Net 4 Society

Opportunities for Researchers from the Socio-economic Sciences and Humanities (SSH) in Horizon 2020

Analysis of SSH-relevant Topics Work Programme 2018-20

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Coordination and Support Action

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Introduction

This document is designed to help potential proposers find SSH-related topics across the different parts of Horizon 2020 in Work Programmes 2018-20.

SSH in H2020

Horizon 2020 aims at fully integrating Socio-economic Sciences and Humanities (SSH) in each of its pillars and specific objectives. SSH is therefore a cross-cutting issue and integrated in the whole framework programme. While SSH research aspects are particularly present in the societal challenge 'Europe in a changing world: Inclusive, innovative and reflective societies', they are also present in all other challenges and in other parts of Horizon 2020.
H2020 requires applicants to submit proposals and build consortia that transcend disciplinary and sectorial boundaries, bringing together scholars from SSH and from life and physical sciences, technology, engineering and mathematics (STEM) as well as researchers and practitioners across these fields.

The SSH encompass a wide range of disciplines such as sociology and economics, psychology and political science, history and cultural sciences, law and ethics. Contributions from these research and activity fields are needed under Horizon 2020 to generate new knowledge, support evidence-based policymaking, develop key competences and produce interdisciplinary solutions to both societal and technological issues.

SSH-flagged topics across H2020

To assist SSH researchers in identifying funding opportunities, the European Commission (EC) has established a search engine within its online Funding & Tenders Portal. Certain topics with substantial SSH aspects have been "flagged" by the EC as SSH-relevant topics and the search engine offers the possibility to directly search for these SSH "flagged" topics. It also allows for keyword and full-text search.
This document compiles the "SSH-flagged topics" and is based on the analysis of SSH relevant topics carried out jointly by the thematic services and Unit B.6 Inclusive Societies of the EC Directorate-General for Research and Innovation. The document also includes a few additional topics that, while not flagged, may require the contribution of Social Sciences and Humanities researchers.
This document serves as a guideline and is meant to demonstrate the wealth of possibilities for scientists in Socio-economic Sciences and Humanities within Horizon 2020 and includes:

- SSH-DEDICATED TOPICS: topics where SSH aspects dominate the text,
- SSH-RELEVANT TOPICS: topics with substantial relevance to the SSH community. In these topics, SSH aspects are indicated in **bold text,**
- TOPICS WITH MINOR SSH RELEVANCE: brief information is provided (title and link to the Participant Portal)

Researchers are strongly encouraged to screen the Work Programmes themselves, in order not to lose out on research opportunities offered on their specific interest. In any case, the Work Programmes need to be read in more detail to be aware of the overall approach of the theme, the context of the topics, rules for participation and other specific requirements. At the same time, the topic texts may include footnotes with more information, which could not be included in the compiled topic texts within this document.
Of special importance are the "type of action" and the eligibility criteria connected to it. These and any other relevant information can be found in the specific "Work Programme" chapter and the specific call

document. All the relevant documents can be downloaded from the Participant Portal. The specific links are provided for topic in the respective chapters.
The structure of the document is determined by the degree of SSH integration in the different Horizon 2020 programme parts. Instead of following the numerical order of the different parts in Horizon 2020 (*I. Excellent science, II. Industrial leadership, III. Societal challenges*), this report starts with the part that includes "top down" topics and the highest amount of SSH research dimensions, the *societal challenges*. It continues with the "Leadership in enabling and industrial technologies" of the *Industrial leadership* part. In the following chapter, SSH aspects in *Excellent science* are presented (mostly "bottom up" opportunities). Last but not least, the SSH-relevant topics in "Science with and for society" and in "Spreading Excellence and Widening Participation" are included.

SSH Opportunities in ERA-Initiatives

Topics that clearly address research funding agencies and not researchers, such as ERA-Net topics, are not included.
To support researchers in finding European funding opportunities in ERA-calls, Net4Society performs a regular monitoring and publishes up-to-date information on SSH-relevant calls of ERA-Nets, Joint Programming Initiatives, Joint Technology Initiatives or Article 185 Initiatives.
Open calls are available online on the Net4Society website under www.net4society.eu/public/408.php

This document includes information on open or forthcoming topics for 2019-2020 as of November 2018.
An update for 2020 topics will be published in 2019.

DISCLAIMER

Information on calls might be subject to change. Researchers need to consult the Participant Portal to receive the latest information on calls.
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Societal Challenge 1

Health, Demographic Change and Wellbeing

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SC1-HCO-01-2018-2019-2020: Actions in support of the International Consortium for Personalised Medicine

Specific challenge

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, which includes representatives from most EU countries along with several other European countries and Canada. Also the 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:

1. 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 and cultural aspects, health economy issues and equitable healthcare.** For the 2018 call, the project should focus on CELAC as a group of countries, and for the 2019 call on China. 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 from the international partner region CELAC or from China, respectively.
2. 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).
3. 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. 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).
4. 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 and the HMA network, as well as the European legal framework. 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).

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:

1. International aspect: Integrating the country/group of countries into ICPerMed activities. Support wider adoption of standards developed in Europe. Contribute towards the UN Sustainable Development Goal 3: Ensure healthy lives and promote well-being for all at all ages.
2. 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.
3. 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.
4. 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**.

Type of action	Coordination and support action
Deadline	**16 April 2019**
Call identifier	H2020-SC1-BHC-2018-2020
Topic information	Link

Call - Better health and care, economic growth and sustainable health systems

SC1-BHC-28-2019: The Human Exposome Project: a toolbox for assessing and addressing the impact of environment on health

Specific challenge

Despite the general acknowledgement by the scientific community that 'Genetics load the gun but environment pulls the trigger' when it comes to the causation of major non-communicable diseases (NCDs), there is persistent uncertainty as to the global burden of disease attributable to environmental (including life-style and climatic) factors, including healthcare costs and negative economic impact. Deciphering the human exposome is a novel way of addressing the challenge to improve health and reduce the overall burden of disease. This will require improved knowledge of health risks, including combinations of several risk factors, and the mechanisms by which they affect health at different stages throughout the life course, including exposures in foetal life. **Effective preventive action will need to be designed, building on knowledge of various risk factors, including exposure to pollutants in daily life, individual behaviour and the social context, taking into account gender issues**.

Developing a Human Exposome Project would present a fundamental shift in looking at health, by moving research away from 'one exposure, one disease' understanding to a more complex picture upon which to build solid, cost-effective preventive actions and policies in the future. It would respond to the need for more complete and accurate individual-level exposure data in order to estimate the largely unknown environmental component of NCDs.

Scope

Applicants should take advantage of the last decade's rapid technological advances which have opened up new opportunities to collect, combine and analyse large data sets offering new possibilities to understand the contribution of environmental factors to the global health burden of common chronic diseases. Proposals should use innovative approaches to the systematic and agnostic identification of the most important environmental risk factors for the development of major NCDs across the life course (including in utero), leading to preventive interventions at the individual, group or population level and contribute to sustainable healthcare. Well-designed retrospective epidemiological studies may be included and proposals may envisage the creation of a prospective Europe-wide exposomics cohort and biobank, **integrating behavioural, socio-economic factors and clinical records**.

The following components should be considered: agnostic evaluation of the role of multiple and unknown exposures; assessment of individual exposure to multiple stressors; sensors that combine external exposure and health data measurements; integration of external exposome data with cross-omics responses and (epi)genetic data; systematic evaluation and simulations of the health impacts; **socio-economic modelling and econometric analysis including ethical and sex/gender aspects where relevant**; better data mining tools, including advanced statistical analysis of complex data and high-performance/high throughput computing and storage; a long-term host and a single shared data infrastructure, taking into account existing structures and ensuring open access to data generated.

Innovation and connections with industry are expected in the areas of sensor development (external exposome), omics technology and novel biomarker development (internal exposome), bioinformatics, and data processing and management. Proposals are expected to respond to a persistent or long-standing policy/regulatory need where the exposome approach would be useful to solve a scientific issue to underpin better regulation now or in the future (examples: indoor and outdoor air quality, waste, occupational health, noise).

In order to establish an overarching Human Exposome Project, an overall coordination mechanism between the projects funded will be required and will be added at the grant preparation stage to all selected proposals as a common work package. Grants awarded under this topic will be complementary. The respective options of Article 2, Article 31.6 and Article 41.4 of the Model Grant Agreement will be applied. The Commission considers that a proposal requesting an EU contribution between EUR 8 to 12 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

- Innovation in environmental health sciences, in particular for external and internal exposure assessments and data management.
- Enabling researchers and policy makers to continuously include new knowledge in the policy making processes by using the toolbox to generate data and information.
- Better prediction of disease risk by acquisition of new knowledge on the influence of external exposures on biological pathways at different life-stages and identification of early signs of health damage caused by environmental factors.

Type of action	Research and Innovation action
Deadline	**16 April 2019**
Call identifier	H2020-SC1-BHC-2018-2020
Topic information	Link

Call - Better health and care, economic growth and sustainable health systems

SC1-BHC-31-2019: Pilot actions to build the foundations of a human cell atlas

Specific challenge

For better understanding human health as well as improving the diagnosis, monitoring and treatment of diseases, greater knowledge is needed of the diverse cells found within the human body. Recent developments in single cell technologies, analytical methods and computational tools allow for unprecedented characterisation of human cells. A novel approach to address this challenge is the international Human Cell Atlas initiative (HCA) which will create molecular reference maps of all human cells. The potential scientific scope and organisation, including the community values to be adhered to by participating researchers, are described in a recent white paper. European researchers are at the forefront of developments and thus, well-positioned to make an important contribution to building a human cell atlas. For this, it is imperative to bring together and strengthen European expertise to generate data and/or develop methods for indepth, integrated molecular analysis and spatial resolution of single cells from complex biological systems such as human organs and tissues.

Scope

Each pilot action should demonstrate the utility of an interdisciplinary technological/biological platform to generate and integrate standardised molecular, cellular, biochemical and other data sets, characterising single cells or their nuclear components, their interactions and/or spatial location in tissues from one human organ. Platforms supporting analysis of tissues from more than one organ are also in scope. The primary focus should be on healthy tissues, though comparison between healthy and diseased tissues could be appropriate. **Sex, age and ethnicity comparisons could also be considered. Proposals should provide detailed plans for quality management of tissue procurement and data in compliance with the relevant EU legislation (e.g. ethics, data protection).** Proposals supported under this topic must strictly adhere to the values, standards and practices of the HCA 35 and provide for co-ordination with ongoing European and international activities. Plans for building sustainability beyond the funding period and scalability should be included. Proposals for pilot phase actions under this topic should be ready to deliver results for the HCA quickly, therefore project should have a duration of two years. To ensure coherence and communication between projects funded under this topic and with the HCA, the Commission will ensure an overall coordination mechanism between the projects. Proposals are expected to budget for the attendance of co-ordinators to regular meetings, where communication of results and exchange of knowledge gained from each pilot will be the objective The Commission considers proposals requesting a contribution from the EU of between EUR 3 and 5 million would allow for the specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact

- Timely contribution of project results to the HCA
- Effective and sustainable biological and/or technological platforms.
- Competitive and sustainable European role in HCA
- Strong involvement of European technology SMEs
- Laying the groundwork for improving diagnosis and treatment of disease

Type of action	Research and Innovation action
Deadline	**16 April 2019**
Call identifier	H2020-SC1-BHC-2018-2020
Topic information	Link

SC1-DTH-01-2019: Big data and Artificial Intelligence for monitoring health status and quality of life after the cancer treatment

Specific challenge
Currently available methods and strategies for diagnosis and treatment of cancer help clinicians continuously improve quality of care and prevent cancer deaths in the population. Accurate risk assessment, availability of genetic tests, timely diagnosis and effective treatment has created the impression of cancer being a chronic disease that can be cured. However, often rather aggressive treatment, psychological stress (anxiety and depression) can cause physical and psychological problems that may cause long-term after-cure consequences such as similar or other types of cancer, other types of (chronic) diseases and affect the quality of life of a patient. Therefore, the importance of addressing and, if possible, preventing long-term effects of cancer treatment is growing. In addition to patient-reported outcomes such as functional status, symptoms intensity and frequency, multiple domains of well-being and overall satisfaction with life, the use of big data can bring valuable information for monitoring health status and quality of life after the cancer treatment. Big Data can provide new opportunities to define statistical and clinical significance, but present also challenges as it requires specific analytical approaches.

Scope
Proposals should focus and deliver on how to better acquire, manage, share, model, process and exploit big data using, if appropriate, high performance computing to effectively monitor health status of individual patients, provide overall actionable insights at the point of care and improve quality of life after the cancer treatment. Relevant solutions include for example systems for determining and monitoring (taking also in account gender differences) the combined effects of cancer treatment, environment, lifestyle and genetics on the quality of life, enabling early identification of effects that can cause development of new medical conditions and/or impair the quality of life. **Proposals preferably address relevant health economic issues, use patient reported outcome and experience measures (PROMs and PREMs) and take into account the relevant social aspects of health status and quality of life after cancer treatment. Integrated solutions should include suitable approaches towards security and privacy issues.**
Information can be collected from traditional sources of health data (cohorts, comprehensive electronic health records or clinical registries, incl. genetic data, validated biomarkers for remission), from new sources of health data (mobile health apps and wearables) and from sources that are usually created for other purposes such as environmental data.
It is important to assure ethical aspects of data, confidentiality, and anonymity of data transfer and engagement of those who collect / code such data in its analysis and interpretation, in order to avoid misinterpretation and inappropriate conclusions by using proper annotation methodologies of the data. Involvement of those who work within healthcare systems, patients, family and relatives, and the general public is needed.
The Commission considers that proposals requesting a contribution from the EU of 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 other amounts. Participation of SMEs is encouraged.

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

- Mapped comprehensive big data in a reachable and manageable way by applying principles for sharing and reusability, creating a network of knowledge by linking translation tools, heterogeneous data sources and biomedical texts for monitoring health status and quality of life after the cancer treatment;
- Emerging data driven analytics and advanced simulation methods to study causal mechanisms and improve forecasts of ill-health, identification of disease trajectories and relapse;
- Better and faster means of high quality response to prevent or timely address development of new medical conditions and/or improve the quality of life;
- Better knowledge for improved patient counselling as well as to improve follow-up of patients;
- Novel information on health maintenance, onset and course of medical conditions with a view to optimise prevention and treatment;
- Evidence base for the development of policy strategies for prevention, early diagnosis, therapies as well as addressing health inequalities, support to patient registries at national level;
- **Improved quality of life after cancer treatment, strengthening personal confidence and enhancing employability;**
- Preventative strategies are established which have a real effect of reducing the occurrence of health disorders and co-morbidities associated with cancer treatment.

Type of action	Research and Innovation action
Deadline	**24 April 2019**
Call identifier	H2020-SC1-DTH-2018-2020
Topic information	Link

SC1-DTH-05-2019: Large scale implementation of digital innovation for health and care in an ageing society

Specific challenge

An ageing population is increasing demand-side pressures on public health and social care providers across Europe. These pressures undermine the long-term sustainability of existing models for delivering care services to the ageing population.
The challenge is to scale up outcome-based innovative digital health and care solutions across EU borders through joining up actions in procurement of innovation. Digital health and social care solutions have been tested and have demonstrated success in smaller scale settings. However, despite cooperation initiatives amongst regions through INTERREG programmes or the transfer of innovation schemes of the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA), large-scale deployment of digital health and care solutions across EU borders remains limited. There is a lack of collaborative efforts in public purchasing of innovative ICT-based solutions for active and healthy ageing and successfully engaging demand and supply sides in scaling up innovation. This is the case in particular for digital solutions integrating health, social or community care and informal care, IoT enabled independent living solutions that allow the citizens to live safely and independently at home therefore avoiding institutionalisation, or tele-care solutions and tools supporting for self-care and person-centred care. Moreover, take-up of these ICT-based solutions by both public care providers as well as people in need for care is a crucial factor in successfully alleviating the demand-side pressures on public health and care provision. Supporting the public procurement of innovation helps public authorities by aggregating demand and sharing the inherent risks associated to deploying new innovative solutions that can be integrated with existing public health and care provision systems.

Scope

This topic will contribute to the Digital Single Market Strategy priorities on digital transformation of health and care (notably to the priority on user-centred integrated care), to the Scaling-Up Strategy of the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA) and will support the EIP on AHA Reference Sites contribution to the Digital Single Market Strategy, notably the priority focusing on user-centred integrated care. The actions supported will target large-scale deployment of digital health and care solutions across different regions in Europe. In line with the priority actions of the EIP on AHA Scaling-up Strategy, the scope of this PPI is to specify, purchase and deploy ICT based solutions (made up of services and ICT products to enable the provision of services) for active and healthy ageing through a common supply and demand side dialogue, which can deliver sustainable, new or improved health and care services promoting patient feedback in which public procurement approaches for innovative solutions lead to improved outcomes. Proposals should:

- **Be driven by clearly identified procurement needs of the participating organisations and building on a deep understanding of the needs of the ageing population, as well as the needs of the relevant health and care providers**;
- Support sustainable deployment of new or improved person-centred and outcome-based services promoting patient feedback by providers involved in the procurement of solutions for digital health and care providers, including networking of inpatient and outpatient care, nursing services and care homes;
- Contribute to the creation of scalable markets across Europe in innovative solutions for active and healthy ageing;
- Specify measures that will ensure the sustainability of solutions beyond the lifespan of the proposed project, notably **taking into account levels of acceptance with users and professionals as well as health economics considerations**.
- Engage public and/or private procurers from each country participating (at national, regional or local level) that have responsibilities and budget control in the relevant area of care or supply of services;
- Be based on a complete set of common specifications for end to end services;
- Demonstrate that the implementation phase will reach "large scale" (i.e. sufficient scale to achieve statistical significance) through region-wide deployment across multiple regions of Europe;
- Contribute to the use of interoperable solutions based on open platforms and take into account existing best practices and standardisation initiatives;
- **Provide robust safeguards to ensure compliance with ethical standards and privacy protections and take account of the gender dimension**;
- Contribute with good outcome-based practices that are impact measured according to the MAFEIP methodology and can be made available for replication across other regions (e.g. "detailed plans" for larger scale sustainable uptake of innovative solutions for active and healthy ageing, reference material and guidelines, manuals and education materials) through the EIP on AHA innovative practices repository.
- Contribute to the development of national strategies to stimulate the procurement of digital innovation for health and care services based on the outcomes achieved at national level.

The European Commission considers that proposals requesting a contribution from the EU of between EUR 2 and 5 million would allow this specific challenge to be addressed appropriately through PPI. This does not preclude submission and selection of proposals requesting other amounts.
Proposals of this topic should follow the specific requirements for innovation procurement PPI supported by Horizon 2020 grants as set out in Annex E of the WP.

Expected Impact

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

- Growing awareness and successful use of public procurement to boost ICT innovation applied to integrated care and active and healthy ageing, implemented across the whole chain of care ultimately benefiting the growing ageing population across Europe;
- Contribution with data and experiences to regulatory and legislative process development addressing potential barriers to procurement of innovative solutions for active and healthy ageing;
- Contribution of an open and comprehensive socio-economic evidence base for ICT investments in the field that can support the development of sustainable business models (e.g. cost-benefit analysis, increased efficiency of health and care systems, impact assessments, return on investments, quality of life improvements for users, ethics, safety gain and user satisfaction);
- Support initiatives on interoperability and standardisation that can contribute to defragmentation of the market for ICT based active and healthy ageing solutions;
- Creation of economic boundary conditions that can support long-term sustainability of health and care systems and emergence of new business models to develop ICT innovation for active and healthy ageing in Europe;
- Support forward-looking, concerted public-sector investment strategies that benefit from joint approaches across different regions;
- Create new opportunities for market uptake and economies of scale for the supply side for ICT based solutions and services for active and healthy ageing in a Digital Single Market for Europe.
- Contribute to inform policy measures that foster the take-up of ICT solutions for active and healthy ageing.

Type of action	Public Procurement of Innovative solutions
Deadline	**24 April 2019**
Call identifier	H2020-SC1-DTH-2018-2020
Topic information	Link

SC1-DTH-11-2019: Large Scale pilots of personalised & outcome based integrated care

Specific challenge

Senior people are statistically at greater risk of cognitive impairment, frailty and multiple chronic health conditions with consequences for their independence, their quality of life (and the one of their families) but also for the sustainability of health and social care systems. There is also increasing evidence that interactions with the environment play an important role in the evolution of the patient's health status and condition. The challenge is now to foster secure, scalable and robust digital solutions for integrated care which will:

- Ensure a truly personalized delivery of health and social care, whilst supporting outcomes-based significant efficiency gains in health and care delivery.
- Promote a shift towards outcome-based delivery of integrated (health and social) care, which can be realised in a realistic operational, organisational and financial setting.
- Ensure trust of users and policy makers with regard to data access, protection and sharing.
- Design flexible but replicable solutions with a potential for financial sustainability, large scale deployment and further business and job creation opportunities.

Scope

The scope of this topic is to foster the large-scale pilots for deployment of trusted and personalised digital solutions dealing with Integrated Care, with a view to supporting and extending healthy and independent living for older individuals who are facing permanently or temporarily reduced functionality and capabilities. This in turn is expected to contribute to a patient-centred and truly individualized strategy in order to develop trusted, robust and financially sustainable services potentially useable in any Member States and the Digital Single Market, and applicable to a very wide range of patient pathways. These approaches aim to enable people to remain independent as long as possible and prevent hospitalisation.

Expected outcomes are in priority:

- Efficiency gains in terms of resource utilization and coordination of care.
- Flexibility and replicability of service delivery patterns to combine personalization and large scale adoption of services with patient and citizen feedback.
- Ensuring secure and efficient sharing and processing of all data and information involved in the supply chain at each step of data stream: access, protection, sharing, processing and storage.
- **Improvement of quality of life for the patient and his/her family and also of working conditions of all health care and social care providers involved in the supply chain, taking into account multi-disciplinary environment and constraints. Working conditions of professionals should cover in priority: work time management, quality of data/information exchange and multi-disciplinary coordination.**

Outcome indicators should contribute to the assessment of the action regarding trust, recruitment, added value for the patient (in terms of quality of life) and cost-efficiency altogether.

- Recruitment of professionals will be measured by the number of professionals registered as actual used compared with the number of professionals actually registered in the pilot site region.
- **Quality of life should be measured on the basis of commonly used questionnaires (like SF36) but also if required on the basis of specific disease-oriented measurement tools.**
- Measurement of cost-efficiency should be measured on the basis of work time information dedicated to each patient.

The Commission considers that proposals requesting a contribution from the EU of between EUR 4 and 6 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 should provide measurable progress towards:

- A common vision of technical prerequisites and framework to ensure users trust with regard to health and social data and information in IT supported environment, in line with existing EU data protection regulation (and if required with EU reflection on platforms).
- An evidence-based minimum data set on key points of the pathway:
- Clerical information: complete definition
- Clinical information: generic definition.
- Harmonisation, certification, approval labelling or reliable identification of adequate solutions for integrated care.
- Robust and reliable and replicable business models for IT supported solutions in a truly personalized and multi-disciplinary environment.

Call – Digital transformation in Health and Care

Type of action	Innovation action
Deadline	**24 April 2019**
Call identifier	H2020-SC1-DTH-2018-2020
Topic information	Link

SC1-HCC-02-2019: Support for the large scale uptake of open service platforms in the Active and Healthy Ageing domain

Specific challenge

In the past years several open service platforms for Active and Healthy Ageing domains have been developed, originating from the medical, independent living, and IoT domain. These platforms aim at building a common basis for application development, assuring interoperability at the application and service level, and reducing development cost by re-use of components. As these platforms mature more insight is needed in the way they contribute to the development of a scalable and open market for digital solutions for health and ageing, and which value is actually achieved through them. The integration of platforms between different domains will introduce new interoperability issues that need to be tackled. A coordination and support action that addresses these issues and gathers the insight referred above is needed in order to promote the effective uptake and impact of open platforms.

Scope

Proposals should deliver an inventory of the state of the art and analyse the use of open service platforms in the Active and Healthy Ageing domain, covering both open platforms -such as universAAL and FIWARE - and partly-open/proprietary platforms developed by industry. In addition, proposals should address interactions between platforms.
Proposals should elaborate a methodology that monitors open platform development, adoption and spread across Europe, with relevant KPI's, factors that support or hinder the uptake of open platforms in Europe, including the associated evolution of the ecosystems and stakeholder networks.
Proposals are then expected to put this methodology into practice and study the use of open platforms by, amongst other possible actions, collecting and processing data from running and recently ended projects –including EU funded projects- and initiatives that use the referred platforms, with special focus on those building upon UniversAAL and FIWARE. They should also address the evolution in the further development and maintenance of the platforms as well as the use and sustainability of relevant open platforms.
Proposals should elaborate evaluation guidelines aimed at collecting evidence on socio economic costs and benefits of the use of open platforms as means for service delivery to serve as a reference for promoting further use of this approach.
Proposals are expected to include activities aimed at fostering integration efforts and knowledge exchange between the projects and initiatives referred above and also the user communities around the platforms. **Proposals should collect best practices and practical experience** with integrating multiple platforms. Technical, **organisational, financial/business and legal aspects should be taken into account.** Proposals should explore and link relevant on-going policy initiatives in the field such as the Blueprint for digital transformation of health and care.
Proposals should describe collaboration activities with other relevant European projects or initiatives, e.g. the European Innovation Partnership on Active and Healthy Ageing. They are also expected to include dissemination activities for different stakeholder groups - technology developers, policy makers, end users-, preferably in the context of major events such as EIP-AHA summit, AAL Forum and eHealth Week.
The Commission considers that proposals requesting a contribution from the EU of up to 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

Proposal should present appropriate indicators to measure their progress and impact in these areas:

- Identification of the critical success factors of open platform development, deployment, and spread;
- Increased knowledge on the differences and synergies between open platforms, with regard to both their features and their interoperability on different levels (data / information / applications / services);
- **Evidence for the socioeconomic benefit of open service platforms;**
- Engagement of required stakeholders to ensure the reliability of the data collected and to maximize the value of results achieved;
- Increased levels of participation by service platform providers and platform users in networking and knowledge exchange events;
- Contribution to the effective implementation of relevant policy initiatives in the field;
- Enhanced synergies with other European projects to make joint progress on favourable framework conditions to scaling-up digital innovation for active and healthy ageing across the EU, including standardisation.

