space-2018-2020

Topic Title: Copernicus market uptake

Topic Identifier: DT-SPACE-01-EO-2018-2020

Type of Action: IA Innovation action

Deadline(s): 05.03.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/dt-space-01-eo-2018-2020

Specific Challenges: Copernicus, the Union's Earth observation and monitoring programme produces a wealth of data and information services on the Earth, its lands, atmosphere, oceans and inland waters, as well as on climate change and in support of disaster management and security. Copernicus data and information services are available with a free and open data licence.

Copernicus data is an integral part of the European Data Economy. Europe needs to strengthen its position as provider of products and services based on data, enabling new market opportunities.

Copernicus data value will be greatly enhanced by its integration with data assets contributed by other vertical domains (i.e. not necessarily from the space/geospatial sector) as well as by leveraging the synergies with EGNOS/Galileo to seize new market opportunities. Many vertical domains, other than space, can benefit from the use of Copernicus.

Mature software technologies such as big data processing and linking technologies, machine learning and artificial intelligence, are widely developed also within the LEIT-ICT Work Programmes of H2020, shall be adopted to offer user-friendly solutions at the scale of the large quantities of data involved. They shall be adopted to contribute to the digitization challenges of the European industry by opening up innovative business avenues and to support societal challenges.

Real-world industrial/commercial requirements, or societal needs, shall drive the Innovation Actions so that the projects' results can find their logical path towards market adoption.

Scope: Actions under this topic should be instrumental to help European companies innovate, develop and bring to market new or improved products and services by exploiting Copernicus data assets and, whenever relevant, the link with European satellite positioning/navigation/timing technologies.

Copernicus data will be at the core of the data value chains and integration activates needed to fulfil the industrial requirements that will drive the proposals.

Proposals should adopt state-of-the-art ICT technologies, such as big data processing and linking technologies, machine learning and artificial intelligence to address the challenges of making sense of large volumes of diverse data from distributed sources, at the scale required to address European and global challenges.

Proposers are strongly encouraged to make use of existing European data infrastructures such as (but not limited to) Copernicus' DIAS platforms, European open data portals, industrial data platforms, and explore synergies with EGNOS/Galileo signals and services whenever those are relevant. Use and re-use of existing data and computing assets is also strongly recommended.

The participation of industry is required to define the project's industrial requirements from the very beginning of the action and to take ownership of the results.

End users (i.e. professional experts and decision-makers as opposed to researchers or software developers) should also be involved to rigorously test the project's solutions to make sure the human factor is considered appropriately.

Proposals must demonstrate that they have access to appropriately large, complex and realistic data sets, in addition to Copernicus. The data assets to be used in the Action should be described in the proposal.

Solid, quantitative and innovative business models should support the proposal giving evidence of the expected industrial, commercial, or societal benefit, and demonstrating a plan towards sustainability after the project's end.

A clear distribution of IPRs amongst the members of the consortium is expected.

For proposals under this topic:

- The participation of at least one industrial partner is mandatory, and the participation of SMEs and start-ups is encouraged;
- Involvement of post-graduate scientists, engineers and researchers and promotion of gender balance is also encouraged, for example through professional work experience or through fellowships/scholarships as applicable;
- A business plan and evidence of user engagement is compulsory and is to be provided as part of the proposal, to demonstrate the user need and sustainability of the project.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1 and 3 million would allow this specific challenge to be

addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Establishment of new sustainable data value chains with Copernicus data at their core with a commercial value;
- Substantial increase in the market of the number of products and services enabled by integrating Copernicus data across sectors with state-of-the-art innovative technologies, able to generate growth and new jobs;
- Enhance European industry's potential to take advantage of market opportunities and establish leadership in the field, as well as boost business activity;
- Increased market share for European companies in the supply of innovative geospatial products and services.

Cross-cutting Priorities: **Blue Growth**, Socio-economic science and humanities

Horizon 2020 Pillar: Industrial Leadership

Programme: Leadership in enabling and industrial technologies (LEIT)

Call Title: Space 2018-2020

Call Identifier: h2020-space-2018-2020

Topic Title: Big data technologies and Artificial Intelligence for Copernicus

Topic Identifier: DT-SPACE-25-EO-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 05.03.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/dt-space-25-eo-2020

Specific Challenges: Copernicus is producing increasingly large data volumes that require specific Big Data technologies and Artificial Intelligence (AI) methods to analyse it and manage it.

The adoption of Big Data technologies in the space industry represents a significant opportunity to innovate. As an example, performance and/or automation of processes can benefit and greatly improve the capabilities to deliver timely services.

In addition, solving the big data management challenges of the integration, processing and analysis of Copernicus data with other distributed data sources from other industrial domains other than Space will open up new market avenues and strengthen European leadership in earth observation applications and technologies.

Copernicus' data and applications are part of the European Data Economy and its value chains. As such, this call is promoting the collaboration of ICT actors, both from industry and academia, with the earth observation/space stakeholders.

Scope: Development of big data technologies and analytics, and AI methodologies addressing industrial requirements and/or societal challenges with Copernicus' earth observation data at their core, scaling up to the increased data volumes of Copernicus' archives. They shall aim to develop new, enabling, operational solutions to improve capabilities and performance of the Copernicus value chain: from access and discovery of data and information to integration with other data sources and analysis to delivery and applications. Proposals can address individual elements of the value chain or the value chain as a whole, and should provide quantitative measures of the progress beyond the state of the art.

Proposals are also required to seek end user involvement to drive the research with their requirements and test the developed solutions, with a clear path to the exploitation of the results.

Proposals are strongly encouraged to make use of existing European data infrastructures such as (but not limited to) Copernicus' DIAS and to develop solutions that can be plugged into DIAS and/or other existing European data infrastructures to enhance their capabilities and offer.

Whenever relevant, proposals are invited to explore the synergies with EGNOS/Galileo signals and services.

The "other distributed data sources" should be available to the project and described in the proposal.

For proposals under this topic:

- Participation of industry, in particular SMEs, is encouraged;
- Involvement of post-graduate scientists, engineers and researchers and promotion of gender balance is also encouraged, for example through professional work experience or through fellowships/scholarships as applicable.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 and 4 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Increased capacity of processing and analysing large volumes of Copernicus earth observation data, with powerful tools that demonstrate their applicability in real-world settings;
- Increased performance and/or automation of processes involving the processing of Copernicus data;
- Enhanced, innovative applications to support the Copernicus DIAS platforms;
- Demonstrated adoption of results of the Copernicus data analysis in decision-making (in industry and/or society).

Cross-cutting Priorities: **Blue Growth**

Horizon 2020 Pillar:	Industrial Leadership
Programme:	Leadership in enabling and industrial technologies (LEIT)
Call Title:	Space 2018-2020
Call Identifier:	h2020-space-2018-2020
Topic Title:	Copernicus evolution: new concept for an innovative and holistic solution for Sentinels calibration & validation
Topic Identifier:	LC-SPACE-19-EO-2020
Type of Action:	CSA Coordination and support action
Deadline(s):	05.03.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-space-19-eo-2020

Specific Challenges: Copernicus is addressing all domains of the Earth environment, including the atmosphere, the land (including inland waters) and the oceans. The EU environmental programme Copernicus implements six services that benefit significantly from measurements acquired by EO satellites, the so-called Sentinels series. The first generation of Sentinels includes 6 families of satellites (from S1 to S6), each family having 4 members (from A to D) and additional satellites providing complementary measurements to the existing fleet are foreseen in the context of the expansion of the Copernicus programme.

The utility of the large and growing volume of satellite observations and derived data products for operational services is crucially dependent on the proper calibration of the instruments and validation of the products. Global monitoring over extended periods is expected to require even more rigorous inter-calibration in the future.

These routine calibration/validation (cal/val) exercises are required in order to relate the space measurements to internationally recognized standards to ease comparability of satellite measurements taken at different times and locations, by different instruments and to facilitate cross-validation with other types of measurements and model output.

Cal/val activities are a fundamental aspect of the entire Copernicus programme as the essential connection between Space Component, in-situ Component and Services. Data sharing and data exchange principles and processes should be well defined and promoted by the Programme.

The dimension and breadth of such an operational programme calls for a commensurate instrumental support to perform the required cal/val procedures.

Such procedures are currently implemented through existing infrastructures, which are strictly tied to individual missions, set up in an ad hoc manner by different agencies and institutions to provide the basic needed support.

The lack of sustainability in the maintenance of the calibration and validation infrastructures is clearly not in balance with the dimension of the Copernicus space component and its ambitions for evolution in future. Often there is a strong dependency on research infrastructures which is not fit-for purpose in the context of an operational Programme such as Copernicus.

Moreover, the lack of sustainability goes along with a lack of a holistic approach, e.g., a minimum set of standard instruments to be operated through optimised sites or "supersites", which would in addition enable an economy of scale. Such “supersites” of fiducial reference measurements may have to be domain specific to cover various geophysical media, but also across domains as the case for the atmosphere in particular. Many issues are at stake when setting up a ground-based network of fiducial reference measurements including the need for optimization depending on the foreseen applications.

Scope: The action should define an innovative and holistic strategy for the cal/val activities for and across all existing and planned Sentinels in an operational perspective to better access to the necessary infrastructure for Fiducial Reference Measurements.

A number of specific questions need to be addressed:

- The clear identification of cross-Sentinels calibration requirements (from level 0 to level 1 data) and of validation requirements (from level 1 to level 2 data).
- The clear identification of different cal/val sources: e.g. other satellites, on board calibration, in situ networks, regular airborne campaign, ad hoc site characterization with an overview of existing relevant networks, their distribution and current resourcing.
- The comparative evaluation of various methodologies including those which are operational and those which are in a pre-operational status, evaluation of the steps needed to bring the latter to an operational level.
- The project should design a comprehensive operational approach for medium and long term cal/val strategy for and across all existing and planned Sentinels with a particular focus on:
  - The definition of appropriate reference networks and gap analysis with respect to existing ones, an assessment of the sustainability and operational status of the existing networks, an assessment of "interoperability" needs between networks;
  - The definition of the characteristics and the location of optimised sites or “Sentinel supersite(s)”, or where necessary of supersite definition per domain (land, atmosphere and ocean);
  - An evaluation of the direct impact on level 3 products when relevant;
  - A proposed solution that should be modular and expandable in light of the potential future Sentinels in the context of the Copernicus evolution.
- The linkage between EU and non-EU aspects of the networks needs and identifying the necessary non-EU partnerships to prioritise.

- The definition of a long-term strategic reference scenario for the implementation of the required infrastructure.

Efforts should be made to establish counterparts and strong linkages with the international community working on issues relating to Calibration and Validation, in particular with the European Space Agency and EUMETSAT and established standards in place through the CEOS Working Group on Cal/Val and Quality Assurance for Earth Observation framework (QA4EO) as well as the operational elements in place through the WMO Global Space-based Inter-calibration System (GSICS).

The project should take into account relevant on-going coordination activities performed by the European Environment Agency (EEA) as the Entity entrusted by the European Commission to coordinate activities within the Copernicus In Situ component.

The project should also propose recommendations and establish a roadmap to develop this innovative "Sentinels cal/val concept" with specific reference to the "Copernicus supersite(s)" definition and their distribution, including considerations on data quality check, harmonization, traceability, distribution and conservation process of related information.

For proposals under this topic:

- Involvement of post-graduate scientists, engineers and researchers and promotion of gender balance is encouraged, for example through professional work experience or through fellowships/scholarships as applicable.

The Commission considers that proposals requesting a contribution from the EU of EUR 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Consistent approach for the calibration and validation for and across Copernicus Sentinels
- Coordination of networks and space agencies and institutions contributing to Copernicus Sentinels cal/val activities

Cross-cutting Priorities: **Blue Growth**

Horizon 2020 Pillar: Industrial Leadership

Programme: Leadership in enabling and industrial technologies (LEIT)

Call Title: Space 2018-2020

Call Identifier: h2020-space-2018-2020

Topic Title: Copernicus evolution: Mission exploitation concept for WATER

Topic Identifier: LC-SPACE-24-EO-2020

Type of Action: CSA Coordination and support action

Deadline(s): 05.03.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-space-24-eo-2020

Specific Challenges: In the frame of the space strategy and with the willingness to ensure the sustainability and the development of an enhanced capacity for the evolution of the Copernicus programme, several mission concepts are developed to support areas such as agriculture, forest, water resources, climate change, or polar challenges. In addition, the design and evolution of the current generation of Sentinels will have to be prepared to ensure the enhanced continuity of the current Copernicus services. Existing and planned space component capacities will be also potentially available in terms of contributing missions.

Data and product information related to water and hydrological / hydrodynamic processes are already developed or used in several Copernicus services: the global land service, the pan-European and local land service, the emergency service, the climate and the marine monitoring service. Their developments are performed separately and in the specific purpose of each service without considering the global understanding and better representation of the water cycle from regional to global scale.

Additionally, the user requirements process undertaken by the European Commission has also identified many requirements on data and products to water issues (in a broader sense: from water reservoirs to rain, river runoffs, ice or water in soil and groundwater) to support many policies areas: the EU Water Policy - Framework Directive (2000), the Bathing Water Directive (2006), the Flood Risk Directive (2007), but also indirect support to policies related to the Agriculture, inland transport, food security, energy and hydropower that commonly focus on a local-regional scale. The efforts made at international level for water management should also be taken into account, including the UN Water coordination mechanism and the World Bank Water Partnerships. The

Sustainable Development Goal no.6 (Clean Water and Sanitation) ensuring availability and sustainable management of water and sanitation is fully embedded into this international context.

Those requirements can only be fulfilled by addressing all issues relating to the global water cycle. The coordination and integration of the water monitoring approach should be improved inside the Copernicus land service and along all the other services. The portfolio should be reinforced with the view of monitoring with a better consistency inland waters on and beneath the Earth surface (mapping water storage and water transport processes, as well as hydrodynamic processes, water quality, hydrological cycle, connection with ocean processes, …) providing a real support to policy actors and to decision-makers.

The development, the implementation and eventually the operation of an enhanced European space capacity including possible innovative expansion missions and the enhanced continuity of Sentinels is an opportunity to better address this crosscutting issue.

It will need the involvement of various players: such as National Space Agencies, European and Member States Institutions (e.g Member States' Water Authorities), International Organisations, the private sector, operators of in-situ measurement stations, and of leading scientific experts in the identified fields such imagery processing, aquatic optics, data fusion and data assimilation of in-situ measurement stations and networks and hydrological / hydrodynamic modelling for different water storage and flux components.

Initiating and consolidating the establishment of this community and thus reaching the critical mass required for addressing such a challenge will need to take into account:

- The catalogue of products in the Land component of Copernicus (i.e. High resolution layers with water and wetness layers, riparian areas, water products from the global land service at EU and global scale…);
- Current and planned activities led by the Copernicus Programme (space component and services, i.e. land, emergency, climate, marine) for future services;
- The relevant H2020 and ESA projects.

Scope: The main goal is to analyse current and planned EO space capacities together with innovative processing, modelling and computing techniques to reinforce the existing portfolio offered under Copernicus and to propose an integrated approach for a coherent and consistent inland water monitoring system.

A specific attention should be paid to Copernicus core services providing an economy of scale at EU level, how to avoid also duplication of effort between the six services and to support and benefit from the innovation power of the market driven the industry. Through this Copernicus evolution action, specific elements should be addressed:

- improved quality of inland water variables with remote sensing at high and very high resolution (spatial, temporal and radiometric) considering specific

pre-processing cloud screening and atmospheric correction, providing objective harmonized measured over different water (e.g. with gradients of trophic status, optical properties), water storage and flux components types with methods from regional to global applicability, building on a multi-sensor and sensor-independent approach to retrieve seamless and gap-filled products;

- development of high level biogeochemical products, beyond basic variables for water quality and food web modelling or analysis;
- development of mixed EO / model approach leading to enhanced key variables with hindcast and forecast features, continuity of altimetry water-levels and water storage consistent between land and ocean, integrative approach of water at atmosphere (e.g. precipitation) combined with land and ocean, water hydrological cycle and its hydrodynamics provided seamlessly along the hydrographic networks, lakes and rivers including the transition from land to ocean;
- Development of temporal and change detection approaches based on the analysis of existing times series of satellite observations of inland waters, including water availability, water quality, water storage, water fluxes, temperature, ice conditions of rivers, lakes, basins and coastal areas, including socio-economic data of the catchment area;
- Development of innovative methodologies for uncertainties characterisation (including in-situ data and crowd sourcing).

This should result in the assessment, for the long term, of the best mission concept for water with expected performances, combining existing, next generation and expansion missions under study plus in-situ or non-space observation capacities.

Activities should coordinate ongoing efforts, include mutual identification of research and infrastructural gaps, identify a clear delineation between a core service and a downstream application and facilitate a cooperation of further research and development to be undertaken to reach sufficiently mature capacities for an operational integration as a subsequent step.

The coherence between the space component and the service related requirements should be ensured.

For proposals under this topic:

- Involvement of post-graduate scientists, engineers and researchers and promotion of gender balance is encouraged, for example through professional work experience or through fellowships/scholarships as applicable.

The Commission considers that proposals requesting a contribution from the EU of EUR 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Increased coverage of EU policies clearly identifying which and how the project would like to address them;
- Based on Copernicus services and existing and future Copernicus missions, define a scenario with the use of new operational capacities and to improve the interactions with non-EO communities on the inland water domain.

Cross-cutting Priorities: **Blue Growth**

Industrial Leadership, Societal Challenges

Horizon 2020 Pillar: Industrial Leadership;Societal Challenges

Programme: Leadership in Enabling and Industrial Technologies - Space

Call Title: Space 2018-2020

Call Identifier: h2020-space-2018-2020

Topic Title: Copernicus evolution: Research activities in support of the evolution of the Copernicus services

Topic Identifier: LC-SPACE-18-EO-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 05.03.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-space-18-eo-2020

Specific Challenges: Copernicus operational services are not static, but need to evolve with recognised and emerging user requirements and EU policies.

R&D activities which are suitable for this call are identified to this end by the Commission, together with the Entrusted Entities, for each service. The challenge is to clearly demonstrate if and under which conditions an evolution of the operational service portfolio is appropriate and in line with the Copernicus Programme.

Scope: The proposal should tackle only one of the following sub-topics. For the chosen sub-topic the proposal should clearly identify one (or more) core product(s) to be developed as a completely new or improved product.

The Commission, together with the Entrusted Entities, has identified for each service (sub-topic) the areas of Copernicus R&D interests:

- Copernicus Emergency Monitoring Service (CEMS): resilience to climate risk, population exposure risk (e.g. in coastal areas, flood prone areas, areas exposed to droughts…). The proposed activities need to consider the existing CEMS framework and describe how they can contribute to a fully integrated risk cycle monitoring service
- Copernicus Monitoring Atmosphere Service (CAMS): Up-to-date emissions of reactive gases and aerosol based on inverse modelling, Improve atmosphere monitoring using data assimilation and preparation for upcoming sentinels (with a focus on Sentinel-4), Integrated soil-vegetation-atmosphere modelling and data assimilation for representing emission and deposition of atmospheric pollutants.

- Copernicus Climate Change Service (C3S): exploitation of seasonal forecasting systems as natural integrator of Copernicus Services, enhancement of predictive skills at seasonal timescales, consistent climate re-analysis of the Earth system, improvement in predicting variations of the climate system over the next few years and decades, linkages between current extreme weather events such as droughts, heat waves or floods to anthropogenic climate change and/or natural climate variability.
- Copernicus Marine Environmental Monitoring Service (CMEMS): Advanced marine data assimilation techniques for physics (e.g. ensemble methods, assimilation of future satellite observations like swath altimetry and surface currents), improvement of biogeochemical products for the carbon cycle (CO2 ocean component), water quality and food security (food web modelling, habitats), with assimilation of satellite and in-situ data, improved biogeochemical models, coupled physics and biogeochemistry models and use of new in-situ observations (e.g. BGC Argo) to validate biogeochemical models.
- Copernicus Land Monitoring Service (CLMS): essential ecosystem variables for natural capital accounting, HRL for agriculture, forest and urban monitoring, CLC+, environmental compliance, support to sustainable development goals, exploitation of mid and high resolution satellite combination for continuous environmental change monitoring.
- Security New concepts for applications based on the integration of relevant information derived from space or non-space sources, current services or other value-added applications, targeted to support civil protection and security. New algorithms for automated monitoring and detection of changes and patterns of life. Those activities should also aim at bridging the gap between demand and supply, complementing the offer of the Copernicus Security services and enlarging its user base.

Actions should take into account the existing portfolio of the services and clearly define to what extent main model, algorithm, tool and technique should be improved to generate new or better products.

Actions aim at demonstrating the technical operational feasibility of the selected product(s).

The proposed development should be modular and scalable. The project should provide a proof-of-concept or a prototype (e.g. system element) demonstrating the feasibility of the integration in the existing core service. This new “system element” should also guarantee the expandability required for the integration of new data from potential space or no-space new mission/sensors.

During the development of the project, the team taking into account the delineation between Copernicus core services and downstream services, should clearly identify the right context of the proposed product(s). The border delineation takes into account the principles of subsidiarity and proportionality, the avoidance of duplication, and the facilitation of user uptake.

The proposal should also investigate to what extent the proposed evolution could be a candidate for the operational Copernicus service in terms of cost-benefits, calendar and operational feasibility.

R&D activities should aim at a better integration of space research with other non-space domains (e.g citizen science including social media) focusing in particular on policy areas addressing global and societal challenges highlighting horizontal synergies and multidisciplinary approaches. In particular, proposals should clearly mention which of the UN Sustainable Development Goals the project will support.

New IT tools should be considered and innovative solutions should be proposed for a better data exploitation, processing and distribution, e.g.: cloud and HPC computing, distributed computing, Artificial Intelligence, machine learning (e.g. for automatic feature recognition), ensemble modelling, model coupling & nesting, software as-a-service.

Additionally, the operationalisation of the research results should receive active attention during the course of the project to strengthen the readiness for an operational deployment in the future, including the conditions for making available, for re-use and exploit the results (including IPR) to the entities implementing the EU Copernicus programme. The software should be open licensed in order to use, copy, study, and change it in any way.

Proposers are advised to consult information on the Copernicus programme in general at https://www.copernicus.eu/en, the availability of Copernicus Sentinel Data, access to Copernicus Contributing Mission data at the Commission's website (https://www.copernicus.eu/en/access-data).

It should be noted that funding of the H2020 project in no way commits the Commission or the Copernicus service operators to deploy the outcomes from the research in the Copernicus operational services.

For proposals under this topic:

- Participation of industry, in particular SMEs, is encouraged;
- Involvement of post-graduate scientists, engineers and researchers and promotion of gender balance is also encouraged, for example through professional work experience or through fellowships/scholarships as applicable.

At least one proposal per sub-topic shall be selected for funding.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1 and 1.5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Increased coverage of EU policies, clearly identifying which and how the project intends to address them;
- Integration of different observation capacities with a clear demonstration of an increase in the service performance (compared with the existing one);
- The proposed proof-of-concept or prototype, as outcome of the project, should clearly demonstrate an improvement of the Copernicus service evolution.

Cross-cutting Priorities: **Blue Growth**

Societal Challenges

Horizon 2020 Pillar: Societal Challenges

Programme: Health, demographic change and wellbeing

Call Title: Better Health and care, economic growth and sustainable health systems

Call Identifier: h2020-sc1-bhc-2018-2020

Topic Title: Innovative actions for improving urban health and wellbeing - addressing environment, climate and socioeconomic factors

Topic Identifier: SC1-BHC-29-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 24.09.2019, 07.04.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sc1-bhc-29-2020

Specific Challenges: The natural and built[1] environment as well as the social fabric are critical determinants of health and well-being. Three quarters of the European population now live in cities and urbanisation continues at high speed, driven by economic growth and employment opportunities. The related environmental changes e.g. pollution of air and water, transportation problems, reduced social cohesion and stress affect physical as well as mental health. Although health has improved in the EU over the last decades, large differences in health still exist between and within all countries in the EU. These differences are caused by many factors such as living conditions, health-related behaviour, education, occupation and income, health care. Some of these inequalities are widening[2]. As European cities are growing, they are increasingly taking action and introducing policies to become more sustainable and liveable, adapting to climate change, investing in a range of smart and innovative solutions such as clean and sustainable transport, higher energy efficiency and stronger social cohesion. Similar initiatives are underway e.g. in **Canada**, USA as well as in Asia and Africa which could provide valuable knowledge.

At EU level, the Urban Agenda for the EU[3] focuses on improving the life of their citizens for example through the development of digital solutions, reducing urban poverty and better integration of migrants and refugees. The headline targets in the EU2020 strategy aim to turn the EU into a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion[4].

Improving urban health and reducing health disparities can be achieved by changes in individual behaviour as well as policies such as urban design and sustainable transport, (re)creating green and blue space or improved housing standards. There is a need to address public policies across sectors to achieve health benefits, systematically taking into account the health implications of decisions, to seek synergies, and avoid harmful health impacts (health in all policies[5]).

Scope: European research should engage to build the evidence base of effective policies, developing and testing new initiatives to improve urban health and environment in Europe. Given the variety of national experiences across European countries and regions, there is an important potential to learn from each other's practices and develop innovative actions for urban health.

Proposals should develop and test effective actions and/or policies for improved urban health and wellbeing in Europe. Where applicable, health inequalities and environmental aspects should be addressed. These actions or policies should also be assessed for cost-effectiveness as well as barriers and facilitators to implementation. Proposals should address improved physical or mental health, or both, while considering the relevant socio-economic and/or environmental determinants of health. They could address any sector (with priority on other sectors than health care) or policy area relevant to achieve a lasting health improvement. Proposals should include analysis of vulnerable groups and gender aspects and address any such inequities in the design of interventions. Research teams should bring in all appropriate scientific disciplines to design and test interventions. This includes social scientists not least for their role on behavioural aspects

In order to link research to practical needs and user demands, teams should include other relevant parties in urban health, building partnership with stakeholders such as policy makers, users, business, and local communities. Proposals should address the need for more systematic data collection on urban health across the EU, to allow better analysis and conclusions. This may include the linking up with relevant population based cohorts.

As urban health is of concern in many regions of the world, proposals should foresee the possibility to link up internationally with other relevant urban health initiatives. Proposals should include in their budgets funds for participation in at least one international meeting gathering urban health initiatives relevant to the research.

The Commission considers that a proposal requesting an EU contribution between EUR 4 and 5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- More robust evidence for policy making on improved urban health in the EU
- Improved population health, physical and/or mental, in urban areas of the EU
- Reduced health inequalities in urban areas

Cross-cutting Priorities: Gender, Open Innovation, Socio-economic science and humanities

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[1] Man-made structures, features, and facilities viewed collectively as an environment in which people live and work (https://en.oxforddictionaries.com/definition/built_environment)

[2] http://www.health-inequalities.eu/about-hi/health-inequalities-in-the-eu

[3] https://ec.europa.eu/futurium/en/urban-agenda

[4] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF

[5] http://www.who.int/healthpromotion/conferences/8gchp/statement_2013/en

Horizon 2020 Pillar: Societal Challenges

Programme: Health, demographic change and wellbeing

Call Title: Better Health and care, economic growth and sustainable health systems

Call Identifier: h2020-sc1-bhc-2018-2020

Topic Title: **Global Alliance for Chronic Diseases** (GACD) - Prevention and/or early diagnosis of cancer

Topic Identifier: SC1-BHC-17-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 07.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sc1-bhc-17-2020

Specific Challenges: The **Global Alliance for Chronic Diseases**[1] (GACD) call will focus on implementation research proposals for the prevention[2] and/or early diagnosis of cancer in Low and Middle-Income Countries (LMIC) and/or in vulnerable populations[3] in High- Income Countries (HIC)[4].

The world is facing a critical healthcare problem due to ageing societies, unhealthy lifestyles, socio-economic inequalities, and a growing world population. Cancer is becoming one of the most important public health problems worldwide. In 2018, it is estimated that 181 million[5] people have been diagnosed with cancer and 9.6 million have died from it. Predictions suggest that 30 million people will die from cancer each year by 2030, of which three-quarters in low- and middle-income countries (LMICs).

With an estimated 30-50% of avoidable cancers, it is a leading cause of premature death, reducing a country's productivity. Current cancer prevention and control do not fully reflect ethnic, cultural, environmental, socio-economic and resource differences. In particular, limited implementation research is conducted on cancers primarily found in LMICs and vulnerable populations in HIC. In order to achieve the United Nations' sustainable development goal 3.4[6], implementation research and healthcare efforts are needed to prevent and control cancers in these countries and populations.

Scope: Proposals should focus on implementation research for the prevention and/or early diagnosis of cancer on in LMIC and/or in vulnerable populations in HIC. Proposals should build on interventions with promising or proven effectiveness (including cost-effectiveness) for the respective population groups under defined

contextual circumstances. For promising interventions, a limited validation period can be envisaged. However, the core of the research activities should focus on their implementation in real-life settings. The proposed interventions should gender-responsive.

The aim should be to adapt and/or upscale the implementation of these intervention(s) in accessible, affordable and equitable ways in order to improve the prevention and early diagnosis of cancer in real-life settings. Interventions should meet conditions and requirements of the local health and social system context and address any other contextual factors identified as possible barriers.

Each proposal should:

Focus on implementation research addressing prevention, and/or early identification strategies derived from existing knowledge about effective and/or promising interventions.

For screening interventions, the pathway to referral for positive cases should be included.

Include a strategy to test the proposed model of intervention and to address the socioeconomic and contextual factors of relevance to the targeted region and community.

Lead to better understanding of key barriers and facilitators at local, national and international level that affect the prevention and/or early diagnosis of cancer.

Include health economics assessments as an integral part of the proposed research, including considerations of scalability and equity.

Propose a pathway to embed the intervention into local, regional or national health policy and practice, addressing:

A strategy to include policy makers and local authorities (possibly by being part of the consortium), as well as other relevant stakeholders such as community groups, patient groups, formal and informal carers and any other group, where ever relevant from the beginning of the project, which will contribute to the sustainability of the intervention, after the end of project.

Relevance of project outcomes/evidence for scaling up the intervention at local, national and international level and then scaled-up appropriateness with respect to the local social, cultural and economic context.

Research under GACD involves regular exchange of research findings and information across participating projects by means of cross-project working groups and annual joint meetings. Wherever feasible, projects should harmonise and standardise their data collection and exchange data. Applicants must budget for annual costs of having two team members participate in one annual face-to-face meeting of the Annual Scientific Meeting (location to vary annually). Applicants must budget their involvement in GACD working groups and other GACD wide activities, beyond their projects.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1 to 3 million would allow this specific challenge to be addressed

appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The proposals should address one of or combinations of:

- Advance local, regional or national cancer prevention and/or early diagnostic health policies, alleviating the global burden of cancer;
- Establish the contextual effectiveness of cancer intervention(s), including at health systems level;
- Improve tailored and affordable prevention and/or early diagnosis;
- Provide evidence and recommendations to national programmes and policies focusing on prevention, screening, and/or early diagnosis;
- Inform health service providers, policy and decision makers on effective scaling up of cancer interventions at local, regional, and national levels, including affordability aspects for users and health providers;
- Reduce health inequalities and inequities, including due consideration of socio-economic, gender and age issues where relevant, in the prevention and/or early diagnosis of cancer at both local and global levels;
- Provide pathway to cancer care for the patients diagnosed with cancer;
- Maximise the use of existing relevant programmes and platforms (e.g. research, data, and delivery platforms);
- Contribute to the United Nations' Sustainable Development Goal 3.4.

Cross-cutting Priorities: International cooperation, Socio-economic science and humanities

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[1] http://www.gacd.org/

[2] Tertiary prevention is excluded from the topic.

[3] Proposals should demonstrate the vulnerability of the targeted population in HIC.

[4] https://databank.worldbank.org/data/download/site-content/CLASS.xls

[5] GLOBOCAN and CONCORD-3

[6] https://www.un.org/sustainabledevelopment/health/

Horizon 2020 Pillar: Societal Challenges

Programme: Health, demographic change and wellbeing

Call Title: Better Health and care, economic growth and sustainable health systems

Call Identifier: h2020-sc1-bhc-2018-2020

Topic Title: Creation of a European wide sustainable network for harmonised large-scale clinical research studies for infectious diseases

Topic Identifier: SC1-BHC-35-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 07.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sc1-bhc-35-2020

Specific Challenges: Infectious diseases pose a serious threat to human health and there are many challenges and needs to efficiently protect citizens across Europe and beyond. There is still a need to understand how antibiotics and other interventions work on patients and how to better assess the effectiveness of vaccines. Innovation is needed to overcome the problem of antimicrobial resistance, and in case of emerging epidemics and pandemics, a timely response to a rapidly emerging infectious diseases is significantly challenging and often delayed. In this context there is a need to establish a pan-European clinical research network that has the capacity and capability to directly enrol patients with infectious diseases, and to increase efficiency for testing and developing new diagnostic, preventive and/or therapeutic strategies and therapies. Europe should also contribute to the **G7** aim concerning the need to establish a global clinical studies network on drug resistance that provides access to a large clinical research infrastructure for the design, coordination and conducting of clinical trials and studies. It should also respond to the Council Recommendation on strengthened cooperation against vaccine preventable diseases[1], which calls for the reinforcement and establishment of novel infrastructures to increase the effectiveness and efficiency of EU and national vaccine R&D funding.

Scope: Proposals should set up a European-wide multidisciplinary network able to provide a platform for a rapid response in the conduct of clinical studies in relation to any severe infection. The initial clinical studies to be performed should be included in the proposal, whereas criteria and processes for including

further clinical studies in the project should be clearly described. This should include provisions for flexibility (including re-allocation of budget and de-prioritisation) in case of new scientific developments and in particular the need to address newly or re-emerging infectious diseases.

The proposed consortium should comprise expertise of stakeholders from academic organizations, SMEs, larger industry, patient organisations, ethics committees, public health bodies and regulators. It is expected to perform clinical studies and further advance clinical research in the field of infectious diseases. It should develop new, or make use of existing, standardised methodological approaches to rapidly perform large-scale clinical trials with the view of delivering optimal diagnosis and preventive or therapeutic interventions to patients affected by infectious diseases, taking into account sex and gender differences when relevant. Applicants should build on the results of successful European collaborative initiatives such as PREPARE[2] and COMBACTE[3]. Proposals should build on established structures for infectious disease clinical research at national or regional scales. To ensure the common benefit of the outcomes, it should also work in cooperation with existing global experts networks and infrastructures such as ECRIN[4]and BBMRI[5]. Proposals should in particular take into account the available result of the H2020-funded project ECRAID Plan (project resulting from SC1-HCO-08-2018). The network should address all aspects of clinical trial conduct, from study preparation and design, trial management and reporting. It should develop and allow for innovative research approaches and enable flexibility in responding to unpredictable events during its implementation. The sustainability of the network should be carefully worked out in the proposal. Furthermore, the network should create synergies with global initiatives, enabling quick and smooth interactions and collaboration across the world.

Special attention should be given to EU Member States and Associated Countries with currently limited capacity to perform clinical trials.

The Commission considers that a proposal requesting an EU contribution between EUR 25 to 30 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amount.

Expected Impact:

- Reduced cost and time through efficiently implemented clinical trials for diagnosis, prevention and treatment of infections.
- Create and strengthen the operational capacity and the infrastructures for providing real-time evidence for optimal medical intervention and practice in infectious diseases.
- Contribute to existing EU policies, including the Council Recommendation on strengthen cooperation for vaccine preventable diseases, and the Communication "A European one health action plan against Antimicrobial Resistance (AMR)”[6].
- To ensure the EU´s worldwide leadership in controlling and responding to infectious diseases.

- Foster links between existing networks in Europe and other countries/regions in the world to optimise a coordinated response to infectious diseases for innovation and delivery of new preventive and therapeutic technologies.
- Foster collaboration between stakeholders from academic organizations, SMEs, larger industry, patient organisations, ethics committee, public health bodies and regulators.

Cross-cutting Priorities: Gender, International cooperation

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[1] http://data.consilium.europa.eu/doc/document/ST-14152-2018-REV-1/en/pdf

[2] http://www.prepare-europe.eu/

[3] https://www.combacte.com/

[4] http://www.ecrin.org/

[5] http://www.bbmri-eric.eu/

[6] https://ec.europa.eu/health/amr/sites/amr/files/amr_action_plan_2017_en.pdf

Horizon 2020 Pillar: Societal Challenges

Programme: Health, demographic change and wellbeing

Call Title: Better Health and care, economic growth and sustainable health systems

Call Identifier: h2020-sc1-bhc-2018-2020

Topic Title: Actions in support of the International Consortium for Personalised Medicine

Topic Identifier: SC1-HCO-01-2018-2019-2020

Type of Action: CSA Coordination and support action

Deadline(s): 07.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sc1-hco-01-2018-2019-2020

Specific Challenges: Personalised Medicine is a very broad and multifaceted area where success relies on a well-functioning collaboration between several disciplines and different actors. While great advances have been made in some fields of medicine, in particular in stratification of cancer patients and in addressing rare diseases, most of today's healthcare protocols do not include personalised approaches apart from occasional division into broad age groups (children/adults/elderly), sex or ethnicity. Furthermore the prevention aspect of personalised medicine, i.e. identifying individuals prone to develop certain diseases, is largely isolated from treatment options. As is the case for a relatively nascent field there is a need for standardisation of approaches, including for sampling, data storage, interpretation and data exchange and also for clinical trials design and reimbursement models. European countries with their social model of healthcare along with (in several cases) centralised cost reimbursement, are ideally placed to lead the way for an integrated health management system. Many needs for coordination and support activities have been identified by ICPerMed[1], an EU Member States led initiative which includes representatives from most EU countries along with several other European countries, Brazil and **Canada**. The EC currently supports ICPerMed with a grant to operate its secretariat until October 2020[2]. Wider internationalisation of ICPerMed can be underpinned by coordinating networking activities with **third countries**.

Scope: Each action should focus on one of the following fields:

- International aspect: The action should focus on building links with **third countries** by analysing the potential and advantages of collaboration in personalised medicine (PM) with those countries, studying areas of interest for Europe in PM collaboration and promoting international standards in the field. In particular the uptake of personalised approaches in health systems and healthcare should be addressed, taking into account social, cultural, ethical and legal aspects, health economy issues and equitable healthcare. For the 2018 call, the project should focus on CELAC[3] as a group of countries, and for the 2019 call on China. For the 2020 call, the project should focus on countries in Africa[4], linking also into the EU-AU (African Union) policy dialogue and taking into account the new Africa-Europa Alliance for Sustainable investment and Jobs[5]. Alignment with activities of the **Global Alliance for Chronic Diseases** (GACD) and The European and Developing Countries Clinical Trials Partnership (EDCTP) activities should be explored. Special attention should be given to prediction and prevention, and to promoting well-being for all at all ages. Furthermore, the project should seek to integrate local knowledge and practice. Data safety and privacy should be addressed in line with existing standards and legislation. The project should have a duration of at least four years and address sustainability beyond that to ensure longer term structuring effect. Due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, proposals shall include at least one participant based in the international partner region; Africa (2020 call).
- Regional aspect: The action should establish and support networking between regions and interregional cooperation in different European countries, in particular linking remote or sparsely populated regions with regions harbouring critical mass of medical and PM expertise while taking into account broader socio-economic and cultural aspects. The focus of the action can include aspects of genomic analysis, me-Health (mobile and electronic Health), telemedicine etc. but should aim at structuring PM application at regional level. Linkage to existing inter-regional projects (financed by INTERREG programmes) or interregional partnerships of Thematic Smart Specialisation Platforms will be actively encouraged. (2018 call).
- Healthcare- and pharma-economic models for personalised medicine, interlinking European public health approaches with medical practice and financing. The action should carry out studies in support of research in and development of new health- and pharma economic models for PM, including prevention, to capture value and to develop relevant health financing models. Analysing mid- and long-term impacts of innovative products designated for sub-sets of patient populations on the patients themselves and on public health systems. Assessing the benefits of personalised medicine development for citizens and their broader social environment while ensuring patient safety, access, equity, solidarity, data safety and financial sustainability of public health systems in the EU. The action should involve different relevant stakeholders and take into account work being carried out by other EU funded initiatives, such as EUnetHTA[6]. SME participation is encouraged. Results of the studies and workshops should be actively disseminated to a wider

audience, including relevant authorities, professionals and the wider public. (2018 call).

- Standardisation for clinical study design. Establishment of innovative clinical trial design methodology for PM, including guidelines for research and reflection papers. The action should take into account sex/gender differences as well as the work done by relevant stakeholders and authorities such as EMA[7] and the HMA network[8], as well as the European legal framework[9]. SME participation is encouraged. The results of the studies and workshops should be actively disseminated to a wider audience, including, industry, researchers and other professionals. (2019 call).
- ICPerMed secretariat: The project should continue the work done by the secretariat for ICPerMed, e.g. maintenance of existing services, organising the meetings of the ICPerMed Executive Committee, convening dedicated workshops and preparing and issuing updates of the ICPerMed Action Plan. Furthermore maintaining the network of policy makers and funders gathered in ICPerMed and expanding the membership to new interested and complementary partners as well as maintaining communication with all EC funded activities related to ICPerMed (2020 call).

For grants awarded under this topic for Coordination and Support Actions it is expected that results could contribute to European or international standards. Therefore, the respective option of Article 28.2 of the Model Grant Agreement will be applied.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1.5 and 2 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Contributing to the implementation and reach of the ICPerMed initiative; furthermore:

- International aspect: Integrating the country/group of countries into ICPerMed activities. Support wider adoption of standards developed in Europe. Support the EU-AU policy dialogues relevant to research and health (2020 call). Contribute towards the UN Sustainable Development Goal 3: Ensure healthy lives and promote well-being for all at all ages.
- Regional aspect: Strengthened links between European regions setting up or planning personalised medicine healthcare approaches. Aligning research funding with ongoing and foreseen investments e.g. from Structural Funds. Recommendations on best practice in implementing PM at regional level.
- Healthcare- and pharma-economic models: Increased understanding of personalised medicine perspectives on how to capture value, develop institutional support and design relevant payment models. Recommendations for faster translation from discovery to patients'/citizens' access. Contributing to understanding of trends and dynamics in the pharmaceutical markets in relation to increased emphasis of research and development efforts on PM. Suggestions on how savings through prevention can be included in payment and reward models and contribute to the sustainability of public health

systems in the EU. Improved knowledge and understanding among healthcare professionals and the wider public of potential benefits of PM approaches.

- Standardisation for clinical study design: Contribute to standardisation of PM clinical trial design. Demonstrate feasibility and importance of PM approaches. Underpin accelerated market uptake. Improved knowledge and understanding among healthcare professionals, regulatory authorities and industry how best to adapt clinical trials designs to stratified patient populations.
- ICPerMed secretariat (2020 Call): Ensure continuity of the operations of ICPerMed beyond 2020. Increase the visibility of the consortium and ensure openness of the structure. Provide harmonised vision for the further development of personalised medicine. Contribute to the convergence of members' approaches to personalised medicine and further alignment of research efforts in the field.

Cross-cutting Priorities: Gender, International cooperation, Socio-economic science and humanities

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[1] http://icpermed.eu

[2] H2020 Grant Agreement 731366

[3] Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Grenada, Guyana, Jamaica, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay,Venezuela

[4] African Union Member States

[5] https://www.africa-eu-partnership.org/en/stay-informed/news/european-commission-unveils-new-africa-europe-alliance-sustainable-investment-and

[6] European Network for Health Technology Assessment: http://www.eunethta.eu/

[7] European Medicines Agency: https://www.ema.europa.eu

[8] Heads of Medicines Agencies: http://www.hma.eu/

[9] Especially the clinical trials regulation (EU) No 536/2014 and the data protection regulation (EU) 2016/679

Horizon 2020 Pillar: Societal Challenges

Programme: Health, demographic change and wellbeing

Call Title: Digital transformation in Health and Care

Call Identifier: h2020-sc1-dth-2018-2020

Topic Title: International cooperation in smart living environments for ageing people

Topic Identifier: SC1-DTH-04-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 22.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sc1-dth-04-2020

Specific Challenges: Demographic change and the ageing of the population create new heterogeneous challenges for society and, in particular, for ageing people. On top of the health-related age impairments such as poor health, cognitive impairment and frailty, ageing people are at risk of facing situations leading to potential social exclusion with considerable negative consequences for their independence, quality of life, those who care for them, and for the sustainability of health and care systems.

Digital solutions can play a key role when addressing these challenges and, especially those aimed at creating smart living environments for ageing people. For these to be successful, one necessary condition is to ensure users' acceptance, which in turns requires bringing the users to the centre of the design. Moreover, these environments need to provide innovative user-friendly user interfaces such as voice-based interaction.

These challenges are shared by ageing populations beyond the EU and other countries are also looking into the potential of digital solutions to address them. In this context, there is a need to explore collaboration and cooperation with international efforts in this domain.

This action aims to address these challenges by developing smart living environments for ageing people, while strengthening relevant international collaboration in the area.

Scope: Proposals should develop and validate new solutions leading to smart living environments for ageing people, supporting independent active and healthy lifestyles.

The proposed solutions should provide personalised advice, guidance and follow-up for key age and health related issues in daily life which impact the person's ability to remain active, healthy and independent. These may include amongst others diet, physical activity, risk avoidance, preventive measures, lifestyle and activity management, leisure, social participation and overall wellness and health. Proposals should pay particular focus to measures aimed at fostering social participation and avoiding social exclusion.

Proposal should convincingly describe the planned progress beyond state of the art in the development and integration of trusted smart living environments for ageing people, which should build upon intelligent and interoperable information and communication technology (ICT) environments, access to relevant physiological and behavioural data, emotional computing, open platform and Internet of Things approaches.

Proposals should be based on trans-disciplinary research, involving behavioural, sociological, psychological, medical and other relevant disciplines, including gender and cultural aspects.

Proposed solutions should make use and further develop user interaction, including voice-based, taking into account Artificial Intelligence methods for understanding the users' intentions, knowledge extraction and learning. It is essential that they build on active user engagement in order to ensure the understanding of user needs. They need to safeguard ethics, privacy, security and regulatory aspects and take gender issues into account appropriately. The proposed solutions should be unobtrusive and avoid attention theft.

Proposals should include validation in realistic test sites, such as at home or at care centres, in order to demonstrate the expected benefits and impacts.

The proposed research and innovation actions should address one of the following international collaboration possibilities:

1. Cooperation with Japan

   Proposals addressing international collaboration with Japan should ensure the use of generalized infrastructures such as cloud system and open sources.

   Without limiting the use of specific applications or hardware systems, platform approaches are required to ensure interoperability and future expandability.

   Proposals are recommended to foster the adoption of the existing standards (including de-facto/ consortium standards), contributions to appropriate ongoing standardization work, and suggestions of new standards by an EU-Japan joint consortium in order to accelerate practical introduction of the results into societies.

   Proposals should be driven by the needs, interests and lifestyles of older people in order to ensure user acceptance, taking into consideration the relevant cultural aspects.

   Proposals are expected to contribute to help ageing people remain active and healthy inside and outside their home, by providing action guidance and

decision support derived from personal information such as memories and action histories through progress beyond the state of the art in interaction technology and ICT.

The proposed solutions on an open-platform where data collection by sensors, data analysis by artificial intelligence and user-friendly user interfaces cooperatively work are expected to be naturally integrated into ageing people's daily life and provide emotional support to ageing people.

Proposed solutions should make use and further develop multimodal interaction including voice-based conversation and gesture in order to help ageing people by the most effective and personalized way.

An amount of EUR 4 million will be reserved for proposals focusing on cooperation with Japan.

2. Collaboration with **Canada**[1]

   In addition to the scope and challenge of this topic as defined above, proposals addressing the international collaboration with **Canada** need to include the use of ICT-based solutions to support smart living environments that address transitions in care challenges for ageing people. Applications should focus on the development, integration and evaluation of eHealth innovations, in collaboration with stakeholders, including eHealth industry partners[2], clinicians, patient/family/caregivers and decision makers, in order to improve health outcomes.

   In collaboration with stakeholders, applicants should consider ways to improve the quality of outcomes and the cost-effectiveness of smart living environments that support care transitions. This call supports the integration of smart living environment solutions which are ready to progress beyond the prototype stage for use into care delivery programs and undergo pragmatic evaluation. Applicants are required to use strong research designs; and should provide a clear description and justification of the proposed research methodology to be used.

   Funding of the **Canadian** component of the proposal requires that a proposal also includes one or both of the following research areas as relevant to aging people.

   Areas:

   1. Changing health status or care: Individuals facing changes in their health status or living with chronic or complex health conditions. These individuals experience several handovers among health providers, institutions, hospital units and/or have a change in their care location (e.g., home vs. hospital; community care vs. tertiary care).

   2. Key populations to optimize transition in care outcomes: Populations at increased risk of adverse transition in care outcomes include but not limited to: First Nations, Inuit and Métis Peoples; individuals residing in rural and/or remote communities; individuals who are transgender; individuals with an intersex condition; older adults and new aging populations (i.e., survivors of diseases/conditions that previously led to

early death); new immigrants; and those who experience systemic, cultural and/or language barriers.

The consortium should also have the capacity to:

- Establish productive partnerships with eHealth innovation industries to co-design eHealth-enabled smart living environments to improve transitions in care;
- Evaluate the impact, efficiency, and cost-effectiveness of eHealth innovations in addressing gaps and inefficiencies using smart living environments in servicing the identified research areas. The evaluation will utilize rigorous research design(s) to generate high-quality (valid and reliable) evidence that will assist in the subsequent spread and scale (sharing) of successful innovations; and
- Integrate successful eHealth innovations into care delivery programs and promote their uptake and use to support effective and efficient smart living environments.

Example of potential topics may include, but are not limited to the following:

- Ageing patients/survivors patients with acute, chronic or complex health conditions that are transitioning from hospital to home and supported by Information and Communication technology (ICT)-based solution (i.e. sensors monitoring their vitals and providing feedback to themselves and providers).
- Ageing patients/survivors of chronic conditions transitioning into a smart living long-term care facility.
- Implementing smart living environments for managing care transitions of ageing people within different culture and social groups, and/or geographic regions.
- Evaluation of smart living environment solutions that address transition in care challenges for ageing patients with the capability to progress beyond prototype stage, into care delivery programs for pragmatic evaluation. In alignment with the CIHR Sex, Gender and Health Research policy[3], all proposals requesting funding from the CIHR are expected to consider how sex and/or gender might shape eHealth innovations to support transitions in care for ageing populations.

An amount of EUR 4 million will be reserved for proposals focusing on cooperation with **Canada**[4].

At least one proposal collaborating with Japan and at least one proposal collaborating with **Canada** should be funded under this action. The evaluation of proposals will be jointly carried out by the Commission and the relevant Japanese and **Canadian** funding organisations as applicable.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 and 4 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Participation of SMEs is encouraged.

Due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, proposals shall include at least one organisation as partner in the consortium from Japan[5] or **Canada**[6].

Expected Impact: The proposal should provide appropriate indicators to measure its progress and specific impact in the following areas:

- Independent living, and quality of life of older persons compared to current state of the art;
- Usefulness and effectiveness of personalized recommendations and follow-up in terms of the goals of preserving physical, cognitive, mental and social well-being for as long as possible;
- Evidence of user-centred design and innovation, effective ways of human computer interaction, and user acceptance;
- Fostering social participation and reducing social exclusion's risks;
- Validation of non-obtrusive technology for physical, cognitive, social and mental well-being;
- Strengthened international cooperation in Research and Innovation on ICT for AHA.