Type of action	Coordination and support action
Deadline	**24 April 2019**
Call identifier	H2020-SC1-DTH-2018-2020
Topic information	Link

Societal Challenge 2

Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy

Net 4 Society

SFS-01-2018-2019-2020: Biodiversity in action: across farmland and the value chain

Specific challenge

Agricultural biodiversity is understood to comprise all components of biological diversity that (i) are of relevance for food and agriculture and all components of biological diversity that (ii) constitute agro-ecosystems. It is the result of highly dynamic interactions between the environment, genetic resources, agricultural practices and historical land management. The various dimensions of agricultural biodiversity play a significant role in conferring stability, resilience and adaptability to farming systems. Below ground biodiversity for example plays a major role in soil nutrient and water cycling, nutrient uptake by plants and in the control of plant diseases. Genetic diversity within species is at the origin of plant development, adaptation to different environments (including climate) and a wide range of properties which cater for diverse needs. The native biodiversity on and around farms is associated with the provision of important ecosystem services beyond farm level.

The way farmers manage their land has immediate effects on domesticated and native biodiversity. Specialised, intensive agriculture has generally resulted in higher productivity at the expense of decreasing levels of biodiversity, partly due to a lack of incentives for farmers to safeguard biodiversity. **Ambitions to make diversity a more integral part of farming are reflected in a number of European policies** and global commitments. **Translating these ambitions into practice will require the necessary know-how and a range of options for optimising the joint delivery of economic, environmental and social services by farming**.

Scope

Activities will tackle biodiversity from various angles ranging from its supporting functions in agro-ecosystems (e.g. through activities of plant and soil biota), the integration of diversity into farming practices and incentives for wider biodiversity management including native biodiversity. Proposals will consider various temporal and spatial scales when assessing the dynamics of biodiversity and its relationship with farming systems, the surrounding landscapes and throughout value chains.

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

A. [2018] Small organisms, big effects for plants- Belowground biodiversity interaction with plants (RIA)

B. [2019] Capitalising on native biodiversity in farmland landscape (RIA)

Proposals will enhance the understanding of the relationship between farm management and native biodiversity in the surrounding landscape, together with the associated ecosystem services. Activities will be developed at different scales and cover different habitats, as well as a diverse range of species (flora and fauna) from having beneficial to adverse effects on agriculture (i.e. from wild plants and wild pollinators to large carnivores). Work will consider both of the contrasting dynamics threatening farmland biodiversity (namely specialisation/intensification and marginalisation/abandonment).

Proposals will support the definition of biodiversity targets at the appropriate scale and design result-based incentives at policy and/or market level taking into account the current regulatory framework. Proposals will look at the synergies between increasing biodiversity awareness/acceptance by farmers and their involvement in the monitoring. They shall develop, test and scale-up existing and new biodiversity indicators taking into account the perspectives of stakeholders and provide integrated information platforms and improved methods.

Work shall build on existing initiatives, provide support for the setting-up of new networks that address biodiversity in farmland landscapes and liaise with relevant European Research Infrastructures such as ANAEE. **Proposals should build on the system proposed for in-situ observatories ("Citizen Observatories") and the effective transfer of biodiversity knowledge to farming, research, policy and society.** Proposals should fall under the concept of 'multi-actor approach' engaging key stakeholders and experts and ensuring adequate involvement of the farming sector in open source collaboration and data collection covering a wide range of agri-ecosystems. This will include enabling networking on similar issues across Europe. **They should also seek contributions from social and economic sciences to cover the broader economic, social, behavioural and environmental issues**.

Proposals may involve financial support to third parties, particularly for supporting regional/local networks. The proposal will define the process of selecting entities for which financial support will be granted up to EUR 100.000 per party over the project duration.

C. [2020] From agrobiodiversity to dynamic value chains

All scopes (A), (B): The Commission considers that proposals requesting a contribution from the EU of up to EUR 7 million for A and 8 million for B would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Proposals should include a task to cluster with other projects financed under the same sub-topic.

Expected impact

Funded activities will showcase the benefits of agro-biodiversity at various levels and develop solutions and approaches to embed these benefits more effectively into farming practices and policy measures.
In the short to medium term work will

- expand the agro-ecological knowledge base on the links and dynamics between biodiversity and agricultural production;
- deliver best practices based on production systems (both conventional and organic) that combine support for biodiversity with value creation;
- result in improved methods and tools to assess, evaluate and monitor different levels of diversity (genetic, species and ecosystem) as well as the linkages between agro-biodiversity and ecosystem services;
- define operational biodiversity targets from the field to regional level;
- deliver strategies and tools for biodiversity focused soil management (scope A);
- reduce the dependence on external inputs in plant management through effective plant-soil interactions and the use of soil organisms (scope A);
- develop private and public incentives to foster farmer's delivery of biodiversity as a public good (scope B);
- generate news sets of harmonised data on native biodiversity in farmland landscapes and contribute to foster a European biodiversity platform and network involving farmers (scope B).

In the longer term funded activities will help to foster the synergies between agricultural production, biodiversity and the delivery of ecosystem services of local, regional and global relevance. They will allow the farming sector to continue fulfilling its multiple functions under more challenging biotic and abiotic conditions expected in the future, mostly as a result of climate change effects.

Type of action	Research and Innovation action
Deadline	**1st stage - 23 January 2019** **2nd stage - 04 September 2019**
Call identifier	H2020-SFS-2018-2020
Topic information	Link

SFS-04-2019-2020: Integrated health approaches and alternatives to pesticide use

Specific challenge
Plant protection and biocidal products (both covered under the term "pesticides") are used in agriculture in order to secure yield and food safety in plant production and animal husbandry. At the same time, pesticides may have effects on the environment, non-target organisms, animal and human health. In the EU they are regulated and assessed for pre-market approval but tools and methods need to be further developed to better understand the overall risks and impacts associated with their individual and combined use and possible side effects. Member States and EU policies seek to reduce reliance on pesticides by designing and implementing more integrated approaches towards the use of pesticides while at the same time safeguarding the competitiveness of EU's agriculture. Significant efforts are required to develop alternatives to critical active substances used in plant protection and/or biocidal products. It is also necessary to carry out an overall assessment in order to gauge the complexity and trade-offs inherent to the sustainable use of pesticides and related impacts at various scales, in line with a global health approach.

Scope
Proposals should address only one of the following sub-topics:
A. [2019]: Integration of plant protection in a global health approach (RIA)
Activities will test and deliver integrated approaches to advance in the assessment of the impacts of plant protection products and their metabolites (PPPs) on plant, human, animal and ecosystem health. **Activities will build on existing data, validated models of PPPs fluxes/concentrations, models for economic analysis, integrated risk assessment tools,** running projects and the European Food Safety Authority's (EFSA) activities**.** Activities will support new measurements and observations and further develop more comprehensive and reliable models. **A synthesis of risks, cost and benefit analysis of PPPs' use at different spatial and temporal scales and their distribution between different stakeholders should be performed (including damages caused by pests, product quality and regulatory costs).** Activities will build on representative case studies covering different agricultural products.
In terms of human health, both direct and indirect exposures to PPPs will be taken into account with a particular focus on direct exposure of farmers and the rural population and the exposure of consumers to PPP residues in food. Animal health risk assessment should take into account the exposure to residues of PPPs in feed (aggregating EU uses and residues in imported feed). Work on environmental risks and impacts should consider the diversity of European agricultural landscapes, as well as ecological and environmental variability. It should make it possible to gauge the spatial dimension of impacts and map risks at regional, national, European and global levels. Work should connect the risk assessment of PPPs with initiatives for the protection of European biodiversity, as well as initiatives under the Water Framework Directive.
Proposals will identify lock-ins, develop transition paths towards a sustainable use of PPPs, taking a transdisciplinary approach, and should consider the needs of risk managers for the authorisation/restriction of PPPs as well as of farmers for selecting more appropriate and sustainable products and their optimal use avoiding side effects. Activities will include the development of a research agenda on plant protection in the context of a global health approach.
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.
B. [2020] Biocidal and plant protection products (IA)

All sub-topics (A), (B): Projects should fall under the concept of the 'multi-actor approach' bringing together contributions from a wide range of stakeholders including research, farming, advisory services, industry as well as consumers and civil society. **They should also seek contributions from social and economic sciences to cover the broader economic, social, behavioural and environmental issues associated with the adoption of novel management strategies. This will include looking at gender aspects, as appropriate.**

Expected impact
Activities will contribute to a better understanding of complex, interlinked issues and reduce the reliance on the use of pesticides by helping to:

- establish the impacts of the use or non-use of pesticides on the environment and human health (consumers, operators, farm workers and residents in agricultural areas);
- **improve farmer, consumer and citizen awareness of and trust in global health approaches through clear and transparent and integrated assessments, plant health protection strategies and related communication**;
- contribute to the ongoing collection of harmonised EU-wide datasets in open source collaboration and of indicators to assess and monitor trends over time and support risk management measures (scope A);
- improve monitoring of pesticide uses and pressures on human and animal health and the environment, by developing appropriate tools and integrated approaches considering various pathways (scope A);

- foster lasting transdisciplinary cooperation in the fields of life sciences, human, plant and animal health and environmental sciences and strengthen the European scientific community (scope A);
- support relevant EU plant health policies and/or European risk assessments in relation to EFSA's activities.

In the longer-term results will strengthen an integrated health approach and foster the sustainable use of pesticides thereby reducing the exposure of human and animals, terrestrial and aquatic ecosystems, drinking water and the food chain to pesticides.

Type of action	Research and Innovation action
Deadline	**1st stage - 23 January 2019** **2nd stage - 04 September 2019**
Call identifier	H2020-SFS-2018-2020
Topic information	Link

SFS-08-2018-2019: Improving animal welfare

Specific challenge

EU animal welfare legislation has evolved on the basis of scientific knowledge, improving the quality of animals' lives taking into account citizens' expectations and market demands. Nevertheless, a number of problems remain unsolved and the sector faces challenges to cope with them. Research is needed to further improve the management of animal welfare, by looking into new opportunities offered by technological developments, **development of appropriate business models** and linking animal welfare with other production parameters, including animal health and environmental performance.

Scope

A. [2018] Organic and low-input farming (RIA)

B. [2019] Precision livestock farming (IA)

Proposals should address various stages of the terrestrial livestock production system (e.g. breeding, rearing, fattening, transport and slaughter). Proposals should build on state of the art animal welfare approaches to develop innovative technologies, while also considering the needs to reduce emissions of air pollutants from agriculture. Work on indicators should be pursued, especially on those with potential for inclusion in efficient and impactful animal welfare management models. **Innovative business models should be developed in order to make it easier for consumers to identify and choose enhanced welfare-friendly products**. Projects may cover development of early warning systems; increased monitoring of behaviour, stress or other animal-based welfare indicators and effects on production efficiency; development of related intervention mechanisms. Proposals for both sub-topics A and B should fall under the concept of the **multi-actor approach, ensuring that all the stakeholders, from farmers to consumers and regulators, will contribute to the building of new animal welfare approaches to further add value to EU foods of animal origin**.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 10 million (sub-topic A) and EUR 6 million (sub-topic B) would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected impact

Provide the knowledge base for further improvements in animal welfare management and policy making. More specifically, activities will contribute to:

- a better understanding of animal welfare and associated animal behaviour;
- a broader range of animal welfare management strategies and tools;
- solving long-standing welfare related issues in organic farming, notably in poultry (subtopic A);
- developing innovative approaches to measuring animal welfare at various stages of the production system (sub-topic B);
- increase the range of animal welfare management strategies and tools. In the long run, projects shall increase the sustainability of the livestock sector by better responding to consumer demands and/or increasing competitiveness of the sector.).

Type of action	Research and Innovation action
Deadline	**23 January 2019**
Call identifier	H2020-SFS-2018-2020
Topic information	Link

SFS-11-2018-2019: Anti-microbials and animal production

Specific challenge

Since their discovery, anti-microbials have played an essential role in the treatment of infectious diseases in humans and farmed animals, whether terrestrial or aquatic, and have enormously improved population health as well as food security and safety. However, with the widespread use of anti-microbials for human and animal health in recent decades, the world is increasingly confronted with the emergence and spread of microbes that resist anti-microbial treatment. Discoveries of new anti-microbials are not keeping up with pace anti-microbial resistance (AMR). AMR is responsible for an estimated 25 000 deaths yearly and over EUR 1.5 billion of healthcare costs and productivity losses in the EU alone. Addressing AMR is a cross-sectorial issue, requiring action by different policy areas, from health to agriculture, aquaculture and environment, from research to users, stakeholders and policy makers. A large proportion of anti-microbials is used in livestock production. Although links between this and resistance on human health are not fully established, agriculture is a main target for action. In line with the EU animal health strategy "prevention is better than cure" alternative strategies to anti-microbials need be developed. Alternatives to antimicrobials may be valuable, although evidence of efficacy in controlled trials is currently very limited.
In 2011, the European Commission came up with a five year action plan to fight against AMR and the new action plan is focussing on three pillars: making the EU a best practice region; boosting research, development and innovation; shaping the global agenda. For the purpose of this topic, the words 'animals' and 'farmers' apply to both terrestrial and aquatic animals.

Scope

A. [2018] Rethinking management of health of farmed animals (RIA)

B. [2019] Alternatives to anti-microbials (RIA)

Activities shall focus on developing and testing new, efficient and targeted alternatives to anti-microbials in farmed animal production. This could be any type of alternative intervention measures (prophylaxis/prevention or treatment), other than vaccines - such as the modulation of host immunity and/or of microbial flora, feed additives or novel molecules. Basic research on gut microbiome should not be covered under this topic**. Proposals should take into account the guidelines, standards and legislation in the field, to facilitate the marketing of the measures the project will identify**. Proposals should fall under the concept of 'multi-actor approach, involving at least representatives of practitioners (e.g. veterinarians), of the feed/feed additives and pharmaceutical industries.
The selected projects under sub-topics A and B should follow the policies and contribute to the objectives of the STAR-IDAZ international research consortium. International cooperation is recommended.
The proposals under sub-topic A and sub-topic B should liaise with other relevant EU projects and initiatives, in particular JPI AMR and the project selected under topic SFS-36-2017. The projects should take into account the guidelines and standards of relevant EU and international statutory bodies, in particular the European Medicines Agency and the World Organisation for Animal Health.
The Commission considers that proposals requesting a contribution from the EU of up to EUR 6 million, for sub-topic A and for sub-topic B, 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 funded activities will contribute to the fight against anti-microbial resistance arising from farmed animal production. More specifically they will help:

- develop options for reducing the use of anti-microbials in farming (scope A);
- develop alternative intervention measures from technology readiness levels (TRL) 5-6 to TRL 7 (scope B).

More generally, the funded activities will contribute to improved animal disease prevention and control, reduced production losses and improved resource-use (scopes A and B).

Type of action	Research and Innovation action
Deadline	**1st stage - 23 January 2019** **2st stage - 04 September 2019**
Call identifier	H2020-SFS-2018-2020
Topic information	Link

LC-SFS-19-2018-2019: Climate-smart and resilient farming

Specific challenge

Evidence on climate change is solid and reveals that it will affect the EU with European farming first in line through changes to rainfall regimes, rising temperatures, the variability and seasonality of the climate and the occurrence of more frequent extreme events (heatwaves, droughts, storms and floods). In addition to finding effective solutions for greenhouse gas (GHG) mitigation such as reducing GHG emissions and sequestering carbon below and above ground, farmers will need to adapt to climate change and develop farming systems resilient to fluctuating environmental and socio-economic conditions.

Scope

Proposals should address only one of the following sub-topics (A) or (B).

A. [2018] Microclimate management: from field to landscape (RIA)

B. [2019] Efficiency and resilience of mixed farming and agroforestry systems (RIA)

Activities will develop further mixed farming systems and show how the integration of crops, livestock and forestry activities can improve the resilience of agriculture in combination with the related climate change mitigation potential (e.g. carbon sequestration, nutrient recycling). **Proposals should enable the participative design of mixed farming and agroforestry systems not only focusing on technical and agronomic aspects but also taking on board socio-economic aspects of mixed farming modes**, the related value chains and necessary infrastructures as well as the environmental and climate mitigation and adaptation potential. Proposals will contribute to increase synergies between crops and livestock by defining optimal combinations of production to increase income stability at farm level and sustainability of the relevant value chains. They shall develop models and tools adapted to real farm management to grasp the inherent complexity of mixed farming and agroforestry systems. Proposed work shall benefit both the conventional and organic sectors. Activities will use transdisciplinary research methods and proposals should fall under the concept of the 'multi-actor approach'.

All sub-topics: The proposals funded under this topic (sub-topics A and B) will contribute to the development of a conceptual framework on resilience and mitigation at different levels (farm, community, region, national and EU) and its policy implications. Proposals should include a task to cluster with other projects financed under the same topic. The Commission considers that proposals requesting a contribution from the EU of up to EUR 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

Funded activities will improve the climate and **socio-economic resilience** of the agricultural sector. In the short to medium term work will:

- Deliver effective solutions for ensuring the highest level of implementation on the farm and landscape scale regarding climate-smart and resilient systems and provide decision support systems adapted to mixed farming and agroforestry systems in heterogeneous landscapes;
- Unlock and improve viability and replicability of efficient and resilient farming systems and propose different transition scenarios leading to the development of modern land use systems, value chains and infrastructures;
- Reduce the environmental impact of farming and contribute towards mitigation and adaptation to climate change;
- Provide ecosystem services through integrated and small-scale land management.

In the longer term funded activities will help to foster the synergies between agricultural production, climate change mitigation and adaptation. They will allow the farming sector to continue fulfilling its multiple functions under predicted, more challenging abiotic conditions.

Type of action	Research and Innovation action
Deadline	**1st stage - 23 January 2019** **2st stage - 04 September 2019**
Call identifier	H2020-SFS-2018-2020
Topic information	Link

CE-SFS-24-2019: Innovative and citizen-driven food system approaches in cities

Specific challenge

The challenge of providing the inhabitants of European cities with affordable, safe, and nutritious food is both urgent and complex. Moreover, the health and wellbeing of EU citizens and consumers are directly affected by the way cities and regions themselves are shaping a sustainable food environment. Research and (open) innovation co-created with citizens are part of broader city-region food system approaches. Such initiatives stimulate the development of cities as innovative food hubs. Nevertheless, there are barriers to the application and demonstration of systemic food-related innovative approaches due to the diversity of European cities and regions that are not well understood, leading to market failure in the uptake of promising research results and innovation in cities. Demonstration and first application in the market of innovative solutions, co-created with citizen and cities with the involvement of public authorities, economic actors and non-profit organisations, could be one way to support sustainable food security in cities.

Scope

The proposals shall identify several food-related innovative approaches based on citizen science and engagement, to be practised in cities to foster sustainability of the food system. Proposals shall explore and share the application of these approaches in a wider range of European cities and shall be built on results of existing research, best practices and existing platforms and programmes. Proposals could comprise activities such as prototyping testing, demonstrating and piloting in a (near to) operational environment, as well as experimental production, all with a view to subsequent replication and application in other cities. **Proposals shall include the development of a classification and assessment of the benefits (economic, environmental and societal) of existing approaches** for dissemination purposes, accessible online. Proposals may include limited R&D activities and a clear focus on validating the benefits of pilot activities for citizens with a view of increasing engagement and replication. The action shall cover cities in rural and coastal areas and urban agglomerations. **Proposals shall also include co-creation between social innovation and technological innovation.** Following the RRI principles, proposals will ensure that societal actors work together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of society. Active participation of municipalities and SMEs is strongly encouraged.
The Commission considers that proposals requesting a contribution from the EU of the order of EUR 6 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 the framework of SDG no 2, 3, 9, 11 and 12, the EU's Bioeconomy Strategy 2012, and the FOOD 2030 Staff Working Document, proposals should explain how activities included are expected to contribute to:

- Job creation in EU cities in which good practices for sustainable food security are applied in the short term (up to 3 years), fostering thriving urban, rural and coastal economies and communities;
- Intensified interactions between all actors in the food chain such as research, (small scale) food production, city municipalities, education centres, consumers and citizens in the medium to long term;
- Empowered local communities by using their potential to contribute to ensuring food and nutrition security at city level, which in turn supports the relevant SDGs;
- Increased participatory and citizen science initiatives in the area of food and nutrition security in cities;
- Easy and increased knowledge-sharing;
- In the long term, positive economic, social and environmental links between urban, peri-urban and rural areas, meeting the needs, values and expectations of society in a responsible and ethical way.

Type of action	Innovation action
Deadline	**23 January 2019**
Call identifier	H2020-SFS-2018-2020
Topic information	Link

LC-SFS-34-2019: Food Systems Africa

Specific challenge
Nutritional imbalances in both Europe and Africa are increasing, characterised by growing diet-related, non-communicable diseases and persistent under-nutrition. The UN projects that the global population will increase from 7 billion to more than 9 billion by 205079, of which the majority is expected to occur in Africa. To anticipate such population growth and challenges associated with enhanced climate change, agricultural systems need to become more sustainable and better linked to nutrition performance by strengthening the agro-biodiversity of resilient cropping systems, thereby increasing the range of food products for a balanced, healthy diet. Furthermore, resource-efficient, resilient food value chains need to be developed to deliver sufficient, safe, affordable and nutritious food to local consumers and for high value global markets. Africa has a wealth of local varieties, food intelligence and healthy African diets including plant based proteins, which are currently largely untapped and not reaching the market, neither in African cities nor in Europe.

Scope
Proposals shall assess and deliver better nutrition performance of African farming systems, strengthening the agro-biodiversity (and integrated aquaculture systems) and food diversity. **They shall address innovative approaches in local food systems while covering technological, food safety, social and gender issues,** and address sustainable postharvest technologies, including bio-based packaging, to reduce food waste along the post-harvest/consumer chain and plastic littering. Empowerment of small farmers (including aquafarmers) and processors benefitting rural areas leading to diversity of diets and improving food identity is essential. Food supply chains (conventional and organic) for both local urban markets and high value global markets shall be targeted. Proposals need to ensure the commitment and participation of a variety of partners established in the EU and in Africa, and shall establish relevant links with other projects involved in the EU-Africa Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA). Proposals should include a task to cluster with other projects involved in the EU-Africa R&I Partnership on FNSSA and with the cooperation platform established under SFS-33-2018.
The Commission considers that proposals following a multi-actor approach including civil society organisations requesting a contribution from the EU of the order of EUR 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
In the framework of SDG no 1, 2, 3, 8, 10, 12, 13, 15 and 17, the EU-Africa R&I Partnership on FNSSA, the EU's Bioeconomy Strategy 2012, and the FOOD 2030 SWD, proposals shall describe how projects can contribute to:

- Improved food systems resulting in sustainable, healthy African diets (comparable to the Mediterranean diet) that on the short term are to become mainstream in 10 African cities;
- Empowerment of small farmers (including aquafarmers) combined with sustainable growth of food chain operators (SMEs) in rural areas in Africa, both for internal markets and export;
- New market opportunities for novel food products, tools and processes applicable in Africa that are taking into account food safety issues across the entire food value chain (e.g. improved food storage under mycotoxins free conditions) and reduce food waste;
- Significant reduction of malnutrition in Africa and particularly in relation to children, including those within the first 1,000 days of life, by implementing nutritional recommendations (proportion/figures to be specified in the proposals as well as reflections on specific food strategies for crisis and civil war situations);
- Major progress towards the establishment of the EU-Africa Research and Innovation Partnership on FNSSA and impact at local level;
- Development and implementation of pilot innovation actions for the benefit of African and European consumers at TRL 4-5.

Type of action	Research and Innovation action
Deadline	**1st stage - 23 January 2019** **2st stage - 04 September 2019**
Call identifier	H2020-SFS-2018-2020
Topic information	Link

SFS-35-2019-2020: Sustainable Intensification in Africa

Specific challenge

African and European agriculture share the common challenge of moving towards more sustainable ways of agricultural production. Both regions aim to ensure food production and reduce the environmental impact of agricultural activities in the face of climate change, more unpredictable water supply and increased degradation of (land) resources. Systems approaches are needed to optimise agricultural productivity as well as the delivery of ecosystem services.

Scope

A. [2019]: African Farming Systems, sustainable intensification pathways (RIA)

Activities shall seek to implement and test systems approaches for the sustainable intensification of primary production in Africa, taking into account its long term economic support to local communities. The proposed research should address the improvement of agricultural practices by tackling land and water management (including land degradation where appropriate) and sustainable soil management (including its quality and nutrients uptake) for sustainable intensification. The importance of traditional agricultural practices like grazing methods, livestock, crops and legumes should be duly reflected. Emphasis should be given to farming systems that support restoration of land, increase land productivity and/or bring land back into production. Proper attention should be given to the importance of gender in African agricultural production.

For proper analysis, a range of different systems should be included (e.g. organic farming, agroecology, agroforestry). While presenting results the importance of scale of the analysis and its applicability should be taken into account. **The analysed systems should include socio-economic aspects, analyse its resilience to climate change, farm income and where pertinent also cultural aspects of farming**. Preference will be given to proposals focusing on specific regions of Africa.

Proposals fall under the concept of the 'multi-actor approach'. Proposals should include a task to cluster with other projects financed under the topic and with the cooperation platform established under SFS-33-2017.

B.[2019]: Soil system for Africa (RIA)

For the implementation of the EU-Africa R&I Partnership on FNSSA a comparable and open database on agricultural soils information is needed. It is expected that a minimum of 20 000 sampling points will be sufficient to create a database with standard soil properties (a similar procedure to the one used for LUCAS - European database - should be developed).

The soil samples will only be taken from the agricultural land and analysed by one laboratory for the: physical and chemical parameters. As a minimum the following parameters should be analysed: particle size (clay, silt and sand content), pH (acidity and alkalinity), organic carbon, carbonate content, phosphorus content, total nitrogen content and extractable potassium content. In addition an analysis of heavy metal content and other chemical residues in selected sub-samples might be proposed in order to assess the risk of soil contamination. Based on the analysed samples a set of indicators for monitoring of state of land soil, water and ecosystem should be proposed. Other physical, chemical and biological parameters for soil test might be proposed along with the specific indicators for which they will be used. The indicators should be developed as a part of the long-term implementation of FNSSA and its contribution to the SDGs discussion. Presentation of data should be provided in an open data and map viewer and should include four aspect pictures of where the soil sample was taken and should link with open earth data from e.g. the Copernicus programme and the project funded under H2020 topic SFS-43-201786. It is expected that the open database will contain at least a minimum of 20 000 soil sample analysed by one laboratory. The final methodology should be developed in cooperation with and validated by the Joint Research Centre and the Global Soil Partnership – IPTS African members.

Proposals should include a task to cluster with other projects financed under the topic and with the cooperation platform established under SFS-33-2018.

The Commission considers that proposals requesting a contribution form the EU of up to EUR 7.5 million for sub-topic A and EUR 5 million for sub-topic B would allow this specific challenge to be addressed properly. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected impact

In the short to medium term:

- Boost the impact of Africa-EU joint research at local level by addressing the entire value-chain, strengthening capacity-building and focusing on demonstration projects and pilot actions to bring research and innovation results to the users (sub-topic A);
- Provide simple tools and solutions for preserving and increasing natural resources of specific agro-system (sub-topic A);
- Identification of methods and tools for improving soil condition for water retention, increase in nutrient and organic matter (sub-topic A);
- Proposed methods and solutions for different farming systems should include potential of transferability and scale at which solution can be implemented (sub-topic A).
- Solutions and tools for increasing farm income within sustainability of long term farming (sub-topic A);
- Based on the soil sample analysis, provide a set of key indicators for soil assessment in Africa (sub-topic B).

In the long term: for sub-topic A - improve agricultural production potential and income of farmers and for sub-topic B- provide an open soil dataset with a set of key indicators with methodology for which soil samples and the time line of indicators can be independently repeated in

support of monitoring of soil and land degradation. The set of indicators should as much as possible support the relevant SDGs implementation discussion.

Type of action	Research and Innovation action
Deadline	**1st stage - 23 January 2019** **2st stage - 04 September 2019**
Call identifier	H2020-SFS-2018-2020
Topic information	Link

Topics with minor SSH relevance

LC-SFS-17-2019: Alternative proteins for food and feed
Link

DT-BG-04-2018-2019: Sustainable European aquaculture 4.0: nutrition and breeding

Specific challenge

European aquaculture provides 1.25 million tonnes of seafood annually, valued at over 4 billion euro. However, Europe heavily depends on external markets to ensure consumer demands for seafood (including from fresh water) is met. EU aquaculture needs to increase the competiveness of its food products and to respond to consumer demands for high-quality and safe food, in a challenging context of climate change, greater competition for natural resources, and conflicting interests for space and markets. **To ensure food and nutrition security by 2030, European aquaculture** has to sustainably expand in terms of space, production and new value chains, exploring and enhancing innovation opportunities offered by sustainable and resilient aquaculture production systems, implementing the circular economy principles and **increasing social acceptance** of the corresponding activities and products. European aquaculture has now a unique opportunity to address not only today's challenges of climate change and food and nutrition security, but also to implement the international commitments encompassed in the UN SDGs, while fostering economic growth and social prosperity.

Scope

Activities shall develop smart breeding programmes and/or tailor feeding formulas and technologies for conventional and organic aquaculture – for marine and/or freshwater - targeting animal health (contributing to disease resistance) and welfare, different production systems, feeding efficiency, resilience and climate change mitigation - when applicable, including related traits and possible links between them (synergies, trade-offs) -, zero waste, by-products valorisation following circularity principles and organoleptic and nutritional values of seafood optimisation. Efforts to close the reproduction cycle of economically important species should be considered. In addition, activities shall explore the potential of the microbiome on health and productivity of farmed species. Activities shall consider sound cost-effective production methods and profitability, testing, demonstrating and upscaling of the production processes to pre-commercial product. **Regulatory authority and consumers should also be consulted, addressing their concerns and demands.** The use of Internet of Things (IoT) and Artificial Intelligence (AI) should be considered. The participation of deep-tech start-ups is encouraged. Activities shall develop a set of indicators to monitor and measure progress towards the expected impacts as listed in the call text and in particular the improvement of the production systems that increases productivity, resilience and sustainability. **The interdisciplinary and cross-sectorial nature of the project should also apply to training activities improving the professional skills and competencies and supporting the creation of new jobs in the blue economy.**

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 6 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

Contributing to the ongoing implementation of EU policies such as the Bioeconomy Strategy, the Circular Economy Strategy, the Blue Growth Strategy, the Common Fisheries Policy, the Marine Strategy Framework Directive, the priorities defined in the European Commission Staff Working Document FOOD 2030, as well as international policies and initiatives such as the UN SDGs, the EU Biodiversity Strategy, the BLUEMED Initiative, the Atlantic Ocean Research Alliance and the BIOEAST Initiative, activities shall:

In the short term:

Demonstrate that investment in sustainable aquaculture research and innovation leads to the creation of new value chains, markets, growth and jobs in coastal, offshore and landlocked areas.

Improve consumers' awareness, perceptions and acceptability of the European aquaculture products and methods.

Contribute to the creation of improved sustainable aquaculture systems and implement productive and resilient aquaculture practices that maintain healthy aquatic ecosystems and strengthen capacity for adaptation to climate change, by 2020 (UN SDG 2).

Contribute to ensure the genetic diversity of farmed algae (micro and macro) and farmed aquatic species (fish, molluscs and crustaceans) and their related wild species, and promote access to the utilisation of genetic resources by 2020 (UN SDG 2).

In the medium term

Contribute to increasing available, accessible, affordable and nutritious food and feed, while conserving natural resources and contributing to climate change mitigation (UN SDG 2).

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.

Type of action	Innovation action
Deadline	**23 January 2019**
Call identifier	H2020-BG-2018-2020
Topic information	Link

BG-05-2019: Multi-use of the marine space, offshore and near-shore: pilot demonstrators

Specific challenge

Combining several activities such as renewable energy, aquaculture, marine bio-resources and biotechnologies, maritime transport and related services, in the same marine space, including in multi-use platforms, can serve to divide and reduce the costs of offshore operations and the demand on the space needed for different activities. Research on multi-use platforms funded under the FP7 call 'The Oceans of Tomorrow' has provided promising designs, technological proposals and models for combining activities in terms of economic potential and environmental impact. Horizon 2020 funded projects have helped to identify and tackle regulatory and technological barriers and develop business models to reduce the risk for operators and investors. Before reaching a stage enabling large scale installations, it is necessary to develop pilots for demonstration in a real environment of multi-use platforms or co-location of activities in a marine space with their logistic support, including service vehicles and port facilities.

Scope

Activities shall develop pilots by involving industrial actors and by integrating the available knowledge, technologies and facilities, in particular capitalising on the results of EU and national projects for the development of multi-use platforms or co-location of different activities in a marine space, and relevant support offshore vessels and autonomous vehicles. Pilots could include the reconversion/reuse of decommissioned platforms. **The pilots shall aim to demonstrate in a real environment the viability (economic, social and environmental)** of the multi-uses of a marine space for the output of at least two economic activities (such as renewable energy, aquaculture, marine bio-resources and biotechnologies, maritime activities and related services or tourism). **The aim is to demonstrate the economic, social and environmental added-value of the multi-use of a marine space around coastal or deep sea environments and should include a business plan and a commercial economic feasibility assessment** (informed by the Pilot's results), addressing possible trade-offs and costs for other sectors, for the combined activities to generate revenue**.** The pilots should also address health and safety issues, including for the logistics, ancillary infrastructure and maintenance services. **Societal acceptance should also be integrated, especially by involving local communities. The interdisciplinary and cross-sectorial nature of the project should also apply to training activities improving the professional skills and competencies and supporting the creation of new jobs in the blue economy.**

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

In order to contribute to the implementation of the EU Integrated Maritime Policy and its environmental pillar, the EU Blue Growth Strategy, the EU Marine Strategy Framework Directive, the EU Maritime Spatial Planning Directive, the EU International Ocean Governance Communication, the EU Communication for a Sustainable European Future, the EU Bioeconomy Strategy, the EU Integrated Maritime Policy and in order to reinforce European competitiveness in the blue economy, activities shall:

In the short term:

- Starting from technology readiness level (TRL) 5, bring selected designs of multi-purpose and multi-use facilities to TRL 7, ensuring validation in the real environment.
- Improve health and safety in multi-use platforms or co-location of activities.
- Reduce costs of implementation and increase economic viability of multi-use of marine space for the European maritime industry.
- **Raise societal awareness, involve local communities and secure acceptance of these new developments by society-at-large.**

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.

Type of action	Innovation action
Deadline	**23 January 2019**
Call identifier	H2020-BG-2018-2020
Topic information	Link

CE-BG-06-2019: Sustainable solutions for bio-based plastics on land and sea

Specific challenge

Decoupling of plastics production from fossil feedstock is necessary. In addition to the recycled plastics waste, alternative feedstock such as biomass is part of a more resource-efficient, greenhouse gas emission (GHG) neutral solution. The shift towards biomass-sourced plastics will only make sense in the framework of a circular plastics economy where plastics reuse and recycling are maximised. Reuse and recycling of plastics, particularly for some applications such as packaging, remain very low. It has been estimated that globally, about 12 million tonnes of plastics waste per year leak out of the waste management systems and end up in the environment, in particular in the oceans, where it interferes with ecosystem processes and eventually enter the food-feed chain. As regards marine litter, while land-based sources are predominant as a result of land-sea interaction, sea-based sources such as shipping, fishing or aquaculture are also significant. As part of the mitigation efforts, biodegradable or compostable plastics for specific applications such as fishing gear could be a positive development if a clear sustainability framework for biodegradability conditions is provided.

Scope

Activities shall focus on sustainability strategies and solutions for bio-based products. **They shall include innovative product design and business models facilitating efficient reuse and recycling strategies and solutions, including ensuring the safety of recycled materials when used for toys or packaging food stuffs**. **They shall address the technical and economic barriers** to bio-based plastics recycling as regards established and/or alternative recycling options. The risk, impact and solutions to cross-contamination with conventional plastics waste streams or other contaminants shall also be addressed. Additionally, activities shall contribute to building a biodegradable plastics sustainability framework by mapping and focusing on the applications where biodegradable and compostable solutions could support public policies. Work on the biodegradable sustainability framework could include pre-normative research including field tests on land and at sea. Lastly, in line with the requirements of responsible research and innovation, activities shall support the development of international fora and platforms that would facilitate systemic innovation and uptake of results by enabling different actors of the value chains, from industry to civil society and public authorities, to cooperate towards more circularity in the bio-plastics economy. Activities shall build on the results and ongoing developments of EU projects funded under Framework Programmes FP7 and Horizon 2020 as well as on available and on-going standardisation results and activities including work within CEN TC 411 or under ISO. **The interdisciplinary and cross-sectorial nature of the proposal should also apply to training activities improving the professional skills and competencies and supporting the creation of new jobs in the blue economy and in the bioeconomy.**

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

Expected impact

Contributing to the implementation of the EU Bioeconomy Strategy, the EU Plastic Strategy, the EU Circular Economy action plan, the EU Marine Strategy Framework Directive, the EU Maritime Spatial Planning Directive, the Energy Union's vision for a low carbon, energy-efficient economy, the EU Blue Growth Strategy and the UN SDGs, activities shall:

In the short term:

- Deliver solutions with work starting at technology readiness level (TRL) 5 and achieving TRL 6 or higher, where technological innovation is involved.
- Deliver results in a form that allows for efficient feedback into policymaking in research, innovation and technology, in particular in the EU Plastic Strategy.
- Prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution by 2025 (UN SDG 14).
- **Raise awareness and create a better framework for systemic innovation and uptake of results through broad stakeholder engagement.**

In the medium term:

- Demonstrate solutions and develop strategies for circular innovation of the whole bio-plastics system, building on a shared vision and enhancing cooperation between all stakeholders on land and at sea.
- Contribute to the development of EU-harmonised criteria for biodegradability (in open-air and in oceanic conditions) and a sustainability framework that increase market transparency and improves waste management practices on land and sea.
- Contribute to the assessment of the impact of plastics on terrestrial and aquatic flora and fauna and on human health**.**
- Improve the professional skills and competences of those working and being trained to work within the blue economy and the bioeconomy.
- Improve framework conditions and foster innovations that enable the plastics value chains to become more circular, resource-efficient and reduce their carbon and GHG footprint, in line with climate, energy and sustainable development goals (e.g. UN SDG 14).
- Contribute to policymaking in research, innovation and technology.

Type of action	Innovation action
Deadline	**23 January 2019**
Call identifier	H2020-BG-2018-2020
Topic information	Link

Topics with minor SSH relevance

BG-08-2018-2019: All Atlantic Ocean Research Alliance Flagship
Link

LC-BG-09-2019: Coordination of marine and maritime research and innovation in the Black Sea
Link

RUR-01-2018-2019: Building modern rural policies on long-term visions and societal engagement

Specific challenge

The design of modern rural policies requires capturing and anticipating the long-term trends affecting European rural areas. The EU has already invested in rural research on a variety of issues, although the impact on policies has been insufficient due to the diversity of rural areas, the complexity of the problems at stake and the multiplicity of policy makers involved. The interfaces between science, society and policy makers need to be improved to enhance the use of new and existing knowledge, provide policy makers with the evidence they need and empower rural citizens to take part in policy-making, including designing future research priorities. In addition, there are still knowledge gaps regarding big challenges facing rural areas and how they will impact people and territories. One of the most important is demographic change. Current trends combine rural exodus, selective out-migration of women and young people and the arrival of newcomers, including migrants, highly-skilled former urban dwellers and retired people. The challenge is particularly acute in the farming sector. With 6% of farmers under the age of 35, as opposed to 55% who are above 55, the ageing of farmers is one of the biggest threats to food security, farming systems diversity, biomass provision and rural vitality in the coming decades. The situation is similar for small forest owners. A new generation needs to be empowered to take over. Beyond young farmers, who are supported by the common agricultural policy (CAP), a broader group of people referred to as "new entrants into farming" could contribute to generation renewal while bringing new approaches to farming and rural areas. This could happen provided they can overcome the many obstacles they face, such as access to land. Finally, long-term trends and changes are likely to increase disparities between rural areas faced with various constraints. Mountainous areas, which represent 15% of EU utilised agricultural area and are particularly supported under the CAP, are likely to be more strongly impacted by climate change, as well as by increased economic competition, due to geophysical conditions which limit productivity, production choices and adaptability. A deeper understanding of how rural communities, territories and businesses will evolve is needed to design new policies that would protect rural areas from the existing threat of decline and help them seize opportunities.

Scope

Proposed actions shall address one of the following sub-topics:

A. [2018] Rural society-science-policy hub (CSA)

B. [2018] Renewing rural generations, jobs and farms (RIA)

C. [2019] Building resilient mountain value chains delivering private and public goods (RIA)

Actions shall carry out foresight analyses of the development of primary production and related value chains and ecosystems in mountainous areas, in the coming decades, looking in particular at the positive and negative effects of climate change, of changes in policies influencing these areas and of **broader socio-economic drivers**. The analysis shall benchmark production and land-use systems with regards to their capacity to sustainably improve performance and resilience under changing climate and broader conditions while securing public goods provision for uplands and lowlands, taking into account interactions across scales (field, territories and ecosystems) and sectors. Particular attention shall be paid to new or emerging products or practices which could develop sustainably under more favourable climatic conditions. Activities shall cover a variety of situations representing the diversity of environmental and socio-economic conditions in European mountains as well as the diversity of mountain crop, livestock and forest-based products and value chains. Public engagement of stakeholders in the activities will be key to securing relevant results. Activities shall assess whether current policy approaches are fit for the future and shall deliver a set of renewed policy options, backed by a prior assessment of their possible impacts and accompanied by practical tools and recommendations to i) modernise relevant policy instruments available at EU and other governance levels (with a particular focus on CAP, quality policy, regional policy, climate and environment policies and innovation policy tools), ii) adapt value chain development strategies, and iii) secure long-term public good provision.

D. [2019] Rural society-science-policy hub (CSA)

Actions shall set up a knowledge and policy hub that engages policy makers, scientists, stakeholders and rural dwellers locally with the objectives to: i) take stock of past and ongoing rural research; ii) translate outcomes into attractive and easily understandable tools for policy makers and citizens (serving in particular strategic thinking around post-2020 EU policies); iii) conduct public engagement activities contributing to future rural policy and research policy design; and iv) **explore avenues for longer-term science-society-policy interfaces**. Activities shall synthetize and capitalise on the outputs and results of relevant past and on-going rural research projects, including at least those funded under EU framework programmes for research and innovation in the last fifteen years, and consider integrating toolboxes and datasets used within these projects. Communication products and tools valorising useful rural knowledge shall bring real adding-value content to the different society and policy target groups in various countries and languages. The use of multimedia is encouraged. Public engagement activities shall involve rural dwellers, policy-makers and other business, social innovation or community actors at various geographic levels in a representative and balanced set of geographical and socio-economic situations across the EU, including coastal areas. Building on knowledge made accessible by a wide range of projects and on outcomes of foresight activities under other actions funded through this topic or other programmes, public engagement activities shall result in concrete proposals to renew policy instruments that impact rural areas at various levels, as well as an agenda for future research activities matching rural citizens' needs. Close cooperation and networking activities with relevant networks and platforms and with all the relevant on-going projects will be needed throughout the project. The duration of the project and the planning of its activities shall take into account the need for participatory activities contributing to the preparation of the implementation of future EU policies impacting rural areas.

All sub-topics – Proposals should include a task to cluster with other projects financed under this topic, under RUR-02-2018 and – if relevant – with other relevant projects in the field funded by Horizon 2020. They shall fall under the concept of multi-actor approach, bringing in the

complementary expertise of private sector and civil society representatives of relevance to the scope. The Commission considers that proposals requesting a contribution from the EU of up to EUR 5 million (sub-topic A), 6 million (sub-topics B, 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

This topic aims to foster the design of future-proof rural policies. In the short to medium term, proposals are expected to:

- translate visions of future trends and dynamics and understanding of the associated drivers into strategic options for policy design, delivery and monitoring and maximise their uptake by the relevant policy levels (sub-topics A,B,C);
- ensure a wide outreach and engagement in most EU Member States through a balanced and representative coverage of activities (sub-topics A,B,C);
- improve the uptake of available knowledge by policy makers and open avenues for long-lasting mechanisms improving interfaces between society, science and policy makers (sub-topic A);
- help diversifying rural economic activities, improve the skills base and social capital by identifying and promoting policy options which enhance the attractiveness and sustainable development of rural areas and favour generation renewal (sub-topics B, C);
- increase the number and success rate of new entrants into farming; ease their access to farmland and forested land by promoting the most efficient instruments and strategies implemented in the Member States when it comes to accessing land (sub-topic B);
- maintain and enhance sustainable primary production, income generated by value chains and ecosystem service delivery in mountain areas through adequate policies and integrated strategies (sub-topic C).

In the long term proposed actions shall contribute to improving quality of life, socio-economic prospects, resilience to climate change, job diversity and the attractiveness of rural areas.

Type of action	Research and Innovation action, Coordination and support action
Deadline	**RIA - 1st stage - 23 January 2019 2st stage - 04 September 2019** **CSA - 23 January 2019**
Call identifier	H2020-RUR-2018-2020
Topic information	Link

RUR-04-2018-2019: Analytical tools and models to support policies related to agriculture and food

Specific challenge
Society assigns an increasing number of objectives to the policies influencing the agricultural sector and rural areas that it expects to see fulfilled. Therefore, justifications for policies extend well beyond mere food production. **Evidence-based policy making implies the development and maintenance of appropriate instruments for use in the design of these policies and for the monitoring of their effects, taking advantage of new socio-economic approaches** and increased possibilities opened up by progress in the ICT area.

Scope

A. [2018] Developing new models supporting policies related to agriculture (RIA)

B. [2019] Modelling international trade in agri-food products (RIA)

Trade modelling has a long-standing tradition but some issues are notoriously difficult to assess and include in the existing simulation models. **Proposals will develop appropriate methodologies to include some of these issues in existing trade models. These issues include** (non-exhaustive):

- **Non-tariff measures (NTM**): The project will work on a methodology to assess the welfare effects of NTM (both positive and negative) and to include them in trade simulation models. This should go further than the standard gravity model approach which has strong downsides as discussed in the literature;
- Geographical Indications (GIs): The project will work on a methodology to assess the welfare effect of GIs and the resulting trade impacts of different schemes under trade negotiations;
- **Zero trade flows**: Current trade models have problems creating trade flows that did not exist before due to tariff or NTM reasons. This project will work on a methodology to overcome this bias;
- **Quality differentiation:** current trade models typically assume homogeneous goods. However, agri-food trade is becoming increasingly heterogeneous. The project should aim to broaden the commodity scope by including horizontal and vertical product differentiation trade models.

Proposals for both sub-topics should ensure that the approach proposed will be compatible with and improve the tools used at the European Commission. Proposals should include a task to cluster with other projects financed under the topic and with the modelling platform SUPREMA established under SFS-49-2017.
The Commission considers that proposals requesting a contribution from the EU of up to EUR 4 million for A and 5 million for B 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 the short term: improvement of the capacity to model policies dealing with agriculture and related natural resources, food and international trade;
- In the medium to long term: improvement of policy design, impact assessments and monitoring.

Type of action	Research and Innovation action
Deadline	**1st stage - 23 January 2019** **2st stage - 04 September 2019**
Call identifier	H2020-RUR-2018-2020
Topic information	Link

CE-RUR-08-2018-2019-2020: Closing nutrient cycles

Specific challenge

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. Agro-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, 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 agro-food or the forestry sectors, and conversion into novel fertilisers. Proposals 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).

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

A.[2018] Understanding properties and impacts of bio-based fertilisers (RIA)

B.[2019] Bio-based fertilisers from animal manure (IA)

Projects shall demonstrate processes for recovery of mineral nutrients and production of novel fertilisers from animal manure. Proposals shall perform a thorough analysis of the state of the art, and demonstrate that the activities proposed go beyond past or ongoing research, without overlaps. Technologies that are currently under development shall be further improved, and possibly integrated, to produce high quality end-products. **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 shall 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' including relevant actors such as agro-food industries, technology providers, research centres, end-users (farmers and farmer associations), or public administration.

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

The Commission considers that proposals requesting a contribution from the EU of up to EUR 6 million for sub-topic A and 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. For sub-topics B and C, participation of partners from CELAC countries 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:

- set up a coherent policy framework for the sustainable production and use of organic-based fertilisers (sub-topic A);
- replace conventional, non-renewable mineral fertilisers, hence reducing external dependence and risks related to depletion (sub-topics A, B and C);
- 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, or to the production of fossil-based fertilisers (sub-topics A, B and C);
- **develop new business models creating value from agro-food, fisheries, aquaculture or forestry by-products (sub-topics B and C).**

In the long term, this shall 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.

Type of action	Innovation action
Deadline	**23 January 2019**
Call identifier	H2020-RUR-2018-2020
Topic information	Link

CE-RUR-10-2019: Circular bio-based business models for rural communities

Specific challenge

To boost the development of a bio-based economy in Europe, there is a need for business models that can be replicated easily in a variety of locations and contexts, with relatively low levels of investment, risk and technical sophistication. A wider range of rural entrepreneurs needs to get involved in the emerging bio-based business sector, including farmers, forest owners, their associations, and small rural business. This will help to diversify and revitalise the economy and create quality jobs in rural areas. Local and regional authorities need to do more to support the bio-economy in their respective territories. They should therefore have a range of options to choose from and be able to select the approach that best suits local needs and assets. As a key part of a circular economy, the bioeconomy needs to close loops to make the most efficient possible use of biomass under market and logistical constraints, and to ensure the sustainability of business models.