Cross-cutting Priorities: Gender, International cooperation, Socio-economic science and humanities, Open Science

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[1] This collaboration is a component of the CIHR Transitions in Care Initiative, one of CIHR's multi-Institute Initiatives. This multi-Institute Initiative is led by the **Canadian** Institutes of Health Research (CIHR), and includes a number of dedicated funding opportunities focused on supporting research that aims to transform the **Canadian** health system to optimize the outcomes of patients experiencing transitions in care.

[2] In **Canada** small-to-medium enterprises (SMEs) are the primary driver of innovation in most industrial sectors, including eHealth. Team grants are intended to foster an alignment of funding and incentives with SME funding and support agencies at the federal, provincial, territorial and regional levels, as well as with national and multi-national industries. As such, eHealth Innovation partners are targeted towards (but not limited to) **Canadian** SMEs and foreign subsidiaries in the digital health care/medtech sector.

[3] Applicants are encouraged to visit the CIHR sex- and gender-based analysis resource page for more information on key considerations for the appropriate integration of sex and gender in their proposal.

[4] In addition, the total amount available to the **Canadian** component of the team focusing on cooperation with Europe is expected to be CAD $1,920,000, enough to fund up to two (2) grants. The maximum CIHR amount per grant is $240,000 per year for up to four (4) years for a total of $960,000, per grant. Of note, **Canadian** applicants must secure partnership contributions equivalent to a minimum of 30% of the total grant amount requested, with a minimum of half (15%) of the amount must represent a cash contribution (i.e., a total of $288,000 partner match required per grant with a minimum of $144,000 as a cash contribution per grant), for a total grant value of up to $1.248 million per grant over four (4) years.

[5] Funding is expected to be made available in Japan by the Ministry of Internal Affairs and Communication (MIC) and/or the National Institute of Information and Communications Technology (NICT).

[6] Funding is expected to be made available in **Canada** by the **Canadian** Institutes of Health Research (CIHR)

Horizon 2020 Pillar: Societal Challenges

Programme: Food security, sustainable agriculture and forestry, marine and maritime and inland water research

Call Title: **Blue Growth**

Call Identifier: h2020-bg-2018-2020

Topic Title: The Future of Seas and Oceans Flagship Initiative

Topic Identifier: BG-07-2019-2020

Type of Action: IA-LS Innovation action Lump Sum

Deadline(s): 22.01.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/bg-07-2019-2020

Specific Challenges: Our future is intimately linked to the future of the seas, oceans and coasts. The seas, oceans and coasts provide multiple ecosystem services and a wealth of resources, influence climate and provide many economic opportunities. To fully profit from the seas and oceans also in the future, we have to preserve those valuable resources and ensure that their exploitation is sustainable. Furthermore, without appropriate ocean observations for forecasting and for the protection of property and human activities, the global economy would lose hundreds of billions of euros annually. For this, we need to have the technologies for observations, integrated ocean observing systems, data management systems, and appropriate models and services. This action will contribute to make ocean observations and data management in European seas and the **Atlantic Ocean** fit for the future, in line with the **G7** Future of the Oceans Initiative (Tsukuba Communiqué of the **G7** Science Ministers[1]). It will also support the Collaborative Research Action on Oceans of the **Belmont Forum**[2] and the International Ocean Governance Communication[3]. Similarly, ocean observation data must be available to effectively address local, national and global challenges such as the forecasting of ocean conditions and climate change, to take stock of biomass and biodiversity, to mitigate the impact of climate change and ocean acidification, to ensure food security and food safety (also in fresh water), and to contribute to the UN 2030 Sustainable Development Agenda, notably UN SDGs 2, 13, 14 and 15, and monitoring their targets for 2020 and 2025.

Scope: Proposals shall address the following sub-topic: technologies for observations (in 2020). Actions shall demonstrate integration, capacity and (scientific, economic

etc) potential. They shall complement and build on existing observation tools and systems such as EuroGOOS/EOOS, IOOS, GEO/GEOSS, COPERNICUS Marine Service or EMODnet, European research infrastructures such as Euro-Argo ERIC and EMSO ERIC as well as funded H2020 projects such as SeaDataCloud[5]. The interdisciplinary and cross-sectorial nature of the proposal should also apply to training activities improving the professional skills and competencies of workers and supporting the creation of new jobs in the blue economy.

[C] 2020 - Technologies for observations

Proposals shall address

i) the demonstration of new and innovative technologies to measure the Essential Ocean Variables (EOV) at all depths, and

ii) sensors to measure variables for aquaculture, fisheries, micro and nanoplastics, and marine litter and micro-litter,

iii) the demonstration of novel approaches to observe the ocean with multiple underwater, surface, and air vehicles (surface and air vehicles are optional, but underwater must always be included) with a view to realizing the digital ocean. Optional air vehicles could potentially, among others, contribute to the development of fully documented fisheries.

Sensors should measure in-situ biogeochemical and biological EOVs and may include new or emerging EOVs (possibly defined at OceanObs19[20] or those needed for MSFD Descriptors) as well as technologies needed for “augmented” observatories (i.e. genome-enabled multidisciplinary observatories) to allow deeper investigation of marine biology and ecology and as sites to test the new technology. Demonstrations to advance deep sea oceanography, notably biological oceanography, by combinations of fleets of gliders, fixed stations, research vessels, etc. should reach TRL 6 or higher. Proposals may also cover the standards, protocols and communications needed for the observations, for open access to data, standards for data management and communication. Activities to transfer technologies from other sectors (for example combinations with data from satellites) will also be considered. The proposals shall also address issues such as low-power, miniaturisation, modularity, interoperability and low-cost. The proposals shall take agreed standards (for example Open Geospatial Consortium standards) into account. The development of new vehicles or other platforms are excluded from this call. Data collected (except data for testing) must be prepared in line with commonly agreed standards and be made available in a form suitable for EMODnet and clouds.

This topic is in support of the European Strategy for Plastics in a Circular Economy. Selected projects under this topic as well as projects selected under other topics in H2020 supporting the Plastics Strategy are strongly encouraged to participate in joint activities as appropriate. These joint activities could take the form of clustering of projects, participation in workshops, common exploitation and dissemination etc. The projects should describe how they will be complementary with already existing relevant national activities or other multilateral activities funded by the EU or funded jointly by several Member

States. The proposals are expected to demonstrate support to common coordination and dissemination activities. Therefore, the proposals should foresee a dedicated work package for this purpose and earmark appropriate resources. Further details of these coordination activities will be defined during the grant preparation phase with the Commission.

Please note that this topic is part of the lump sum funding pilot scheme. Funding for grants awarded under this topic will take the form of lump sums as defined in Commission Decision C(2017)7151 of 27 October 2017. Details of the lump sum funding pilot scheme are published on the Funding and Tender Portal together with the specific Model Grant Agreement for Lump Sums applicable.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 9 million for sub-topic [C] would allow this specific challenge to be adequately addressed. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact: Contributing to the ongoing implementation of the **Galway** and Belèm Statements and of EU policies such as the EU Bioeconomy Strategy, the Circular Economy Strategy, the European Open Science Cloud Initiative, the **Blue Growth** Strategy, the Common Fisheries Policy, the EU Maritime Spatial Planning Directive, the Marine Strategy Framework Directive, the International Ocean Governance Communication and the UN Sustainable Development Goals, activities will:

In the short-term:

- Support the implementation of the **G7** Future of the Seas and Oceans initiative, the Paris Climate Agreement, the UN Decade of **Ocean Science** for Sustainable Development, and the needs of the Marine Strategy Framework Directive.
- Achieve at least TRL 6 for ocean observations' systems and tools (sub-topic B and C).
- Contribute to regularly measure 50% of biological and biogeochemical EOVs, including in the sea below 2000 m, and predict negative impacts of ocean acidification and other selected stressors to take timely preventive measures, notably to protect aquaculture resources (sub-topic B and C).
- Lay the foundations for and contribute to the sustainable management and protection of marine and coastal ecosystems to avoid significant adverse impacts (UN SDG 14).

In the medium-term:

- Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health (UN SDG 14).
- Improve forecasting of climate changes, weather and ocean conditions to protect human activities, in support of UN SDG 14 and other relevant goals, and of the objectives of related conventions (for example on biodiversity).

- Shorten the time span between research and innovation and foster economic value in the blue economy.
- Improve the professional skills and competences of those working and being trained to work within the blue economy and in the context of open data sharing.
- Contribute to policymaking in research, innovation and technology.
- Increase data sharing and increase integration of data.
- Contribute to determining the distribution and fate of marine litter and microplastics (sub-topic C).

Cross-cutting Priorities: **Blue Growth**, Open Science, International cooperation, Socio-economic science and humanities

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[1] http://www8.cao.go.jp/cstp/english/others/20160517communique.pdf

[2] **Belmont Forum** https://www.belmontforum.org/

[3] (JOIN(2016) 49)

[5] This will also include mutual feedback processes with the Copernicus Programme and other relevant actions such as those undertaken by IOC/IODE or the Marine Environment Monitoring Service. See topic DT-SFS-27-2019 under this Work Programme's SC2 Sustainable Food Security Call. European Research and Innovation for Food and Nutrition Security, SWD(2016)319. http://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/SWD-2016-319-F1-EN-MAIN.PDF

[20] https://www.oceanobs19.net/

Horizon 2020 Pillar: Societal Challenges

Programme: Food security, sustainable agriculture and forestry, marine and maritime and inland water research

Call Title: **Blue Growth**

Call Identifier: h2020-bg-2018-2020

Topic Title: Fisheries in the full ecosystem context

Topic Identifier: BG-10-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 22.01.2020, 08.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/bg-10-2020

Specific Challenges: Fisheries, an important part of the blue economy, provides food, generates gross profit of around EUR 1,342 billion and accounts for more than 150,000[1] jobs, and contributes to coastal social cohesion and resilience. The Common Fisheries Policy (CFP) regulates access to and use of the marine living resources. The CFP seeks to apply the ecosystem-based approach to fisheries management, with fishing in line with the Maximum Sustainable Yield concept and minimizing the effect of fishing on the ecosystem[2]. The Marine Strategy Framework Directive (MSFD) requires that fish and shellfish stocks are in good environmental status[3]. The Maritime Spatial Planning Directive[4] aims to regulate uses of the marine environment. The design of such policies can be better served with a holistic, integrated approach. For successful policy implementation an improvement of our predictive capacity of environmental impacts on marine biogeochemistry and productivity, food webs and ecosystem structure and functioning, is required. Considerable effort to scientifically and technically support these policy objectives goes hand in hand with filling considerable gaps in basic knowledge and providing predictive tools available for integrated management.

Scope: Building on related work done in previous research and innovation framework programmes and in other EU-funded programmes, research activities shall fill in knowledge gaps which hinder an efficient, ecosystem-based approach to the management of fisheries (e.g. biological characteristics and assessment of marine habitats; links of environmental factors and abundance, health, growth, reproduction etc. of fish stocks and human health and consumption etc., taking into account sex and gender differences if and where relevant; relations of

different trophic levels in the food chain; efficiency of management measures protecting the ecosystem, interactions with and impacts from/on other uses of the sea). The proposals shall integrate existing and new knowledge in modelling or other applied tools/methods which can be used by scientific advisory bodies in sustainable fisheries management.

Following the principles of responsible research and innovation, proposals will ensure that societal players work together during the whole research and innovation process. Proposals should also test the efficiency of the proposed solutions across Europe.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 8 million would allow this challenge to be addressed appropriately. This does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact: In the framework of UN SDGs (1, 2, 7, 8, 12, 13, 14), the Common Fisheries Policy, the Food 2030 policy blueprint for food and nutrition security, the BLUEMED strategic research and innovation agenda and the **Atlantic** research and innovation cooperation, proposals will:

- Improve integrated understanding of environmental impacts on marine ecosystem and food web structure and reduce uncertainties in future projections;
- Improve fisheries management assisting EU Member States to comply in a meaningful way with the requirements of European and international marine related legislation;
- Contribute to conserve and restore fish stocks, and to regulate harvesting of fishing and end overfishing including illegal, unreported and unregulated fishing and destructive fishing practices, and to contribute to the conservation of coastal and marine ecosystems;
- Provide improved tools for ecosystem-based fisheries management which are tested, effective, discussed with scientific bodies in charge of advising on stock, fisheries and ecosystem dynamics and that are fit for the 21st century;
- Ensure that the ecosystem-based approach to the sustainable use of seas can be applied by different public bodies and in the framework of different public policies;
- Provide improved alignment of research and innovation processes and their outcomes with the values, needs and expectations of society;
- Contribute to a thriving fishing sector and to a thriving European blue economy, including improved professional skills and competences;

In the medium term:

- Improve the professional skills and competences of those working and being trained to work within the blue economy.
- Contribute to policymaking in research, innovation and technology.

Cross-cutting Priorities: RRI, **Blue Growth**, Gender

[1] Facts and figures on the CFP Basic statistical data 2016 Edition ISSN 1977-3609 EU publication office

[2] Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 And (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC

[3] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy

[4] Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
Call Title:	**Blue Growth**
Call Identifier:	h2020-bg-2018-2020
Topic Title:	Towards a productive, healthy, resilient, sustainable and highly-valued Black Sea
Topic Identifier:	BG-11-2020
Type of Action:	RIA Research and Innovation action
Deadline(s):	22.01.2020, 08.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/bg-11-2020

Specific Challenges: The Black Sea contains the largest body of oxygen-free hydrogen sulphide-rich marine waters on Earth. Any new local, national or transboundary policy measures should consider its special ecosystem characteristics, its biodiversity and its submerged cultural heritage sites.

The European Commission has been supporting the work of researchers from all the Black Sea countries to advance a shared vision for a productive, healthy, resilient, sustainable and highly-valued Black Sea by 2030. The first step was a gap analysis and a Vision Paper: A **Blue Growth** Initiative for Research and Innovation in the Black Sea (May 2018), leading to the drafting of a Strategic Research and Innovation Agenda (SRIA) for the Black Sea basin.

The Vision Paper identifies a series of challenges for the Black Sea basin, which are driven by a range of human-induced and natural drivers, such as pollution, maritime transport, eutrophication, climate change, and coastal hazards. The abundance of gas hydrates is a particular asset of the Black Sea that represents both opportunities and risks. Fish stocks and species diversity are under severe stress, common surveys and monitoring can provide a base for better assessment, management and prevention. The area's marine heritage and its ecosystem services are also at risk. Black Sea societies can be more deeply connected through a bridge of knowledge, technologies, services and innovations. The EU is committed to supporting the development of solutions to solve these issues. This work will support several policies and international agreements such as the EU Integrated Maritime Policy (IMP), the EU Marine

Strategy Framework Directive (MSFD), the EU Common Fisheries Policy (CFP), the EU Neighbourhood Policy, and the Bucharest Convention[1].

Scope: Proposals shall provide solutions for accurate predictive tools and capabilities to tackle the increasingly complex array of multi-stressors and their poorly understood interactions, including their connection with rivers flowing into the Black Sea.

Proposals shall address the fundamental Black Sea research challenges, that have been identified so far and others that may be defined as the priority-setting work proceeds, taking into account policy documents such as the MSFD reports of Romania and Bulgaria and the Strategic Action Plan of the Bucharest Convention. Proposals shall:

- Develop innovative multi-disciplinary research, building on past and on-going regional, international, as well national and EU projects/initiatives, including research infrastructures, data sharing mechanisms that will generate the knowledge needed to increase ecosystem resilience (e.g. SEAS-Era ERA-NET, PERSEUS, COCONET, SENTINEL, Marine Copernicus Monitoring Environment Service, European research infrastructures such as EMBRC, Euro-Argo ERIC, ICOS ERIC and EMSO ERIC, Black Sea Economic Cooperation, DANUBIS-RI etc.);
- Provide new knowledge to assess and mitigate the impacts of global climate change and the multiple natural and human-induced stressors in the Black Sea from land-sea interface to the deep basin.

Furthermore, proposals should provide scientific support to very early development of emerging start-ups in the region.

All data collected must be handled in line with commonly agreed standards and be compatible with EMODnet and clouds.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 9 million would allow this specific challenge to be adequately addressed. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact: Activities will support the implementation of the MSFD and the Bucharest Convention, marine and maritime research and innovation to create synergies, increase economic benefits, and reduce hazards for prosperous, resilient and empowered communities deriving interest from the Black Sea basin.

In the short term, activities will develop:

- sustainable smart observation and monitoring systems, and assessment frameworks promoting governance for a sustainable ecosystem, mitigation of climate change impact and other stressors, and accurate forecasting for adaptive management;
- a harmonised set of working methods, standards and procedures on all aspects of coastal and **Marine Research**. This would provide compatible data, information and knowledge at the sea-basin level;
- facilities for promoting start-ups oriented towards the circular and blue economies in the region and

- new marine-based technologies by harnessing the Industry 4.0 for the Black Sea to promote safe and sustainable economic growth of the marine and maritime sectors, the conservation and valorisation of marine cultural heritage.

In the medium term:

- Improve the professional skills and competences of those working and being trained to work within the blue economy.
- Contribute to policymaking in research, innovation and technology.

Activities will promote education and capacity building:

- training and utilisation and transfer of technologies and knowledge for established and new marine and maritime-related jobs;
- educational and vocational youth mobility related to the blue economy among the countries in the region;
- enhanced science-policy dialogue in formulating coastal and marine policies and programmes;
- ocean-engaged citizens and policy-makers by providing high-level scientific output, contributing to a clean, plastic-free, healthy and productive Black Sea.

Cross-cutting Priorities: **Blue Growth**, International cooperation

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[1] The Horizon 2020 work programme for 2019 includes a Coordination and Support Action: Coordination of marine and maritime research and innovation in the Black Sea.

Horizon 2020 Pillar: Societal Challenges

Programme: Food security, sustainable agriculture and forestry, marine and maritime and inland water research

Call Title: Food and Natural Resources

Call Identifier: h2020-fnr-2020

Topic Title: FOOD 2030 - Empowering cities as agents of food system transformation

Topic Identifier: CE-FNR-07-2020

Type of Action: IA Innovation action

Deadline(s): 22.01.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ce-fnr-07-2020

Specific Challenges: Our current food systems are unsustainable and threatened by global pressures. Environmental challenges (e.g. climate change, loss of biodiversity, scarcity and degradation of natural resources), combined with increasing social inequalities amplified by poverty, hunger and malnutrition, and urbanisation, are putting serious pressure on cities and their peri-urban interfaces.

It is estimated that by 2050, not only will food demand increase, but also over 70% of people will be living in cities. Therefore, future proofing our food systems will require a rethinking of the role of cities as agents of positive change. Cities have the potential to become ecosystems of innovation facilitating experimentation and multi-stakeholder engagement, to establish long-term evidence-based strategies that will ultimately ensure safe, healthy, sustainable and nutritious food to their inhabitants and surrounding communities.

Local authorities have a key role to play in convening, connecting and supporting food system actors and citizens across their City Region Food System (CRFS) [1] to build and deliver transformative solutions with real societal impact based on sound science, research and innovation. However, the degree of embedding of systemic thinking into urban food policies varies greatly among cities and many of the existing fragmented initiatives focus on the production and/or the consumption side only.

The specific challenge of this topic, therefore, is to support cities to overcome existing barriers to food system transformation and develop integrated, sustainable and safe urban food system policies/strategies in line with the FOOD

2030 policy priorities (i.e. Nutrition for sustainable and healthy diets; Climate-smart and environmentally sustainable food systems; Circularity and resource efficient food systems; and Innovation and empowerment of communities).

Scope: Proposals shall support cities and their peri-urban interface to develop and implement urban food systems policies delivering on the four FOOD 2030 priorities accompanied by the deployment of concrete actions. Innovation shall be fostered via the establishment of FOOD 2030 living labs as open innovation ecosystems.

The proposals shall draw key learnings from existing good practices in cities that have already engaged themselves in food policies and practices (e.g. the signatories of the MUFPP). Proposals shall include a wide diversity of cities (e.g. in terms of size and geography) that also ensure a good pan-European coverage. Furthermore, proposals shall include cities that have a 'good track record' in food systems transformation, as well as less experienced cities which aspire to put food systems transformation at the heart of their policy agenda.

In line with the principles of Responsible Research and Innovation (RRI), proposals shall support urban participatory policy processes that convene a wide variety of public and private stakeholders throughout the whole food system from farm to fork to gut and back.

These shall include, for instance: food producers, processors, retailers, procurers, food service industry, nutritionists, universities, SMEs and local/regional business, educators, behavioural and social scientists, museums/science centres, professional associations, innovative ICT companies, banks, venture capitalists and other sources of investment, NGOs, media and citizens and taken into account gender aspects. The set-up of a living lab in each city is required[2]. In particular, proposals shall collaborate with local authorities with a view of creating political commitment and institutionalising the expected food policy for a long-term deployment.

Proposals shall also deploy a compelling communication and dissemination strategy to share best practices throughout a broader network in order to inspire, share learnings and mobilise other cities, regions and national governments. Finally, proposals shall dedicate resources to attract additional financial investments and opportunities to ensure the long-term sustainability of the planned actions. Proposals shall require a strong centralized professional coordination to ensure cities are assisted in implementing a harmonised approach, to allow comparability assessment and to develop an aligned overarching communication strategy.

Proposals shall also foresee the inclusion of a specific and budgeted work-package in view to cooperating closely with other projects funded under this topic and with the European Commission, in particular to align with the FOOD 2030 framing, for consistent communication and dissemination, monitoring and comparability of outcomes. Furthermore, proposals shall foresee cooperation with relevant projects in this domain under Horizon 2020 (e.g. with the projects funded under CE-SFS-24-2019) and other programmes.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 12 million would allow this specific challenge to address at least 10 cities. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts and number of cities.

Expected Impact: In the framework of the objectives of FOOD 2030, as well as of the New Urban Agenda and the UN Sustainable Development Goals, in particular SDG 11 on "Sustainable Cities and Communities", this topic is expected to support the development of sustainable, healthy and inclusive food systems policies in city-regions, where system thinking, institutional innovation and participatory planning are at the core.

In particular, the expected impact includes the following:

- the creation of new and sound evidence for policy makers in relation to urban food systems in support of policy development;
- the building up of political commitment and capacity for multi-objective coordinated strategies, roadmaps and actions between different government departments, jurisdictions and stakeholders that aim at delivering co-benefits relevant to FOOD 2030 priorities;
- the creation of a wide network of pilot European cities of different sizes and geographical settings that will develop and implement food system policies and actions including living labs, act as demonstrators of good practice, and become ambassadors for the transferability of the food system model all over Europe and beyond;
- the reconnection of citizens with food fostering behavioural change towards healthy sustainable diets and nutrition, responsible production and consumption;
- increased food and nutrition security for urban and rural dwellers;
- improved social inclusion and equity of all actors of the food systems;
- the creation of innovation opportunities, jobs and growth relevant to city region livelihoods and economic development for all actors of the food systems.

Cross-cutting Priorities: RRI, Socio-economic science and humanities, Gender, **Blue Growth**

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[1] In this context, CRFS refers to hybridity of the food system of any city, which could include urban, peri-urban and nearby rural farms in the complexity of urban-rural linkages.

[2] Living labs are referred to as open innovation ecosystems based on a systematic user co-creation approach integrating research and innovation processes in real life communities and settings.

Horizon 2020 Pillar: Societal Challenges

Programme: Food security, sustainable agriculture and forestry, marine and maritime and inland water research

Call Title: Food and Natural Resources

Call Identifier: h2020-fnr-2020

Topic Title: Pilot action for the removal of marine plastics and litter

Topic Identifier: CE-FNR-09-2020

Type of Action: IA Innovation action

Deadline(s): 22.01.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ce-fnr-09-2020

Specific Challenges: Marine litter is high on the scientific and political agendas and of major concern for European citizens. More than 80 percent of marine litter is plastic. It is estimated that by 2050, more plastic could be in the ocean than fish. It can be found on beaches (mostly produced locally), on the ocean surface, in animals and on the seafloor. Microplastics can get into the food chain, together with the integrated and adsorbed toxins. It is estimated that each year 5 to 13 million tonnes plastics reach the seas and oceans (worldwide), becoming eventually the main source of microplastics. In addition to possible health risks, the damage to marine ecosystems and the blue economy (tourism and other maritime sectors) due to plastic litter are enormous.

Therefore, urgent action is needed both for the prevention and for the removal of existing marine litter, notably plastics and microplastics. For this topic, a demonstration of the removal of marine litter and research is being proposed, highlighting how the environment is impacted by the removal, and the corresponding impacts in terms of ecosystem and economic recovery.

Scope: The overall goal of this topic is the demonstration of approaches or technologies to improve marine spatial planning and conservation (or even restoration) of coastal ecosystems. More specifically, this topic is for the demonstration of technologies to clean the seafloor and the surface of nearshore waters, and possibly the water column, from historically accumulated plastics and micro-plastics as well as from other accumulated marine litter and the assessment of effectiveness and impact. Accompanying research will have to address impacts on coastal ecosystems' food chains, biodiversity and functioning, fisheries, aquaculture, Marine Protected Areas, wild life and local economies (all of these)

6, 12, 18 and 24 months after the (start of the) cleaning. At the end of the project, the consortium is expected to identify a way forward and lay the foundations for upscaling with a view to a future potentially automated removal of historically accumulated marine litter (legacy), in particular at hot-spots of accumulated marine litter.

The inclusion of actions to reduce other pollutants and effects of stressors is an advantage.

Projects shall demonstrate the effectiveness of an (or several) automatic or remotely controlled wireless device(s) capable of collecting plastics and other marine litter of reasonable size (larger micro-litter and macro-litter up to a meter or so). The proposed solution must be able to work at the sea surface and on the seafloor/beach. The demonstration has to be for longer periods of time (several months on one site; several sites at the same time are acceptable). The marine litter must be sorted and reused (project must include demonstration of feeding of litter into reuse/recycling chains) in line with the circular economy and the plastics strategy[1].

The environmental impact, notably on biota, has to be minimized and assessed.

The project must include demonstrations in different sites, including beaches, harbours and shallow seafloor.

This topic is in support of the European Strategy for Plastics in a Circular Economy. Selected projects under this topic as well as projects selected under other topics in H2020 supporting the Plastics Strategy are strongly encouraged to participate in joint activities as appropriate. These joint activities could take the form of clustering of projects, participation in workshops, common exploitation and dissemination etc. The projects should describe how they will be complementary with already existing relevant national activities or other multilateral activities funded by the EU or funded jointly by several Member States. The proposals are expected to demonstrate support to common coordination and dissemination activities. Therefore, the proposals should foresee a dedicated work package for this purpose and earmark appropriate resources. Further details of these coordination activities will be defined during the grant preparation phase with the Commission.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 6 million would allow this challenge to be addressed appropriately. This does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact: Contributing to the ongoing implementation of EU Policies such as the EU Bioeconomy Strategy, the Circular Economy Strategy, the European Strategy for Plastics in a Circular Economy, the European Integrated Maritime Policy, the Marine Strategy Framework Directive and the UN Sustainable Development Goals, activities will:

In the short-term:

- Support the implementation of the UN Nations Decade of **Ocean Science** for Sustainable Development, and the needs of the Marine Strategy Framework Directive.
- Achieve at least TRL 6.
- Achieve a removal of 90% of macro-plastic litter and a substantial fraction of micro-litter in the demonstration areas reducing the clean-up cost to the local blue economy.
- Increase availability of efficient and environmentally sustainable technologies to remove existing marine litter.
- Contribute to awareness rising of citizens about the importance of prevention to avoid environmental damage and high costs (for the community and the tax payer instead of the polluter).
- Contribute to the sustainable management and protection of marine and coastal ecosystems to avoid significant adverse impacts (UN SDG 14).

In the medium-term:

- Obtain no more damage from marine litter to the local blue-economy and marine ecosystems services.
- Achieve 80% reduction of micro-plastics in shellfish in treated areas (or other locally important small marine animals).
- Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health (UN SDG 14).
- Ensure that collected marine plastics are reused or reconverted in a way that is in line with the European Strategy for Plastics in a Circular Economy.
- Shorten the time span between research and innovation and foster economic value in the blue economy.
- Improve the professional skills and competences of those working and being trained to work within the blue economy and in the context of open data sharing.
- Increase data sharing and increase integration of data.
- Contribute to determining the distribution and fate of marine litter and microplastics.

In the long-term:

- Achieve 80% reduction of micro-plastics and plastics in non-migratory birds species in the areas where cleaning technologies are being used.
- Achieve substantial reduction of micro-plastics originating from macro-plastics locally.

Cross-cutting Priorities: Socio-economic science and humanities, RRI, **Blue Growth**

[1] http://ec.europa.eu/environment/circular-economy/index_en.htm

Horizon 2020 Pillar: Societal Challenges

Programme: Food security, sustainable agriculture and forestry, marine and maritime and inland water research

Call Title: Rural Renaissance

Call Identifier: h2020-rur-2018-2020

Topic Title: Closing nutrient cycles

Topic Identifier: CE-RUR-08-2018-2019-2020

Type of Action: IA Innovation action

Deadline(s): 22.01.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ce-rur-08-2018-2019-2020

Specific Challenges: The EU depends strongly on external sources for the supply of key fertilisers used in agriculture. Resource depletion and an increasing global demand for mineral fertilisers may, in the long term, lead to price tensions with an impact on food security. Mineral-based fertilisation also poses significant environmental problems, linked e.g. to the amounts of fossil energy needed to produce and transport these fertilisers. At the same time, large amounts of minerals are being dispersed in the environment through a large variety of organic waste streams, resulting in soil, water and air pollution. Agri-food specialisation has led to regional imbalances: whilst in some regions a nutrient overabundance is causing severe environmental impacts (e.g. nitrate pollution), other are experiencing nutrient deficits. These contrasting effects may also be observed between locations within the same region.

Several technologies are being developed to recover and re-use nutrients from organic by-products and waste streams, but many are insufficiently mature and the characteristics of end-products do not always match end-user preferences. It is expected that the EU 'circular economy package' will boost the emergence and commercialisation of such new fertilisers, hence it is important to understand their agronomic and environmental performance in order to establish adequate policies, guidelines and application rules.

Scope: Proposals shall address inter-regional and intra-regional imbalances through effective nutrient recovery from by-products of the agri-food or forestry sectors, or from waste water and sewage sludge, and conversion into novel fertilisers.

Proposals should address only one of the following sub-topics:

C.[2020] Bio-based fertilisers from by-products of the agri-food, fisheries, aquaculture or forestry sectors (IA)

Projects shall demonstrate processes for recovery of mineral nutrients and production of novel fertilisers from by-products of the agri-food, fisheries, aquaculture or forestry sectors, excluding animal manure, water and sewage sludge (covered in scopes B and D). Proposals should demonstrate that the activities proposed go beyond past or ongoing research, without overlaps. Technologies that are currently under development should be further improved, and possibly integrated, to produce high quality end-products[6]. Proposals shall address end product marketability, safety, sustainability including emissions of greenhouse gasses and pollutants, and compliance with relevant EU regulations. Their suitability and acceptability under the organic farming regulatory framework should also be analysed. An integrated assessment of the business model (economic, agronomic, social and environmental) shall be performed. The whole value chain shall be demonstrated to a near-commercial scale (TRL 6-7). Proposals shall fall under the concept of the 'multi-actor approach'[5], including relevant actors such as agri-food industries, technology providers, research centres, end-users (farmers and farmer associations), or public administration.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 6 million for sub-topic A and D and EUR 8 million for sub-topics B and C would allow this specific challenge to be addressed appropriately. Nonetheless this does not preclude the submission and selection of proposals requesting other amounts. Proposals for sub-topics A, B and C should include a task to cluster with other projects financed under this topic, under topic SFS-39-2019 and - if possible - with other relevant projects in the field funded by Horizon 2020 (including under the BBI JU). For sub-topics B and C, participation of partners from CELAC countries[9] is encouraged.

Expected Impact: Proposals are expected to provide the technologies needed to develop a new generation of commercial, sustainable and safe fertilisers based on organic by-products, and the scientific knowledge needed to frame their use. This will help to:

- replace non-renewable mineral fertilisers, hence reducing external dependence and risks related to depletion (sub-topics A, B, C and D);
- balance nutrient concentrations between or within regions, thus increasing resource efficiency (sub-topics A, B and C);
- reduce the environmental impacts linked to the dispersion of nutrients present in waste flows, to the emissions of greenhouse gases, or to the production of fossil-based fertilisers (sub-topics A, B, C and D);
- develop new business models creating value from agri-food, fisheries, aquaculture or forestry by-products (sub-topics B and C) and from water sector and the industrial sector subject to waste water treatment, including desalination or demineralisation plants (sub-topic D).

In the long term, this should contribute to a thriving, sustainable and circular bio-economy, the development of new business models that are synergic with other

economic sectors, and therefore to the creation of wealth and quality jobs in rural areas.

Cross-cutting Priorities: **Blue Growth**, RRI, Socio-economic science and humanities

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[5] See definition of the 'multi-actor approach' in the introduction to this Work Programme part.

[6] These can be mineral-type (i.e. with low organic matter content), or advanced organic fertilisers (e.g. through improved composting processes).

[8] Water desalination or demineralisation plants may include, for example, plants treating wastewater in food or pulp & paper industries.

[9] Community of Latin American and Caribbean States

Horizon 2020 Pillar: Societal Challenges

Programme: Food security, sustainable agriculture and forestry, marine and maritime and inland water research

Call Title: Rural Renaissance

Call Identifier: h2020-rur-2018-2020

Topic Title: Closing nutrient cycles

Topic Identifier: CE-RUR-08-2018-2019-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 22.01.2020, 08.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ce-rur-08-2018-2019-2020

Specific Challenges: The EU depends strongly on external sources for the supply of key fertilisers used in agriculture. Resource depletion and an increasing global demand for mineral fertilisers may, in the long term, lead to price tensions with an impact on food security. Mineral-based fertilisation also poses significant environmental problems, linked e.g. to the amounts of fossil energy needed to produce and transport these fertilisers. At the same time, large amounts of minerals are being dispersed in the environment through a large variety of organic waste streams, resulting in soil, water and air pollution. Agri-food specialisation has led to regional imbalances: whilst in some regions a nutrient overabundance is causing severe environmental impacts (e.g. nitrate pollution), other are experiencing nutrient deficits. These contrasting effects may also be observed between locations within the same region.

Several technologies are being developed to recover and re-use nutrients from organic by-products and waste streams, but many are insufficiently mature and the characteristics of end-products do not always match end-user preferences. It is expected that the EU 'circular economy package' will boost the emergence and commercialisation of such new fertilisers, hence it is important to understand their agronomic and environmental performance in order to establish adequate policies, guidelines and application rules.

Scope: Proposals shall address inter-regional and intra-regional imbalances through effective nutrient recovery from by-products of the agri-food or forestry sectors, or from waste water and sewage sludge, and conversion into novel fertilisers.

Proposals should address only one of the following sub-topics:

D.[2020] Bio-based fertilisers from waste water and sewage sludge (RIA)

Projects shall develop techniques for nutrients recovery from waste water streams such as urban and industrial waste water, sewage sludge from waste water treatment plants, brine from water desalination or demineralisation plants[8]. Building on related work under previous research framework programmes and other EU-funded programmes, projects should design and test techniques for nutrients recovery and subsequent mechanical, chemical or biological processes to upgrade recovered nutrients. The monitoring and removal or mitigation of contaminants affecting food safety, human and ecosystem health (e.g. pharmaceuticals in sewage sludge) in recovered nutrients should be key in the process design. A life-cycle assessment should be carried out in order to evaluate the environmental impacts of processes along the whole value chain, including waste/residues, and products' environmental performances. Regulation issues should be part of the investigation. Involvement of governments at different levels as regards regulation issues, regional/local strategies and territorial development plans is an asset.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 6 million for sub-topic A and D and EUR 8 million for sub-topics B and C would allow this specific challenge to be addressed appropriately. Nonetheless this does not preclude the submission and selection of proposals requesting other amounts. Proposals for sub-topics A, B and C should include a task to cluster with other projects financed under this topic, under topic SFS-39-2019 and - if possible - with other relevant projects in the field funded by Horizon 2020 (including under the BBI JU). For sub-topics B and C, participation of partners from CELAC countries[9] is encouraged.

Expected Impact: Proposals are expected to provide the technologies needed to develop a new generation of commercial, sustainable and safe fertilisers based on organic by-products, and the scientific knowledge needed to frame their use. This will help to:

- replace non-renewable mineral fertilisers, hence reducing external dependence and risks related to depletion (sub-topics A, B, C and D);
- reduce the environmental impacts linked to the dispersion of nutrients present in waste flows, to the emissions of greenhouse gases, or to the production of fossil-based fertilisers (sub-topics A, B, C and D);
- develop new business models creating value from agri-food, fisheries, aquaculture or forestry by-products (sub-topics B and C) and from water sector and the industrial sector subject to waste water treatment, including desalination or demineralisation plants (sub-topic D).

In the long term, this should contribute to a thriving, sustainable and circular bio-economy, the development of new business models that are synergic with other economic sectors, and therefore to the creation of wealth and quality jobs in rural areas.

Cross-cutting Priorities: **Blue Growth**, RRI, Socio-economic science and humanities

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[8] Water desalination or demineralisation plants may include, for example, plants treating wastewater in food or pulp & paper industries.

[9] Community of Latin American and Caribbean States

Horizon 2020 Pillar: Societal Challenges

Programme: Food security, sustainable agriculture and forestry, marine and maritime and inland water research

Call Title: Food and Natural Resources

Call Identifier: h2020-fnr-2020

Topic Title: Supporting the food safety systems of the future

Topic Identifier: FNR-08-2020

Type of Action: CSA Coordination and support action

Deadline(s): 22.01.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/fnr-08-2020

Specific Challenges: The EU evidence-based food safety framework is based on the General Food Law, which, among others, introduced the risk analysis principle to underpin food safety policy making and established the European Food Safety Authority. Recent consumer concerns on the transparency of the process of safety assessment of our foods as well as technological developments and innovations have shown that there is a need to reflect on the EU food safety system of the future. The challenge requires fostering coordination and integration among different food safety stakeholders in order to ensure that the science and infrastructures needed to support evidence-based policies of the future will be timely available.

Scope: Proposals shall aim at developing a research and innovation platform for collaboration and coordination across food safety stakeholders in Europe. Actions shall engage key stakeholders such as National Food Safety Authorities, relevant EU Agencies, Commission Services, policy makers, scientists and civil society with the objectives to: i) map the state of play in food safety research and innovation in the different Member States and Associated Countries; ii) strengthen research and innovation capacity to ensure that Europe continues to be the global leader on food safety standards; iii) exchange of knowledge and data across the scientific community and policy actors including relevant EU Agencies; iv) improve coherence and reduce the overlap between national and EU funding in Food safety research. v) develop innovative approaches to communicate both on food safety research and innovation as well as on risk assessment procedures in the area of food safety in a manner that citizens are properly informed and engaged in taking into account gender aspects, thus

contributing to boosting consumers' confidence on the evidence-base for food safety systems and vi) explore avenues for long-term science- policy-society interfaces.

In agreement with the Commission services, proposals should ensure appropriate flexibility so as to respond in real time to potentially fast-changing policy scenarios.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: In line with principles, requirements and procedures of the General Food Law, in the short/medium term proposals will:

- Deliver a platform for European cooperation at multi-partner level on food safety that builds on research and innovation (R&I) and policy coherence, exploits synergies and capabilities between countries and regions and enhances public confidence.
- Develop innovative models for collaborations and knowledge exchange across food safety actors and develop networks to promote coherence and harmonisation across the food safety stakeholders throughout the Member States.
- Identify integrated and reliable resources (e.g. data repositories, accredited laboratories, individual roadmaps, inventories) accessible for the food safety stakeholders.
- Deliver the basis for the development of joint trans-national research programmes and alignment of national research agendas.
- Develop a coherent Food Safety Strategic Research and Innovation Agenda (SRIA) which shall also address consumers' expectations, emerging technologies and policy priorities.
- Deliver models to inform civil society of the science-based risk assessment process providing clear guidance on dissemination models.
- Deliver logistic and technical support for permanent structure in the future ensuring that research and innovation will support food safety policies.

Cross-cutting Priorities: Gender, **Blue Growth**, RRI

Horizon 2020 Pillar: Societal Challenges

Programme: Food security, sustainable agriculture and forestry, marine and maritime and inland water research

Call Title: Food and Natural Resources

Call Identifier: h2020-fnr-2020

Topic Title: Prospecting aquatic and terrestrial natural biological resources for biologically active compounds

Topic Identifier: FNR-11-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 22.01.2020, 08.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/fnr-11-2020

Specific Challenges: Global biodiversity remains a largely untapped source of natural bioactive molecules and compounds. Such molecules offer unmatched chemical diversity and structural complexity, together with biological potency and selectivity. While some of the natural chemodiversity has been studied, resulting in open access and proprietary compound libraries, the potential for developing commercial products is far from exhausted. There is still significant potential for application in various industries, such as high-value agro-chemicals (e.g. natural plant protection products), food and feed ingredients (such as nutraceuticals), pharmaceutically active ingredients, cosmetics, flavourings etc. On conservative estimates, these compounds represent a global market of EUR 150 billion[1] and global industrial revenues of EUR 19 billion[2].

The main challenges tackled in the topic are, depending on the source:

- technological readiness for the sustainable exploitation of natural resources, linked with;
- scarcity of the source natural biological material (e.g. in case of protected / rare species);
- low concentrations of the target compounds, leading to the difficulties in obtaining sufficient amounts of the pure molecules.

The challenge is to match their sustainable sourcing and processing with efficient and cost-effective use. This calls for close cooperation between industrial and academic partners, with due consideration for health and environmental legislation, and informed public engagement.

Scope: Proposals should cover the entire development pipeline with a focus on:

- biodiscovery (prospecting natural biological resources from land and sea), i.e.:
  - identifying suitable molecules;
  - verifying their claimed benefits;
  - optimising technological exploitation, including cultivation strategies for selected production systems and metabolic engineering to ensure high productivity and purity;
  - assessing safety, and
  - developing products (final formulation) and their commercialisation, in Europe.

Proposals should focus on small molecules[3], with novel bioactivities, qualities and applications, in particular from unusual or underutilised sources, and on our understanding of their relevant chemical, genetic, physiological and environmental make-up. Special attention should be devoted to ensuring sustainable sourcing from the raw feedstock, to avoid overexploitation, taking into account recent technical advances in molecular biology (e.g. metabolomics, new gene mining and optimisation techniques, development of suitable host production platforms). Proposals could explore in vivo or in vitro approaches to study the interactions between various biological entities (e.g. through symbiotic or defence relationships) as a source of interesting bioactive properties. They should:

- prove the techno-economic feasibility and effectiveness of a chosen production route[4];
- commit to assessing, as part of the project, the environmental and health impacts of the developed products or processes, using life-cycle assessment (LCA) methodologies based on available standards, certification, and accepted and validated approaches, and
- guarantee biodiversity preservation and comply with relevant international rules on access to biological resources, their sustainable use and the fair and equitable sharing of benefits from their utilisation, with the national regulations in the source countries and with the Convention on Biological Diversity and its Nagoya Protocol.

In line with the EU's policy on responsible research and innovation, dissemination and public engagement via modern communication and dissemination tools will be an essential element of the projects that are funded. Projects should involve an analysis of the state of the art to avoid duplications and overlaps with past or ongoing research. Cooperation with other selected proposals under this topic is encouraged.

Proposals should address one of the following sub-topics:

A: Prospecting terrestrial natural biological resources for biologically active compounds
Actions must focus on land-based biological natural resources.

B: Prospecting aquatic natural biological resources for biologically active compounds
Actions must focus on marine and fresh-water biological natural resources.

The Commission considers that proposals requesting an EU contribution of around EUR 7.5 million would allow this specific challenge to be addressed appropriately. This does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact: Activities will support the sustainable biodiscovery and use of natural biological resources from diverse environments and ecosystems, allowing better assessment of the selected bioactivity potential. This will increase capacity in the European biotechnology sector and other industries to respond to society's needs. Specifically, activities will contribute to:

Short/medium term:

- developing novel natural, sustainable and 'eco-friendly' products with significant bioactive properties, especially as relevant for the pharmaceutical, cosmetic, agrochemical or marine sectors and applications. These will deliver clear-cut benefits for consumers by being more effective and/or eco-friendly, cheaper, and more readily accessible than existing alternatives;
- developing sustainable exploitation, cultivation and processing methods based on promising species/organisms, and chosen production routes;
- increasing public-private cooperation in European biotechnology, while integrating its sectors e.g. 'green' (plant), 'blue' (marine), and 'white' (industrial); and;
- increasing public knowledge of biodiversity potential and, if relevant, ecosystem interactions, and their impact on bioactive response;

Long term:

- reducing the pressure on the harvesting of wild populations; and;
- ensuring the environmental and economic sustainability of the entire process, inter alia by reducing and extracting waste via the efficient use of biomass (cascade approach).

Cross-cutting Priorities: RRI, **Blue Growth**, International cooperation

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[1] "The role of biomass and bioenergy in a future bioeconomy: policies and facts" (2015) World Markets 2012 European Commission, Joint Research Centre (JRC).

[2] Frost and Sullivan revenues by end-user industry (2010 world) Fraunhofer White Biotechnology, N8E3-39 (June 2011).

[3] Defined as chemical compounds or substances that are produced naturally by living organisms, such as bioactive secondary metabolites (e.g. alkaloids, terpenoids, flavonoids, glycosides, polyketides and peptides), and/or their derivatives. Large macromolecules such as proteins/enzymes are excluded.

[4] Including, if appropriate, an outline of continuation of the end-product development beyond the project timeline and its resources.

Horizon 2020 Pillar: Societal Challenges

Programme: Food security, sustainable agriculture and forestry, marine and maritime and inland water research

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Healthy terrestrial livestock microbial ecosystems for sustainable production

Topic Identifier: SFS-02-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 22.01.2020, 08.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-02-2020

Specific Challenges: Research is increasingly paying attention to the importance of interactions between the animal host and microbiota and their effects on the production efficiency, and the health and welfare of animals. These interactions are highly dynamic and influenced not only by genetics, but also by external factors such as environment, nutrition/feeding and management. Recent developments in omics science and technologies have opened new avenues for understanding not only the biology and genetics of animals, but also the ecosystems in which they function and those which they harbour, i.e. microbiomes. This is particularly relevant for micro-organisms that are currently non-culturable. Research on the interplay between the animals and their microbial ecosystems is needed to contribute to the improvement of sustainable livestock production.

Scope: Activities shall address relevant microbial ecosystems of terrestrial livestock, and their effects on the production, health and welfare of animals. They should look in a balanced way at the characterisation of microbial ecosystems (including microbial communities and microbe-derived metabolites), assessing variability within and between breeds in relation to variability of production systems and diet; at microbial behaviour (e.g. interactions between microbiota, evolution with age of animals, transmission); at microbial functions and interactions with host, environment and management practices, including feeding where relevant; and at possible ways in which those ecosystems can be managed, including socio-economic aspects, in order to reduce environmental impact, improve production and its quality, and/or health in particular during challenging periods

such as early life, weaning or after disturbances. Activities will include the incorporation of data on microbial ecosystems in the models used to analyse phenotypic variability and to perform genetic evaluations. The activities shall address either ruminants, or monogastrics. Gut microbiome of pigs or poultry can be addressed only in so far as the activities are complementary to those in related projects selected under LC-SFS-03-2018. Proposals may cover one or more species and one or more microbial ecosystem.

Research on anti-microbial resistance can be included as long as it is not the main objective of the project (see topic SFS-12-2018/2019). Research on single animal pathogens is not the focus of the topic. The projects are encouraged to interact as appropriate with relevant collaborative projects in Europe as appropriate and with international initiatives such as the rumen microbial genomics network of the **Global Research Alliance on Agricultural Greenhouse Gases**[1].

The Commission considers that proposals requesting a contribution from the EU of up to EUR 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Funding will allow support for at least one project relating to ruminants and one to monogastrics.

Expected Impact: Funded activities will contribute to deciphering the characteristics and functions of the livestock microbial ecosystems and understand the ways in which they influence production, health and/or welfare of animals. They will provide standardised methodologies for further application in livestock production to the greatest extent possible, including socio-economic aspects.

In the short- to medium term, the application of the knowledge and solutions developed will, as appropriate:

- enable inclusion of data on microbial ecosystems in the models used to analyse phenotypic variability and to perform genetic evaluations;
- improve resource use and environmental impact of terrestrial livestock production;
- improve robustness and health of terrestrial livestock, in relation to productive functions;
- reinforce collaborations with initiatives in related domains to promote coherence and applicability of research on microbial ecosystems.

In the longer term, the funded activities will contribute to more resilient production systems.

Delegation Exception Footnote: This topic is part of a microbiome cluster. For complementary activities see also SC2 topics SFS-01-2018/19/20, SFS-03-2018 and BG-06-2018 on Marine Microbiomes as SC1 topic SC1-BHC-03-2018

Cross-cutting Priorities: International cooperation

[1] https://globalresearchalliance.org/research/livestock/networks/rumen-microbial-genomics-network

Horizon 2020 Pillar: Societal Challenges

Programme: Food security, sustainable agriculture and forestry, marine and maritime and inland water research

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Epidemiology of non-EU-regulated contagious animal diseases: from integrated data collection to prioritisation

Topic Identifier: SFS-10-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 22.01.2020, 08.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-10-2020

Specific Challenges: The increasing demand for animal derived food and the mounting pressure on land and oceans is expected to push further intensification and expansion of animal production in certain regions of the world. Contagious livestock diseases impede the efficiency of animal production and lead to economic costs, poor animal welfare, and in the case of certain diseases, have an impact on trade, consumer confidence and public health. While the impact of epizootic diseases and some other regulated contagious diseases is relatively well known due to the regulatory framework, the situation with non-regulated contagious diseases is poorly known, even less for diseases with multiple pathogens (disease complexes). It is up to the private sector to deal with them. There is a need to determine the prevalence of production related diseases, the burden of these diseases and to set up a framework to facilitate monitoring of the situation and enable improvements in risk assessments and prioritisation of disease control measures throughout the animal production chain, for the producers and their organisations, the private stakeholders in the livestock sector (e.g. veterinarians, animal health industry, animal breeding industry, food industry) and the public stakeholders (e.g. risk managers, funders).

Scope: Activities will aim to harvest the knowledge inherently carried in existing data streams on contagious, non-EU-regulated, animal diseases, including diseases with multiple pathogens (disease complexes) and AMR. The proposals should address at least terrestrial livestock, while including marine and freshwater aquaculture whenever relevant, and should investigate the feasibility of addressing relevant wildlife. Data from different production systems should be

included. Activities will look for ways to validate, integrate and process these data, including modelling, possibly generating additional useful information inferred from existing data and identifying new data that could be integrated in data streams. They will focus on identifying and characterising relevant data on diseases (including animals, pathogen and environment, including genomic and metagenomic data), context and consequences (e.g. performance), the various components of data streams and will assess opportunities and barriers to utilising or sharing information across countries and stakeholders throughout Europe. This should improve risk identification and determination of the burden and cost of non-regulated contagious diseases and effectiveness and efficiency of control measures. Relevant geospatial information and data on animal welfare and genetics, in so far as they can be connected to animal diseases, can be included in the planned activities.