Scope

Based on an established agro-food system, proposals shall consider a variety of additional bio-based processes and end products that could be integrated into the system, and that are viable on a small scale (farm to rural community level). The TRL of the technologies considered can vary at the start. The project shall test and demonstrate the combination of these in a circular configuration. The integrated system shall achieve a TRL 6-7.

Proposals can target any combination of non-food bio-based outputs, but projects focussing mainly on bio-fuels or bio-energy are not eligible. The choice of feedstock sources shall avoid negative effects on food security. Proposals shall focus on a single agro-food system that should be common in Europe and offer high replication potential, and can be combined with sustainable management of natural areas and/or use of marginal lands. **A complete assessment (economic, environmental and social) of the integrated system shall be carried out. The project shall include a business plan, and a set of policy options and recommendations.**

Proposals shall fall under the concept of the 'multi-actor approach', ensuring solid collaboration between relevant actors such as farmers or farmers associations, agro-food industry (including small businesses), technology providers, research centres or public authorities. Proposals should include a task to cluster with other projects financed under this topic, under topic SFS-35-2020 and – if possible – with other relevant projects in the field that are funded by Horizon 2020 (including under the BBI JU).

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

Proposed activities will expand the range of business models available to entrepreneurs and local authorities by developing circular and sustainable business models with large potential for replication in areas with unexploited resources, at a relatively low cost, risk and with low levels of technical complexity. This will help to:

- expand and diversify the sector by mobilising a wider range of players in the bio-based economy, including small businesses, farmers, forest owners and their associations;
- develop regional and local bio-based models adapted to the wide variety of contexts found in the EU, including rural and remote areas and outermost regions;
- ensure adequate recovery of nutrients and organic matter, and their reuse in agriculture.

In the longer term results consolidate a diversified, circular and climate-friendly bio-based sector that harnesses regional assets, provides quality jobs and opportunities in rural areas and revitalises rural economies.

Type of action	Innovation action
Deadline	**23 January 2019**
Call identifier	H2020-RUR-2018-2020
Topic information	Link

LC-RUR-11-2019-2020: Sustainable wood value chains

Specific challenge
Forests play a vital role in Europe's economy, society and environment. Scenarios likely to keep the global warming below 2oC (Paris Agreement goal) would entail a substantial reduction of anthropogenic GHG emissions, through far-reaching changes to energy systems, land use and associated value chains. The second consumer-driven factor of GHG emissions is the construction sector (ca. 15%), implying a significant role for forest-based products. The forest-based sector can contribute to climate change mitigation through increasing sinks in and reducing emissions from living biomass, soils and wood products, and the substitution of fossil fuels through the material and energy use of wood-based materials. The combined sink and substitution effects of wood value chains can provide a key mitigation option, provided that changes in fossil and biogenic carbon are taken into account in a comprehensive and balanced manner. Several research projects and COST Actions launched in FP7 looked into the development of innovative, resource efficient wood-based products. While ensuring the sustainability of forest production systems under changing climate conditions remains a long-term objective for the sector, a key challenge now is to further develop and deploy the technological advancements of micro/macroclimate-friendly wood-based value chains on the ground.

Scope
A. **[2019] Building with wood**: **Proposals shall develop and test new technologies and environmental friendly solutions for the use of wood-based materials in the (re)construction and/or retrofitting of buildings. Proposals should also explore** options for building with wood in combination with composite/hybrid materials, linkages with other nature-based solutions, make use of ICT, and consider LCA and carbon accounting, 'environmental documentation' (i.e. standards and construction codes), **performance standards, public policies and regulations, consumer perception and engagement/co-creation.** Activities could include limited research and shall produce plans and arrangements or designs for new, altered or improved products, processes or services. For this purpose they may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication. **Proposals shall ensure that relevant actors (researchers, citizens, policy makers from urban/rural areas, businesses, architects, site-managers, etc.) work together during the whole research and innovation process in order to better align the process and its outcomes with the societal values, needs and expectations.**
B. **[2020] Resilient forest systems**

Both sub-topics (A and B) are suitable for INCO and SMEs participation, and are expected to integrate technology with SSH and RRI aspects. The Commission considers that proposals requesting a contribution from the EU of the order of EUR 10 million for sub-topic A and 5 million for sub-topic B 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 the framework of SDG 9, 11, 13 and 15, the EU's Bioeconomy Strategy 2012, the EU's Forest Strategy 2013, the Circular Economy Package 2015 and Paris Agreement 2015, proposals are expected to assess how they will contribute to:
- Increased resource and/or energy efficiency and added value and minimising pollution and the environmental footprint (emissions of GHG and air pollutants included) in the construction sector in the cities, by specific.
- Enhanced connectivity of rural-urban areas and their overall contribution to a resilient, circular and competitive, forest-based bioeconomy, by 2025 [sub-topic A];
- Increased long-term resilience of forest production systems and associated value chains to enhanced climate/environmental change and societal demand [sub-topic B];
- Enhanced contribution of forest-based sector to long-term climate change mitigation and rural development objectives [sub-topics A & B];
- Also in the long-term, prompt a sizeable positive change to European landscapes and economies, by keeping the countryside green and serving to make the cities greener, and increasing the share of both decent and green jobs [sub-topics A & B].
- Advance available solutions from TRL 4-5 to TRL 6-7 for sub-topic A and from TRL 3-4 to TRL 5 sub-topic B

Type of action	Innovation action
Deadline	**23 January 2019**
Call identifier	H2020-RUR-2018-2020
Topic information	Link

RUR-17-2019: Reinforcing the EU agricultural knowledge base

Specific challenge
Since 2014, the EU has invested in a large number of agricultural research, innovation, coordination and support actions to improve knowledge flows in the Agricultural Knowledge and Innovation Systems (AKISs) – the systems of people and organisations in countries/regions that generate, share and use agriculture-related knowledge and innovation. These projects, in particular those applying the multi-actor approach, have compiled innovative solutions for farming and forestry practice, and their outputs include enduser material in many forms such as knowledge databases, IT applications, decision-making tools, videos etc. made available through the websites of the projects, using a variety of standards and IT systems. However, the long-term longevity of knowledge and end-user material produced or collected by these individual actions is not necessarily ensured. The challenge now is to favour their longer-term and wider use with a view to enable updating, consolidating and connecting to regional and national AKISs.

Scope
Proposals shall review activities and outputs, and the communication and information channels for dissemination used by Horizon 2020 multi-actor projects. Consortia shall organise participatory activities with partners from multi-actor projects. Activities shall analyse and compare the approaches taken on their performance and impact for farmers/foresters as well as effectivity of the communication and information channels used for dissemination in countries and regions. Proposals shall explore the feasibility and added value of developing joint tools, joint platform(s) and/or (e-) infrastructure integrating some or all of the outputs of projects into an EU wide open source system(s) and propose options for the future. Moreover, these options should connect efficiently to existing communication and dissemination channels within the national and regional AKISs.
Proposals shall fall under the concept of the 'multi-actor approach' with a project duration of up to two years. Consortia shall engage with the variety of actors involved in the multiactor projects as well as with key players in the national and regional AKISs, therefore coordinating activities with the Member States and experts in the SCAR-AKIS Strategic Working Group.
The Commission considers that proposals requesting a contribution from the EU of up to EUR 2.5 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
This action aims at improving knowledge flows in the long-term by proposing ways to structure and connect agricultural knowledge created through EU-funded and other projects, with a view to maximise their impact beyond the end of the projects themselves.
By driving future knowledge sharing systems towards the most efficient solutions, the action will, in the short term:

- increase sharing of multi-actor project know-how and spreading of practical information between as many geographical areas and agricultural sectors in Europe as possible, drastically improving dissemination to end-users; and
- produce recommendations and technical specifications which favour greater interoperability and integration of EU and Members States' knowledge bases for practitioners in the future; and
- improve long-term access to practical knowledge produced by the Horizon 2020 multiactor projects.

In the longer term, greater circulation of innovative knowledge around Europe will contribute to increased competitiveness and sustainability for European farmers and foresters.

Type of action	Coordination and support action
Deadline	**23 January 2019**
Call identifier	H2020-RUR-2018-2020
Topic information	Link

Topics with minor SSH relevance

RUR-16-2019: Fuelling the potential of advisors for innovation
Link

RUR-18-2019: Support to the BIOEAST initiative: boosting knowledge and innovationbased bioeconomies
Link

Societal Challenge 3

Secure, Clean and Efficient Energy

Net 4 Society

LC-SC3-EE-2-2018-2019: Integrated home renovation services

Specific Challenge
Many project promoters – public authorities, individuals or businesses – lack the skills and capacity to set up, implement and finance ambitious low-energy and clean energy building projects. In addition, many project developers still face obstacles in raising the necessary up-front costs for their projects – particularly as the small-size of investments and the lack of turnkey solutions increase implementation cost – and lack access to attractive and adequate financing products from the market.

Scope
This topic aims at creating or replicating innovative local or regional "integrated home renovation services". **The developed services should cover the whole "customer journey" from technical and social diagnosis, technical offer, contracting of works, structuring and provision of finance (e.g. loans or EPCs), to the monitoring of works and quality assurance.** Such integrated services should be operational at the end of the project and create more demand for holistic approaches as a result of improved offer by trustful market operators and **better awareness from homeowners.** They should also support the streamlining of standards and practices into consistent and transparent processes investors can rely on, and by doing so help connect the supply of finance with demand for it.
Proposals should build upon the promising experiences of integrated renovation services emerging in Europe and aim at developing / improving economically viable business models, ultimately running without the need for public subsidies.
Projects funded under this topic will optimise the services required along the renovation process (based on a thorough analysis of the local needs and actors in place), **improve trust and awareness of homeowners towards such services, reduce renovation costs and time on-site through standardised approaches (e.g. optimized business processes, standardised contractual arrangements, branding of the proposed services, …),** mainstreaming innovative technical solutions adapted to the local context, **help improve their legal and regulatory environment, and overall improve financing conditions for energy renovation.**
The services can be developed through dedicated operators (new public or public/private entity or mandated private operator) and/or through an improved co-ordination between existing local actors.
The Commission considers that proposals requesting a contribution from the EU of between EUR 0.5 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
Proposals are expected to demonstrate the impacts listed below, using quantified indicators and targets wherever possible:

- **Implementation and upscale of economically viable business models, ultimately running without the need for public subsidies. Data evidence made available to market actors. Proof of the replication of these initiatives by other market actors;**
- **Availability of adequate financing offer for integrated renovation services; Proposals are encouraged to take advantage of using the already developed common methodologies for calculating energy savings in public buildings and social housing.**
- Strong and trustworthy partnerships with local actors (e.g. SMEs, ESCOs, financial institutions, energy agencies, NGOs) and quality of the proposed services recognized by market actors;
- Development of large, locally-developed investment pipelines for home renovation, connecting the supply of finance with demand for it (in million Euro of investments within the first 5 years);
- Uptake of home energy renovation at local level and corresponding primary energy savings triggered (in GWh/year).

Additional positive effects can be quantified and reported when relevant and wherever possible:

- Reduction of the greenhouse gases emissions (in tCO2-eq/year) and/or air pollutants (in kg/year) triggered by the project.

Type of action	Coordination and support action
Deadline	**03 September 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-EE-4-2019-2020: Upgrading smartness of existing buildings through innovations for legacy equipment

Specific Challenge

An essential part of Europe's clean energy transition is the changing role of buildings from energy consumers to actively controlling and optimising indoor environment while contributing to energy system flexibility by ensuring distributed energy generation from renewable energy sources, energy storage, facilitate smart charging of EVs, load reduction through energy efficiency and load shifting through demand response. Innovative technologies will enable smart buildings to interact with their occupants and the grid in real time and to manage themselves efficiently, so as to become an active element of the energy system. Intelligent and connected devices, sensors and controllers, supported by the development of new business models for new energy services, will create new opportunities for energy consumers.

Today in the EU, the existing building stock represents the main challenge for a more efficient energy use, in buildings as well as across the whole energy system. The smart readiness of buildings may evolve faster for devices and systems easily replaced and installed, than for other parts of the building's equipment such as HVAC and DHW systems due to higher costs of replacement, longer lifecycles and difficulties related to integration in buildings. This installed equipment remains highly relevant for buildings interactions with the energy system, making its upgrade to higher levels of smartness an essential step. The revised Energy Performance of Buildings Directive introduces a Smart Readiness Indicator (SRI) to reflect the level of services offered by a smart building. Once established, this indicator will give a framework to assess the smart readiness of buildings and building units to adapt operation to the needs of the occupant and the grid and to improve energy efficiency and overall performance.

Scope

Proposals should develop and demonstrate cost-effective technological solutions to manage energy within existing buildings and interact with the grid providing energy efficiency, flexibility, generation and storage, **based on user preferences and requests**. These solutions should be aimed to upgrade existing buildings, either residential or tertiary, using automation and IT to offer new services and control to the building users, thereby improving their comfort and increasing their satisfaction. This upgrade should translate into improvements in the areas put forward by the revised EPBD, in relation to the smart readiness indicator.

Proposals should demonstrate how the smart systems, smart controls and smart appliances can be integrated seamlessly in existing buildings to interface and/or to control the major energy consuming domestic appliances that are already installed. These pilots should involve several types of domestic appliances and technical building systems with longer lifecycles (boilers, radiators, DHW preparation, motors for ventilation, windows opening and shading; lighting etc.) and with shorter lifecycles (dryers, washing machines, fridges, etc.), testing several types of control modes (ON/OFF, power modulation, etc.) possible for a given type of appliance. Recharging points for electric vehicles and other forms of energy storage should also be incorporated in the pilots. The proposed solutions should not adversely affect the original functionalities, product quality, lifetime, as well as warranties of the appliances. **Besides the pilot demonstrations, proposals are expected to include clear business model development and a clear path to finance and deployment**. Key partners should have the capability and interest in making the developed solution a core part of their business/service model to their clients. These business models and exploitation strategies should target the broad uptake of the proposed smart systems into specific building typologies in Europe and their integration with evolving electricity markets, e.g. dynamic pricing or other services and information offered by energy suppliers and/or aggregators. Integrations with other energy networks (e.g. DHC) can also be considered.

The solutions should focus on cost-effectiveness and user-friendliness: easy installation and maintenance, maximising consumer comfort (e.g. self-learning) and information on own consumption (e.g. recommendations to the user in order to maximise savings) as well as on gains from its contribution to grid operation.

These solutions should build on innovative technologies, initiatives and approaches contributing to building smartness: semantics, data models, data layers, protocols, software building blocks, APIs, middleware, solutions for smart services, standards, relevant industrial consortia or technology initiatives, etc. Interoperability is essential to ensure the required smart readiness, in particular integration with legacy equipment, user-friendliness and broad market uptake.

A realistic estimate should be provided on the total energy savings/year and on the impact of the innovations demonstrated in the project on the total power available for cost effective demand response actions. The projects should involve technology providers (e.g. manufacturers of appliances, movable envelope components, smart control/ home systems providers), energy services providers (aggregators and/or suppliers and/or ESCO's), user representatives, electricity system operators and other actors as relevant.

The activities are expected to be implemented at TRL 6-8 (please see part G of the General Annexes).

The Commission considers the proposals requesting a contribution from the EU of between 3 to 4 million would allow this specific challenge to be addressed appropriately. Nonetheless this does not preclude submission and selection of proposals requesting other amounts. This topic contributes to the roadmap of the Energy-efficient Buildings (EeB) cPPP.

Expected Impact
Proposals are expected to demonstrate the impacts listed below using quantified indicators and targets wherever possible:

- Primary Energy savings triggered by the project (in GWh/year);
- Investments in sustainable energy triggered by the project (in million Euro);
- Upgrade of existing buildings to higher smartness levels, including a significantly enlarged base of existing building equipment and appliances monitored by energy management systems and activated through demand response actions;
- Reduction in energy consumption and costs, exceeding the additional consumption from IT and its cost.

Additional positive effects can be quantified and reported when relevant and wherever possible:

- Reduction of the greenhouse gases emissions (in tCO2-eq/year) and/or air pollutants (in kg/year) triggered by the project.

Type of action	Innovation action
Deadline	**03 September 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-EE-8-2018-2019: Capacity building programmes to support implementation of energy audits

Specific Challenge
The Energy Efficiency Directive, in its art.8, requires Member States to develop programmes encouraging SMEs to undergo energy audits and to implement the recommended energy-saving measures. SMEs represent enormous energy saving potential. However, the lack of expertise, time and capital, including energy audit supporting scheme, often prevents SMEs from implementing energy conversation measures or from getting access to the energy services market.
The effectiveness of energy audit recommendations is influenced by people's behaviours and the improvement of enterprises' energy cultures. The availability of reliable energy consumption data is of utmost importance to monitor the impact of energy saving measures and behaviours. The actions should lead SMEs to become fully aware of the multiple benefits resulting from energy audits as well as facilitating their actual implementation. Moreover, capacity building programmes should also support implementation of the recommended energy-saving measures both for small and large enterprises.

Scope
Proposals should focus on one, or more, of the following issues:

- Staff trainings and capacity buildings programmes, facilitating SMEs to undergo energy audits and to implement the recommended energy-saving measures, shall be developed according to SMEs specificities (size, sectors, lifetime of the company etc.) and highlighting the financial aspects. Programmes should aim at bridging the gap between demand and supply side (SMEs, auditors, finance institutions, managing authorities of supporting schemes). An active participation of both managerial and operational staff must be ensured. The proposed solution should be tailored to national/local conditions in order to ensure the effective uptake by the SMEs.
- Capacity building to support the take-up of audits recommendations and undertake the actions necessary to reduce energy consumption (maintenance or investments in new equipment but possibly also behavioural actions) in the companies required to undergo energy audits (large enterprises). **Development and implementation of corporate policy measures involving all actors (from decision makers/corporate board members to employees in each department) willing to undertake more efficient energy-related actions (motivations, behaviour change, mitigation of perceived risks and barriers). Evaluation of the total costs of building investments, in terms of financial, environmental and health impact.**
- Initiatives supporting Member States in empowering or establishing national supporting schemes for SMEs providing appropriate incentives to undergo energy audits and/or to implement the recommended energy-saving measures.

Proposals should demonstrate how the proposed activities will be continued commercially beyond the project lifetime. Involvement of relevant multiplier organisations is also encouraged.
The Commission considers that proposals requesting a contribution from the EU of between EUR 1 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
Proposals are expected to demonstrate, depending on the scope addressed, the impacts listed below using quantified indicators and targets wherever possible:

- Primary energy savings triggered by the project (in GWh/year);
- Investments in sustainable energy triggered by the project (in million Euro);
- Market stakeholders with increased skills/capability/competencies (to be measured in number of people with increased capacity) and long-lasting training schemes;
- Number of people/enterprises with enhanced energy culture documenting why and how changes are an effect of particular measures taken as consequence of energy audits, as well in terms of the sustainability of the behavioural change;
- Policies and strategies created/adapted at national level (to be measured in number of initiatives/actions taken to improve/create audit supporting schemes and/or number of SMEs supported in the implementation of energy audit).

Additional positive effects can be quantified and reported when relevant and wherever possible:

- Reduction of the greenhouse gases emissions (in tCO2-eq/year) and/or air pollutants (in kg/year) triggered by the project.

Type of action	Coordination and support action
Deadline	**03 September 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-EE-11-2018-2019-2020: Aggregation - Project Development Assistance

Specific Challenge
Investors and lenders need to gain more confidence on investment projects related to energy efficiency which are still seen as risky and fragmented. EU added value can be realised in particular where projects introduce innovation to the market regarding project aggregation and financing solutions minimising transaction costs and engaging the private finance community. EU added value could also be realised where projects demonstrably remove legal, administrative and other market barriers for mainstreaming large scale sustainable energy investment schemes.

Scope
Project Development Assistance (PDA) will be provided to public and private project promoters such as public authorities or their groupings, public/private infrastructure operators and bodies, energy service companies, retail chains, large property owners and services/industry. **The action will support building technical, economic and legal expertise needed for project development and leading to the launch of concrete investments, which are the final aim and deliverable of the project.**
Proposals should focus on one or more of the following sectors:

- existing public and private buildings including social housing, with the aim to significantly decrease energy consumption in heating/cooling and electricity;
- energy efficiency of industry and service;
- energy efficiency in all modes of urban transport (such as highly efficient transport fleets, efficient freight logistics in urban areas, e-mobility and modal change and shift); and
- energy efficiency in existing infrastructures such as street lighting, district heating/cooling and water/wastewater services.

The proposed investments will have to be launched before the end of the action which means that projects should result in signed contracts for sustainable energy investments to that effect, e.g. construction works, energy performance contracts, turnkey contracts. Whilst proposals may address investments into distributed, small-scale renewable energy sources in combination with energy efficiency, the main focus should lie on capturing untapped high energy efficiency potentials.
Proposals should include the following features:

- an exemplary/showcase dimension in their ambition to reduce energy consumption and/or in the size of the expected investments;
- **deliver organisational innovation in the financial engineering (e.g. on-bill financing schemes, guarantee funds, or factoring funds) and/or in the mobilisation of the investment programme (e.g. bundling, pooling or stakeholder engagement);**
- demonstrate a high degree of replicability and include a clear action plan to communicate experiences and results towards potential replicators across the EU;
- build on the experiences from previous PDA projects.

This PDA facility focuses on small and medium-sized energy investments of at least EUR 7.5 million to EUR 50 million. Large scale investments are covered by the ELENA facility. The Commission considers that proposals requesting a contribution from the EU of between EUR 0.5 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
Proposals are expected to demonstrate, depending on the scope addressed, the impacts listed below using quantified indicators and targets wherever possible:

- Primary energy savings triggered by the project (in GWh/year);
- Investments in sustainable energy triggered by the project (in million Euro);
- Market stakeholders with increased skills/capability/competencies (to be measured in number of people with increased capacity) and long-lasting training schemes;
- Number of people/enterprises with enhanced energy culture documenting why and how changes are an effect of particular measures taken as consequence of energy audits, as well in terms of the sustainability of the behavioural change;
- Policies and strategies created/adapted at national level (to be measured in number of initiatives/actions taken to improve/create audit supporting schemes and/or number of SMEs supported in the implementation of energy audit).

Additional positive effects can be quantified and reported when relevant and wherever possible:

- Reduction of the greenhouse gases emissions (in tCO2-eq/year) and/or air pollutants (in kg/year) triggered by the project.

Type of action	Coordination and support action
Deadline	**03 September 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-EE-14-2018-2019-2020: Socio-economic research conceptualising and modelling energy efficiency and energy demand

Specific Challenge
In the Energy Union Strategy, Energy Efficiency was recognised as a resource in its own right which should be enabled to compete on equal terms with generation capacity and to have primary consideration across all policies. However, the structure of energy demand as well as the real value beyond the fuel's cost and the (energy and non-energy) impacts of energy efficiency are still not well understood with the effect that benefits of energy efficiency are not sufficiently taken into account in financial and political decision making, and planning, while prices of fossil fuels remain relatively low.
The topic addresses three different dimensions of this challenge with the aim to trigger actions which:

1. make the energy efficiency first principle more operational (2018);
2. substantiate the demand side aspects in energy modelling (2019).

Scope
2019:
The aim of the action is to deepen the demand side-related parameters in existing models and to include new aspects and data sources (e.g. by tapping DSOs modelling for forecasting of distributed loads). In general, it is to be expected that the introduction of smart meters and smart equipment will lead to more accurate consumption data providing for a more holistic mapping of the demand side and thus for better projections inside energy policy development and a more effective regulatory framework.

The action should complement the existing demand side energy models by developing multiple-agent energy models and/or modelling segments and/or developing methodologies on how to improve and enhance the demand side aspects in modelling.
These models and/or methodologies should:

- be compatible with the energy models most commonly used at European level;
- model more accurately those aspects not yet sufficiently considered in the existing models;
- make use of new data sources, including big data as for example generated by smart meters, smart buildings and smart equipment;
- identify and refine the structure and patterns of demand and how it will develop;
- contribute to an enhanced demand-side model to be consistently used at European level.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1 million and 2 million would allow this specific challenge to be addressed. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact

2019:
Proposals are expected to demonstrate the impacts listed below, using quantified indicators and targets wherever possible

- More accurate and holistic mapping and modelling of the demand side and to a better assessment of energy consumption trends for different categories of economic agents;
- More accurate follow-up of energy efficiency measures implemented at the demand side;
- Better assessment of demand-side policy needs at European level.

Type of action	Research and Innovation action
Deadline	**03 September 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-EE-16-2018-2019-2020: Supporting public authorities to implement the Energy Union

Specific Challenge

The delivery of the Energy Union targets requires the full engagement of the public sector at all governance levels.

Local and regional public authorities have a crucial role in setting ambitious energy efficiency strategies, for instance in the framework of the Covenant of Mayors for Climate & Energy and Smart Cities & Communities or the Clean Energy for All islands initiative. The political commitment at local level should be enhanced and the focus should turn to implementation and effective monitoring of concrete energy efficiency solutions and actions, which can contribute to modernise and decarbonise the European economy. Synergies should be sought, whenever possible, with local and regional air quality plans and air pollution control programmes to reduce costs since these plans rely to a large extent on similar measures and actions.

Support should continue and be reinforced in building capacity of public authorities and empowering them to take up their role of energy transition leaders at regional and local level, by permanently improving their skills as public entrepreneurs and supporters of market transformation towards more efficient energy systems.

At national level, the Energy Efficiency Directive has triggered numerous positive developments in the Member States by setting targets to incentivise and enable investment in energy efficiency programmes across all sectors. However, Member States have yet to fully implement the Directive and additional support in building capacity and know-how is needed.

Scope

a) Support to local and regional public authorities

Proposers should aim to focus their proposed action on one of the following points:

- **Deliver higher quality and consistency of energy efficiency measures implemented through enhanced coordination of different administrative levels. Actions should lead to politically approved and jointly applied monitoring and verification schemes of energy efficiency measures across local and regional authorities, enhanced and better coordination of the energy efficiency measures implemented and more efficient use of public spending in energy efficiency;**
- Support public authorities in the development of transition roadmaps that clearly outline the path to the European long-term 2050 targets and inform the ongoing implementation of SEAPs/SECAPs or similar plans and the development of future plans/targets for 2030 and beyond. Actions should link closely to the Covenant of Mayors and/or Smart Cities and Communities initiatives;
- **Innovative ways to enable public engagement in the energy transition, developing interface capacities within public authorities to engage with civil society;**
- Deliver large-scale and action-oriented peer-to-peer learning programmes targeting cities and/or regions, with a strong replication potential European-wide. **Proposals should develop transparent, effective and compelling programmes, building on existing initiatives and real needs and ensure embedded conditionalities such as institutionalisation of the skill base and impact monitoring**. Programmes should deliver public entrepreneurs able to drive the sustainable energy transition in their respective territories within the Covenant Mayors and beyond.

b) Supporting the delivery of the Energy Efficiency Directive

Support will be provided to actions that are assisting Member States to fulfil their obligations under the Energy Efficiency Directive and help with its efficient implementation taking into account existing effective practices and experiences from across Europe. Actions may address, for example, the harmonisation of energy savings calculations under Article 3, implementing Energy Efficiency Obligation Schemes or alternative measures and setting up effective and consistent monitoring and verification systems under Article 7 or the removal of barriers to higher efficiency of the generation, transmission, distribution systems including demand response under Article 15.

Proposals should link into existing, relevant initiatives such as ManagEnergy and target a specific sector with high energy saving potential such as buildings, transport mobility, heating and cooling, or water infrastructure operation etc., as seen relevant by applicants.

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

Proposals are expected to demonstrate, depending on the scope addressed, the impacts listed below, using quantified indicators and targets wherever possible:

- Primary energy savings, renewable energy production and investments in sustainable energy triggered in the territory of participating parties by the project (respectively in GWh/year and in million Euro);
- Number of public officers with improved capacity/skills;
- Number of policies influenced through the action;
- Number of Member States with improved implementation of Art 7. (Energy Efficiency Obligation schemes or alternative measures) / Energy savings achieved through successfully implemented Energy Efficiency Obligation schemes or alternative policy measures;
- Number of Members States with improved and consistent monitoring and verification systems for energy savings across governance levels.

Call – Building a low-carbon, climate resilient future: secure, clean and efficient energy

Type of action	Coordination and support action
Deadline	**03 September 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-RES-28-2018-2019-2020: Market Uptake support

Specific Challenge
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. The "Clean Energy for all Europeans" package adopted at the end of 2016 introduces further targets towards 2030 and introduces modifications in the energy market design that will empower individuals or communities to participate actively to the energy system transformation. Renewable energy technologies have the opportunity to play a crucial role in this transition, leading to an increased share of renewable energy consumed in the EU and to a more active role for the consumers. However, introducing and deploying at large scale new and improved technologies entails a number of challenges, notably as regards their initial high cost, the consumer acceptance and the legal and financial barriers arising from bringing novel solutions to a technical environment with already reliable solutions in place.

Scope
The proposal will develop solutions which can be easily implemented for overcoming barriers to the broad deployment of renewable energy solutions. In particular, the proposal will address one or more of the following issues:

- **Recommendation for harmonisation of regulations, life cycle assessment approaches, environmental impact methodologies of renewable energy solutions;**
- Development of additional features for RES to be compliant with the electricity market requirements, making them "market fit", such as developing the possibility to provide additional services to the grid such as peak power and having an active role in electricity balancing/reserve market;
- Support sharing of best practice between public funding bodies for the cross-border participation in RES electricity support schemes, increasing the use of the "RES co-operation mechanisms" foreseen in the legislation**;**
- **Development of insurance schemes to be available to developers in Europe and worldwide to mitigate risks,** such as in geothermal drilling and offshore installation;
- **Development of innovative financing mechanisms, schemes and sharing of best practices for cost-effective support for uptake of renewable sources, such as through the use of Public Procurement of Innovative Solutions instrument or smartly designed tenders;**
- Development of support tools to facilitate export markets, especially for technologies where export market potential is much higher than internal market e.g. for hydropower. The focus will be on capacity building for market activities in developing and emerging countries, including identifying research needs, within the objectives of developing country- specific technologies and solutions, and/or adapting existing ones, taking into account local aspects of social, economic and environmental sustainability. Participation of developing and emerging countries is encouraged, in particular if these countries have identified energy as a priority area for their development and whenever common interest and mutual benefits are clearly identified.
- Development of tools (methods and models) for environmental impact assessments of renewable energy projects;
- Development of tools or services using global earth observation data, (such as those available through COPERNICUS), to support development and deployment of renewable energy sources;
- Determining conditions and defining options for retrofitting existing energy and industrial installations (first generation biofuels, pulp and paper, fossil refineries, fossil firing power and Combined Heat and Power (CHP) plants) for the complete or partial integration of bioenergy, with concrete proposals for such retrofitting for the different cases of bioethanol, biodiesel, bio-kerosene, intermediate bioenergy carriers and other advanced biofuels and renewable fuels and biomass based heat and power generation, on the basis of the assessment of the capital expenditure (CAPEX) reduction and market benefit;
- Development of optimisation strategies regarding cost, energy-performance and LCA for bioenergy and sustainable renewable fuels in upgraded energy and industrial installations;
- Development of cost-effective logistics, feedstock mobilisation strategies and trade-centres for intermediate bioenergy carriers.

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 calls for multi-disciplinary research designs, which should include contributions also from the social sciences and humanities. Where relevant, regional specificities, socio-economic, spatial and environmental aspects from a life-cycle perspective will be considered**. Where relevant, proposals are expected to also critically evaluate the legal, institutional and political frameworks at local, national and European level and how, why and under what conditions these (could) act as a barrier or an enabling element.
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.

Expected Impact
It is expected that the solution proposed will contribute to:

- Facilitate the introduction of these technologies and increase the share of renewable energy in the final energy consumption;
- Lead to substantial and measurable reductions for project developments, whilst still fully addressing the needs for environmental impact assessments and public engagement;

- **Develop 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.**

Type of action	Coordination and support action
Deadline	**11 December 2018**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-RES-29-2019: Converting Sunlight to storable chemical energy

Specific Challenge
To replace fossil energy with sustainable alternatives that provide the same flexibility and convenience of use, we need to store sustainable energy on a large scale and for a long time in new kind of energy storage compounds. This can be done by direct conversion of sunlight into storable chemicals that can be stored for a virtually unlimited time. At present, these processes can be performed at the level of small prototype devices at high cost. Therefore, research and innovation are needed to bring these approaches from infancy to maturity. The production of clean forms of storable chemical energy from direct sunlight is the next step.
Performance breakthroughs, including day and night continuous processes, and cost reductions are a must in order to unlock the potential of technologies converting sunlight to storable chemical energy. This challenge is fully aligned to the "Converting Sunlight Innovation Challenge" identified as a priority in Mission Innovation.

Scope
Proposals are expected to address renewable energy technologies that will answer the challenge described in the "Converting Sunlight Innovation Challenge" of Mission Innovation, bringing them up to TRL 4 or 5. **Beside the technological development, the proposal will have to clearly address the following related aspects: the potential lower environmental impact than the current technologies, possibly through a LCA analysis, the better resource efficiency, issues related to social acceptance or resistance to new energy technologies, related socioeconomic and livelihood issues, and prospective market analysis.** The proposal needs to consider all three dimensions of sustainability, resource efficiency and scalability, i.e. not using materials which are uncommon, dangerous or scarce that could disable its future concept to be used at large scale. At least one of the following technology-specific challenges has to be addressed:

- Improved light-harvesting and efficient charge separation in photocatalytic systems;
- Photoelectrochemical cells – PECs and catalyst development;
- Thermochemical pathways to energy rich chemicals (using concentrated solar light); and
- Design and engineering of devices, systems or prototypes integrating together the different processes, with day and night control and applicability for the production of chemical energy rich carriers.

The area of electrolysers efficiently utilizing a renewable electricity input, such as provided by photovoltaics, wind turbines or other sustainable means, is not covered by this challenge. **The proposal must have a plausible pathway to scale the technology to the terawatt scale by 2050, a plausible potential for an EROI > 10 (EROI: Energy returned on energy invested) and the full recyclability of the conversion devices in the context of a circular economy must be ensured.** As part of Mission Innovation actions, the project will be required to contribute towards the activities of the "Converting Sunlight Innovation Challenge". Beside solving the technical challenge, the consortium is expected to budget the participation in the development of the Challenge work plan through activities such as dissemination, exchange of researcher and networking as well as through contributing in official meetings.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 to 3 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact
Projects will not only contribute to mitigating climate change through the production of storable chemical energy from the sun, but also enhance energy security and provide opportunities for economic development across the globe. Projects should show its contribution towards establishing a solid European innovation base and building a sustainable renewable energy system. Contributing to Mission Innovation aims, projects will deepen the international collaboration in clean energy research and development.

Type of action	Research and Innovation action
Deadline	**27 August 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-EC-1-2018-2019-2020: The role of consumers in changing the market through informed decision and collective actions

Specific Challenge
A precondition for active demand is for consumers to be aware of their own potential to permanently or temporarily reduce energy consumption; and moreover, for them to know how to offer this potential to the market and what it would represent in terms of monetary value by bringing benefits to the energy system.
Different forms of collective action have the potential to assist consumers in forming critical mass and to facilitate increased uptake of energy efficiency & active demand solutions and services. Although collective actions on energy efficiency have emerged in recent years, a lack of awareness on the potential benefits of such actions, together with regulatory barriers, continues to hamper their full development and uptake.
Finally, important challenges involve installed appliances (such as boilers for space and/or water heating) of which a big share is inefficient and fossil-fuel based, resulting in increased fuel consumption and fuel costs for households. Informing consumers of the potential energy savings and their monetization, as well as other benefits such as increased comfort and improved air quality, can result in increased motivation for replacing inefficient appliances, thereby permanently reducing consumption.

Scope
2019:

The proposed action should set up and/or support consumer cooperatives, consumer collective purchase groups, and/or other consumer driven collective actions that form such energy communities to increase energy efficiency and/or optimise energy management within the community by for example combining collective solutions to distributed generation, distributed storage, and/or demand-response aggregation. The focus of the proposed action should be on households, however, this does not preclude the complementary involvement of non-residential buildings.

The proposed action should cover the following:

- **Identify and address regulatory barriers and contractual conditions with utilities, suppliers, grid operators, technology providers etc. for cooperative actions, possibly linking activities with structural solutions involving public authorities;**
- **Demonstrate that collectively organised energy-related actions are financially viable and attractive to the consumer-members of the energy community.**

In addition, the proposed action could cover the following, as relevant:

- Identify and implement solutions to address split incentives (e.g. allowing tenants to set up/join the consumer driven collective action);
- Demonstrate collective actions of energy consumers based on the solutions and business approaches using digital tools and technologies (such as digital platforms or blockchain transactions). If the proposed action includes smart home/IoT solutions, it should link to the developments under the call DT-ICT-10-2018: Interoperable and smart homes and grids.

Relevant for both years:
The proposed actions should address the risk of "rebound effects" and propose measures to counteract them, where relevant.
All relevant stakeholders necessary for the successful implementation of the action should be involved and relevant consumer organisations, in particular, should be either directly involved or their support demonstrated in the proposal. Proposed actions should also take issues of consumer data ownership and data privacy into account, where relevant. The proposed actions are invited to build on experiences and lessons learned in other relevant projects and programmes.
The Commission considers that proposals requesting a contribution from the EU of between EUR 1 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
Proposals are expected to demonstrate, depending on the scope addressed, the impacts listed below using quantified indicators and targets, wherever possible:

- Primary energy savings triggered by the project (in GWh/year);
- Investments in sustainable energy triggered by the project (in million Euro);
- **Contribution to reducing regulatory barriers and improving contractual conditions;**
- Increase domestic uptake of energy efficient products and services;
- Involvement of at least 5.000 consumers per million Euro of EU funding.

Additional positive effects can be quantified and reported when relevant and wherever possible:

- Reduction of greenhouse gases emissions (in tCO2-eq/year) and/or air pollutants (in kg/year) triggered by the project.

Call – Building a low-carbon, climate resilient future: secure, clean and efficient energy

Type of action	Coordination and support action
Deadline	**03 September 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-EC-2-2018-2019-2020: Mitigating household energy poverty

Specific Challenge

European households continue to spend an increasing share of income on energy, leading to higher rates of energy poverty and negatively affecting living conditions and health. Recent estimates suggest that more than 50 million Europeans are affected by energy poverty. Although roots of this phenomenon lie mainly in low incomes and poor thermal efficiency of buildings, energy efficiency measures at the household level and increased use of renewable energy are key tools in addressing energy poverty and can bring energy savings, leading to lower fuel costs and improved living conditions. The issue is in part exacerbated by a lack of sufficient knowledge on how to identify energy poor households.

In this context, the role of local and national authorities, related networks and initiatives, and availability of support schemes are important to ensure the sustainability and larger scale uptake of the measures.

Energy Efficiency Obligation Schemes can also be used to promote social aims, such as tackling energy poverty. The obligated parties (utilities) have potentially at their disposal the necessary data and means to identify energy poverty among their clients and effectively address it by fulfilling in this way the energy efficiency obligation. Building the capacity of the obligated parties is needed in order to spread such schemes across the EU.

Scope

Actions should contribute to actively alleviating energy poverty and developing a better understanding of the types and needs of energy poor households and how to identify them, taking into account gender differences where relevant, building on any existing initiatives such as the European Energy Poverty Observatory.

The proposed action should cover one or more of the following:

- **Facilitate behaviour change** and implementation of low-cost energy efficiency measures tailored for energy poor households (e.g. provision of information and advice, energy efficiency services such as draught proofing or optimisation of existing building technology systems, as well as energy efficiency devices & kits such as low-energy lighting);
- **Support the set-up of financial and non-financial support schemes for energy efficiency and/or small scale renewable energy investments for energy poor households**. These actions should be embedded in, and add value to, structural frameworks and activities involving local, regional, and national authorities, and/or networks such as the Covenant of Mayors;
- Develop, test and disseminate innovative schemes for energy efficiency/RES investments established by utilities or other obligated parties under Article 7.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1 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.

The proposed actions are invited to build on experiences and lessons learned in other relevant projects and programmes.

Expected Impact

Proposals are expected to demonstrate, depending on the scope addressed, the impacts listed below using quantified indicators and targets, wherever possible:

- Primary energy savings triggered by the project (in GWh/year);
- Investments in sustainable energy triggered by the project in(million Euro);
- Contributions to policy development and to best practice development on energy poverty;
- Support schemes established for energy efficiency and/or small-scale renewable energy investments and to be sustained beyond the period of EU-support.
- Involvement of at least 5.000 consumers per million Euro of EU funding.

Additional positive effects can be quantified and reported when relevant and wherever possible:

- Reduction of greenhouse gases emissions (in tCO2-eq/year) and/or air pollutants (in kg/year) triggered by the project.

Type of action	Coordination and support action
Deadline	**03 September 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

Specific Challenge

The COP21 Paris Agreement recognises the role of cities and calls on them to rapidly reduce greenhouse gas emissions and adapting to climate change. The EU is committed to implementing the 2030 Agenda for Sustainable Development, including Sustainable Development Goal 11 ("Make cities inclusive, safe, resilient and sustainable"). Many forward-looking cities have set themselves climate goals whose achievement rests on wide scale roll out of highly integrated and highly efficient energy systems.

To achieve the necessary energy transition in cities, it is essential to increase energy systems integration and to push energy performance levels significantly beyond the levels of current EU building codes and to realize Europe wide deployment of Positive Energy Districts by 2050.

This call will also contribute to the specific objectives of the SET Plan action 3.2 - Smart cities and communities - focussing on positive-energy blocks/districts.

Scope

Integrated innovative solutions for Positive Energy Blocks/Districts will be developed and tested and performance-monitored in the Lighthouse Cities. Projects will consider the interaction and integration between the buildings, the users and the larger energy system as well as implications of increased electro-mobility, its impact on the energy system and its integration in planning.

Lighthouse Cities will closely collaborate with the Follower Cities and should act as exemplars helping to plan and initiate the replication of the deployed solutions in the Follower cities, adapted to different local conditions.

As a sustainable energy transition will see increased electro-mobility, its impact on the energy system needs to be understood and well integrated in planning.

Definition: Positive Energy Blocks/Districts consist of several buildings (new, retro-fitted or a combination of both) that actively manage their energy consumption and the energy flow between them and the wider energy system. Positive Energy Blocks/Districts have an annual positive energy balance[89]*. They make optimal use of elements such as advanced materials, local RES, local storage, smart energy grids, demand-response, cutting edge energy management (electricity, heating and cooling), user interaction/involvement and ICT.*

Positive Energy Blocks/Districts are designed to be integral part of the district/city energy system and have a positive impact on it. Their design is intrinsically scalable and they are well embedded in the spatial, economic, technical, environmental and social context of the project site.

To increase impact beyond the demonstration part of the project, each Lighthouse City and Follower City will develop, together with industry, its own bold city-vision for 2050. The vision should cover urban, technical, financial and social aspects. Each vision should come with its guide for the city on how to move from planning, to implementation, to replication and scaling up of successful solutions.

Proposals should also:

- Focus on mixed use urban districts and positively contribute to the overall city goals;
- Develop solutions that can be replicated/gradually scaled up to city level. **The technical, financial, social, and legal feasibility of the proposed solutions should be demonstrated in the actual proposal.**
- **Make local communities and local governments (particularly city planning departments) an active and integral part of the solution, increase their energy awareness and ensure their sense of ownership of the smart solutions**. This should ensure sustainability of Positive Energy Blocks/Districts;
- Promote decarbonisation, while improving air quality.
- Incorporate performance monitoring (ideally for more than 2 years) of deployed solutions from the earliest feasible moment. All relevant performance data must be incorporated into the Smart Cities Information System database (SCIS).

Projects should also deliver:

- **Effective business models for sustainable solutions;**
- **Practical recommendations arising from project experience on:**
  - **regulatory, legal aspects and data security/protection;**
  - **gender and socio-economics (Social Sciences and Humanities);**
  - storage solutions (from short-term to seasonal);
  - big data, data management and digitalisation;
  - electro-mobility: i) its impact on energy system and ii) appropriate city planning measures to support large scale roll-out;

Eligible costs are primarily those that concern the innovative elements of the project needed to:

- connect and integrate buildings;
- enable Positive Energy Blocks/Districts;
- foster innovative systems integration;
- complement the wider energy system.

Costs of commercial technologies are not eligible, for example:

- Buildings: purchase, construction, retrofitting and maintenance;
- Electric vehicles and charging stations: purchase, installation and maintenance;
- City-level ICT platforms: purchase, development and maintenance;
- Standard, commercially-available RES: purchase, development and maintenance.

Projects are expected to cooperate with other Smart Cities and Communities projects funded under Horizon 2020 as well as the European Innovation Partnership on Smart Cities and Communities (EIP-SCC).
Therefore, proposals should foresee a work package for cooperation with other selected projects and earmark appropriate resources (5% of the requested EU contribution) for coordination and communication efforts and research work associated with cross-cutting issues.
The Commission considers that proposals requesting a contribution from the EU of between EUR 15 to 20 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.
Typically, projects should have a duration of 48 to 60 months.

Expected Impact
Projects should contribute to:

- Meeting EU climate mitigation and adaptation goals and national and/or local energy, air quality and climate targets, as relevant;
- Significantly increased share of i) renewable energies, ii) waste heat recovery and iii) appropriate storage solutions (including batteries) and their integration into the energy system and iv) reduce greenhouse gas emissions;
- Lead the way towards wide scale roll out of Positive Energy Districts;
- Significantly improved energy efficiency, district level optimized self-consumption, reduced curtailment;
- Increased uptake of e-mobility solutions;
- Improved air quality.

The higher the replicability of the solutions across Europe, the better.

Type of action	Innovation action
Deadline	**05 February 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-NZE-4-2019: Integrated solutions for flexible operation of fossil fuel power plants through power-to-X-to-power and/or energy storage

Specific Challenge

With a growing share of energy produced from renewable resources (RES), fossil fuel power plants will have to increasingly shift their role from providing base-load power to providing fluctuating back-up power (i.e. ramping up and down) in order to control and stabilise the grid. These strong fluctuations result not only in increased wear-and-tear, but (more importantly) also in a lower efficiency and hence higher greenhouse gas emissions per unit of produced electricity. Severe ramping up and down can be limited through load-levelling i.e. storing power during periods of light loading on the system and delivering it during periods of high demand.

Scope

Validation and pilot demonstration of the integration of energy storage and/or use of excess energy (including via power-to-X-to-power in fossil fuel power plants and showing that EU emission limits for such installations can not only still be met, but that emissions of air pollutants can even be reduced. This could include the enabling of the combustion system to deal with synthetic fuels and/or hydrogen enriched fuels, as well as a better integration of combined production of heat and power into the overall system.

Proposals are expected to bring technologies to TRL 6-7 (please see part G of the General Annexes). **Technology development has to be complemented by activities to create awareness, gain feedback on societal impact and advancing society's readiness for the proposed solutions.**

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 6 to 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

Solutions will contribute to a smart, secure and more resilient power system through the integration of energy storage for the purpose of load levelling in fossil fuel power generation. Results of the project(s) should allow a smoother operation of these plants at optimal efficiency and environmental performance in order to better adapt to an energy systems that will increasingly be dominated by intermittent renewable energy.

Type of action	Innovation action
Deadline	**27 August 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-NZE-5-2019-2020: Low carbon industrial production using CCUS

Specific Challenge
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.**
The Commission considers that proposals requesting a contribution from the EU in the range of EUR 10 to 12 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.
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 countries such as China.

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.

Type of action	Innovation action
Deadline	**27 August 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

LC-SC3-CC-1-2018-2019-2020: Social Sciences and Humanities (SSH) aspects of the Clean-Energy Transition

Specific Challenge

The clean-energy transition doesn't just pose technological and scientific challenges; it also **requires a better understanding of cross-cutting issues related to socioeconomic, gender, sociocultural, and socio-political issues. Addressing these issues will help to devise more effective ways of involving citizens and to better understand energy-related views and attitudes, ultimately leading to greater social acceptability as well as more durable governance arrangements and socioeconomic benefits.**

Scope

In 2018, proposals should be submitted under the theme "Social innovation in the energy sector" and in 2019 under the theme "Challenges facing carbon-intensive regions". They should address one or several of the questions listed under the respective sub-topics below. All proposals should adopt a comparative perspective, with case studies or data from at least three European Union Member States or Associated Countries.

2019

***Challenges facing carbon-intensive regions*:** The transition to a low-carbon energy system and economy poses particular challenges for regions that are still heavily dependent on fossil-fuel-based industries or the extraction of fossil fuels themselves ("coal and carbon-intensive regions"). At the same time, this transition offers major opportunities for developing new lines of business and for increasing the competitiveness of structurally weak regions. Focusing on the past 5-10 years up to the present, particular attention should be focused on the following issues:

- **What are the principal socio-economic challenges facing coal and carbon-intensive regions today and what effect have these had on livelihoods and the sustainability of local and regional economies?**
- **What coping strategies have emerged in recent years? What are the principal differences between regions that are coping well and those that are not?**
- **To what extent have coal and carbon-intensive regions experienced outward migration in recent years and in what way has this affected their social and demographic composition?**
- **What effect, if any, have these changes had on the rise of populism and of antidemocratic attitudes in the regions concerned?**

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

The proposed research will:

- provide a better understanding of socioeconomic, gender, sociocultural, and socio-political factors and their interrelations with technological, regulatory, and investment-related aspects, in support of the goals of the Energy Union and particularly its research and innovation pillar;
- yield practical recommendations for using the potential of social innovation to further the goals of the Energy Union, namely, to make Europe's energy system more secure, sustainable, competitive, and affordable for Europe's citizens;
- yield practical recommendations for addressing the challenges of the clean-energy transition for Europe's coal and carbon-intensive regions, including socioeconomic and political ones.