Work shall explore the potential of precision farming and “big” data, cloud-based integrated data collection for the detection of hitherto undetected relations between symptoms, diagnoses, treatments, risk factors, control measures and spread of diseases as well as their associated burden and economic costs. They should test the feasibility and potential benefits of an integrated approach to knowledge extraction and decision support based on a specific risk scenario for a disease. Decision-makers involved at different levels in the management of diseases should be considered (e.g. producers, private stakeholders supporting diseases control plans at a collective level, public sector). Possible integration with farm management and information systems and (automated) decision support systems, should be explored. Development or refinement of existing risk-based approaches and early warning systems should be explored. The project will provide a coherent blueprint and a framework for the necessary changes to allow improved data utilisation to protect animal health and welfare, human health and the food chain in Europe. Proposals should fall under the concept of 'multi-actor approach'[1], involving representatives of producers, veterinarians and other professionals from animal production and the food chain, as appropriate, and decision-makers.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Strategic utilisation of existing and development of new data streams will:

- allow a clear view on occurrence and cost of disease and relation to welfare;
- enable timely and evidence-based decision-making by stakeholders in public and private sectors, and potentially by producers. It will enable a more focused targeting of resources for controlling diseases;
- provide a basis for potential rapid and early detection coupled with prediction of consequent losses,
- facilitate educational strategies for animal disease and animal welfare management; identify gaps in human capital knowledge.

Cross-cutting Priorities: **Blue Growth**

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[1] See definition of the 'multi-actor approach' in the introduction of this Work Programme part

Horizon 2020 Pillar: Societal Challenges

Programme: Food security, sustainable agriculture and forestry, marine and maritime and inland water research

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Agri-Aqua Labs

Topic Identifier: SFS-30-2018-2019-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 22.01.2020, 08.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-30-2018-2019-2020

Specific Challenges: Agriculture and aquaculture are increasingly knowledge-intensive sectors that need to be supported by advances in basic science domains in tandem with translational research. This nexus between basic and applied research requires specific openings for testing ideas and their potential application in plant and animal production, both terrestrial and aquatic.

Recent developments in genomic selection have revolutionised animal breeding and resulted in significant gains in production efficiency of animals. However, our understanding of the biological mechanisms underpinning traits remains limited. Most phenotypes, in particular for traits related to health, biological efficiency and robustness, are complex and a major goal of biological research is to use genome information to predict such complex outcomes.

In the area of crop production, there is a fundamental interest in deciphering the dynamic responses of plants as they (pre)adapt to local conditions or adjust their growth and development to changes in the environment within their plasticity range. These adaptive traits are all the more important as plants are sessile and therefore require effective strategies to deal with uncertainty and to tolerate rather than avoid stress. Understanding the different adaptation strategies, and the circumstances that favour one strategy over another, is vital for understanding how annual or perennial crops perform in a given environment or under changing conditions. It will also help to assess how plants may respond to future environmental changes. Food and other plant-based products are the result of plants' capacity to harvest light and convert it into chemical energy to build energy rich organic compounds and ultimately biomass. Energy efficiency is central to plant yield and robustness. The various components of the complex

plant energy system as well as their interactions (in spatial and temporal terms) need to be better understood as a basis for crop improvement, crop management and adaptability of crops to changing environments.

Scope:

C. [2020]: Plant energy biology (RIA)

Proposals will advance our understanding of the plant energy system in terms of elucidating specific mechanisms as well as the complex processes and interactions that determine overall energy efficiency in plants.

More specifically work will allow to better understand and determine

- (some of) the various components, processes and interactions of plants' energy system and their regulation - from energy capture to its conversion, transport, photoassimilate partitioning and use
- the metabolic reactions underlying particular functions of plants' energy system
- responses of the energy system to abiotic changes (e.g. CO2 concentration, light, temperature, water, salinity)
- the basis of naturally occurring variation of selected components of the energy system
- the overall energy efficiency in plants at various levels: cell – whole plant – canopy (including leaf anatomy and canopy structure)
- trade-offs between the efficiency of the energy system and the plant's susceptibility to or tolerance to biotic stresses

The above listed elements provide a framework for action from which proposals can choose a particular scope and approach in line with the broader objectives of the call.

While capitalising on knowledge resulting from work in model species, proposals should also work in crop species taking into account relevant agronomic conditions.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 5 million for sub-topic C would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Results of funded activities will help to create knowledge hubs in their respective domains and develop specific pathways to feed biological insight into agricultural (husbandry, crops) and aquaculture practices.

In the short to medium term work will:

- allow to better understand the key mechanisms, interactions and control of the various components of plants' energy biology system as well as their inherent trade-offs at the subcellular and whole plant level (sub-topic C)
- help to better assess plant responses to abiotic changes (sub-topic C)
- elucidate energy related traits to feed into breeding and crop management strategies at the level of individual plants and the canopy (sub-topic C)

- advance knowledge on the relationship between photoassimilate partitioning, plant growth and agronomic yield (sub-topic C)

In the long term activities will enhance the sustainability of farmed animal production (sub-scope A). They will allow making more solid assertions on how crops will respond and can possibly better adapt to changing environments, also by means of enhancing plant energy efficiency to optimise productivity of plants.

Cross-cutting Priorities: Open Science, **Blue Growth**, International cooperation

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

Call Title: Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy

Call Identifier: h2020-lc-sc3-2018-2019-2020

Topic Title: Demonstration of innovative technologies for floating wind farms

Topic Identifier: LC-SC3-RES-19-2020

Type of Action: IA Innovation action

Deadline(s): 11.12.2019 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-19-2020

Specific Challenges: The first commercial-scale floating wind farm has recently come into operation and other floating wind farms initiatives are ongoing. Floating wind farms have significant potential but further efforts are needed to drive the costs down and to fully commercialise and industrialise the technology.

Scope: Proposals will focus on the demonstration of floating offshore wind innovations (such as blades, floaters, moorings, electrical subsystems and cabling, monitoring systems, and/or integrated systems, including whole wind turbines specifically conceived for floating offshore), in view of scaling-up power rating to >10 MW. Different sea and weather conditions shall be considered. Proposals shall improve industrial design and manufacturing processes, installation methods and operation & maintenance.

Proposals are expected to bring the technology(ies) to TRL 6-8 (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of up to 25 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Decrease the Levelized cost of Energy (LCOE) and environmental impacts while increasing market value of floating wind power[1].

Cross-cutting Priorities: **Blue Growth**, Clean Energy

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[1] This recent concept becomes increasingly important as wind power is often exposed to merchant prices which can be very low. Formally, it represents the average revenue per energy unit of wind produced. See, for example, Riva (2016, p. 15). System value of wind power - an analysis of the effects of wind turbine design. Available at http://www.ea-energianalyse.dk/reports/student-reports/system_value_of_wind_power.pdf.

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

Call Title: Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy

Call Identifier: h2020-lc-sc3-2018-2019-2020

Topic Title: Market Uptake support

Topic Identifier: LC-SC3-RES-28-2018-2019-2020

Type of Action: CSA Coordination and support action

Deadline(s): 11.12.2019 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-28-2018-2019-2020

Specific Challenges: Since the adoption of RES Directive in 2009, most Member States have experienced significant growth in renewable energy production and consumption, and both the EU and a large majority of Member States are on track towards the 2020 RES targets. At the same time the cost of energy from renewable energy sources has decreased significantly and the performance and market penetration of these sources has increased. Nevertheless, there is still a lot of market potential to be exploited. This potential is recognised in the "Clean Energy for all Europeans" package adopted at the end of 2016, which sets renewable energy targets for 2030 and introduces modifications in the energy market design, while empowering individuals or communities to participate actively to the energy system transformation. Furthermore, in June 2018 member states agreed to set an overall EU renewable energy target of 32% by 2030. Challenges exist for renewable energy to realise its full potential in all sectors and accelerate the clean energy transition, playing a crucial role in leading to an increased share of renewable energy consumed in the EU and to a more active role for the consumers.

The introduction and deployment of renewable energy at large scale requires overcoming a number of barriers. These cover issues such as consumer acceptance, legal and financial challenges related to the introduction of novel solutions into a technical and business environment with incumbent established solutions in place, necessity of making renewable energy solutions compliant with the new legislations, facilitation of legislative and regulatory aspects limiting innovative energy solutions implementation at the grid levels and also at the community or citizen level. Improving existing tools for better assessing the environmental, economic and social impact of renewable energy solutions is

challenging due the breadth and scope of the different renewable technologies. The challenges are also related to creating a renewable energy sector fit for massive deployment in the market, which means ensuring that complete value chains for a broad range of renewable energy technologies are in place, not only covering raw materials (such as e.g. bioenergy feedstock) logistics but also components availability and operational reliability; and ensuring that renewables are fit to the market and capable to provide additional services to the grid. The energy markets outside the EU must not be forgotten, as they represent the most significant long term opportunity growth of the sector, but the penetration of these markets is a challenge in itself too.

Scope: The proposal will develop solution(s) addressing one or more of the identified challenge(s), for the entire renewable energy sector or focusing on a specific energy market, such as electricity, heating, cooling or renewable fuels. The proposed solution can be developed to address a local challenge but should have wide potential for reapplication. The solution must have a long term viability and not be limited to an ad-hoc fix. The methodologies applied may be inspired by successful approaches already tested in other fields or contexts.

For all actions, the consortia have to involve and/or engage relevant stakeholders and market actors who are committed to adopting/implementing the results. The complexity of these challenges and of the related market uptake barriers may call for multi-disciplinary approaches, which should include contributions from the social sciences and humanities. Where relevant, regional specificities, socio-economic, gender-related, spatial and environmental aspects will be considered from a life-cycle perspective.

Where relevant, proposals are expected to also assess the legal, institutional and political frameworks at local, national and European level and examine how, why and under what conditions these (could) act as a barrier or an enabler.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1 to 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: It is expected that the solution proposed will facilitate the wider uptake of renewable energy generation in the energy and industrial sectors leading to an increase share of renewable energy in the final energy consumption by 2030. The solution will contribute to substantial and measurable reductions in the project development timings and efforts, whilst fully addressing the needs for environmental impact assessments and public engagement. It will also contribute to provide a basis for the development of more informed policy, market support and financial frameworks, notably at national, regional and local level, leading to more cost effective support schemes and lower financing costs for RES facilities.

Cross-cutting Priorities: Clean Energy, Gender, Open Innovation, **Blue Growth**, Socio-economic science and humanities, International cooperation, RRI

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

Call Title: Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy

Call Identifier: h2020-lc-sc3-2018-2019-2020

Topic Title: Decarbonising energy systems of geographical Islands

Topic Identifier: LC-SC3-ES-4-2018-2020

Type of Action: IA Innovation action

Deadline(s): 29.01.2019 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-es-4-2018-2020

Specific Challenges: Energy production costs on geographical island are up to ten times higher than on the mainland; therefore the large-scale deployment of local renewable energy sources and storage systems brings economic benefits and, at the same time, contributes to decarbonising the energy system of the island, reducing greenhouse gases emissions and improving, or at least not deteriorate, air quality.

Scope: The proposed solutions will contribute to high levels of local renewable energy and a very significant reduction of the use of fossil fuel based energies (ideally achieving full decarbonisation for the whole island), covering also:

- Improve integration and use of digitalised smart grids and/or thermal networks based on high flexibility services from distributed generation, local power balancing, demand response and storage of electricity, heating and cooling, water, etc.; including innovative approaches to energy storage at different scales.
- Improved forecasting through comprehensive modelling of demand and supply (e.g. based on weather, wind, sun, etc.).

Projects should also deliver:

- Effective business models for sustainable solutions for Renewable Energy Communities, in line with the recently adopted Renewable Energy Directive (Directive (EU) 2018/2001);
- Practical recommendations arising from project experience on:
  - regulatory and legal aspects;
  - gender and socio-economics (Social Sciences and Humanities);

- storage and flexibility solutions (from short to seasonal timescales);
- data management, data processing and related cyber security;

- Contributions to environmental sustainability, in particular in view of the specificities of islands ecosystems;
- Large scale implementation of self-consumption solutions in households, buildings and/or districts, supported by microgrids and decentralised small-scale storage systems.

Proposals will involve at least two Follower islands (geographical islands). The follower islands are to be members of the consortium although their participation in the project can be limited to actions allowing them to develop plans to adapt similar solutions to their islands in a cost-efficient way. The size of the budget allocated to Follower islands should be clearly correlated to their level of involvement in the project's activities. Follower islands participation will focus on exploring, planning and initiating the replication of the deployed solutions adapted to the different local conditions. This has to take the form of a detailed replication plan delivered by the end of the project.

The TRL will range between 5 and 8 (see part G of the General Annexes). Proposers will indicate the estimates levels of TRL at the beginning and at the end of the project.

Proposals will include a task on the analysis of obstacles to innovation under the current context and foresee the coordination on policy relevant issues (e.g. regulatory framework, business models, data management, consumer engagement) with similar EU-funded projects through the BRIDGE initiative[1]. An indicative budget share of at least 2% is recommended for the research work associated with these issues and an additional 2% for the coordination effort.

If relevant, projects should cooperate with the European Islands Facility (LC-SC3-ES-8-2019), and aim to establish synergies with ongoing and planned work on islands in the 'Clean Energy for EU islands' initiative[2].To support this, an indicative budget share of at least 2% of the EU contribution is recommended, which for example could include the development of practical training material and courses for island inhabitants, based on the chosen objectives and deliverables.

The Commission considers that proposals requesting a contribution from the EU of between EUR 5 to 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The projects are expected to contribute to all the following impacts:

- reduce significantly fossil fuel consumption, by developing renewable energy-based systems (including heating and cooling and storage) that allow the island to go towards full decarbonisation goals in a shorter time frame;
- large-scale uptake of validated solutions on the same geographical island and/or on other geographical islands with similar problems;

- Facilitate the creation and/or increase the number of renewable energy communities[3];
- enhance stability of the power network for islands that are grid connected with the mainland.

Proposals are invited to include ad-hoc indicators to measure the progress against specific objectives of their choice that could be used to assess the progress during the project life. Indicators are expected to have clear and measurable targets. Proposals are also invited to identify if they impact on future investment perspectives (see also topic LC-SC3-ES-8-2019).

Cross-cutting Priorities: Gender, Clean Energy, Socio-economic science and humanities, **Blue Growth**

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[1] http://www.h2020-bridge.eu/

[2] https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/clean-energy-eu-islands

[3] 'renewable energy community' as defined in DIRECTIVE (EU) 2018/2001 on the promotion of the use of energy from renewable sources.

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

Call Title: Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy

Call Identifier: h2020-lc-sc3-2018-2019-2020

Topic Title: Developing the next generation of renewable energy technologies

Topic Identifier: LC-SC3-RES-1-2019-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 21.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-1-2019-2020

Specific Challenges: The renewable energy technologies that will form the backbone of the energy system by 2030 and 2050 are still at an early stage of development today. Bringing these new energy conversions, new renewable energy concepts and innovative renewable energy uses faster to commercialisation is challenging. These new technologies must not only have a commercial potential but they should also have a lower environmental impact and lower greenhouse gases emissions than the current renewable energy technologies.

The proposed solution is expected to contribute to implementing the specific priorities for strengthening the EU leadership on renewables laid out in the Communication for Accelerating Clean Energy Innovation[1].

Due to the pre-competitive nature of the research activities of this type, particular emphasis is put on including international cooperation opportunities whenever relevant to the proposal and the domain, in particular in the context of the **Mission Innovation** Challenges[2].

Scope: Support will be given to activities which focus on converting renewable energy sources into an energy vector, or the direct application of renewable energy sources.

This topic calls for bottom-up proposals addressing any renewable technology currently in the early phases of research. Activities also might include energy materials, catalysts, enzymes, microorganisms, models, tools and equipment, as long as those are strictly connected to the energy conversion process.

Developments in sectors other than energy may provide ideas, experiences, technology contributions, knowledge, new approaches, innovative materials and skills that are of relevance to the energy sector. Cross-fertilisation could offer mutually beneficial effects.

Proposals are expected to bring to TRL 3 or TRL 4 (please see part G of the General Annexes) renewable energy technologies that will answer the challenge described. Beside the development of the technology, the proposal will have to clearly address the following related aspects: lower environmental impact, better resource efficiency than current commercial renewable technologies, issues related to social acceptance or resistance to new energy technologies, related socioeconomic and livelihood issues.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 to 4 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The concepts proven or validated within the projects are expected to contribute to accelerating and reducing the cost of the next generation of sustainable renewable energy generation. In addition, the project is expected to advance the knowledge and scientific proofs of the technological feasibility of its concept including the environmental, social and economic benefits. The proposal should show its contribution towards establishing a solid European innovation base and building a sustainable renewable energy system.

Cross-cutting Priorities: **Blue Growth**, International cooperation, Socio-economic science and humanities, Clean Energy

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[1] COM(2016) 763

[2] http://mission-innovation.net/our-work/innovation-challenges/

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

Call Title: Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy

Call Identifier: h2020-lc-sc3-2018-2019-2020

Topic Title: Development of next generation renewable fuel technologies from CO2 and renewable energy (Power and Energy to Renewable Fuels)

Topic Identifier: LC-SC3-RES-26-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 21.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-26-2020

Specific Challenges: Renewable energy is expected to grow faster than the capacity of the grid, thereby creating storage needs. The energy required to produce current renewable fuels reduces their competitiveness as alternatives to fossil fuels. The specific challenge is to increase the competitiveness of next generation renewable fuels through efficiently integrating unexploited renewable energy sources in their production process and to foster their use as a renewable energy storage option taking advantage of the existing infrastructure for gaseous and liquids fuels.

Scope: Proposals will develop next generation renewable fuels for energy and transport, which improve substantially (beyond the state-of-the-art), the performance regarding energy efficiency as well as cost of the conversion of direct renewable energy (e.g., sunlight) or renewable electricity and /or heat to liquid or gaseous renewable fuels from CO2. Targeted fuels should also provide very low engine-out emissions.

Proposals are expected to bring the technology from TRL 3-4 to 4-5 (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 3 to 5 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The supported projects are expected to reduce conversion energy losses and production costs of algal fuels/power to gas/liquid and heat to gas/liquid renewable fuels respectively, as well as improving performance of these fuels as regards the efficiency, the environment and society.

Cross-cutting Priorities: **Blue Growth**, Clean Energy

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

Call Title: Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy

Call Identifier: h2020-lc-sc3-2018-2019-2020

Topic Title: Offshore wind basic science and balance of plant

Topic Identifier: LC-SC3-RES-31-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 21.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-31-2020

Specific Challenges: The contribution of offshore wind power to the energy mix is expected to increase significantly by 2030. Better knowledge of basic wind energy science and related areas contributes to the cost reductions required to achieve that goal.

Scope: Proposals are expected to address one or more of the following research areas for offshore wind which have been identified in the SET-Plan Implementation Plan[1]:

- Atmospheric multi-scale flow modelling (from meso-scale to wind farm flows);
- Understanding and modelling key uncertainties and physical phenomena of offshore wind energy design and operation (e.g. fluid-structure, soil-structure and electro-mechanical interaction, large motion prediction, turbulence, wave modelling, mooring line behaviour);
- High performance computing and digitalisation (e.g. data processing, machine learning and data analytics methods for implementation in data-driven design, digital twins and control and monitoring for O&M);
- Development and validation of models of structural damage and degradation for offshore wind turbines and/or for their components as functions of loads and environment;
- Numerical and test methods for accurate assessment of system and component reliability when introducing new materials and technologies;
- Other offshore balance of plant aspects related to the manufacturing, construction, installation and/or decommissioning of large-scale wind turbines.

While offshore wind must be the cornerstone of the proposal addressing any bullet point above, onshore wind may also be covered when synergies may be exploited from including both. This is just a possibility and not a requirement.

'Materials science', which is also mentioned in the SET-Plan Implementation Plan, is outside the scope of this topic, but is addressed under topic LC-NMBP-31-2020.

The proposals are expected to bring new technologies/models/methods to TRL 4-5 (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 to 4 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Proposals should lower the Levelized Cost of Energy (LCOE); those addressing any of the first four bullet points above should also aim to increase the market value of wind power[2]

Cross-cutting Priorities: Clean Energy, **Blue Growth**

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[1] https://setis.ec.europa.eu/system/files/setplan_wind_implementationplan_0.pdf

[2] This recent concept becomes increasingly important as wind power is often exposed to merchant prices which can be very low. Formally, it represents the average revenue per energy unit of wind produced. See, for example, Riva (2016, p. 15). System value of wind power - an analysis of the effects of wind turbine design. Available at http://www.ea-energianalyse.dk/reports/student-reports/system_value_of_wind_power.pdf.

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

Call Title: Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy

Call Identifier: h2020-lc-sc3-2018-2019-2020

Topic Title: New test rig devices for accelerating ocean energy technology development

Topic Identifier: LC-SC3-RES-32-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 21.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-32-2020

Specific Challenges: By 2050 ocean energy can contribute significantly to the renewable energy mix in Europe. As stated in the SET-Plan Ocean Energy Implementation Plan[1] ocean energy costs must be reduced through, but not only, increased performance and reliability in order to meet its full potential. Researchers and industries are presenting innovative solutions, but to accelerate the development pathway to the market, new testing methodologies will help industries to take more quickly go/no-go decisions. For this a better understanding of basic ocean energy sciences is required to develop the research competences and the underpinning scientific knowledge for the testing methodologies.

Scope: The actions should generate one or more new test rig prototype devices including novel test procedures that should be used by multiple ocean energy technology developers, and facilitate design convergence. This will support improved testing of low TRL wave or tidal device components or sub-systems – e.g. facilities, tools and procedures - and make accelerated life testing possible, considering for instance efficiency, reliability, survivability and/or environmental impact.

Proposals are expected to connect and integrate the various capacities and resources of the beneficiaries and other ongoing European and national projects in the proposed research areas.

Proposals are expected to clearly indicate how the science is contributing to accelerated cost reductions in ocean energy.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 to 5 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: It is expected that this action will accelerate and reduce the cost of the ocean energy technology development pathways. It should contribute to the exchange of knowledge and will progress the scientific understanding of ocean energy.

Cross-cutting Priorities: **Blue Growth**, Clean Energy

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[1] https://setis.ec.europa.eu/system/files/set_plan_ocean_implementation_plan.pdf

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

Call Title: Competitive, low carbon and circular industries

Call Identifier: h2020-low-carbon-circular-industries-2020

Topic Title: Low carbon industrial production using CCUS

Topic Identifier: LC-SC3-NZE-5-2020

Type of Action: IA Innovation action

Deadline(s): 01.09.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-nze-5-2020

Specific Challenges: CCUS in industrial applications faces significant challenges due to its high cost and the fierce international competition in the sectors concerned. However, these sectors currently account for 20% of global CO2 emissions, and in the 2 degree scenario, should represent half of the stored CO2 by 2050. Relevant sectors with high CO2 emissions are for example steel, iron and cement making, oil refining, gas processing, hydrogen production, biofuel production and waste incineration plants.

Scope: Projects will focus on integrating CO2 capture in industrial installations, whilst addressing the full CCUS chain. Projects will elaborate a detailed plan on how to use the results, i.e. the subsequent transport, utilisation and/or underground storage of the captured CO2. Important aspects to address are of technical (e.g. the optimised integration of capture plant with industrial processes; scalability; CO2 purity), safety (e.g. during transportation and storage), financial (e.g. cost of capture; cost of integration) and strategic nature (e.g. business models; operation and logistics of industrial clusters and networks).

Projects are expected to bring technologies to TRL 6-7 (please see part G of the General Annexes). Technology development has to be balanced by an assessment of the societal readiness towards the proposed innovations. Relevant end users and societal stakeholders will be identified in the proposal, and their concerns and needs will be analysed during the project using appropriate techniques and methods from the social sciences and humanities, in order to create awareness, gain feedback on societal impact and advancing society's readiness for the proposed solutions. Projects should also explore the socio-economic and political barriers to acceptance and awareness with a view to regulatory or policy initiatives.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged, in particular with relevant **Mission Innovation**[1] countries such as China[2].

Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the Introduction of this part of the Work Programme.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Successful, safe and economic demonstration of integrated-chain CCUS from relevant industrial sources such as mentioned in the specific challenge will accelerate the learning, drive down the cost and thus help break the link between economic growth and the demand for industrial output on one hand, and increasing CO2 emissions on the other hand. The impact of projects under this call will to a large extent be determined by the extent to which the results will be exploited, i.e. the plan on how the captured CO2 will be actually utilised and/or stored, either in the project or planned as a future phase. This will be evaluated based on the maturity and quality of the proposed post-capture solutions. Projects under this call that are carried out in areas where there is both a high concentration of CO2 emitting industries and a nearby capacity for geological storage are considered prime sites for hub and cluster developments, and will generate the highest impact on full-scale deployment in the medium to longer term.

Cross-cutting Priorities: Socio-economic science and humanities

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[1] http://mission-innovation.net/our-work/innovation-challenges

[2] A Co-funding mechanism is in place in China; see https://ec.europa.eu/programmes/horizon2020/en/news/eu-china-research-and-innovation-co-funding-mechanism-first-call-launched-china

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

Call Title: Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy

Call Identifier: h2020-lc-sc3-2018-2019-2020

Topic Title: International cooperation with **Canada** on advanced biofuels and bioenergy

Topic Identifier: LC-SC3-RES-36-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 01.09.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-36-2020

Specific Challenges: The optimisation of advanced biomass supply chains and overcoming specific conversion technology barriers are needed to improve the market up-take of sustainable advanced biofuels and bioenergy and accelerate their deployment for replacing the use of fossil fuels in the transport, power and heating sectors. International collaboration is mutually beneficial in strategic areas where knowledge can be exchanged and Europe can obtain leadership together with its international partners.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), actions will contribute to the **Mission Innovation** Challenge 4[1].