Type of action	Research and Innovation action
Deadline	**27 August 2019**
Call identifier	H2020-LC-SC3-2018-2019-2020
Topic information	Link

Topics with minor SSH relevance

LC-SC3-EE-6-2018-2019-2020: Business case for industrial waste heat/cold recovery
Link

LC-SC3-EE-9-2018-2019: Innovative financing for energy efficiency investments
Link

LC-SC3-EE-10-2018-2019-2020: Mainstreaming energy efficiency finance
Link

Societal Challenge 4

Smart, green and integrated transport

Net 4 Society

MG-4-5-2019: An inclusive digitally interconnected transport system meeting citizens' needs

Specific Challenge

Merging physical transport assets like infrastructure or vehicles with the digital layer, through the Internet of Things (IoT) and big data applications **opens vast possibilities in terms of** the development of new transport services, **business/operating models and social innovations**. This has been exemplified in the rapid development of services such as multimodal travel planners, transportation network companies, Mobility as a Service, public transport on demand, new airline ancillary products, various forms of tracking and tracing and many others.

Digitally based services and applications provide citizens with an increasing level of tailored real-time information and greater choice thus allowing for a travel process that is faster, more comfortable and which gives travellers greater control. These services and applications **can also serve as basis for social innovations in mobility**. In the longer time frame, digitisation of transport promises to lead towards fully personalised services and commercial offers. Despite this, important and often **overlooked aspects are user impact and user's ability and readiness to take advantage of the new opportunities.** Benefiting from digital technology requires specific skills, willingness and ability to assume a new role as an active participant of the digital travel ecosystem. The main challenge is therefore to ensure that all members of society can benefit from digitisation. In order to achieve this, **it is necessary to better understand the needs and attitudes of various users, in particular vulnerable-to-exclusion citizens such as, for example, elderly, low-income, disabled or migrants**, in relation to the requirements brought about by the digitised transport system as well as the skills and strategies necessary for all citizens in order to fully benefit from it.

Scope

Proposals should address several or all of the following:

- Identify the main characteristics of demands that digitally based mobility solutions place on the users;
- **Identify the needs and attitudes of all societal strata of transport users** - in particular vulnerable to exclusion citizens - in the digitised travel ecosystem, taking into account interpersonal and intrapersonal (over time for the same person) variations(age, culture, etc);
- **Identify the obstacles to the appropriation of digital mobility by different user groups and possible nudges to facilitate it, including the potential for social innovations**;
- Investigate user requirements when transport is interrupted, e.g.: due to extreme weather, man-made or technical hazards.
- Investigate gender related differences in the adoption of digitally based transportation products and services;
- Identify skills and strategies needed in order to fully benefit from digitalisation in transport and thus to avoid digital exclusion or digital divide in terms of social and spatial aspects;
- **Analyse differences and particularities in relation to the adoption of new mobility solutions and social innovations** across a representative sample of member states, both in terms of user uptake and service provision;
- **Provide recommendations for policy making** and practical applications for designing an inclusive digital transport system and its related products and services with due regard to data protection and cybersecurity issues; Research should be validated in a selected number of case studies through pilot demonstration, trials and testing involving service providers and end-users. Furthermore, actions should be undertaken in view of ensuring take up of research results by key stakeholders.

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

Expected Impact

Research will help policy-makers **design appropriate regulatory frameworks and social and educational strategies** in order to create the best possible conditions for an inclusive, user friendly digital transport system, taking into account the needs and characteristics of all parts of society, **with particular attention to vulnerable to exclusion citizens**. Moreover, research will also help regional authorities and businesses in designing digital transport solutions that are better tailored to citizens' individual needs.

Type of action	Research and Innovation action
Deadline	**24 April 2019**
Call identifier	H2020-MG-2018-2019-2020
Topic information	Link

Topics with minor SSH relevance

LC-MG-1-10-2019: Logistics solutions that deal with requirements of the 'on demand economy' and for shared-connected and low-emission logistics operations
Link

MG-2-6-2019: Moving freight by Water: Sustainable Infrastructure and Innovative Vessels
Link

MG-2-7-2019: Safety in an evolving road mobility environment
Link

MG-4-4-2018-2019: Support for dissemination events in the field of Transport Research
Link

MG-4-6-2019: Supporting Joint Actions on sustainable urban accessibility and connectivity
Link

DT-ART-03-2019: Human centred design for the new driver role in highly automated vehicles

Specific Challenge
Significant research efforts are addressing driver performance and behaviour in automated driving conditions still requiring the driver to be prepared to assume control (SAE automation level 3 and lower). In highly automated driving conditions (SAE automation level 4) the role of the driver will change dramatically since driver intervention is not required during defined use cases. This means that during a single trip there will be a coexistence of different automated driving functions demanding various degrees of human attention. When a vehicle is in highly automated driving mode the driver may take on different behaviours. Solutions need to be developed and they have to ensure both a safe transfer between use cases with different automation levels and that drivers always have a very clear understanding about the degree of automation enabled in each situation.

Scope
Proposals for research and innovation should focus on the design of safe human-machine interfaces for vehicles with highly automated driving functions and the safe and controlled transfer between use cases of different SAE automation levels (between level 4 to/from levels 3 or 2) for all types of drivers.
The proposed actions should include all of the following aspects:

- Research to characterise driver roles in SAE automation level 4 situations and for the transition between use cases with different automation levels. **Upgrade of comprehensive models for driver behaviour/reaction, awareness, readiness and monitoring**. **Driver generational effects, considering in particular variations in IT usage experience and age, but also other cultural factors should be taken into account**.
- Effectiveness assessment methods, especially for safety aspects, based on these models. The new relationship between driver and vehicle (mutual cooperation or even handover rather than continuous control) should be reflected, also considering the variety of activities a driver may engage in while the vehicle is in charge. Use cases where an operator controls the vehicle remotely may be included.
- **Develop easily understood solutions making it clear to the driver what is the operational capability (authority) of the automated mode or modes** currently enabled, as well as ensuring safe and reliable function (re-)allocation and corresponding driver/operator readiness. Driver control handover, driver/operator state and impairment are among the aspects that should be considered and the intended driver reaction should be secured.
- Demonstration of concept functionality in real world situations with various use cases and driving environments where automated systems receive and give back control from/to the driver.

Proposed actions should build on the knowledge and results of ongoing projects addressing human machine interactions of automated driving systems.
In line with the Union's strategy for international cooperation in research and innovation, international cooperation is encouraged. In particular, proposals should consider cooperation with projects or partners from the US, Japan, South Korea, Singapore, and/or Australia. Proposals should foresee twinning with entities participating in projects funded by US DOT to exchange knowledge and experience and exploit synergies.
The Commission considers that proposals requesting a contribution from the EU between EUR 4 to 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

- Innovative solutions, concepts and algorithms for a safe human-machine interface of highly automated driving functions and for safe and controlled transfer between use cases of different automation levels.
- Reduction of risks for driver behaviour related incidents by ensuring that drivers/operators are adequately alerted, made aware and engaged when the highly automated vehicle encounters situations or use cases that it cannot handle and thus will turn to lower automation levels.
- The research will help achieve the European Transport White Paper "Vision Zero" objective by preventing road accidents caused by human errors. Once on the market the developed concepts and solutions will also contribute to Sustainable Development Goal 3 (Ensure healthy lives and promote well-being for all at all ages; in particular goal 3.6. "By 2020, halve the number of global deaths and injuries from road traffic accidents").

Type of action	Research and Innovation action
Deadline	**24 April 2019**
Call identifier	H2020-DT-ART-2018-2019-2020
Topic information	Link

DT-ART-04-2019: Developing and testing shared, connected and cooperative automated vehicle fleets in urban areas for the mobility of all

Specific Challenge

Shared, connected and cooperative automated vehicles may become a game changer for urban mobility. They can provide seamless door to door mobility of people and freight delivery services, which can lead to healthier, more accessible, greener and more sustainable cities, as long as they are integrated in an effective public transport system. Since a few years the development of shared automated vehicle pilots are emerging around the world. Today, most of these pilots are small-scale and involve either on-demand ride services or low-speed shuttles operating in controlled environments. In order to accelerate the uptake of high quality and user oriented mobility services, based on shared, connected and cooperative automated vehicles, there is a need for demonstrating these services in real life conditions to test the performance, safety and viability of these **systems and services** and to prove that they are **attractive for and accepted by users**. Furthermore, the potential impacts on reducing CO2 emissions and pollutants, safety and overall transport system costs need to be assessed.

Scope

The proposed actions should include all the following aspects:

- **Thorough analysis of new, emerging business/operating models** and related technologies for shared, connected and cooperative automated vehicle fleets that are complementing existing high-capacity public transportation systems.
- Design innovative shared, connected, cooperative and automated vehicle concepts (road vehicles at SAE level 4 and higher) and the associated **new business/operating models addressing user and customer needs, including cultural aspects,** for mobility of people and/or delivery of goods. **Specific user needs in different regional and operating environments and for different user groups, e.g. elderly, children and users with disabilities should be considered and attractiveness and acceptability by all users should be ensured**. The potential of combining automated urban delivery and people transportation should be addressed.
- Test robustness, reliability and safety of shared highly automated vehicle fleets that are operating in semi-open or open environments focusing on the interaction with other road users, including pedestrians, cyclists and public transport systems. The fleets should consist of electrified vehicles. Synergies with advanced energy efficient, smart and multimodal mobility concepts should be actively developed. Fleet management should include operational optimisation as well as energy management. Fleet tests should consider the entire "functional urban area" and explicitly include feeder services and other collective transport options in peri-urban and low-density urban areas.
- Vehicles should use connectivity technologies to allow communication and cooperation between vehicles, infrastructure and with other road users and to enable automated, smart mobility services, innovative fleet management concepts and higher performance of automated vehicle functions. Proposals should make the best use of EGNOS and Galileo which significantly improve the vehicle positioning availability and reliability. The development of solutions for the next generation of cooperative services by efficiently combining C-ITS and automation for smart, smooth, safe and efficient traffic flows (including the development and testing of "open message definitions" for all CITS stakeholders) would be an asset.
- **Identify and provide for the needs of vulnerable road users** (including their potential redefinition to include non-connected users, out-of-position passengers in automated cars, cyclists, pedestrians, etc.) resulting from this new automated/mixed environment (use of standard & highly automated vehicles).
- Develop architecture, functional and technical requirements for ICT technologies, for secure data collection and processing needed for the operation of connected and cooperative automated vehicles. Develop ways to enhance the optimised use of big data in (road) transport for implementing smart and safe mobility solutions, innovative traveller services and (city) traffic management.
- Fulfil all security requirements to protect the shared automated vehicles to any threats and avoid any conscious manipulations of the information enabling automated driving.
- Assess and demonstrate benefits of the pilot implementation on energy efficiency, traffic flow, safety, **user appreciation** etc, based on holistic modelling solutions.

In line with the Union's strategy for international cooperation in research and innovation, international cooperation is encouraged. In particular, proposals should consider cooperation with projects or partners from the US, Japan, South Korea, Singapore, and/or Australia. Proposals should foresee twinning with entities participating in projects funded by US DOT to exchange knowledge and experience and exploit synergies.

The Commission considers that proposals requesting a contribution from the EU between EUR 15 and 30 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 will test the overall mobility impact, in particular, how shared mobility solutions using connected and cooperative automated vehicles can contribute to a more sustainable, inclusive, and safe mobility system and help residents of a city/region (in particular less mobile persons, elderly and children) to increase mobility and improve urban freight transport efficiency. Proposed actions will help to reduce the total number of passenger cars and goods km in cities, overall CO2 and air pollutant emissions and energy consumption. They will improve market opportunities for SME's and new-entrants by addressing and developing innovative cross-sector business models. Actions will create strategic partnering opportunities between public agencies and the private sector for developing

sustainable and scalable business models. They will also support the accelerated deployment of electrified vehicles for shared automated mobility services and integrated strategies for a smart and multi-modal mobility system and urban development, including land use and ITS and infrastructure development.

Type of action	Innovation action
Deadline	**24 April 2019**
Call identifier	H2020-DT-ART-2018-2019-2020
Topic information	Link

LC-GV-03-2019: User centric charging infrastructure

Specific Challenge

The market share of full electric vehicles is still low in many European member states. Several reasons have been identified for this. Charging infrastructure is considered as one of the central reasons when the urban model does not allow for widespread garage availability, or when frequent long range travel is involved. Currently most EV owners have their own garage and live in peri-urban areas.

Innovative solutions need to be evaluated and developed to allow EV drivers to have a similar or even better mobility experience than with conventional fossil fuel vehicles in terms of availability, convenience, performance and costs of the necessary charging infrastructure. At the same time, the infrastructure should not affect the noise environment around them, in order not to create resistance to their installation in urban contexts.

In the longer term, electric roads can be considered for further streamlining the user experience and optimising vehicle design, starting from urban and peri-urban applications such as bus, taxi and LDV lanes, for later extension to extra-urban applications.

The challenge will be to support the accelerated deployment of recharging infrastructure, on one hand a slow charging one for cities with low garage availability, on the other to support occasional ultrafast charging for long range travel. The responsible stakeholders need to be incentivized to take clear steps for a wide availability of charging points and to improve the conditions for a broad market acceptance in the electrification of transport.

Scope

Proposals will have to address all following technical areas including demonstration of the final solutions and their interoperability in multiple cities and TEN-T transnational road links:

- **Analysis of subjective perception of charging options and identification of decision influences and concerns of users. The results should provide the basis for strategies or solutions to encourage or incentivize users of different social groups to overcome acceptance barriers in order to accelerate widespread usage of EVs.**
- Attractive and convenient charging infrastructure access with connected vehicle systems avoiding waiting times (through for instance, charging facility reservation and scheduling, integration with route planning of multiple vehicles). **User preferences** like use of renewable energy and avoidance of frequent handling of heavy cables have to be considered. Automated conductive or wireless solutions are expected with highly reliable and interoperable devices. Test methods need to be further optimized, for instance to assess interoperability. Optionally, further extension of the developed stationary wireless charging technology towards urban and periurban "electric road" applications, with the aim of creating an installed base of wireless-ready vehicles to provide the critical mass needed for the deployment of electrified roads at a later stage.
- Transparent, flexible and interconnected payment systems for maximum availability of the charging infrastructure also for drivers who do not regularly use the same car (company/family sharing, commercial car sharing, rental cars, …) or travel across Europe.
- **User survey about parking habits,** considering for instance how much time is spent at a given location; what type of services are needed or expected during charging; how should the future charging station look like.
- Improvement of the currently deployed or planned superfast charging systems according to the previous survey to convince all car owners of the advantages of electric mobility including a sufficient convenience for long trips. All technical possibilities for optimization, both on the vehicle (like temperature preconditioning), or for energy demand rationalisation (e.g. local renewable power support for solar panels, battery storage for peak shaving and other grid services, demand control by interconnected route management systems for incoming vehicles while taking into account the electricity grid availability and voltage and frequency control constraints in real-time) need to be taken into account.
- Scalable charging infrastructure for ramp-up of expected electric mobility needs in terms of power levels and number of charging posts at one site, adequately managing the impact on the grid.
- Cheap low power DC-Charging for highly efficient connection to future home and office energy systems based on DC-Networks with possibility of V2G by smartening the link between vehicle, charging infrastructure and the grid.
- Low power DC-charging for LEV's in combination with theft-proof parking for two-wheelers.
- **Analysis of market models, regulatory and harmonization recommendations** to foster the deployment of EV charging infrastructure in all member states of the EU. Demand control also for slow charging in public or private parking garages shall be enabled by standardized communication to remove barriers of electricity installations in existing apartment blocks and garages considering smart grid implications.
- Development of planning methods to optimize the location of charging sites, taking in consideration user needs and habits (volume of EVs in the area, type of mobility needs, accessibility to charging points, traffic volume, …) as well as time and costs associated to the availability and reinforcement of the necessary electricity network with easy scalability according to the different stages of EV penetration. Analysis and cost effective solutions for specific cases
  like availability of infrastructure in isolated mountain or seaside locations, or for special events, where high peak demand is associated with short periods of use. Consideration for local storage benefits in the different cases studied.
  The Commission considers that proposals requesting a contribution from the EU between EUR 8 and 15 million depending on the level of involved demonstration would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Call – Building a low-carbon, climate resilient future: Green Vehicles

Expected Impact

- **Wide user acceptance beyond early adopters, urban users and garage parkers**;
- Foster investors to invest in charging infrastructure;
- **Determine legal gaps which slow down infrastructure expansion and propose solutions**;
- Develop test methods and set up procedures to improve interoperability issues of vehicle-to-charger and charger-to-infrastructure communication;
- Facilitate grid integration of high-power chargers;
- Improve and standardize charging solutions and payment systems for LEVs for price reduction and **higher market acceptance** in urban environments.

Type of action	Innovation action
Deadline	**24 April 2019**
Call identifier	H2020-LC-GV-2018-2019-2020
Topic information	Link

Topics with minor SSH relevance

LC-GV-05-2019: InCo flagship on "Urban mobility and sustainable electrification in large urban areas in developing and emerging economies"
Link

Societal challenge 5

Climate action, environment, resource efficiency and raw materials

Net 4 Society

LC-CLA-05-2019: Human dynamics of climate change

Specific Challenge
As climatic changes increasingly place populations under pressure, human beings are already adapting. However, less developed countries – particularly in Africa – are often less resilient to climate change and require the deployment of appropriate support to adaptation, including in the form of bespoke **climate services tailored to users' needs**. There is some evidence that **climate change may already be playing a role in shaping population migration pattern**s around the world (e.g. Africa to Europe). It is important to **make use of the wealth of available socio-economic and geophysical data to better understand these patterns in order to develop appropriate policy responses.**

Scope
Actions should address only one of the following sub-topics:
a) Climate services for Africa: Actions should exploit new, relevant climate data made available by Copernicus and other relevant sources (such as GEOSS) and create dedicated climate services for Africa for at least two of the following sectors: water, energy, land use, health and infrastructure. **Actions should develop and deliver tools/applications which demonstrate clear end-user engagement, consultation and participation**, and which enhance planning and implementation of climate adaptation strategies in Africa. Actions should consider activities addressed by other initiatives such as the Global Framework for Climate Services (GFCS), Copernicus, and development cooperation activities, and provide added value. Actions should further consider the EU-Africa Research and Innovation Partnership on Climate Change and Sustainable Energy.
b) Climate and human migration: **Actions should identify and analyse drivers relating to climate change that may affect human migration and displacement patterns**. **Actions should – using a multidisciplinary approach – identify and describe climate parameters,** develop analytical methodologies, **and demonstrate how these relate to human migration patterns, including the probability of migration/forced displacement and design adaptation solutions that may help in alleviating migration pressures at the source. They should also provide guidelines and policy recommendations for the European Agenda on Migration.** Actions may also harness local knowledge and information by engaging with civil society organisations and citizen groups.

For both of the sub-topics, in line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged.
The participation of social sciences and humanities disciplines is encouraged to address the complex challenges of this topic, including challenges associated with relevant gender issues.
The Commission considers that proposals requesting a contribution from the EU of between EUR 5 million and EUR 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 project results are expected to contribute to:

- better policy making for climate adaptation in partner countries and Europe;
- supporting international scientific assessments such as the IPCC Assessment Reports;
- stronger adaptive capacity and climate resilience.

Type of action	Research and Innovation action
Deadline	**1st stage - 19 February 2019** **2st stage - 04 September 2019**
Call identifier	H2020-LC-CLA-2018-2019-2020
Topic information	Link

LC-CLA-06-2019: Inter-relations between climate change, biodiversity and ecosystem services

Specific Challenge
The Paris Agreement notes the importance of taking action to ensure the integrity of all ecosystems and the protection of biodiversity in the context of combatting climate change and adapting to its impacts. An improved understanding of the interactions and feedbacks between ecological processes and climate change, together with evidence-based guidance, is crucial for the development of appropriate solution-oriented strategies and measures for biodiversity conservation and cost-effective ecosystems-based climate change adaptation and mitigation. Furthermore, there are opportunities to let biodiversity and ecosystems benefit multidimensionally from climate change adaptation and mitigation, because intelligent climate policy can simultaneously reduce other environmental stresses, such as air pollution.

Scope
Actions should investigate at all relevant spatial and temporal scales the way that ecological processes, biodiversity (including terrestrial and/or marine ecosystems as appropriate) and ecosystem services are impacted, both directly and indirectly, by climate change. Actions should consider the interactions and feedbacks between climate change and biodiversity, ecosystem functions and services. The vulnerability of biodiversity and ecosystems functions and services to climate change should be investigated and modelled across a range of European (including other European territories) climatic and ecological regions; this includes human activities with relevance to climate change. They **should account for social, ecological and economic aspects and climate change relevant stressors and sources of uncertainty.** These should include tipping points and safe operating spaces. The role of nature-based solutions in enhancing the efficiency and effectiveness of climate change adaptation and mitigation strategies should be assessed and synergies with other pollution-reducing environmental policies be explored. Work should build, as appropriate, on existing knowledge and activities such as relevant FP7/Horizon 2020 projects, European climate adaptation platforms and Copernicus Services, in particular on climate change, land monitoring and marine environmental monitoring, and contribute to long-term monitoring initiatives.
Projects should envisage resources for clustering with projects funded under the same topic and with ongoing and future projects funded under other relevant topics within Societal Challenge 5 and other parts of Horizon 2020.
In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged, in particular with CELAC 21 countries.
The Commission considers that proposals requesting a contribution from the EU in the range of EUR 5 million 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 project results are expected to contribute to:
- more effective, integrated and evidence-based biodiversity conservation strategies and ecosystem management in the face of climate change;
- pushing the EU to the forefront in climate-change predictive capacity through models better accounting for the interactions and feedbacks between biodiversity, ecosystems and the climate system;
- more effective ecosystem-based adaptation and mitigation, through evidence-based design and implementation of systemic nature-based solutions ;
- enhanced ecosystem integrity, functionality, resilience and delivery of services;
- increased investment in nature-based solutions, and ecosystem conservation, restoration and management, to support climate change adaptation and mitigation strategies;
- underpinning the EU Nature Directives, EU Biodiversity Strategy, 7th Environment Action Programme, and the EU Strategy on adaptation to climate change;
- informing major international scientific assessments such as the IPCC reports and the IPBES;
- the protection, restoration and enhancement of natural capital in line with the work of the Convention on Biological Diversity (CBD), the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES), the Intergovernmental Panel on Climate Change (IPCC) and further relevant global processes and organisations.

Type of action	Research and Innovation action
Deadline	**1st stage - 19 February 2019** **2st stage - 04 September 2019**
Call identifier	H2020-LC-CLA-2018-2019-2020
Topic information	Link

LC-CLA-07-2019: The changing cryosphere: uncertainties, risks and opportunities

Specific Challenge
Globally, glaciers and the large ice sheets of Antarctica and Greenland are particularly vulnerable to climate change, risking a significant future contribution to changes in sea levels. At present, there are significant uncertainties, e.g. relating to their stability, which prevent an accurate assessment of their vulnerability. The 'Arctic amplification' of global warming is putting pressure on the ecosystems and communities of the region and having an impact at global level as well. The Arctic's fragile natural ecosystems and societies are under serious threat, and additional human activities, linked to the new economic opportunities that are made possible by climate change, are putting additional pressure on them.

Scope
Actions should aim at developing innovative approaches to address only one of the following sub-topics:
b) Changes in Arctic biodiversity (Research and Innovation action): Actions should identify and analyse major drivers and implications of changing biodiversity in the Arctic, such as the role of invasive species, and how vulnerable land and/or marine ecosystems are with respect to combined human and natural influences. **Actions should assess the ecosystems' responses to both external and internal factors and how these responses are impacting on indigenous populations and local communities at socio-economic level.** Actions should also identify adaptation strategies in relation to the changes in Arctic ecosystems.
The participation of social sciences and humanities disciplines is important for addressing the complex challenges of this topic.
The Commission considers that proposals requesting a contribution from the EU in the range of EUR 5 to EUR 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.
c) Sustainable opportunities in a changing Arctic (Research and Innovation action): **Actions should assess the viability of new economic activities** – such as resource exploitation, shipping and tourism **– and their ecological and socio-economic impacts and feedbacks at various scales,** and their impact on the provision of ecosystem services. **Actions should investigate key processes with high societal and economic impacts and provide appropriate, solution-oriented adaptation and mitigation responses, as well as capacity building for sustainable livelihoods while considering – in a co-design approach – the needs, priorities and perspectives of indigenous populations, local communities and economic actors operating in the region.**
The participation of social sciences and humanities disciplines is essential for addressing the complex challenges of this topic.
The Commission considers that proposals requesting a contribution from the EU in the range of EUR 5 to EUR 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.
d) Arctic standards (Coordination and Support action): **The action should propose guidelines and protocols to develop 'Arctic standards', also including the legal framework,** based on the translation of research outcomes into cold-climate technologies and services with commercial potential and the assessment of the sustainability of associated processes and technologies. **The action should cover a wide range of technologies and services that have the potential to bring broad social and economic benefits** within and beyond the Arctic region. The action should also provide requirements on how to design, build, install, and operate equipment and services to safely perform activities in the Arctic and to respond to emergencies.
The participation of standardisation organisations is encouraged.
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.

For all of the above sub-topics, 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 first Arctic Science Ministerial of 28 September 2016.