Scope: Proposals will aim at international cooperation with **Canada** for fostering the deployment of advanced biofuels and bioenergy while substantially decreasing the costs of the feedstock supply or the conversion process.

Proposals should address at least one of the following issues:

- Development of the full supply chain of biomass-to-bioenergy applications including intermediate bioenergy carriers, advanced biofuels, heat and power generation. Sustainable biomass production and collection strategies that facilitate sustainable bioenergy production and decrease feedstock supply costs will be included. All types of non-food/feed biomass including forestry, agricultural and their residues, organic fractions of municipal and industrial wastes can be targeted.

- Thermochemical, biochemical and chemical processing of sustainable biomass to advanced biofuels focusing on the pre-treatment and the conversion process and in particular on reducing the respective marginal cost.

Proposals are expected to bring the technology from TRL 3 to TRL 5 (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 3 to 5 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: It is expected that the exchange of knowledge through the targeted research activities with **Canada** will progress the technology state-of-the-art, strengthen the European and **Canadian** technology base and accelerate the development of sustainable fuels to replace the fossil fuel alternatives. At the same time, it is expected that the development of secure, long-term supply of sustainable feedstock and/or the technology advances will also significantly contribute to increase the viability of advanced biofuels and bioenergy in the EU and **Canada**.

Cross-cutting Priorities: Clean Energy, International cooperation

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[1] http://mission-innovation.net/our-work/innovation-challenges/sustainable-biofuels-challenge/

Horizon 2020 Pillar: Societal Challenges

Programme: Smart, green and integrated transport

Call Title: 2018-2020 Mobility for Growth

Call Identifier: h2020-mg-2018-2019-2020

Topic Title: Decarbonising long distance shipping

Topic Identifier: LC-MG-1-13-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 09.01.2020, 08.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-mg-1-13-2020

Specific Challenges: In 2018 historic targets were agreed within International Maritime Organization (IMO) to cut the total net global GHG emissions from international shipping by at least 50% by 2050, to reduce carbon intensity by at least 40% by 2030 compared to a 2008 benchmark and to completely decarbonise shipping by the end of the century.

Presently shipping accounts for around 2.5% of global GHG emissions and although ships are becoming more efficient, due to increasing global trade this contribution is increasing. These emissions are more than any EU state and if the sector was a country, it would rank as the sixth highest in the world. In 2015, shipping accounted for 13% of overall EU greenhouse gas emissions from the transport sector[1]. Overwhelmingly, long distance shipping accounts for the majority of GHG emissions and its decarbonisation is particularly challenging. It is expected that solutions will need to combine a variety of technologies, operational practices, energy sources and efficiency measures. Furthermore, it will be essential to link any measures to robust data and measurements to better quantify their effectiveness and optimisations.

Scope: All following aspects should be addressed:

- Working together with, for example operators, ship builders, marine equipment manufacturers, fuel and energy suppliers and others research will address the development of technologies combined with operational practices to substantially reduce GHG emissions from long distance shipping in line with the IMO target and without increasing other forms of pollution.
- Excluding fuel development, a wide range of potential solutions can be proposed including the use of wind and solar assistance combined with

efficiency improvements and other alternate energies. Solutions can be proposed in combination and should take into account the likely availability of infrastructure (including bunkering) on long distance routes.

- Solutions should also take into account the CO2 equivalent from any reduction of black carbon emissions.
- Costs, GHG reductions and any other potential waste streams shall be convincingly analysed using real data and testing programmes in addition to theoretical analysis.
- Implications for the provision of new infrastructures shall be quantified and assessed.
- To at least TRL5, technologies, systems and practices shall be tested at full scale on operational shipping. The differences between predicted and measured data should be identified.
- Any reduction in GHG emissions that are founded upon innovative operational practices must be robustly benchmarked against the current state of the art, for example concerning ship routings and speeds through the use of "big" AIS "data" and/or other satellite data.
- A robust communication strategy should be developed and implemented so as to ensure wider public engagement as well as a strong engagement with the global shipping sector and its customers.
- Cooperation with IMO and EU activities and fora concerning the decarbonisation of shipping is encouraged. Build upon and cooperate with any related activities and research.

The Commission considers that proposals requesting a contribution from the EU of between EUR 5 to 10 million would allow the specific challenge to be addressed appropriately.

Expected Impact: Development of innovative solutions to decarbonise shipping that exceed the IMO's 2050 target to decarbonise by 50% and which are applicable to ship types that are the largest emitters of GHGs such as: bulk carriers, tankers, container ships, cruise ships and passenger liners. Establishment of robust benchmarks and methods which will provide wide confidence of the "real world" impacts from any specific GHG reduction measure including potential scalability and any secondary environmental impacts. Improve the competitiveness of European maritime industries and shipping companies within the field of green shipping. Increase the awareness and take up by end users. Provide evidence to policy makers within EU and globally concerning infrastructure requirements necessary to meet the 2050 decarbonisations target.

Cross-cutting Priorities: **Blue Growth**

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[1] https://www.eea.europa.eu/data-and-maps/indicators/transport-emissions-of-greenhouse-gases/transport-emissions-of-greenhouse-gases-10

Horizon 2020 Pillar: Societal Challenges

Programme: Smart, green and integrated transport

Call Title: 2018-2020 Mobility for Growth

Call Identifier: h2020-mg-2018-2019-2020

Topic Title: Understanding and mitigating the effects on public health of emerging non-regulated nanoparticle emissions issues and noise

Topic Identifier: LC-MG-1-14-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 09.01.2020, 08.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-mg-1-14-2020

Specific Challenges: Growing road traffic in Europe results in detrimental effects on the environment and public health in spite of the gradual emissions reduction due to increasingly stringent emission standards. Some technologies lead to particles of smaller and smaller size that influence the health of citizens living close to traffic, before aging in the atmosphere and contributing to background pollution. Secondary particles from gaseous and volatile engine exhaust components are also coming into focus as a significant health-affecting contribution. Moreover, the effects of some specific emissions (e.g. particles from tyres or natural gas engines) are either not sufficiently understood or remain undetected by current air quality or certification procedures. Finally noise (again in particular from tyres), remains an issue for larger road vehicles, since it would remain so even in the case they were progressively electrified.

Scope: Proposals can focus on one or both of the following subtopics, but must be ready to work in cooperation and share results with other selected or running proposals particularly as far as data and material for experimentation (particle samples for health testing, for instance) are concerned:

1. Transport nanoparticles

   All bullet points within this subtopic must be addressed:

   - Assessing and understanding the biological processes leading to negative effects on human beings and animals (including sex and gender differences, when relevant) in particular impacts of nanoparticles below 100 nm on carcinogenesis in multiple organs including both inflammation

effects and the "Trojan Horse" effect of the different chemicals constituting or absorbed on the particles, as well as combined effects of the various components of exhaust gases. Work should consider both aged and fresh aerosols, include primary and secondary volatile and not volatile particles, in particular considering the significant emerging component of extremely fine nanoparticles (below 23 and even 10 nm) constituting a large share of exhausts from certain types of engines like gasoline and natural gas ones.

- Assessing if and what variability of these effects exists with size, chemical composition and morphology, linking as far as possible the impacts with specific emission sources and leading to an understanding and quantification of the risks posed by different types and sources of particles. This research should cover all types of transport-related particles sources (both exhaust and non-exhaust, from road, rail, aviation and shipping) taking into account results from previously funded research projects in the same areas.
- Evaluating the possible future impact of new policies in this area on public health and well-being of citizens and acceptance of the negative economic impacts that could derive from them.

2. Reduction of noise and particles emissions from tyres

   All bullet points within this subtopic must be addressed:

   - Assessment and characterisation (respectively for at least one representative car and truck tyre size), of the amounts of tyre particles emitted in different driving conditions (acceleration, braking, different constant speeds, corner driving) both in laboratory and on real roads with on-boards system, by implementing sensors and analysing nanoparticles characteristics (size, distribution, chemical composition) determining in particular the number and mass shares of particles contributing to PM10, PM2.5 and PM0.1. The effects of chemical transformations of these particles in the air, if any relevant ones are possible, should be assessed to verify if any other negative health effect can be defined and quantified.
   - Evaluation of traffic noise effect on the cardiovascular system, assessing which type of noise (impulsive or background) has the most consequence on health taking into account sex and gender differences when relevant, in order to influence the development methodologies for limiting noise, and to anticipate future legislation and emerging issues.
   - Develop innovative tyres of heavy-duty freight transport optimised for low noise, rolling resistance, wear and therefore particles emissions, particularly in cruise conditions, while keeping a sufficient level of all other relevant performance parameters (traction, skid resistance, etc.). Due consideration should be taken of all road surface types in Europe present on extra-urban roads, and potential for co-optimisation should be considered if this can deliver global benefits without compromising the specific design features of tyres and road surfaces in the different environments for which they have been developed and for other types of vehicles (i.e. an improvement of road surface for trucks should not lead to worsening performances for other vehicles).

- From the above experience, development of reliable and repeatable methodologies for the assessment and comparison of tyre emissions and tread wear for potential future legislation.
- Particles tracing and quantification of the contribution of tyre wear to the microplastics issue in water bodies (rivers, lakes, seas..) and in the ground.
- Evaluating the possible future impact of new policies in this area on public health and well-being of citizens and public acceptance of the negative economic impacts that could derive from them.

Proposals in all areas could foresee international cooperation and experience and exploit synergies in view of establishing future international standards and regulations, including contributing to risk governance in the emerging field of nanomaterials (from which some input from relevant research projects could be gained as well).

The Commission considers that proposals requesting a contribution from the EU of between EUR 3 to 4 million would allow this specific challenge to be addressed appropriately.

Expected Impact: The project resulting from these areas shall deliver the following impacts:

- Enhanced understanding of the health threats posed by particles and noise.
- Guidance for developing and prioritising mitigation measures in future legislation on air quality and emissions, taking into account social aspects.
- European and possibly global standards in critical industrial areas like engines and wear components (brakes, clutches and tyres).
- At least 6dB(A) truck tyre noise reduction in areas which will not benefit from zero emissions vehicles low powertrain noise, i.e. along motorways and urban/periurban thoroughfares at speeds between 50 and 90 kph, where truck tire noise is very relevant.

Cross-cutting Priorities: **Blue Growth**, Gender

Horizon 2020 Pillar: Societal Challenges

Programme: Smart, green and integrated transport

Call Title: Building a Low-Carbon, Climate Resilient Future: Next-Generation Batteries

Call Identifier: h2020-lc-bat-2019-2020

Topic Title: Reducing the cost of large batteries for waterborne transport

Topic Identifier: LC-BAT-11-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 21.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-bat-11-2020

Specific Challenges: Large battery packs are increasingly deployed to improve the efficiency and to eliminate emissions from waterborne transport. However waterborne transport batteries can be up to ten times more expensive than an automotive battery of equivalent capacity and their high cost is an important barrier to increasing the deployment of both hybrid and fully battery electric shipping. Unlike for other transport modes, the space, weight and consequently power density of waterborne transport batteries is usually of secondary importance within the systems total life cycle cost. Several factors contribute to the cost difference including production processes, safety certification, fire suppression, lower economies of scale and higher assembly costs. The challenge is to substantially reduce the cost of large waterborne transport battery systems and cells for both marine and inland waterway transport applications.

Scope: Proposals can address either the battery cell or the battery system (racks, battery management system, fault detection and any integrated fire suppression) or both the cell and battery system.

All of the following aspects should be addressed:

- With respect to waterborne transport, research and develop a large battery system and/or specific battery cells that are substantially cheaper on a total cost basis with respect to existing system.
- Work should be applicable to battery systems of at least 1 MWh capacity.
- Prove the technology and manufacturing processes through system trials and testing.
- Address production process efficiency.

- Address the requirements for type approval from relevant authorities including a comprehensive risk based safety assessment.
- Development of a marine battery certification methodology with the objective of: validating and verifying safety (with consideration of air, liquid or passive cooling), including the standardisation of test methods and tools for certification cost reduction.
- Considering of different vessel types, address the integration of battery systems into Energy/Power management system of vessel.
- Undertake a cost benefit analysis to convincingly demonstrate the cost savings in comparison to current state of the art waterborne battery technology.
- Assess end of life and disposal strategies.
- Develop a convincing business case and consider potential financing models.

The Commission considers that proposals requesting a contribution from the EU of between EUR 8 and 12 million would allow the specific challenge to be addressed appropriately.

Expected Impact: The principal impact should be to substantially reduce the lifetime cost of large waterborne battery systems and to enhance the competitiveness of European industry within the waterborne battery market. Cut greenhouse gas emissions from waterborne transport. Increase the European skills base in large battery technology and manufacturing processes. Support European jobs and growth. Increase confidence in waterborne battery technology investment. Speed up the transition of most short range freight and ferry services towards zero emission.

Cross-cutting Priorities: **Blue Growth**

Horizon 2020 Pillar:	Societal Challenges
Programme:	Smart, green and integrated transport
Call Title:	2018-2020 Mobility for Growth
Call Identifier:	h2020-mg-2018-2019-2020
Topic Title:	Towards global environmental regulation of supersonic aviation
Topic Identifier:	LC-MG-1-15-2020
Type of Action:	RIA Research and Innovation action
Deadline(s):	21.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-mg-1-15-2020

Specific Challenges: This action is part of the Aviation International Cooperation Flagship called "Safer and Greener Aviation in a Smaller World" mentioned in the introduction to this work programme 2018-2020.

Accelerated public and privately-funded development and demonstration efforts in the US, over the last years, aim towards the introduction of new commercial supersonic aircraft as early as 2020-2022. In parallel, the FAA Reauthorization Act of 2018 directs the Federal Aviation Administration (FAA) to take a leadership role in creating federal and international policies, regulations, and standards to certify safe and efficient civil supersonic aircraft operations. Other countries such as Japan and Russia are also investing in research on commercial supersonic aircraft.

The International Civil Aviation Organisation (ICAO) Assembly Resolution A39-1 instructs the Council to review its Annexes so as to ensure that they take due account of the problems that the operation of supersonic aircraft may create for the public. In response to this Resolution, the Committee on Aviation Environmental Protection (CAEP) is in the process of developing environmental standards and recommended practices (SARPs) under Annex 16. In October 2018 Austria on behalf of the European Union, of all EU Member States, of other Member States of the European Civil Aviation Conference and of Eurocontrol, submitted a working paper at ICAO (AN-Conf/13-WP/211)[1]. This European working paper presents the European views on the subject and urges a holistic environmental approach (noise and emissions) before considering the introduction of supersonic aircraft into the global air navigation system.

In response to this European working paper, the challenge for the EU is to act promptly and shape together with the International community high environmental standards in line with ICAO Assembly Resolution A39-1. Research is needed for better understanding the combined and interdependent environmental impacts of potential supersonic aviation on citizens, as well as on the European and international regulatory and certification processes.

The EU should remain a decisive player for thorough development of ICAO noise and emissions standards setting (CO2 and air pollutants). This topic supports this objective by developing expertise at European and international level.

Leveraging resources with international partners can help, on the one hand, in shaping the new global regulations in line with EU's climate change Long Term Strategy, and on the other hand, in sharing costs, risks and benefits, as well as in ensuring a level playing field.

Scope: Proposals should timely assess the holistic environmental impact of potential supersonic aviation and provide evidence for public acceptance long with suitable international high environmental standards. Proposals should take into consideration the results achieved within the EU projects FP6 HISAC[2] (Environmentally friendly high-speed aircraft) and Horizon 2020 RUMBLE[3] (Regulation and norm for low sonic boom levels). Proposals should also include the latest technological developments and explore potential solutions beyond the state-of-the-art, contributing to two or more of the following areas:

- Advance further high-fidelity environmental modelling integrated into multi-disciplinary optimization of supersonic aircraft, trajectories and operations.
- Assess and explore physics-based pathways to decrease noise and emissions at airport/local and global level (i.e. CO2, NOx, water vapour as well as their impact to ozone concentration in the stratosphere). Assess their impacts to trajectory optimization and aeropropulsion technologies to further reduce sonic-boom level and emissions.
- Quantify the efficiency of sonic boom shaping in terms of various boom effects, and not only in terms of noise (e.g. sleep disturbance).
- Explore further the characterisation of indoor boom annoyance (relevant metrics, measurements devices and locations), in collaboration with EASA and other national and international agencies.
- Quantify sonic boom variability due to meteorology, turbulence, urban environment and buildings and address the development of certification processes that take into consideration the stochastic nature of sonic boom.
- Develop at European or International level, accepted and validated modelling tools that capture the physics of the generation and propagation of sonic booms, towards further contributing at ICAO level, according to the CAEP work programme and agenda.

The proposals may include the commitment from the European Aviation Safety Agency and European national civil aviation authorities to assist or to participate in the actions. In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged, in particular with countries such as the Russian Federation, United

States of America, Japan, **Canada**, Brazil, Australia and South Africa. International cooperation can include work towards the development of enabling technologies, joint tests, standards and certification, taking into account bodies such as United Nations' International Civil Aviation Organisation (ICAO).

Where applicable, proposals are encouraged to join international demonstration campaigns for noise and emissions assessments at all phases, including take-off and landing, provided that meaningful outcomes can be delivered according to CAEP work programme and agenda.

The Commission considers that proposals requesting a contribution from the EU between EUR 3 and 5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting lower or higher amounts.

Expected Impact:

- Maintain high level of environmental protection, especially in terms of global and local emissions and noise.
- Ensure suitable global regulations, standards, operational procedures and recommended practices for the protection of the citizens and of the environment.
- Contribute to maintain world-class knowledge and skills in Europe in the field of civil supersonic aviation.
- Contribute to stimulate disruptive innovation in civil aviation with spin-offs into other civil aerospace segments and other civil sectors.
- Contribute to inspire and engage new generations of students and engineers.

Cross-cutting Priorities: International cooperation

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[1] https://www.icao.int/Meetings/anconf13/Documents/WP/wp_211_en.pdf

[2] https://cordis.europa.eu/project/rcn/75786/reporting/en

[3] https://rumble-project.eu/i/

Horizon 2020 Pillar: Societal Challenges

Programme: Smart, green and integrated transport

Call Title: 2018-2020 Mobility for Growth

Call Identifier: h2020-mg-2018-2019-2020

Topic Title: The effects of automation on the transport labour force, future working conditions and skills requirements

Topic Identifier: MG-2-14-2020

Type of Action: CSA Coordination and support action

Deadline(s): 21.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/mg-2-14-2020

Specific Challenges: The European Commission has launched a number of initiatives, studies, workshops and conferences on the challenges and effects that digitalisation and automation in transport may have on the labour force, including on women and persons with disabilities. In road transport, studies and research projects are starting to assess on the future employment needs and the new set of skills required for automation. However, such aspects need to be further explored for all modes of transport (road, waterborne, aviation, rail), as well as in the context of urban transport, logistics and for new forms of work (for instance platform work in transport).

In particular, action is needed to ensure the preparation of a comprehensive, evidence-based, action-oriented, appropriate agenda to tackle the identified challenges. This would also require the investigation of gaps and barriers, which could potentially impede or neutralise any positive effects expected from automation. For this purpose, in order to successfully address this challenge, it is key to have a strong involvement and engagement of all relevant European stakeholders, including European, national and regional social partners[1] (representing employers and workers) and EU Member States.

Attention should also be given to the collaboration with non-EU stakeholders where relevant, in order to solve common challenges, leverage resources, and establish long-term relationships.

Scope: Proposals shall address all of the following areas:

- Assess the impacts of automation and connectivity in all modes of transport on the labour market as a whole, focusing on both direct effects on the transport workforce and indirect / induced effects in other sectors.
- Review past/contemporary experiences from other automation-driven transitions to derive best practices in the transfer of lessons learned between different environments and social contexts.
- Review and analyse recommendations/contributions from past/ongoing related studies, activities and H2020 R&I projects. Identify and prioritise relevant targets and elaborate an action-oriented agenda aiming to achieve at least an overall neutral impact of automation at the level of the entire economy.
- Activate the wider engagement of the social partners and EU Member States in order to validate the agenda, as well as increase their participation and involvement in the implementation of identified actions. Develop an appropriate framework to foster collaboration and exchange of best practices at EU, national and regional level.
- Provide a forum for EU and international stakeholders (as appropriate) in this field to exchange experiences and knowledge on the effects of transport automation on the workforce and future skills and discuss future challenges. Organise conferences and workshops in this area.

Proposed actions should build on the knowledge and results of past and/or ongoing EU-funded projects (such as SKILLFUL), addressing the socio-economic impacts of automation in transport and/or undertaking related reviews of transport jobs and future skills requirements.

In line with the Union's strategy for international cooperation in research and automation, international cooperation is encouraged. In particular, proposal should consider cooperation with projects or partners from **Canada**, Japan and the US.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 and 2.5 million would allow the specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Demonstrate the expected impacts of automation and connectivity in all modes of transport on the labour market as a whole
- Inform, mobilise and engage all relevant European stakeholders, including the European, national and regional social partners and EU Member States, in an active dialogue on the socio-economic effects of automation on the present and future transportation workforce
- Minimise any potential negative effects of automation on the transport labour force
- Demonstrate the potential to achieve at least an overall neutral impact of automation for the entire society and economy.

Cross-cutting Priorities: Gender, Socio-economic science and humanities

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[1] https://ec.europa.eu/social/main.jsp?langId=en&catId=329

Horizon 2020 Pillar: Societal Challenges

Programme: Smart, green and integrated transport

Call Title: 2018-2020 Mobility for Growth

Call Identifier: h2020-mg-2018-2019-2020

Topic Title: Improved Production and Maintenance Processes in Shipyards

Topic Identifier: MG-3-7-2020

Type of Action: IA Innovation action

Deadline(s): 21.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/mg-3-7-2020

Specific Challenges: European Ship building, repair, modification and maintenance has been founded upon a technology based competitive advantage which has enabled it to build, improve and maintain the world's most advanced ships. However, competitors are also becoming more advanced and seeking to enter European high technology markets. Many ship types developed within Europe are now built elsewhere. Also European marine equipment, including environmental technologies are often retrofitted to ships within non-European shipyards. Europe is still a global leader for very high technology ships such as large passenger vessels, but this is a niche and competitors have a strategy to also enter these markets.

The market is particularly challenging for smaller shipyards across Europe who can be agile to develop and maintain niche products or to be integrated within smart supply chains yet do not have significant resources to undertake research and innovation.

Consequently, continuous innovation is needed for the sector to remain competitive and in this respect, lessons and technologies can be drawn for other sectors including automotive, aerospace and IT. For example taking advantage of the latest developments within digital production, advanced robotics and co-bots, machine vision, internet of things, flexible production systems, 3D printing, supply chain integration across multiple sites, skills development and deployment strategies.

Scope: All following aspects should be addressed:

- The development of innovative technologies and systems to enhance the competitiveness of production and maintenance processes within European

shipbuilders and ship yards. Where appropriate, technologies transfer from outside of the marine industry shipbuilding, ship maintenance and ship modification sectors, particularly those with potential to reduce CO2 and/or other polluting emissions.

- Identification of the necessary related skills development needs and strategies to address these in order to maximise the value from innovative production technologies and practices.
- Testing and physical demonstration of the developed technologies to at least TRL 5, including the benchmarking of existing practices, consideration of the environmental impacts and quantification of the additional value from the technology and/or system developed.
- Development of business plans and roll out strategies.
- IPR and or other measures to reduce leakage of the developed innovations outside of Europe.

Whilst not excluding very large shipyards, an emphasis on the competitive needs of smaller and medium size shipyards across Europe would be welcome in cases where the incremental benefits from Research and Innovation maybe higher.

The Commission considers that proposals requesting a contribution from the EU of up to between EUR 4 and 6 million would allow the specific challenge to be addressed appropriately

Expected Impact: With an emphasis on smaller and mediums sized European shipyards and ship builders, to increase competiveness and growth of the European sector, particularly within international markets. Reinforce and grow European employment and the necessary skills development for the successful uptake of innovative production processes and technologies. Improve environmental performance of shipyards and ship builders. Support a multiplication effect within Europe beyond the immediate participants. Maximise EU added value by appropriate means of minimising knowledge and technology leakage.

Cross-cutting Priorities: **Blue Growth**

Horizon 2020 Pillar: Societal Challenges

Programme: Smart, green and integrated transport

Call Title: 2018-2020 Mobility for Growth

Call Identifier: h2020-mg-2018-2019-2020

Topic Title: Improving impact and broadening stakeholder engagement in support of transport research and innovation

Topic Identifier: MG-4-10-2020

Type of Action: CSA Coordination and support action

Deadline(s): 21.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/mg-4-10-2020

Specific Challenges: Increasing the impacts and broadening stakeholder engagement in support of transport research is an essential element to underpin the European added value from the Transport challenge of Horizon 2020.

One way to achieve this goal is to organise and participate in events that have major strategic importance.

An excellent example is the Transport Research Arena (TRA) organised in different Member States jointly with the Commission, whilst, amongst others, SMM Hamburg, the world's largest Maritime Technology exhibition represents a valuable opportunity to broaden engagement in European Waterborne research and innovation.

Furthermore, additional targeted coordination and support activities are needed in the Inland Waterways sector and in particular with respect to the further development of the NAIADES actions and the leverage of the outcomes from related projects and to establish a bridge towards future research, innovation and implementation needs within inland waterways in.in coordination with the wider waterborne and logistics sectors.