Expected Impact
For projects addressing parts a), b) or c), the project results are expected to contribute to:

- the implementation of the new integrated EU policy for the Arctic;
- the IPCC assessments and other major regional and global initiatives;
- enhanced engagement of and the interaction with residents from local communities and indigenous societies.

For projects addressing part d), the project results are expected to contribute to:

- enhanced stakeholder capability to operate in cold climate environments;
- better servicing of the economic sectors that operate in the Arctic (e.g. shipping, tourism);
- promoting sustainable Arctic opportunities arising from climate change and supporting the leverage of regional (EU) funds into these opportunities;
- supporting the competitiveness of European industry, particularly SMEs, engaging in sustainable development of the Arctic.

Call – Building a low-carbon, climate resilient future: climate action in support of the Paris

Type of action	Research and Innovation action, Coordination and support action,
Deadline	**RIA - 1st stage - 19 February 2019** **2st stage - 04 September 2019** **CSA - 19 February 2019**
Call identifier	H2020-LC-CLA-2018-2019-2020
Topic information	Link

CE-SC5-04-2019: Building a water-smart economy and society

Specific Challenge
There is a growing demand for water from various economic activities and increasing stress on natural water sources. To secure water for our society, there is therefore a need to make available alternative water resources of various qualities and which are appropriate for different functions and multiple users, and to better exploit water resources and all the valuable substances that could be obtained through the wastewater treatment and reuse process. However, innovations in this domain remain fragmented and/or only experimented at small scales; testing and deployment in operational environments and at scales suitable for encouraging wider uptake is still missing.

Scope
Actions should demonstrate the feasibility of a 'water smart' economy and society in which all available water resources, including surface, groundwater, waste water, and process water, are managed in such a way as to avoid water scarcity and pollution, increase resilience to climate change, appropriately manage water-related risks, and ensure that all valuable substances that could be obtained from waste water treatment processes, or are embedded in used water streams, are recovered.
Actions should address only one of the following sub-topics:
a) **Symbiosis between industry and water utilities**: Actions should demonstrate resource-efficient solutions derived from the systemic exploitation of symbiotic inter-linkages between wastewater treatment in industry and by water utilities. These might address, for instance, the reuse of treated wastewater, the use of substances or energy derived from wastewater treatment, or might demonstrate the concept of dynamic allocation of the right quality of water for the right purpose, while ensuring health and safety**. Innovative solutions do not need to be only technological, but may also encompass other types of innovation such as innovative governance and stakeholder engagement or business models in industrial environments.**
b) **Large scale applications with multiple water users at various relevant scales**: Actions should test and demonstrate systemic innovation in real life, large scale operational environments. Actions should address multiple water users (urban, industrial, rural and agricultural) and various relevant scales (regional/national/international) for:

- stimulating efficient and multiple use, recycling and reuse of water; recovery of energy and materials (such as nutrients, minerals, chemicals and metals) from water;
- managing water demand and efficient allocation;
- exploiting alternative water sources;
- prevention of water pollution and degradation of the aquatic environment and soil; and
- cost-effective and smart management of the water system and infrastructure.

As far as possible, the innovative solutions should include all of the above-mentioned activities. **Actions should also consider: new marketing and financing concepts and strategies to maximise the multiple values of water and increase the attractiveness of the water sector for investors; new governance approaches and decision-making instruments for water managers**; water systems vulnerability approaches and other sustainability assessments (e.g. footprint, Life Cycle Assessment).
The participation of social sciences and humanities, also addressing the gender dimension, is considered crucial to properly address the complex challenges of this topic, especially those related to human behaviour and attitudes towards water, the inter-linkages between policy and implementation, and acceptance of the solutions developed by both the public and other water users.

For both sub-topics, deployment of enabling digital solutions for the monitoring, control and optimisation of data and processes is also encouraged. **Where appropriate, related regulatory and institutional barriers which prevent the wide application of developed innovative solutions should be addressed**. Where technological innovation is concerned, TRL 5-7 should be achieved. **To assure applicability and wide deployment of the innovative water technologies in different conditions (including different water resources, economic, social and regulatory settings) involvement of market take-up partners and/or end users** from a wide range of different European regions is strongly encouraged, as well as SME participation.
The Commission considers that proposals requesting a contribution from the EU of between EUR 10 million and 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:

- significantly reduced use of water from freshwater sources;
- improved recovery and use of resources (materials and water itself), including energy;
- mobilisation of water-related investments and synergies with other funding instruments.
- the creation of new business opportunities and increased competiveness of EU industries;
- supporting, as appropriate, the implementation of EU water policies, the transition to a more circular economy at different scales and economic and social conditions, water security, water use efficiency, enhanced resilience to climate change and achievement of the relevant Sustainable Development Goals;
- the implementation of the objectives of the EIP Water and, where appropriate, supporting the implementation and evaluation of technology verification schemes, including the EU Environmental Technology Verification Pilot (ETV) programme.

Call – Greening the economy in line with the SDGs

Type of action	Innovation action
Deadline	**1st stage - 19 February 2019** **2nd stage - 04 September 2019**
Call identifier	H2020-SC5-2018-2019-2020
Topic information	Link

SC5-13-2018-2019: Strengthening international cooperation on sustainable urbanisation: nature-based solutions for restoration and rehabilitation of urban ecosystems

Specific Challenge
Unsustainable, non-resilient urbanisation patterns, the expansion or neglect of urban areas have caused the fragmentation, depletion and destruction of habitats, biodiversity loss and the degradation of ecosystems and their services. Increasing connectivity between existing, modified and new ecosystems and restoring and rehabilitating them within cities and at the urban-rural interface through nature-based solutions, is necessary to enhance ecosystem resilience and adaptive capacity to cope with the effects of climate and global changes and to enable ecosystems to deliver their services for more liveable, healthier and resilient cities.

Scope
Actions should develop models, tools, decision support systems, methodologies, strategies, guidelines, standards and approaches for the design, construction, deployment and monitoring of nature-based solutions and restoration, prevention of further degradation, rehabilitation and maintenance measures for urban and peri-urban ecosystems and the ecological coherence and integrity of cities. Actions should review and capitalise upon existing experiences and good practices in Europe and (for option a) China or (for option b) CELAC. **The strategies and tools should be part of an integrated and ecologically coherent urban planning and city-making process** that would secure a fair and equitable distribution of benefits from the restored urban ecology and limit its exposure to environmental stresses. Methodologies, schemes and indicators should be developed to allow for the assessment of the cost-effectiveness of the restoration measures, also accounting for their possible negative effects. **They should account for the totality of the benefits** delivered by the restored ecosystems in terms of, for example, enhancing cities' climate-proofing and resilience, enhancing mitigation options, **improving** human health and **well-being, reducing inequalities** and reducing cities' environmental footprint. **Actions should also dedicate efforts to awareness raising, outreach activities and education of citizens, including school children about the benefits of nature for their social, economic and cultural well-being.**
Actions should bring together European and – depending on the option chosen – Chinese or CELAC research partners, government agencies and urban authorities, private sector and civil society with relevant expertise and competence and foster participatory engagement in urban ecological restoration actions. Further to the eligibility and admissibility conditions applicable to this topic, proposals are encouraged to ensure, to the extent possible, an appropriate balance in terms of effort and/or number of partners between the EU and the international partners, which would correspond to their respective ambition, objectives and envisaged work. This would enhance the impact of the actions and the mutual benefits for both the EU and the international partners.
In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged. Proposals should pay attention to the special call conditions for this topic.
The participation of social sciences and humanities disciplines, addressing also the gender dimension, is crucial to properly address this topic. Cooperation and synergies with the activities undertaken within the Covenant of Mayors initiative for Climate and Energy initiative (supported by the EC) should be sought where appropriate.
Actions should address only one of the following sub-topics:
a) Strengthening EU-China collaboration (2018)

b) Strengthening EU-CELAC collaboration (2019)
The possibility for participants from some CELAC countries to apply for funding under national co-funding mechanism should be explored.
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:

- restored and functioning urban ecosystems with an enhanced capacity to deliver their services;
- **making a business and investment case for nature-based solutions on the basis of increased evidence about the benefits from restored urban ecosystems with regards to urban liveability, climate change resilience, social inclusion, urban regeneration, public health and well-being;**
- **guidelines for cost effective urban ecosystem restoration and ecological rehabilitation measures and new planning approaches and methods**.

Call – Greening the economy in line with the SDGs

Type of action	Research and Innovation action
Deadline	**1st stage - 19 February 2019** **2nd stage - 04 September 2019**
Call identifier	H2020-SC5-2018-2019-2020
Topic information	Link

SC5-14-2019: Visionary and integrated solutions to improve well-being and health in cities

Specific Challenge

It is estimated that by 2050 up to 70% of the world's population will be living in urban areas. **Urbanisation affects human health and well-being through factors such as exposure to pollutants, including noise, disasters, stressors and diseases, urban density, lack of physical activity, degraded ecosystems and erosion of natural capital, which can be exacerbated by climate change.** As acknowledge by the Habitat III New Urban Agenda, **public spaces** play a crucial role in urban interaction and systemic urban innovation and they **need to be designed and managed sustainably and equitably to ensure that the way citizens produce, consume, commute and interact within the urban fabric has a positive impact on their health and quality of life,** enhances resilience to disasters and climate change and reduces the environmental footprint of the cities. **The systemic integration of social, cultural, digital and nature-based innovation in the design, development and governance of public space** has a tremendous potential to transform these spaces into diverse, accessible, safe, inclusive and high quality green areas that increase well-being and health and deliver a fair and equitable distribution of the associated benefits.

Scope

Actions should deliver visionary and integrated solutions (e.g. therapy gardens, urban living rooms, creative streets, city farms) **at the intersection of social, cultural, digital and nature-based innovation to increase citizens' health and well-being in cities**. **These solutions should address social, cultural, economic and environmental determinants of health and wellbeing** and support urban communities in reducing their exposure to climate-related risks, pollution (including noise), environmental stress and social tensions, including the negative effects of gentrification.

Actions should also demonstrate how the integration of these solutions into innovative land-use management, urban design and planning could reduce health-related environmental burdens in socially deprived neighbourhoods, foster equitable access for all to public spaces, enhance their quality and use and promote sustainable urban mobility patterns.

Actions should test new transition management approaches, governance models, legal frameworks and financing mechanisms to re-design public spaces and urban commons and assess their contribution to improving health and well-being. They should promote multi-stakeholder initiatives, citizens' engagement, co-creation and co-ownership of public spaces. **Optimal and cost-effective use of behavioural games**, networks of sensors, GIS-mapping, big data, observational programmes such as Copernicus and GEOSS, and citizens' observatories should be made as appropriate to enable the integration and visualisation of data for more effective monitoring of the transition towards healthier and happier cities.

The involvement of social sciences and humanities disciplines such as psychology, behavioural science, economics, law, anthropology, sociology, architecture, or design studies, is considered essential to enhance social learning and promote the role of social and cultural innovation in transforming public spaces, with particular attention devoted to gender dynamics and diversity.

To enhance the impact and promote upscaling and replication of these solutions, projects should engage in substantial networking and training actions to disseminate their experience, knowledge and deployment practices to other cities beyond the consortium. To enhance impact cooperation and synergies with the activities undertaken within the Global Covenant of Mayors for Climate and Energy initiative and its regional components (supported by the EC) should be sought where appropriate.

Furthermore, actions should envisage resources for clustering with other ongoing and future projects on sustainable cities through nature-based solutions funded under the 'Smart and Sustainable Cities' call in part 17 of the 2016-2017 Work Programme as well as relevant projects to be funded under topics SC5-20-2019 and CE-SC5-03-2018 of this Work Programme. Cooperation with relevant actions funded under the Horizon 2020 Societal challenge 6 topic 'TRANSFORMATIONS-03-2018-2019: Innovative solutions for inclusive and sustainable urban environments' should also be sought as appropriate.

Funded projects are expected to establish long-term sustainable data platforms securing open, consistent data about the impacts of the deployed approaches and ensure interoperability with other relevant data infrastructures for effective communication, public consultation, exchange of practices, and sharing of experiences.

Proposals should pay attention to the special call conditions for this topic.

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:

- **high quality, multifunctional, public spaces able to integrate digital, social, cultural and nature-based innovation to enhance health and well-being**, while ensuring 'the right to the city' as specified in the Habitat III New Urban Agenda;
- **European cities being world ambassadors of sustainable lifestyles, providing universal access to greener, safe, inclusive and accessible public spaces, also accounting for the gender dimension**;
- **participatory approaches in re-designing and transforming public spaces to increase health and well-being in cities** through innovative public-private-people partnerships (PPPPs);
- **more comprehensive assessment of the sustainability and resilience of cities through the development of health and well-being indicators**;
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- **establishing innovative monitoring systems to measure benefits and capture the multiple co-benefits created by nature-based solutions in terms of health and well-being**.

Type of action	Innovation action
Deadline	**1st stage - 19 February 2019** **2nd stage - 04 September 2019**
Call identifier	H2020-SC5-2018-2019-2020
Topic information	Link

SC5-20-2019: Transforming historic urban areas and/or cultural landscapes into hubs of entrepreneurship and social and cultural integration

Specific Challenge
Over the past decades, abandonment and decay of urban, industrial and rural heritage has occurred in many historic urban areas and cultural landscapes due to reduction of economic activities and closing down of industries. This has led to unemployment, disengagement and economic stagnation. Other areas, in contrast, have implemented regeneration processes, yet these have not always been successful as they were based on top-down decision making and implementation without engaging the local population. This has led to breaking up of traditional social structures, gentrification and overreliance on volatile sectors, such as tourism.
Thanks to their symbolic and cultural value, and to their specific urban fabric, **historic areas have the potential to be transformed into hubs of entrepreneurship, creativity, innovation, new lifestyles, and social and cultural integration reaping the opportunities offered by**, for instance**, emerging creative sectors, digital technologies, the sharing and 'maker' economy, and social innovation. Evidence-based intelligent leveraging of the value of historic and cultural assets can transform challenges into economic, social and cultural opportunities, while fully respecting the identity of the historic urban areas and cultural landscapes.**

Scope
Actions should develop, demonstrate and document strategies, approaches and solutions to re-activate and re-generate historic urban areas and/or cultural landscapes. They should foster innovation by relevant start-ups, cultural and creative industries, including from the digital technologies sector, small scale advanced manufacturing producers and local 'makers', craft workshops, etc. for adaptive re-use and leverage of heritage assets and social integration. Solutions should be co-created, co-managed and co-implemented at the appropriate scale (e.g. for districts, buildings, public spaces etc.) within the broader context of urban and regional development, and involving local populations, research centres, appropriate authorities, innovators, universities, city-makers movements and, where relevant, new population groups. Systemic approaches and methodologies to identify the latent capacities of historic urban areas and to activate them may be developed. **They should assess cultural and heritage values, respect the identity of the places and promote social innovation, also accounting for the gender dimension, economic sustainability, inclusiveness, social cohesion and integration in the long term. Innovation in its various forms (e.g. regulatory, governance, business, finance) should be considered.** Synergies with other ongoing relevant projects, such as the European Creative Hubs Network, should be sought where appropriate.
Proposals should pay attention to the special call conditions for this topic.
Actions should envisage resources for clustering with other ongoing and future projects relevant to cultural heritage funded under previous, current and future Horizon 2020 calls within Societal Challenge 5 as well as with relevant projects to be funded under topics CESC5-03-2018 and SC5-14-2019.
The Commission considers that proposals requesting a contribution from the EU of between EUR 7 million and EUR 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:

- reversing trends of abandonment and neglect of historic heritage in urban areas and landscapes;
- new and tested blueprints for the socially and economically viable regeneration of European historic urban areas and cultural landscapes, with enhanced well-being and quality of life, social cohesion and integration;
- boosting heritage and culture-relevant innovation, creativity, entrepreneurship and light 'reindustrialisation' of historic urban areas and cultural landscapes;
- cross-sector collaboration, creation of job opportunities and skills in cultural and creative sectors and innovative manufacturing linked to historic heritage.

Type of action	Innovation action
Deadline	**1st stage - 19 February 2019** **2nd stage - 04 September 2019**
Call identifier	H2020-SC5-2018-2019-2020
Topic information	Link

Topics with minor SSH relevance

CE-SC5-08-2018-2019-2020: Raw materials policy support actions for the circular economy
Link

Societal challenge 6

Europe in a changing world: Inclusive, Innovative and Reflective Societies

Net 4 Society

Dedicated Topic

MIGRATION-01-2019: Understanding migration mobility patterns: elaborating mid and long-term migration scenarios

Specific Challenge
Global migration is growing in scope, complexity and diversity, which requires better preparedness and responses. A deeper understanding of the drivers of migration and of their interrelation with people's propensity to migrate is needed as well as projections and scenarios that are essential for appropriate planning and effective policymaking.

Scope
Patterns, motivations and modalities of migration should be explored, with a focus on new geographies and temporalities. This may include among others the changing nature of flows and factors such as international demand for and supply of labour, sector policies in countries of origin and destination, aging population in industrialised countries, demographic trends in countries of origin, migration propensity, transnational networks, the impact of corruption, shifting representations of Europe, temporary migration and return (both voluntary and forced) and forced movements linked to conflicts, environment-related threats, other relevant geopolitical factors, international development and regional policies, as well as livelihood opportunities (e.g. inequalities, income levels, poor job opportunities, working conditions, traditional gender roles). The movement of third country nationals among the various regions of the EU should also be analysed. Proposals should capture population estimates and synthesise solid data on gross international migration flows, including towards Europe, in order to identify emerging trends and anticipate future patterns. Proposals should address the gender dimension of international migration and large-scale movements of migrants, including minors unaccompanied and with their families. Proposals should also reappraise assumptions about migration and identify key uncertainties. The involvement of refugee and migrant scholars and scientists from relevant backgrounds and disciplines is strongly encouraged.
The Commission considers that proposals requesting a contribution from the EU in the 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

Expected Impact
The action will enhance the knowledge base on migration-related flows, drivers, attitudes and behaviours in qualitative and quantitative terms. Scenarios and projections will inform evidence-based governance and regulatory frameworks at international and EU levels as well as relevant sector policies in EU Member States, e.g. social, health, education and labour market related policies and the impact on welfare policies and public social security systems. The action will also improve statistical data and methods in cooperation with national statistical institutes, relevant organisations and Eurostat.

Type of action	Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-MIGRATION-2018-2019-2020
Topic information	Link

Dedicated Topic

MIGRATION-03-2019: Social and economic effects of migration in Europe and integration policies

Specific Challenge
A greater understanding of the social and economic effects and impacts of migration in Europe is needed in order to obtain an objective overview of developments and to address misperceptions. In light of recent and current migratory flows, an assessment of integration policies and efforts is equally important for ensuring their effectiveness in promoting the integration and inclusion of migrants in host societies.

Scope
Proposals should take stock of the long-term effects of migration at EU aggregate and cross-national level on economic growth and productivity, employment levels and wages, entrepreneurship, and fiscal and welfare impacts. They should analyse policies related to the integration of migrants, including refugees. Particular attention should be paid to gender and vulnerable groups such as unaccompanied children and stateless persons. Attention should be also paid to economic, human capital and cultural factors in relation to the integration outcomes of different groups of migrants and the social impact of segregation. Furthermore, proposals should analyse the local and interactional dimension of integration processes and their effects on the provision of local services, workplace conditions, productivity and innovation. They should comparatively examine integration policies (labour market, education, health, civil rights, social welfare, housing, family policies, etc.), and the role of transnational institutions and networks in shaping integration at a local scale. In addition, they should estimate the efficiency, effectiveness and social impact of such policies and highlight best practices and relevant benchmarks, building on the extensive knowledge that already exists in the EU. Finally, an understanding of past and historical experiences of integrating migrant communities, and what these can tell us about current challenges, should also be assessed. Interdisciplinary research with combined insights from disciplines such as sociology, economics, history, anthropology, cultural studies and psychology among others is needed.
The Commission considers that proposals requesting a contribution from the EU in the 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.

Expected impact
The action will improve the knowledge base on the socio-economic effects of migration. It will provide solutions and recommendations for strengthening the effectiveness of policies targeting the integration of migrants. It will also contribute to building comprehensive strategies for integration across EU Member states, conducive to socially inclusive economic growth.

Type of action	Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-MIGRATION-2018-2019-2020
Topic information	Link

DT-MIGRATION-06-2018-2019: Addressing the challenge of migrant integration through ICT-enabled solutions

Specific Challenge
The integration of migrants, including refugees, in many Member States of the European Union and Associated Countries remains a challenge for both public authorities and local communities. ICT-enabled solutions and toolkits for the implementation of inclusion policies by public administrations may facilitate the management of the integration of migrants, improve autonomy and inclusion and therefore the lives of migrants. Such tools may help alleviate the tasks of public administrations and local authorities. They may also analyse available data and provide migrants with information on and easy access to relevant public services specific to their needs or support policy-makers and public administration at all levels in planning and taking decisions on migration-related issues through data analytics and simulation tools. **The specific cultural features, including possible gender differences, the skills and capacities of migrants to express their needs as well as the equity of access to ICT may be considered in this regard.**

Scope
An efficient management of migrant integration requires clear understanding of migrants' personal and family situation, including their legal status, origin, cultural background, skills, language skills, medical records, etc. Once such information is available to public authorities, it can improve societal outcomes to the benefit of both host countries and migrants:

1. the management of migrant integration can be facilitated, e.g. by matching their skills with those needed in the Member States and Associated Countries, by designing tailored training programmes or by creating specific decision support tools;
2. better and customised services can be delivered to match the needs of migrants;
3. more efficient integration strategies can be defined and implemented at local level for a sustainable inclusion of migrants and a fact-based public perception of migration.

Proposals should address at least one of the 3 points above, which should be piloted against a set of clearly defined goals. Processing of personal data of migrants must be conducted in accordance with EU applicable data protection legislation (Directive 95/46/EC which will be replaced as of 25 May 2018 by the GDPR) and existing regulation such as eIDAS. **Proposals should engage all actors and consider the potential for co-creation work with migrant in the design and delivery of services**. In addition, proposals should demonstrate the reusability or scalability at European level and should develop strong and realistic business plans to ensure the long-term sustainability as well as take up of the results by the identified users. **They should also engage multi-disciplinary and multi-sectoral teams** to explore the complexity of this challenge, to identify the necessary changes, and the risks and barriers to their implementation, including cultural questions.
The Commission considers that proposals requesting a contribution from the EU of between EUR 3 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
New or enhanced ICT solutions and tools will facilitate the efforts of public administrations at EU, national and local levels to manage the integration of migrants. They will allow for developing and deploying the necessary processes and services in the view of the efficient identification and inclusion of migrants. They will also facilitate communication with migrants and their access to services such as community language teaching, education, training, employment, welfare and healthcare systems within the host communities.

Type of action	Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-MIGRATION-2018-2019-2020
Topic information	Link

Dedicated Topic

MIGRATION-07-2019: International protection of refugees in a comparative perspective

Specific Challenge
While policy areas such as development or trade benefit from global governance structures, a global refugee governance regime is still in its infancy. The challenge is to safeguard international law standards on the treatment of asylum seekers and internally displaced persons, address imbalances in sharing responsibilities, and ensure the EU plays a key role globally while also aligning the reform of its common asylum system to feed into the emerging regime of global asylum governance.

Scope
Proposals should examine the processes and content of the emerging international protection system, e.g. following the United Nations commitment for the adoption of a global asylum compact as well as its implementation in comparative perspective, with special focus on the EU's role and engagement. They should examine how sharing responsibilities, transferring skills and capabilities, can be organised as well as the compatibility of the emerging global asylum regime with international law, including international conventions on refugees and human rights. The EU arrangements with refugees' origin and transit countries should be assessed. Proposals should advise on the future development of asylum policies and their implementation both globally and within the EU, also addressing issues around both gender issues and equality. They should include comparative assessment of existing legal responses to protection needs and explore future options and their compatibility with international refugee law, with a view to also identifying durable solutions. Particular attention should be paid to the protection of vulnerable groups such as minors, unaccompanied or with their families, including from all forms of abuse and exploitation, and women and girls from gender-based violence and discrimination. International cooperation is encouraged, in particular with Canada, Brazil, South Africa and Jordan, as well as relevant international organisations. Furthermore, the involvement of refugee and migrant scientists and scholars from relevant disciplines is strongly encouraged.

The Commission considers that proposals requesting a contribution from the EU in the 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

Expected Impact
The action will significantly advance the knowledge base on global migration and asylum governance by evaluating the process, discourses and outcomes of the planned compact on refugees. The action will assist European policymakers with identifying suitable strategies for engagement in the process leading to the implementation of the global refugee compact. They will also inform the EU's reform process of its common asylum system.

Type of action	Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-MIGRATION-2018-2019-2020
Topic information	Link

DT-TRANSFORMATIONS-02-2018-2019-2020: Transformative impact of disruptive technologies in public services

Specific Challenge
The challenge is to assess the potential benefits and risks of using disruptive technologies in public administrations as well as the social impact, including the impact on public servants, of using them for government processes and governance (e.g. for registers, for archiving, for tax collection, for decision-making processes, etc.). In addition, **the political, socioeconomic, legal and cultural implications of disruptive technologies and their acceptance are important** not only for public administrations, but also for citizens.