Scope: To address this challenge, three sub topics are proposed and proposals should address only one of the following sub-topics:

1. Innovation awards for students and senior researchers in the context of the Transport Research Arena conference - TRA 2022

   The action should focus on organising two competitions for transport research and innovation awards to be assigned at the TRA conference in 2022:

- A competition for students and young researchers with the goal of stimulating the interest among young researchers/students in the field of transport.
- A competition for senior researchers in the field of innovative transport concepts based on results from EU-funded projects only.

Both competitions should cover all transport modes and cross-cutting issues (technological, socio-economic and behavioural aspects) in line with the EU policy objectives for smart, green and integrated transport. The organisation of these awards should ensure high-quality competition and very good media coverage before, during and after the TRA conference. The action should give particular attention to gender issues.

The awards shall be widely promoted, including within press articles and via important trade publications. Particularly for the student award, wide pan European participation is expected and should be facilitated through engagement with relevant professional associations, their publications and other related student organisations.

2. Broadening Engagement and increasing impact from Waterborne transport research

   The waterborne sector is highly fragmented, with diverse actors and administrative structures, covering ports, maritime and inland shipping. The resulting barriers inhibit innovation and the necessary R&I dialogue to maximise impact. To address this, the following activities should be foreseen:

   - Together with Commission services and the broader waterborne sector, identify the information gaps concerning, innovation needs, awareness of outcomes and opportunities for participation and on this basis devise a communication strategy to be implemented over the course of the project.
   - Develop KPIs and benchmark these at the outset and use to monitor progress throughout the project.
   - Broaden lasting awareness and increase the impact from EU waterborne research through prominent participation within large strategic maritime and inland waterway events such as SMM Hamburg in 2022 and 2024 and for example promote waterborne innovation in overall strategic transport events, stakeholder exercises and the creation of durable engagement with potential public and private users.
   - Produce high quality digital and printed dissemination materials concerning the scope and success stories arising from EU waterborne research. This should include a short video presenting the challenges, innovation needs and successes.
3. Towards an implementation of the future inland navigation action programme

   The action should focus on consolidating the Inland Waterways Transport (IWT) knowledge network and partnership, which was previously established with the support of FP7. In this respect, it should ensure a solid knowledge basis for the implementation of any future NAIADES programme. The coordination and support action will build on the results of previous work and will reflect the multi-disciplinary requirements and complexity of the subject,

coordinating with the wider waterborne, land transport and logistics communities. The coordination action will be organised around the five NAIADES 2 action areas, but will also take into account the results of the NAIADES 2 progress report (adopted 18.09.2018[1]) and other related activities. The coordination action will, in close cooperation with the European Commission, set up a roadmap for the implementation of actions not yet started or to be finalised and ensure the support to permanent-type of actions. It will identify the appropriate measures and define the necessary means and tools. In coordination with the Waterborne technology platform, the action will further develop a R&D roadmap by integrating all stakeholders and will also develop the implementation plan. Also in coordination with the Waterborne technology platform, the project will also monitor the inland navigation R&D projects and their impacts from relevant European programmes. The project will also identify barriers for the deployment of research results, market uptake and improvement of framework conditions to increase innovation in inland waterway transport. A particular focus will be to address the need to decarbonise and improve the environmental performance of inland waterway transport, particularly when operating close to urban areas, as well as on future-proof infrastructure, compatible with digital and automation developments under a changing climate.

This coordination and support action will ensure an active participation of key industrial stakeholders, the Waterborne Technology Platform, Member States administrations, industry associations and river commissions.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 0.7 million for sub-topic 1); of up to EUR 1.3 million for sub topic 2) and of up to EUR 2 million for sub topic 3) would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Contribute to a wide dissemination of the results of European transport research, broaden stakeholder engagement and raise the visibility and weight of the EU policy in the field.
- Increase the attractiveness of transport related studies and reinforce the pursuit of excellence and impact in European transport research and innovation, by giving recognition and visibility to the best achievements.
- Creating links and exchanges between research and innovation stakeholders and policy makers, thus improving the development and deployment of innovative solutions for transport in Europe.
- Increase the impacts and take up of the outcomes from EU research and innovation and broaden engagement beyond those already familiar with EU research programmes.
- Promotion and development of the inland waterway sector: increasing awareness so as to increase usage of Inland waterway transport. Identify best practices and increase their take up and faster modernisation of the inland fleet. Provide a knowledge exchange, discussion and promotion platform; strengthen the coordination between national, EU and industrial research

across waterborne transport and the wider logistics chain. Working together with the waterborne platform, assist in assessing current/future EU R&I programmes, implementation actions, technology assessments, forecasts and transfer of R&I solutions. Improve the environmental performance of inland waterways and contribute to future-proof infrastructure, compatible with digital and automation developments under a changing climate.

Cross-cutting Priorities: **Blue Growth**

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[1] Commission SWD(2018) 428 final: "Mid-term progress report on the implementation of the NAIADES II action programme for the promotion of inland waterway transport (covering the period 2014-2017)" – https://ec.europa.eu/transport/sites/transport/files/legislation/swd20180428-naiades2.pdf

Horizon 2020 Pillar: Societal Challenges

Programme: Smart, green and integrated transport

Call Title: 2018-2020 Mobility for Growth

Call Identifier: h2020-mg-2018-2019-2020

Topic Title: Under water noise mitigation and environmental impact

Topic Identifier: MG-BG-03-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 21.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/mg-bg-03-2020

Specific Challenges: Underwater noise from shipping and boats impacts upon the behaviour and health of water organisms in rivers and at sea, including marine mammals. However, despite previous research, the environmental impacts from effects and the propagation of underwater noise at different amplitudes and frequencies remain poorly understood and largely unquantified. Furthermore, there has been comparatively few studies to better understand the potential noise reduction measures that could be applied to both existing and future vessels.

Scope: All following aspects should be addressed:

- Develop standardised methods to measure and assess the impacts from underwater noise generated by shipping and boats. Consideration should be given to the acute and cumulative effects on different water species in rivers and at sea including marine mammals.
- Establish a stakeholder group of researchers within the domain of underwater noise assessment and mitigation together with other relevant actors including for example NGO's, marine and waterway authorities, industry, ship owners, naval industry etc. Use this group to support methodology and standards development as well as its wide spread take up.
- Identify, quantify and validate any negative impacts from different types and amplitudes of underwater noise from shipping and boats.
- Propose the most effective feasible solutions to mitigate the effects of underwater noise and to establish appropriate limits.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 8 million would allow the specific challenge to be addressed appropriately.

Expected Impact: To enable appropriate mitigation measures, increase understanding of the short and long term environmental impacts of underwater noise from shipping and boats. Identification of the most harmful underwater noise characteristics and the acute and longer term impacts on different organisms including marine mammals. Establishment of standards which can be widely adopted for underwater noise measurement to increase the comparability of data between research programs. Develop cost effective solutions to measure underwater radiated noise from shipping. Identification and assessment of solutions to reduce harm from underwater noise. Develop innovative solutions to reduce the most harmful radiated shipping noise. Provide a foundation for policy. Support implementation of the marine strategy framework directive.

Cross-cutting Priorities: **Blue Growth**

Horizon 2020 Pillar: Societal Challenges

Programme: Climate action, environment, resource efficiency and raw materials

Call Title: Greening the economy in line with the Sustainable Development Goals (SDGs)

Call Identifier: h2020-sc5-2018-2019-2020

Topic Title: A common European framework to harmonise procedures for plastics pollution monitoring and assessments

Topic Identifier: CE-SC5-29-2020

Type of Action: CSA Coordination and support action

Deadline(s): 13.02.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ce-sc5-29-2020

Specific Challenges: To develop long-term solutions to reduce plastic pollution, a thorough understanding of the emission problem is important, including consistent monitoring and mapping of plastic litter. These activities are indeed necessary in order to enable a comprehensive inventory to be carried out to classify the occurrence, to identify pollution priorities and to determine changes in the occurrence by means of subsequent investigations. At present, there are no harmonised EU-wide methods for determining the composition and occurrence of plastics in various relevant environmental compartments (e.g. marine waters, marine sediments, freshwater, soil, air). A commonly accepted terminology is the prerequisite for data comparability, collaboration, meta-level analysis and assessment. Rather than continuing to have different organisations and bodies at international, European and Member State level proposing their own definitions, a coordinated approach needs to be promoted. With research on the scale of the problem rapidly evolving, a systematic collection of available data and a critical assessment is missing.

Scope: The aim of this action is to develop a common European framework to harmonise procedures for plastics pollution monitoring and assessments. This action should do so by bringing together the main national research groups in the field of physicochemical analysis of plastics in the environment, covering nano-, micro- and macro-plastics, to present jointly designed process proposals for the determination of plastics in different environmental matrices. A critical mass of actors and increased synergies between all relevant research areas (e.g.

marine, surface, groundwater, drinking and waste water, soil, air), industry, regulators, associations and relevant EU services and standardisation bodies will be a key element to address the challenge. It is expected that different sampling, extraction and analysis methods are evaluated for their suitability and feasibility (availability, cost-effectiveness, quality of data generated) for use within future monitoring activities.

This action should ensure adequate flexibility for taking into account all relevant aspects prior to formal standardisation procedures and provide:

a. harmonised methods for sampling, sample preparation and analytical detection of different kind of plastics in different environmental compartments and connected matrices, including realistic matrix reference materials;
b. methods for monitoring to enable a comprehensive inventory to be carried out to classify the occurrence, to identify emission and pollution priorities and to determine changes in the occurrence by means of subsequent investigations;
c. methods for identification and analysis of plastics in the environment;
d. proposals as a basis for international and European standards (ISO / CEN);
e. recommendations for future relevant EU policy and legislation;;
f. increased knowledge on the occurrence of plastics in the environment with respect to related questions, such as physical and chemical adverse effects on biota.

In addition, this action should deliver guidance on data management, including the need for relevant infrastructures, cooperation on sharing data, creation of joint databases and the promotion of meta-analysis of existing data. This action does not involve data collection. It should also inform future strategic programming for research and innovation for plastics by identifying knowledge gaps and needs.

This topic is in support of the European Strategy for Plastics in a Circular Economy. Selected projects under this topic as well as projects selected under other topics in H2020 supporting the Plastics Strategy are strongly encouraged to participate in joint activities as appropriate. These joint activities could take the form of clustering of projects, participation in workshops, common exploitation and dissemination etc. The projects should describe how they will be complementary with already existing relevant national activities or other multilateral activities funded by the EU or funded jointly by several Member States. The proposals are expected to demonstrate support to common coordination and dissemination activities. Applicants should plan the necessary budget to cover those activities without the prerequisite to define concrete common actions at this stage.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 2 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The project results are expected to contribute to:

- achieving the objectives of the EU Plastics Strategy, in particular with regard to the possibilities for future prioritisation of measures in Europe and to the possibilities of reviewing their effectiveness in terms of reducing emissions, and contributing to the implementation of Strategic Research and Innovation Agenda foreseen in that strategy;
- fostering innovative policymaking through robust methodologies and uniformed tools and reduction of analytical uncertainties;
- bringing the EU to the forefront of international discussion and collaboration in the field of plastic pollution monitoring and assessing through the know-how generated (planned publications and templates for standardisation procedures);
- improving the economic viability of analytical instrument manufacturers;
- establishing a framework and foundation for the implementation of European and global level monitoring programmes for nano-, micro- and macro-plastic.

Cross-cutting Priorities: **Blue Growth**

Horizon 2020 Pillar: Societal Challenges

Programme: Climate action, environment, resource efficiency and raw materials

Call Title: Greening the economy in line with the Sustainable Development Goals (SDGs)

Call Identifier: h2020-sc5-2018-2019-2020

Topic Title: Plastics in the environment: understanding the sources, transport, distribution and impacts of plastics pollution

Topic Identifier: CE-SC5-30-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 13.02.2020, 03.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ce-sc5-30-2020

Specific Challenges: To date, efforts to understand the sources, transport and distribution of plastic pollution have mainly focused on the marine environmental compartment. However, it is widely acknowledged that the majority of marine plastic litter originates from land-based sources and that plastic litter of all sizes is prevalent in all environmental compartments (freshwater, marine, terrestrial, biological and atmospheric). To develop long-term mitigation solutions, a thorough understanding of the main sources and transport mechanisms of plastics into and through the environment is needed. This needs to be combined with determination of the quantity and composition, an understanding of plastic degradation processes in different environmental compartments and an assessment of plastics impacts on key species and ecosystems. In order to better support the identification of exposed ecosystems and to help decision-makers in reducing exposures, a wider effort bringing together experiences from different disciplines, such as hydrology, oceanography, limnology, monitoring, modelling, chemistry, toxicology, and risk assessments, and from relevant stakeholders, is needed.

Scope: The aim of this action is to gain a better understanding on the sources, transport, distribution and impact of plastic pollution. The main areas for research activities should include:

a. Sources of plastic pollution to different environmental compartments;
b. Transport and pathways of plastics into and through different environmental compartments;

c. Occurrence and distribution of plastic across all environmental compartments;
d. Accumulation, including in soil and the food chain;
e. Degradation mechanisms for different plastic materials under range of environmentally conditions;
f. Physical and chemical effects of plastic pollution on different biotic and abiotic environments.

This action should aim to determine of the main entry routes of plastics into the different environmental compartments (e.g. marine, surface and groundwaters, soils and air, as well as potential transfers between these compartments. Furthermore, it should investigate the fate and transport behaviour of plastics with the goal of improving our current understanding of exposure within biotic and abiotic compartments. This should include determination of the spatial distribution and variability of plastics from its sources into rivers, lakes, estuaries and coastal areas and the open oceans. The research should contribute to the identification of the entry pathways, transport and accumulation within the ecosystems, including the potential for actual accumulations in the food chain (beyond presence in digestive systems).

Proposals should address different ecosystems, geographical areas and spatial scales, including the main environmental media such as marine, surface and ground-water, soils, air and biota. This would require case studies in selected areas, across Europe considering the marine water column and the seabed as well as surface water and terrestrial ecosystems, and comparative data on the contribution of point and diffuse sources and transport pathways to the scale of plastic pollution. To enhance understanding of the processes that drive the transport and fate of plastics in different ecosystems and on different temporal-spatial scales, computational models validated with empirical data, that predict hotspots and sinks of plastics would be also needed. Proposals should also enhance the current understanding of plastic degradation in the environment, including the characterisation of leaching chemicals and plastic degradation products. When the degradation of plastics under environmental conditions cannot readily be predicted based on information available from material sciences, degradation experiments simulating realistic weathering of plastics will inform about the fragmenting process of plastic debris as well as the release of chemicals. Research could cover nano-, micro-, or macro-plastics.

Cooperation with existing national and EU funded activities, such as the JPI Oceans initiative, is encouraged.

This topic is in support of the European Strategy for Plastics in a Circular Economy. Selected projects under this topic as well as projects selected under other topics in H2020 supporting the Plastics Strategy are strongly encouraged to participate in joint activities as appropriate. These joint activities could take the form of clustering of projects, participation in workshops, common exploitation and dissemination etc. The proposals are expected to demonstrate support to common coordination and dissemination activities. Applicants should plan the necessary budget to cover those activities without the prerequisite to define concrete common actions at this stage.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The project results are expected to contribute to:

- achieving the objectives of the Plastics Strategy, in particular with regard to the possibilities for future prioritisation of measures in Europe (prioritisation);
- providing a foundation for the development of mitigation solutions, based on improved and new knowledge on plastics pollution;
- identifying promising intervention points and targeted actions for fighting plastics pollution, in line with of the CE Action Plan and Plastics Strategy;
- establishing the EU as a scientific leader in the area of understanding and solving plastic pollution.

Cross-cutting Priorities: **Blue Growth**

Horizon 2020 Pillar: Societal Challenges

Programme: Climate action, environment, resource efficiency and raw materials

Call Title: Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement

Call Identifier: h2020-lc-cla-2018-2019-2020

Topic Title: Advancing climate services

Topic Identifier: LC-CLA-12-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 13.02.2020, 03.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-12-2020

Specific Challenges: Under the Paris Agreement it was agreed to enhance adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response. It was also recognised that there is a need to enhance action on adaptation with regard to strengthening scientific knowledge on climate, including research, systematic observation of the climate system and early warning systems, in a manner that informs climate services and supports decision-making, including the socio-economic analysis of adaptation options for key impact areas. Recent advances have led to the creation of very large amounts of climate data. It is important that we are able to use said data (in particular data provided by the Copernicus programme) and create services that communicate and deliver bespoke critical climate information to better inform risk-aware decision making and adaptation strategies.

Scope: The proposed action should address only one of the following sub-topics:

a. Mapping European coastal infrastructure at risk from sea-level rise:

   Actions should undertake a new high-resolution mapping of predictions of future sea levels against European coastal elevation and identify risks to relevant coastal infrastructure. Actions should deliver an engaging, interactive and authoritative map of the European coastal zone perceived to be at risk of inundation due to future predicted changes in relative sea levels. Actions should also include low-probability high-impact scenarios and account for local, regional and global processes driving changes in coastal elevation.

Actions may further consider the impact of adaptation measures (e.g. barriers) that are already in place and projected impacts on population displacements. Cooperation with projects under topic LC-CLA-13-2020 and other relevant on-going Horizon 2020 projects is encouraged.

b. Detection and attribution of extreme events using Artificial Intelligence:

Actions should explore novel approaches for detection and localisation of extreme events, including tropical cyclones and heat waves, and for quantifying extreme events trends in current day and future climate change scenarios. Actions should develop artificial intelligence techniques (e.g., deep learning) to detect spatial and temporal patterns and evolutions of climatological fields (e.g., temperature) associated with extreme events. These techniques should be capable of discriminating between different variables based on the event type and capable of handling events at various spatial scales. Particular consideration should also be given to associated impacts and attribution to climate change. Where appropriate, actions should take advantage of data provided by the Copernicus programme.

c. Impacts of overshooting:

Understanding how rising global temperature translates to impacts for society and natural ecosystems is critical in order to prepare for, and strive to reduce, the magnitude of climate change. While global temperature is a good indicator of global change, local impacts can be much more pronounced. Actions should assess and report on the impacts associated with overshooting temperature goals set by the Paris Agreement. Actions should highlight regional differences in associated impacts and identify possible adaptation measures and solutions.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 4-6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. For the evaluation procedure, the following provision applies: at least one proposal per sub-topic will be funded, provided it passed all thresholds.

Expected Impact: The project results are expected to contribute to:

- •enhanced adaptive capacity;
- •reduced vulnerability to climate change;
- •enhanced action on adaptation;
- •strengthened scientific knowledge on climate;
- •better informed climate services and decision-making.

Cross-cutting Priorities: **Blue Growth**

Horizon 2020 Pillar: Societal Challenges

Programme: Climate action, environment, resource efficiency and raw materials

Call Title: Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement

Call Identifier: h2020-lc-cla-2018-2019-2020

Topic Title: Climate resilience of European coastal cities and settlements

Topic Identifier: LC-CLA-13-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 13.02.2020, 03.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-13-2020

Specific Challenges: Extreme high coastal water levels have increased at most locations along the European coastline. This increase appears to be predominantly due to increases in baseline mean local sea level rather than to changes in storm activity (IPCC 5th Assessment Report). According to recent studies, a 30 cm sea level rise by the end of the 21st century, in the absence of adaptation measures, would more than triple annual damages from coastal floods in the EU, from EUR 5 to 17 billion. Robust adaptation measures need to be undertaken in coastal and low-lying areas to protect them from increasing climate and sea level rise risks, including coastal erosion. Uncertainty of regional and local projections and lack of sustainable finance, public-private cooperation and knowledge and evidence-base have prevented authorities to take appropriate actions to prevent or mitigate coastal disasters. Filling these knowledge and innovation gaps will allow for the design and implementation of long term adaptation planning and cost-effective measures within an integrated coastal zone management (ICZM) framework to enhance the overall resilience of coastal cities[1] and settlements.

Scope: Actions should capitalise on past and current initiatives and knowledge including associated uncertainty, to improve the integrated spatial planning, management and adaptation of Europe's coastal cities and settlements. They should provide scientific insight, tools, methodologies and innovative solutions to assist European coastal cities in developing their own coastal resilience plans and management and dynamic adaptation pathways (i.e. protect, accommodate, or retreat options), at spatial and temporal scales most relevant to their specific

needs and context, to address the risks associated to climate change with emphasis to exposure to sea-level rise, while understanding the cascading effects and impacts on other sectors (e.g. water, energy, food, land use, etc.). Actions should use state-of-the-art predictions of the rate and extent of sea-level changes on time scales of years to decades to identify urban coastal areas at risk of flooding and erosion. The assessment and mapping of coastal exposure and vulnerability to sea-level rise should also consider low probability high impact scenarios (H++). Proposals should make use of existing Coastal Risk Assessment Frameworks, including socio-economic considerations, and informative tools for multi-hazard assessment.

As part of the proposed work, actions should develop a methodology for a thorough assessment of the robustness and effectiveness of protective structures measures and governance structures. They should come up with sound methodologies and guidance for the elaboration of resilience plans for vulnerable urban areas implementing, as appropriate, ecosystem-based approaches (e.g., Nature-Based Solutions, landscape planning) along with hybrid and traditional engineering approaches as part of a broader strategy. This includes the design of monitoring plans to detect signals for implementation and/or reassessment of the coastal plan. On the basis of an in-depth literature review and additional studies as appropriate, comparison of economic, social, cultural and environmental impacts (e.g. costs and benefits) of ecosystem-based approaches with the ones of traditional technical approaches should be undertaken, considering security aspects, cost-effectiveness, adaptability to changes and avoidance of undesirable lock-in effects. Actions should develop tools, methodologies and guidelines to assist decision making in selecting optimal mix of protection measures (ecosystem-based, hybrid, and traditional engineering) enhancing resilience for the diverse coastal contexts in Europe.

Action may include pilot studies comprising "front-runner" cities and territories advanced in the elaboration and implementation of coastal adaptation and resilience plans mentoring "follower" cities not so advanced in this process to enhance the potential for replication and up-taking of the outcomes and hence impact of the action.

Actions should envisage clustering activities with other relevant ongoing and future actions (e.g., LC-CLA-12-2020), relevant projects funded under previous and current H2020 Work Programmes 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. They should make use and contribute to knowledge exchange and networking European platforms (e.g. Climate-ADAPT, ThinkNature, OPPLA).

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The project results are expected to contribute to:

- improved decision-making on suitable adaptation options and coastal management strategies, in view of demographic, water supply, climate and land use changes on the basis of adaptation measures for specific local vulnerabilities, urban contexts and sectors in Europe and an assessment of coastal ecosystem services, adaptation costs and benefits,;
- strengthened coastal adaptation network between scientists, engineers, policy-makers, stakeholders and the general public;
- improved integrated spatial management and adaptation of Europe's coastlines;
- the implementation of the Marine Strategy Framework Directive, the Water Framework Directive, the Flood Directive, the Natura and Habitats Directives and the Biodiversity Strategy, and EU Climate Change Adaptation Strategy;
- underpinning of Integrated Coastal Zone Management and multi-level governance.

Cross-cutting Priorities: **Blue Growth**

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[1] For the purposes of this topic, the definition of a 'city' is to be understood according to the harmonised definition of a city established by the OECD and the European Commission, which can be found at: http://ec.europa.eu/regional_policy/sources/docgener/focus/2012_01_city.pdf

Horizon 2020 Pillar: Societal Challenges

Programme: Climate action, environment, resource efficiency and raw materials

Call Title: Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement

Call Identifier: h2020-lc-cla-2018-2019-2020

Topic Title: Forest Fires risk reduction: towards an integrated fire management approach in the E.U.

Topic Identifier: LC-CLA-15-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 13.02.2020, 03.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-15-2020

Specific Challenges: Forest fires are a major hazard in Mediterranean Europe and increasingly so in Central, Eastern and Northern European countries. There is a limit in our capacity to deter fires, particularly mega-fires when conditions are most severe. This is the result of unbalanced management strategies and policies that can be effective in fire suppression under normal weather conditions but are insufficient to deal with extreme events such as mega-fires. Areas at risk from forest fires are projected to increase by 200% in Europe by the end of the 21st century, in particular due to climate change. Moreover, the development of urban areas in the vicinity of forest areas combined with a lack of risk awareness will increase the exposure and vulnerability of local communities. This new context calls for more effective science-based fire management and risk-informed decision-making, which takes into account the socio-economic, climate and environmental roots of forest fires. Improving fire management and governance therefore implies shifting the focus from fire suppression to fire prevention, increasing the awareness and preparedness of people at risk, and developing more balanced and long term forest management strategies that integrate fire prevention with forestry and land management (including conservation of habitats structures, resources and diversity), rural development, urban development, climate and energy policy objectives. An integrated fire management strategy is necessary to ensure that wildfires risks are managed in such a way that people and housing safety, economic growth, well-being, carbon sinks, biodiversity and ecosystem services are maintained or increased.

Scope: Actions should generate the knowledge, tools, capacity and guidance to underpin an Integrated Fire Management strategy that promotes holistic landscape, land use, and forest management and considers the interaction among all phases of the wildfire management process (i.e. fire prevention and preparedness, fire detection and response, post-fire restoration and adaptation).

Proposals should assess the changes in fire regimes under various climate, vegetation and land use change scenarios, including settlement/housing development/infrastructure and rural-urban interface, with particular focus on ignition and fuel patterns, spatial and temporal dimensions of fire activity, including the expansion of the fire-prone area in Europe. Understanding extreme wildfire events, their structural causes, various impacts including on air quality, water quality, soil carbon and nitrogen stocks and greenhouse gas emissions, and the human, biological and physical processes at play is a prerequisite. The trade-offs and synergies between the various socio-economic, climate, and environmental elements influencing forest fires risk management and conditions of enhanced risk should be explored and analysed, particularly in wildland/rural interface areas. Methods to assess and mitigate vulnerability of societies to wildfires should also be developed. In addition, the relation of forest fires with other hazards that may trigger or result from fire (e.g., droughts, floods, debris flows, landslides, heatwaves and storms) should be investigated within a multi-hazard risk assessment framework.

Proposals should capitalise on the existing and develop new scientific knowledge (e.g. fire ecology, soil and water science, landscape restoration, social sciences), enhance understanding of the resistance, resilience and habitat suitability of mixtures of plant species, as well as the human factors (considering human behaviour, gender, economics and socio-demographic issues) affecting fire occurrence and develop strategic guidance for improved forest fire risk management and risk-informed decision-making.

Participatory approaches with national agencies and competent institutional bodies dealing with wildfire management and protection and land management are required. Actions should also promote increased interaction and strengthened cooperation between scientists, practitioners, forest and land owners and other key stakeholders. To ensure wide accessibility and use, they should also facilitate an inclusive approach in developing land management strategies through involving local communities in the design and planning of innovative fire prevention measures, strengthening the forest sector and promoting bio-economy and nature based solutions as well as in the co-design and co-production of research and corresponding outcomes.

In this context, actions are sought to develop and implement effective communication and societal outreach strategies to increase the awareness and preparedness of populations at risk towards a common culture of risk and more disaster-resilient communities. The outcomes should be made available through open access platforms (i.e. the Disaster Risk Management Centre, the European Forest Fires Information System). Actions should take advantage of data and information provided by the Copernicus programme, in particular the Copernicus Emergency Service.

Possibilities for clustering with actions supported under topic LC-CLA-12b-2020, LC-CLA-16b-2020, SC7 DRS-02 and other relevant ongoing and future nature-based solutions, LIFE and Civil Protection relevant projects should be envisaged, as appropriate, for cross-project co-operation, consultations and joint activities on cross-cutting issues and knowledge exchange 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.

Collaboration with leading research institutions with experience in extreme wildfires management such as in Australia, **Canada**, South Africa, the United States and other non-EU countries is highly encouraged.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The project results are expected to contribute to:

- National Forest Fires Risk reduction strategies and risk-informed decision-making emerging from collaboration with key stakeholders, in compliance with the policy objectives set out in the EU Forest Strategy and relevant EU policies;
- improved coherence between EU policies' objectives and national legislative frameworks defining the structural measures and operational activities regarding forest and communities protection from fire;
- more disaster-resilient communities through increased awareness and preparedness of populations at risk and a common culture of risk;
- increased knowledge exchange, sharing and access through the Disaster Risk Management Knowledge Centre, the European Forest Fires Information System and other open access platforms;
- innovation, harmonisation and exchange on methods of consistently recording and measuring wildfires and coherent collection of data;
- common framework for forest fire (wildfire) firefighting modules, training, exercises, incident management and command.

Cross-cutting Priorities: Socio-economic science and humanities, Gender

Horizon 2020 Pillar: Societal Challenges

Programme: Climate action, environment, resource efficiency and raw materials

Call Title: Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement

Call Identifier: h2020-lc-cla-2018-2019-2020

Topic Title: Polar climate: understanding the polar processes in a global context in the Arctic and Antarctic Regions

Topic Identifier: LC-CLA-17-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 13.02.2020, 03.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-17-2020

Specific Challenges: Many of the natural physical processes occurring in the polar atmosphere and oceans are potentially of profound significance in controlling conditions across the globe and affecting lives and livelihoods across the world, in the Polar, sub-Polar, temperate, and tropical regions. Understanding the interacting nature and feedback of polar processes and addressing their consequences in a global context will benefit the people, policy and businesses well beyond the Polar Regions.

Scope: Proposals should aim at developing innovative approaches, building on existing data resources and infrastructures, the latest observational products (including in-situ observations), and state-of-the-art climate models, to assess the key physical and chemical processes in the ocean and atmosphere and the key ocean-atmosphere-ice interactions. Proposals should cooperate with relevant projects funded by the ESA Earth Observation Programme. In addition, they are encouraged to join the EU Arctic Cluster in order to build synergies and maximise the complementarity of the different actions in the Cluster. Proposals should build upon previous actions funded under Horizon 2020 and avoid duplication or overlap.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged, in particular with countries – beyond the EU Member States and countries associated to Horizon 2020 – that took part in the Arctic Science Ministerial meetings of 28 September 2016 and 25-26 October 2018[1].

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 7-8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

The project results are expected to contribute to:

- improved understanding of how the changing polar climate systems affect and are affected by lower latitudes through ocean and atmospheric circulation;
- improved understanding of the key ocean-atmosphere-ice interactions;
- improved understanding of the fully coupled physical climate system (atmosphere-ocean-ice) on diverse space and time scales;
- improved understanding of the key physical and chemical processes in the ocean and in the atmosphere;
- improved projections of future polar and global climate, including feedbacks and impacts
- improved capability to respond to the impact of climatic change on the environment and human activities in the Polar Regions (with a focus on the Arctic), both in the short and longer term;
- the IPCC scientific assessments, the consolidation phase of the Year Of Polar Prediction (YOPP) and to the Copernicus Climate Change (C3S) services.
- supporting the assessment of regional climate impacts.

Cross-cutting Priorities: International cooperation, **Blue Growth**

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[1] i.e. the United States of America, **Canada**, the People's Republic of China, Japan, the Russian Federation, South Korea, New Zealand, India, Singapore, and Greenland; see https://www.arcticscienceministerial.org/en

Horizon 2020 Pillar: Societal Challenges

Programme: Climate action, environment, resource efficiency and raw materials

Call Title: Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement

Call Identifier: h2020-lc-cla-2018-2019-2020

Topic Title: Integrated GEOSS climate applications to support adaptation and mitigation measures of the Paris Agreement

Topic Identifier: LC-CLA-19-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 13.02.2020, 03.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-19-2020

Specific Challenges: Timely and reliable Earth observation data and information on the state of our changing climate and environment are indispensable to support the EU in its international commitment on climate change. In particular, the Paris Agreement accentuates the need for new, transparent, integrated solutions to better understand the Earth system, minimise and address climate change contributors and impacts, support accountability towards long-term goals and inform climate services and decision making. Developing integrated solutions tailored to needs in Europe will depend on the European capability to combine multiple Earth observation (EO) data sets - including GEOSS and Copernicus data sets - with ensemble modelling, socio-economic and in-situ data at the spatial and temporal scales at which interactions in the land, marine and atmosphere ecosystems operate.

Scope: Actions should focus on developing applications in support of users involved in the implementation of climate adaptation and mitigation actions in line with the Paris Agreement, by integrating a whole range of Earth Observation data including those recorded through in-situ observing systems, and Essential Climate Variables (ECVs). The actions will seek to use higher spatial and/or temporal data sets while also taking advantage of a broader open data access and new data mining technologies. In addition, the actions should advance methodologies for integrating resulting data flows with multiple GEOSS data sets (from EO satellites to in-situ data including citizen data where appropriate), numerical model outputs and other relevant statistical and socio-economic data.

Ultimately, integrated applications should concentrate on climate adaptation applications with estimated societal impact, on impact of GHG emissions or related indicators (such as land cover changes), or feed new indicators for the monitoring of progress towards the Sustainable Development Goals (SDGs) in an EU context. Special attention should be given to multi-scale approaches with abilities to scale up and down from European to local scales.

The actions should make use of, contribute to and feedback on the GEOSS platform which provides international user communities with tools for discovery, visualisation and access to GEOSS data. The actions should actively contribute to relevant GEO Tasks of the GEO Work Programme. It should contribute to the development of user-driven climate applications to be delivered through the EuroGEOSS initiative. They should promote open science and underpin the work of the IPCC through the enlarged provision of in-situ data and of further analyses of ECVs. Applications resulting from the actions should complement relevant Copernicus core services (e.g. Climate Change Service - C3S, Land Monitoring, etc.) and address well identified end user needs in Europe. When relevant, actions should align with the European Space Agency (ESA) programmes[1].

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 4-5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The project results are expected to contribute to:

- •the direct support of the adaptation and mitigation measures of the Paris Agreement, as well as the other GEO engagement priorities such as the Agenda for Sustainable Development, and the Sendai Framework for Disaster Risk Reduction 2015-2030;
- •the European input to the GEO Work Programme post-2019 to address the climate change challenge cross-cutting all GEO Societal Benefit Areas (SBA) (e.g. for improved land use management);
- •increasing European capability to combine multiple EO data sets with models, socio-economic and in-situ data, based on a systematic exploitation of the GEOSS Platform ;
- •reinforcing in-situ component of European observing systems for the monitoring of internationally recognised Essential Climate Variables (ECVs);
- •the new EuroGEOSS pilot applications to better understand climate change contributors and impacts, and minimise the degradation of the Earth system, support accountability towards long-term goals and inform climate services and decision making.

Cross-cutting Priorities: **Blue Growth**

[1] https://www.esa.int/Our_Activities/Observing_the_Earth/The_Living_Planet_Programme/ESA_s_Living_Planet_Programme;
https://eo4society.esa.int/

Horizon 2020 Pillar: Societal Challenges

Programme: Climate action, environment, resource efficiency and raw materials

Call Title: Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement

Call Identifier: h2020-lc-cla-2018-2019-2020

Topic Title: Supporting the implementation of GEOSS in the Arctic in collaboration with Copernicus

Topic Identifier: LC-CLA-20-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 13.02.2020, 03.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-20-2020

Specific Challenges: In order to gain more insight in the fast rate of climate, ecological and environmental change taking place in the Arctic and to facilitate well-informed decisions, there is a need to develop coordinated Earth observations and information services specifically targeting this region, also building on the essential contribution of indigenous knowledge and community-based monitoring systems. These observations and services need to be delivered in order to support a sustainable development in the Arctic, particularly for responding to the needs of the people who live there. Observations and services are also necessary to improve the monitoring and predicting capabilities on changes that may affect other parts of the planet, and in particular the Northern hemisphere. The challenge and suitable actions to alleviate adverse consequences were identified in the 2nd Arctic Science Ministerial Joint Statement of Ministers.[1]

Scope: The action should aim at:

(i) advancing the operationalisation of an integrated pan-Arctic Observing System in preparation for a possible future ArcticGEOSS initiative;

(ii) improving and extending the terrestrial, marine and cryospheric in-situ measurements and the community-based monitoring systems necessary for the monitoring of the Arctic;

(iii) setting up pilot services and implementing the coordinated network of those services necessary for the adaptation to climate change in the region;

(iv) contributing to the interoperability of Arctic Data systems; and

(v) to make a positive contribution to national, regional and international decision-making processes and science strategies.

The action should help to build an Arctic “window”[2] of Copernicus by bringing together all Arctic relevant observations deriving from different Copernicus services and promoting access to relevant Copernicus datasets.

The action should coordinate with projects stemming from the NSFs Arctic portfolio, such as the "Navigating the New Arctic" programme, and other actions of the **TransAtlantic Ocean Research Alliance**, by establishing joint operational activities, in order to support the mission and objectives of the international initiative on Arctic observations brought forward by the Sustaining Arctic Observing Networks (SAON).

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged, in particular with the countries and Indigenous Peoples organisations participating in the 2nd Arctic Science Ministerial[3].

The action should build on the outcomes of previous EU-funded projects in the framework of GEO and Copernicus, create synergies and avoiding un-necessary duplications also by joining the EU **Arctic Research** Cluster. Likewise, the action should cooperate with relevant projects funded by the ESA Earth Observation Programme. To this end, proposals should foresee a dedicated work package and /or task and earmark the appropriate resources accordingly.

The pilot services should fall into the scope of EuroGEOSS and follow the direction of the EuroGEOSS initiative. Data and services produced through the projects should be registered in the GEOSS Common Infrastructure (GCI).

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

The project results are expected to contribute to:

- the implementations the GEO-Cold Region Initiative with a specific emphasis on the Arctic, and the initiating of an ArcticGEOSS initiative;
- sound and effective decision-making by policy makers in the Arctic regions through the use of reliable and science-based Earth observation and information;
- supporting of the 2030 Agenda for Sustainable Development, the Paris Agreement and Sendai Framework for Disaster Risk Reduction 2015-2030;
- strengthening Earth observation capacity focused on the European region;
- delivering EuroGEOSS services for the Arctic;
- improved handling, archiving and interoperability of environmental data in polar regions;
- a coherent data management, through the use of GEOSS Data Management Principles and best practices (aligning with INSPIRE).

Cross-cutting Priorities: **Blue Growth**, International cooperation

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[1] Joint Statement of Ministers, 2nd Arctic Science Ministerial, Berlin 2018, https://www.arcticscienceministerial.org/files/ASM2_Joint_Statement.pdf

[2] https://www.copernicus.eu/en/copernicus-services-information-and-sentinel-products-arctic-region

[3] i.e. the United States of America, **Canada**, the People's Republic of China, Japan, the Russian Federation, South Korea, New Zealand, India, Singapore, and Greenland; see https://www.arcticscienceministerial.org/en

Horizon 2020 Pillar: Societal Challenges

Programme: Climate action, environment, resource efficiency and raw materials

Call Title: Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement

Call Identifier: h2020-lc-cla-2018-2019-2020

Topic Title: Coordination of European Polar research

Topic Identifier: LC-CLA-21-2020

Type of Action: CSA Coordination and support action

Deadline(s): 13.02.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-21-2020

Specific Challenges: The EU is a major investor and player in Polar research. The EU also supports the development and the international access to research infrastructures (terrestrial research stations, remote and in-situ observing systems, research aircrafts and vessels, etc.) throughout the Polar Regions, with relevant international scientific cooperation activities with non-EU countries. Previous actions proved to be instrumental in providing the needed support and the high degree of coordination within the European landscape and beyond.

Scope: Proposals should provide a platform to co-develop the strategies to advance and further coordinate the European Polar Research action and its contribution to the policy-making processes. This should include the prioritisation of research areas during transdisciplinary workshops, strategies for capacity building related to meaningful stakeholder involvement, allocation of seed money for the preparation of pre-studies and interaction with national funding agencies on ways of building synergies and optimising the use of resources. Proposals should cooperate with the relevant services of the European Commission and provide evidence-based policy advice. A special focus should be placed on supporting the implementation of sustained observation systems in the Arctic and Antarctic by setting up a European coordination office and by identifying measures to sustain it beyond the termination of the project. The office should also coordinate and support the contributions of the EU and the Associated Countries to International Arctic Science Committee (IASC), Sustaining Arctic Observing Networks (SAON), Scientific Committee on Ant**Arctic Research** (SCAR) and Southern Ocean Observing System (SOOS). Proposals should coordinate the EU

Arctic Research Cluster ensuring a good cooperation between the projects in areas such as communication, dissemination, and stakeholder engagement. Proposals should build upon the previous action funded under Horizon 2020 and avoid duplications or overlaps.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The project results are expected to contribute to:

- substantially advance Polar research cooperation in Europe by creating a Polar European Research Area;
- a more synergetic use of European resources;
- the policy advice at regional, national and EU level and to the support of the EU's international commitments with respect to the Arctic Council, the Montreal protocol, the UNFCCC and others related to polar sciences, such as the Antarctic Treaty System (ATS);
- improved cooperation of international polar research programmes and create the basis for the development of future large-scale joint international polar initiatives;
- the support of international scientific cooperation initiatives of the European Commission such as the **G7** Future of the Seas and Oceans initiative, **Galway** Statement, the Belèm Statement and of the Administrative Arrangement on **Marine Research** between the European Commission and Argentina.

Cross-cutting Priorities: **Blue Growth**

Horizon 2020 Pillar: Societal Challenges

Programme: Climate action, environment, resource efficiency and raw materials

Call Title: Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement

Call Identifier: h2020-lc-cla-2018-2019-2020

Topic Title: Enhancing the **Belmont Forum** Collaborative Research Action on Climate, Environment and Health

Topic Identifier: LC-CLA-22-2020

Type of Action: CSA Coordination and support action

Deadline(s): 13.02.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-22-2020

Specific Challenges: The EU is a major investor and player in both climate change and health research. The EU also supports global research and innovation collaboration, including that done by the **Belmont Forum** - a partnership of funding organisations, international science councils, and consortia committed to the advancement of interdisciplinary and transdisciplinary science. Bringing together climate change and health research has been a particular challenge in Europe that requires coordination and support. Previous similar actions proved to be instrumental in providing the necessary support and the high degree of coordination within the European landscape and beyond.

Scope: Actions should develop and provide support mechanisms to advance and further boost the global added value of the **Belmont Forum**'s Collaborative Research Action (CRA) on Climate, Environment and Health and its inputs to the relevant EU policy-making processes. This should include the promotion and prioritisation of research and innovation areas during transdisciplinary conferences, meetings and workshops, capacity building related to relevant stakeholder involvement, cross-fertilisation activities amongst **Belmont Forum**, EU- funded and relevant nationally funded projects, synthesis of their results, with a particular focus on policy making, such as knowledge based policy briefs, dissemination, communication and outreach.

Cooperation with relevant existing projects under Societal Challenge 1 and 5 of Horizon 2020, including relevant ongoing Coordination and Support Actions, is encouraged.

Actions should also provide support to a knowledge management platform of EU funded research and innovation on the linkages between health and climate, support the **Belmont Forum** Members, partners and secretariat, in relation to this CRA and support the organisation of an international conference on climate change and health.

Cooperation with the relevant services, expert groups and mechanisms of the European Commission will be required to provide evidence-based policy advice, and report on the CRA results and synthesis of their findings. Actions should also build upon EU research and innovation framework programmes and avoid duplication and overlaps.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The project results are expected to:

- contribute to policy advice on climate change and health at international and EU level and supporting the EU's international commitments with respect to the Paris Agreement, UNFCCC and others related to climate change and health sciences;
- bolstering a network of projects funded under the CRA call with relevant EU-funded projects addressing climate, environment and health;
- better flow of information and knowledge dissemination on climate change, environment and health to low and medium income countries;
- raising global awareness of climate impacts on human, plant and animal health.

Horizon 2020 Pillar: Societal Challenges

Programme: Climate action, environment, resource efficiency and raw materials

Call Title: Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement

Call Identifier: h2020-lc-cla-2018-2019-2020

Topic Title: Towards a comprehensive European mountain research strategy

Topic Identifier: LC-CLA-23-2020

Type of Action: CSA Coordination and support action

Deadline(s): 13.02.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-23-2020

Specific Challenges: European mountain regions play a central role for the well-being of many highly populated European regions for instance for water and energy supply, weather regimes, recreation and tourism. European mountain regions are home to a high degree of biodiversity, including many endemic species that occur nowhere else. However, mountain regions are expected to react far more sensitively to global change than other parts of the world. Therefore, research on sustainability of these regions is important not only for the population living there and the many tourists visiting them (e.g. 150 Millions/year for the Alps) but for a significant part of Europe's population. European countries operate excellent research infrastructures in mountain regions and are leading in many fields concerning climate, ecosystems, life in extreme environments, pollution monitoring and other aspects. Making the most efficient use of these resources and the latest scientific developments for addressing the abovementioned challenges, while contributing to climate change mitigation efforts targeted at this specific ecosystem, requires a high degree of coordination within Europe and beyond. Hence, a prominent challenge for this topic is to support and coordinate research and innovation to advance the understanding of current changes in mountain areas derived from climate changes, the synergies with other human–related forcing, the prediction of potential changes in these regions, and to foster observations for a sound monitoring of the regions.

Scope: The action should coordinate and support mountain regions research in Europe and develop a comprehensive European Mountain Research Strategy building on existing European activities. This strategy should aim to support the development of services necessary for the adaption to climate change and the improvement and extension of observations, in particular in-situ ones, for the monitoring of the mountain regions. In line with Responsible Research and Innovation (RRI), citizens, civil society organisations and other relevant stakeholders should be involved in the co-design of the research strategy. This initiative strives for enhanced coordination with international research organisations and programmes related to mountain regions research (e.g. WMO, ESA, GEO, NEMOR and JPI 'Climate') as well as with relevant operational services including Copernicus. This action should support the implementation of the EU Strategy for the Alpine Region – EUSALP (https://www.alpine-region.eu/) and the GEO global Network for Observation and information in Mountain Environment – GEO-GNOME (http://earthobservations.org/geoss_wp.php), and take advantage of other regional and thematic networks initiatives that are being developed in Europe.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged, in particular with countries such as **Canada**, China, India, Russia, United States, and Latin American countries.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 1.5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The project results are expected to contribute to:

- substantially raising the scale and ambition of inter-disciplinary mountain regions research policy in Europe;
- improved coherent and efficient use of European resources for mountain research;
- significant extension of the Copernicus and EuroGEOSS services and products to the mountain regions;
- step change in the domain of open data access, quality control and interoperability for mountain region monitoring and adapting to climate change.

Cross-cutting Priorities: International cooperation

Horizon 2020 Pillar: Societal Challenges

Programme: Europe in a changing world - inclusive, innovative and reflective Societies

Call Title: Migration

Call Identifier: h2020-sc6-migration-2018-2019-2020

Topic Title: Inclusive and innovative practices for the integration of recently arrived migrants in local communities

Topic Identifier: Migration-04-2020

Type of Action: RIA Research and Innovation action, IA-LS Innovation action Lump Sum

Deadline(s): 12.03.2021 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/migration-04-2020

Specific Challenges: The arrival of migrants contributes to diversifying the demographic, cultural, linguistic, ethnic and religious makeup of already diverse European cities and suburbs and rural communities. This may represent an opportunity, but also a significant challenge if taking place in an unorderly manner, as occurred in Europe since 2014. The challenge is to provide policy makers at local, regional, national and supra-national level, civil society organizations and other relevant actors with effective, responsive, flexible, context-specific and culture-specific proposals for measures to promote socio-economic integration and inclusion as well as access to rights and services. This includes sustainable and participatory strategies, also with the involvement of citizens, civil society actors, education institutions and the private sector.

Scope:

a. Innovation action-Lump Sum contribution

The further improvement of the effective integration of newly arrived migrants into societies requires an understanding of existing integration policies and practices. Proposals should examine the provisions for migrants' rights and their access to social services in the host countries, in particular, in the aftermath of the recent unorderly migration flows since 2014. Special attention should be paid to past, existing and potential mechanisms to support the integration of migrant men and women, through participatory practices, social innovation and entrepreneurship, diaspora communities and local civil society initiatives. This Innovation action will develop and test

potentially viable approaches through pilots. It will closely involve migrants, members of the host communities, public authorities and researchers, from preparing the concept over their implementation to their evaluation.

The Commission considers that proposals requesting a contribution from the EU in order of EUR 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Please note that this topic will take the form of lump sums as defined in Commission DecisionC(2017)7151 of 27 October 2017. Details of the lump sum funding pilot scheme are published on the Funding & Tenders Portal together with the specific Model Grant Agreement for Lump Sums applicable

b. Research and Innovation Action

Proposals should comparatively assess the effectiveness of integration policies and practices in major migrant-receiving spaces, in local communities, ranging from urban spaces to rural areas. This should include migrants' access to civic and social rights, social services and facilities (e.g. language tuition and healthcare) in accordance with their legal status, as well as intercultural interaction (including gender aspects) and adaptation to increased diversity of the population. Proposals should also explore social cohesion and societal fragmentation, and how these aspects are accounted for in migrant integration policies. The urban and rural governance of integration processes should be analysed and assessed against the backdrop of a broader multi-level governance framework, whereby potential and real tensions between the local and other levels of governments should be explored. Attitudes to migration and integration by both migrants and the host communities should be studied as well. The role of religious communities could also be examined in relation to outcomes of integration processes. The incorporation of historical and comparative insights from migrant integration processes in relevant non-European societies is strongly encouraged. Cooperation with non-European scholars is also encouraged. This could be done by cooperating with scholars from Africa and the Middle East given the migration relations these regions have in migration policies and dynamics with the EU, as well as with **Canada** with which strong international cooperation on migration research in ongoing. Processes of exclusion, actions and initiatives to redress them, as well as mutual influences between host and migrant communities could be studied, including the analysis of the impact of these dynamics with relations of migrants with their origin countries. Projects should compare the different practices and experience on their viability, efficiency and transferability. They should deliver policy recommendations. Projects should establish a regular exchange with the stakeholders from the different communities and municipalities.

The Commission considers that proposals requesting a contribution from the EU of EUR 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

The outputs of MIGRATION-04-2020 should also be made readily available for cooperation and synergy with MIGRATION-10-2020, a CSA which will compile the outputs of existing research on integration, including such RIAs and IAs.

Expected Impact: Projects will enhance the knowledge base on integration of migrants in local communities. The actions will contribute to improved practices, policies and strategies at local, national and EU level for the integration of migrants in European urban and local settings. This will help increase the possibilities for migrants to thrive and flourish in the labour market and in society. They will advance the implementation of the EU Urban Agenda (building on the specific Partnership on Inclusion of Migrants and refugees [1] and of the UN Sustainable Development Goals related to making cities inclusive, safe, resilient and sustainable.

The pilots developed with the Innovation Action will offer new tools for enhancing the integration of migrants across Europe. This will provide actors working in this multilevel system of governance with already tested options that should be scalable and replicable in different environments with the context specific adaptations. Their evaluation will provide conclusions and recommendations for policy making at local level as well as for the regional, national and European level to create best possible conditions in which local authorities and their stakeholders can operate.

The Research and Innovation Action should deliver analysis for better understanding the phenomenon. Projects should identify approaches and practices, which can be applied in both cities and rural communities, as well as those that would be specific to one or the other. This will expand the knowledge both of dynamics of integration and of the policies managing such process, shedding light on potential gaps and needs which should be addressed by policymakers. The actions will contribute to finding new ways to integrate migrants into European societies, to ensure their cohesion and thus exploit the potential opportunities of migration.

Cross-cutting Priorities: Socio-economic science and humanities, Gender, Socio-economic science and humanities

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[1] https://ec.europa.eu/futurium/en/inclusion-of-migrants-and-refugees