Scope
The use of disruptive technologies (such as block-chain, big data analytics, Internet of Things, virtual reality, augmented reality, artificial intelligence, algorithmic techniques, simulations and gamification) in public administrations, public goods, public governance, public engagement, public-private partnerships, public third sector partnerships and policy impact assessment is growing and can be very beneficial. Yet, the real potential impact of such technologies and the ways in which they can disrupt the existing landscape of public services and legal procedures and can replace present solutions and processes are largely unknown. As a result, deploying these disruptive technologies in public administration requires a thorough assessment of their potential impact, benefits and risks for the delivery of public goods. **Proposals should pilot the technology and should engage multidisciplinary partners, stakeholders and users to examine how emerging technologies can impact the public sector** (including the impact on public servants and the relation between public services and citizens) and explore in a wide-ranging fashion the issues surrounding the use of these technologies in the public sector.
Proposals should also lead to the development of business plans that would ensure the longterm sustainability of the services offered based on the used technology.
The Commission considers that proposals requesting a contribution from the EU of between EUR 3 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
The action will enable public authorities to develop pathways for the introduction of disruptive technologies while also addressing the societal challenges raised by such technologies. **Based on a thorough understanding of users' needs**, the action will enhance knowledge on digital democracy; develop new ways of providing public services, of ensuring public governance and of boosting public engagement with the help of disruptive technologies. It will also contribute to developing new practices, to optimising work processes and to integrating evidence-based decision-making processes in public services and in services such as health, education, social welfare and mobility.

Type of action	Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-TRANSFORMATIONS-2018-2019-2020
Topic information	Link

Call – Socioeconomic and cultural transformations in the context of the fourth industrial revolution

TRANSFORMATIONS-03-2018-2019: Innovative solutions for inclusive and sustainable urban environments

Specific Challenge
The increasing percentage of people living in urban areas and the impact of digital technologies on public services make good governance, inclusive policies, smart planning and social and environmental sustainability ever more important for ensuring the quality of human life. Urban environments and agglomeration effects provide an ecosystem for economic growth and innovation. While the impact of the recent financial crisis on European urban areas is by no means uniform, it has led in many instances to rising socio-economic inequalities that are affecting social cohesion and resilience. **The challenge is to identify the main drivers of inequalities in different urban and peri-urban contexts** and to identify best practices and initiatives, including digital solutions and alternative participatory growth models, with potential for upscaling that can promote upward social mobility, social inclusion and cohesion, resilience and sustainable development.

Scope
b) Research and Innovation action (2019)
Proposals should assess the scale, dimensions and drivers of socio-economic inequalities in urban and peri-urban settings across different city typologies, across Europe and across demographic diversities, paying particular attention to gender differences. **They should assess the effectiveness at local level of relevant policies, strategies, planning practices and other interventions aimed at promoting social inclusion, cohesion and resilience in urban environments,** including new and participatory models of growth that foster sustainable and equitable prosperity. Findings should be communicated also in the form of clearly formulated policy recommendations.
The Commission considers that proposals requesting a contribution from the EU in the 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.

Expected Impact
By linking research, innovation and policy, the action will support urban strategies, policies and planning practices to promote equitable, inclusive and sustainable growth, including the uptake of new, participatory and alternative growth models. It will contribute to the advancement of the EU Urban Agenda and the Sustainable Development Goal dedicated to making cities inclusive, safe, resilient and sustainable. It will also inform the continuous development and implementation of Smart Specialisation as well as the urban dimension of cohesion policy.

Type of action	Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-TRANSFORMATIONS-2018-2019-2020
Topic information	Link

TRANSFORMATIONS-04-2019-2020: Innovative approaches to urban and regional development through cultural tourism

Specific Challenge
The various forms of cultural tourism in Europe are important drivers of growth, jobs and economic development of European regions and urban areas. They also contribute, by driving intercultural understanding and social development in Europe through discovering various types of cultural heritage, to the understanding of other peoples' identities and values. However, although cultural tourism by its nature invites cross border regional and local cooperation, its full innovation potential in this respect is not yet fully explored and exploited. The level of development of cultural tourism between certain regions and sites is still unbalanced, with deprived remote, peripheral or deindustrialised areas lagging behind whereas high demand areas being overexploited in an unsustainable manner. There is also a significant knowledge gap in terms of availability of both quantitative and qualitative data on the phenomenon of cultural heritage tourism and on understanding its contribution towards cultural Europeanisation and economic and social development in Europe.

Scope
a) Research and Innovation action (2019)
Proposals should comparatively assess how the presence, development, decline or absence of cultural tourism has affected the development of European regions and urban areas. **They should investigate motives for cultural tourism and assess the effectiveness and sustainability of multilevel strategies, policies, trends and practices** in attracting, managing and diversifying cultural tourism in Europe in view of identifying best practices that should be communicated to policymakers and practitioners. This should include considerations of specific strategies to promote cultural tourism at a regional, national and European level, including use of structural investment funds where appropriate. Minority cultures and regions as well as urban areas currently less attractive to cultural tourism should receive special attention. **Historical perspectives, as well as comparison with lessons learned at international level on the emergence of particular forms of cultural tourism or reasons for cultural tourism in particular areas should also be investigated.** Innovative methods and techniques, including statistical tools and indicators, for measuring and assessing various practices and impacts of cultural tourism should be developed and tested. Proposals should also deploy place-based and participatory approaches to investigate the relation between intra-European cultural tourism and Europeanisation and whether it impacts identities and belonging.
The Commission considers that proposals requesting a contribution from the EU in the 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.
b) Innovation action (2020)

Expected Impact
The action will improve policies and practices on cultural tourism at various levels. It will also provide strategic guidance at European level concerning the efficient use of European Structural Investment Funds. In addition, it will contribute to the establishment of partnerships between public and private stakeholders in this area. Creation of innovative quantitative/statistical as well as qualitative tools and methods will improve available data on and understanding of the impact of cultural tourism on European economic and social development and on cultural Europeanisation.

Type of action	Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-TRANSFORMATIONS-2018-2019-2020
Topic information	Link

DT-TRANSFORMATIONS-07-2019: The impact of technological transformations on children and youth

Specific Challenge

The ICT are generally valued in terms of skill development, learning and future employability of young generations. Educational and training institutions are getting equipped with ICT tools and educators are trained for designing activities aimed at digital literacy and for making use of media for educational purposes. The time children and young people spend on ICT has been increasing in school, at home and for leisure. However, research on the impact of ICT on health, lifestyles, wellbeing, safety and security has identified potential threats. Moreover, the quantity and quality of digital media use vary accordingly to family backgrounds, with the risk of widening the educational divide between children from favoured and disadvantaged groups. **The challenge is to develop a solid and independent multidisciplinary and longitudinal knowledge base in relation to the 0 to 18 years old age group that explains under which conditions harmful versus beneficial effects occur so that effective social, educational, health and online safety policies, practices and market regulation can be developed.**

Scope

a) Research and Innovation action

Proposals should assess the online behaviour of children and young people as well as their use of digital content and devices by socio-economic, gender and age group, with attention to motivations for using ICT at home, for leisure and in schools or training institutions. **Robust methodologies for measuring and explaining long-term impacts in areas such as skills and competencies** (i.e. digital and media literacy, innovation and creativity, learning and socioemotional competencies and more specific labour market relevant skills), **wellbeing and (mental) health or other relevant aspects of brain development should be developed and tested across EU level.** Methodologies should focus on understanding why and how some children and adolescents benefit from ICT use while others seem to be impacted negatively. Evidencebased models identifying and analysing at-risk groups can be developed. **Proposals should take into account diversity as appropriate (age, cultural, social and economic background, gender etc.) and address the impact of ICT use on education inequalities**. (Lack of) equity of access to ICT across social groups should also be considered. Children and young people should be active collaborators in the project.

The Commission considers that proposals requesting a contribution from the EU in the 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.

b) Coordination and Support action

This coordination and support action should aim at the establishment of a Pan-European platform to co-ordinate research activities in the EU Member States and Associated Countries with the purpose of developing a knowledge base, and filling current gaps, into **how children and young people behave and interact online as well as the risks they may encounter while online**. **Proposals should pay particular attention to the vulnerability of children and young people in the digital environment and propose solutions for building online resilience, while also taking cultural and gender-related issues into accoun**t. Through the proposed platform, **researchers across different countries, disciplines and approaches should share existing knowledge, fill research gaps, build capacity and work towards a consensual framework for future work.** Based on the evidence base, policy recommendations should be developed on how to best protect and ensure positive online experiences for children and young people. In addition, emerging issues such as the rise of hate speech and radicalisation should be addressed.

The Commission considers that proposals requesting a contribution from the EU in the order 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

Explanatory models will inform relevant stakeholders and practitioners on the long-term effects of ICT on child development and on practices that maximise risks (risk factors), minimise risks (resilience factors) and maximise benefits (enhancing factors). The action will contribute to better regulation (e.g. labelling, evaluation of ICT educational tools, protection of online users) and to a safer and more beneficial use of digital technologies at home, for leisure and in educational settings by children and young people. It will formulate recommendations in support of national and European policies in the field. The action will enhance cooperation between schools and families (school-community partnership) in ensuring safe and productive ways of using ICTs. It will also improve statistical data, generate innovative quantitative and qualitative methods as needed, and expand the knowledge base on in-depth case studies.

Type of action	Coordination and Support action; Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-TRANSFORMATIONS-2018-2019-2020
Topic information	Link

Call – Socioeconomic and cultural transformations in the context of the fourth industrial revolution

TRANSFORMATIONS-08-2019: The societal value of culture and the impact of cultural policies in Europe

Specific Challenge

Culture has been an important element of public policy for social, cultural and political cohesion and inclusion throughout European history, and its potential could be significantly enhanced. Although it is often seen today from the angle of economic value added, culture generates additional societal value in terms of well-being and by promoting identity and belonging, inclusiveness, tolerance and cohesion. Culture is also a source of creativity and innovation. **The challenge is to develop new perspectives and improved methodologies for capturing the wider societal value of culture, including but also beyond its economic impact**. **Improved cultural value measurements and case studies also need to be developed in support of effective and inclusive policies and institutional frameworks that offer a convincing vision for citizens to cope with current cultural and societal transformations.** In order to contextualise the debate on the societal value of culture, part of the challenge is to comparatively study the visions that underlie cultural policies as held by policy-makers and as embedded in institutions responsible for designing and implementing these policies at European, national and local levels.

Scope

Proposals should assess and develop appropriate methodologies and perform comparative qualitative, participative and statistical analyses at national and EU level **to map the various forms of cultural engagement, assess the role of cultural participation as a source of wellbeing, and identify the benefits of cultural engagement across population segments. The historical role of culture in integrating and dividing Europe should be addressed with a view to learning more about the specific conditions in which cultural integration occurs. The nature and degree of the contributions stemming from cultural engagement to intercultural dialogue, cultural identity and community building should also be assessed.** On the basis of innovative approaches and a representative geographic coverage of different parts of Europe, **proposals should explain how cultural values are constructed in the age of social media, internet and television across different socio-economic groups. They should also investigate how urbanisation, spatial and social segregation, gender and rising diversity in European societies influence the formation of cultural values**. In addition**, proposals should assess the goals, strategies and effectiveness of cultural policies and institutions in evoking, transferring and maintaining cultural value, as well as addressing issues such as diversity and inclusion.**

The Commission considers that proposals requesting a contribution from the EU in the 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.

Expected Impact

The action will provide new methodologies for capturing the societal value of culture in contemporary societies. It will improve statistical data and methods for capturing cultural impacts in cooperation, when appropriate, with national statistical institutes, relevant international organisations, networks, research infrastructures and Eurostat. It will also equip policymakers with effective tools for measuring, understanding and enhancing the impact of cultural policies. Participatory and co-creation approaches involving a wide range of stakeholders will contribute to innovative scientific and policy results.

Type of action	Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-TRANSFORMATIONS-2018-2019-2020
Topic information	Link

Call – Socioeconomic and cultural transformations in the context of the fourth industrial revolution

TRANSFORMATIONS-16-2019: Social platform on the impact assessment and the quality of interventions in European historical environment and cultural heritage sites

Specific Challenge
The way cultural heritage is preserved and enhanced is a major factor defining Europe's identity and its place in the world. Jobs are created by the conservation, management and promotion of cultural heritage and these activities contribute to sustainable growth and social cohesion. High quality interventions in cultural heritage and cultural landscapes contribute to local communities' well-being and to the development of sustainable cultural tourism. On the other hand, examples of low-quality interventions in the historical environment and cultural heritage sites give rise to complaints from experts and citizens.
Low-quality interventions may even damage irreplaceable historical elements, their environment and related intangible heritage, identities and social practices. Cases where EU funds (e.g. structural funds) are used for such low-quality interventions may have a negative impact on citizens' perception of the actions supported by the EU. The European Parliament has urged the Commission to "include in the guidelines governing the next generation of structural funds for cultural heritage a compulsory quality control system".
A factor hampering the positive outcomes of interventions and the effectiveness of the EU support actions is the lack of a common understanding of the requirements for the quality of restoration and also of all other interventions in the historical environment and cultural heritage sites at European level. Lack of shared standards for the holistic impact assessment – regulated by the Environmental Impact Assessment and the Strategic Environmental Assessment Directives – of these interventions also plays its role in this area.

Scope
The platform should bring together the research communities, heritage professionals, public and private actors and policy makers at local, regional, national and international levels concerned with the impact assessment and quality of interventions in historical environment and cultural heritage sites in Europe. Tangible and intangible heritage, cultural landscapes and seascapes, heritage memory preservation, cultural identities of groups, communities and minorities, legislation, guidelines and codes of ethics and governance should be considered.
The platform should map existing and emerging problems, practices and policy gaps relating to the impact assessment and the quality of interventions in historical environment and cultural heritage sites in Europe. It should overview past and ongoing research and collect, compare, analyse and promote best practices from Europe and beyond, thus becoming a major reference for transnational and interdisciplinary networking in this policy area. Education and awareness raising programmes for specialised communities and the public in general should be considered.
The Commission considers that proposals requesting a contribution from the EU of EUR 1.5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected impact
The action will facilitate the uptake and dissemination of best practices, thereby contributing to the development of strategic and integrated European and international policies and interventions. It will contribute to the coordination of a variety of stakeholders and will develop toolkits and recommendations for them. The platform will formulate recommendations and an action plan for future European action aiming towards harmonised impact assessment and intervention quality standards. It will also build a consensus on future needs and will support the EU in developing an innovative and focused research agenda on cultural heritage and on the quality of interventions in historical environment and cultural heritage sites in Europe.

Type of action	Coordination and Support action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-TRANSFORMATIONS-2018-2019-2020
Topic information	Link

Call – Socioeconomic and cultural transformations in the context of the fourth industrial revolution

TRANSFORMATIONS-17-2019: Societal challenges and the arts

Specific Challenge
The arts can shed new light on the past, hold up a mirror to contemporary life and initiate new perspectives for the future. They have the power to move us, educate us and question accepted narratives. They can also foster an exchange in which people encounter points of view radically different from their own. In the process, the arts can inspire personal belonging and mutual understanding. They can also foster civic engagement and social change, mobilising a variety of actors around a common agenda. As such, the arts can complement scientific and policy approaches.
While art has value in and of itself, the arts have also engaged directly with societal challenges such as inequalities, migration, climate and environmental change, social justice, conflict and violence. However, there is substantial fragmentation as artists and arts organisations sharing common concerns often do not interact or network across artistic genres or geographic locations. **Better multidisciplinary methods for capturing, assessing and harnessing the societal impact of the arts are still needed.** In addition, the potential of the arts and of artistic research to generate alternative or unconventional solutions to current and emerging societal challenges remains largely untapped.

Scope
Proposals should identify and study artistic productions that have generated new thinking, engagement and possibly action in relation to contemporary societal challenges as experienced in Europe. In doing so, they should capture and analyse motivations, philosophies, modes of engagement and impact from a comparative, geographically balanced and multidisciplinary perspective. They should identify and analyse projects and actions that have succeeded in mobilising members of our societies for a common cause, including sections of society which might otherwise remain remote from such initiatives, and identify their success factors as a basis for recommendations to policy makers. Particular attention should be paid to artistic productions, including participatory ones, which give voice to marginalised or disengaged groups and individuals. Community penetration and mechanisms of diffusion, including the role of digital technologies for providing access to the arts, should be studied as should barriers to engagement. **The relationship between art and democracy and between art and individual or community resilience should be addressed. Proposals should also consider the role of local, regional and national identities and traditions, of global and European intellectual trends, and of social movements in shaping artistic representations. Historical analysis and other relevant approaches from the social sciences and humanities could be used as relevant.** Artistic entrepreneurship as well as links to the cultural and creative industries could also be addressed. Where relevant, the impact of EU, national, regional or local policies and funding on the arts could be considered.
Proposals should develop multidisciplinary and comprehensive methods for capturing and assessing the impacts of arts on individuals, communities and policymaking. They should also identify and test solutions to boost the role and reach of the arts as a vehicle for individual, social and political change. This should include guidelines for how artists, organisations and scholars may help to solve societal challenges, for instance through influencing priority setting and through integrating the perspective of the arts in social, political and research agendas. To this end, opportunities for common reflection should be developed to connect actors and stakeholders such as practitioners, curators, researchers, representatives of the civil society and policy makers. Practice-based research and outputs in the form of artistic production (e.g. exhibitions, performances, performing and visual arts, digital media, community arts) are encouraged.
The Commission considers that proposals requesting a contribution from the EU in the 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.

Expected impact
The action will promote innovative approaches to societal challenges that take into account artistic perspectives. It will formulate and test innovative art-based practices aimed at mutual understanding, dialogue and civic participation, thereby enhancing social inclusion. The action will also contribute to the further integration of the arts in the policies and strategic goals of the EU.

Type of action	Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-TRANSFORMATIONS-2018-2019-2020
Topic information	Link

Topics with minor SSH relevance

DT-TRANSFORMATIONS-11-2019: Collaborative approaches to cultural heritage for social cohesion
Link

Dedicated Topic

GOVERNANCE-01-2019: Trust in governance

Specific Challenge
Trust is a fundamental condition for a fair and cooperative society. It also plays an important part in contributing to social capital. While a degree of distrust may be required for a well-functioning democracy, waning trust in governments and other institutions and in the EU can impact European governance in multiple ways. The challenge is to restore and improve trust as a basis for sustainable and legitimate governance.

Scope
Proposals should reappraise definitions of and approaches to trust in and between governments, in public authorities and other public institutions as well as in private actors having due regard to the philosophical, ethical and psychological foundations of trust and trustworthiness. This should include amongst others the EU, the Euro, political parties and financial systems, and may include markets and regulatory institutions, the media as well scientific expertise and institutions. Proposals should also investigate possible correlations between the levels of trust in national governments and in the EU as well as their underlying dynamics. The relationship between trust and distrust should be clarified to identify which levels are conducive to stable, sustainable and fair social relations and governance as well as the thriving of citizens. Factors contributing to and affecting trust in governance at various levels, including transparency and accountability, should be investigated too.
Proposals should identify potential thresholds of decreasing levels of trust, i.e. junctures when distrust becomes a game changer. They should also investigate, both empirically and normatively, possible relationships between trust and inequalities, trust and legitimacy as well as between trust and the quality of democracy. Possible correlations between trust, social inclusion and belonging should also be considered. In addition, research may consider whether and under what conditions participatory practices beyond electoral participation are trust enhancing including transparent and open decision-making. The role of civil society in the underlying dynamics of trust building should be investigated too. In addressing the issues above, experimental research should be performed as relevant. The action should also develop criteria, indicators and early warning mechanisms for detecting weak signals of decreasing trust. The role of the media, including social media, language, news generation and new phenomena such as fake news should be examined. Scenarios on consequences of (further) decreasing trust should be developed which may draw on experiences from outside Europe where relevant.

The Commission considers that proposals requesting a contribution from the EU in the 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.

Expected Impact
By enhancing the knowledge base on trust, including the factors determining changes in trust, the action will feed into various initiatives to restore and improve trust in governance and enhance the quality of democracy. It will also contribute to improving trust in science and to constructing trust-enhancing narratives for national governments and EU governance

Type of action	Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-GOVERNANCE-2018-2019-2020
Topic information	Link

Dedicated Topic

GOVERNANCE-02-2018-2019: Past, present and future of differentiation in European governance

Specific Challenge
Recent challenges faced by the EU raise the question of whether Member States will continue on the same integrationist track. Differentiation, which has been core to the constitutional architecture of the EU, has gained prominence in the light of recent manifestations of centrifugal forces. The challenge is to ascertain whether and how much differentiation is necessary, conducive, sustainable and acceptable as well as how future approaches towards differentiation fare in the light of these findings.

Scope
b) Coordination and Support Action (2019)
The coordination and support action should establish a research network aiming to support policy-making on differentiation both in advising on appropriate approaches to differentiation tendencies and proposals, but also with a view to better anticipating and preparing the EU for future differentiation scenarios.
To this end, it should take stock of and synthesise the results of research actions conducted at EU level and at other levels as relevant (e.g. national and regional). Collaboration with the projects funded under the research and innovation action under point a) in this topic is strongly encouraged.

The Commission considers that proposals requesting a contribution from the EU in the order 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 actions will support policy decisions on different levels of differentiations across a comprehensive range of policy areas, thereby improving EU's capacity and resilience when it comes to constructively approaching and designing future differentiation scenarios. They will provide a comprehensive knowledge base upon which scenarios and models of future differentiation will be devised. By mobilising and linking experts and relevant stakeholders, the actions will contribute to linking research and policy in the area of differentiation.

Type of action	Coordination and support action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-GOVERNANCE-2018-2019-2020
Topic information	Link

GOVERNANCE-04-2019: Enhancing social rights and EU citizenship

Specific Challenge
Boosting social rights can help address divergence in social trends among Member States and reduce the risk of socio-economic shocks. At the same time, social rights are essential for the full realisation of EU citizenship and reaching the EU's targets in reducing poverty and social exclusion. By mitigating social risks and by assisting people with transitions and vulnerabilities, social rights can boost trust to public governance. The challenge is to integrate the social dimension into European policies and to connect it with European citizenship going beyond the traditional focus on mobile citizens to look also at those who are "immobile".

Scope
Proposals should examine how European citizens have been exercising social rights (e.g. to social protection, housing, health, education, access to labour markets, working conditions, including health and safety at work, mobility) in the wake of the economic crisis. The role of the Member States in protecting social rights should be considered as well as the situation of underrepresented and vulnerable groups, including gender aspects. Proposals should analyse how the EU supports citizens' access to social rights and policy levers to foster upward social convergence in the design of employment policies and social protection systems. They should equally establish the relationship between social policy instruments in Member States and outcomes in terms of social inclusion and fairness and should identify policy priorities. Furthermore, they should assess EU social indicators such as the at-risk-of-poverty rate, material deprivation and quasi-joblessness, thereby aiming to strengthen the statistical base. Developments concerning the European Pillar of Social Rights should be studied, including how they can contribute to the exercise of social rights and to social cohesion. The European Pillar of Social Rights brings forward key social rights of citizens structured around three categories: equal opportunities and access to the labour market, fair working conditions, and social protection and inclusion. The merits or pitfalls of a potential harmonisation in social policy among Member States should be investigated. Proposals should also explore conceptualisations and possible content of social citizenship and may consider citizens' own perceptions and understandings of the social dimension of citizenship. Furthermore, attention should be given to the complex links between the exercise of social rights of European citizens and developments in terms of economic growth, inequality trends and social well-being. Studies should also include a historical and comparative dimension when examining the interplay between these factors in European countries.

The Commission considers that proposals requesting a contribution from the EU in the 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.

Expected Impact
The action will contribute to advancing the state of the art and normative content of EU social citizenship. It will also contribute to the implementation of the European Pillar of Social Rights. It will put forward recommendations on the exercise of EU social rights as an integral part of EU citizenship and on upward convergence. It will also contribute to constructing narratives of European citizenship.

Type of action	Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-GOVERNANCE-2018-2019-2020
Topic information	Link

DT-GOVERNANCE-05-2018-2019-2020: New forms of delivering public goods and inclusive public services

Specific Challenge
Governance is being transformed by new approaches to delivering public services which allow for the involvement of citizens and various other actors. The challenge is to critically assess and support as needed this transformation based on an open collaboration and innovation platform supported by ICT ('government as a platform') and on an open environment and ecosystem with clear frameworks and guidelines for modular services quality ('government as a service') in accordance with the EU eGovernment Action Plan 2016-2020 and the European Interoperability Framework Implementation Strategy.
In particular, to deliver better public services, public administrations need to regroup resources together under common infrastructures at the European level that serve the needs of various actors and enable the participation of all relevant communities. In addition, to ensure a cost efficient provision of inclusive digital services, there is a pressing need to identify gaps in accessibility solutions, to establish related best practices, and to promote training, awareness raising and capacity building.

Scope
In a context of open government and digital democracy, the role of the government is changing due to its use of ICT and to the increasing pervasiveness of ICT across all parts of society. In addition to being a manager of societal assets, government is becoming a provider of tools, opportunities, guidance and incentives for co-creation as well as a guarantor of public value over the longer term.
a) Research and Innovation action (2019)
Proposals should develop and demonstrate the potential for sharing common services with different actors (public and private and third sectors) to achieve efficiency and effectiveness in these collaborations. **The proposals should also evaluate the role and responsibility of the public authorities and of the other actors delivering public goods and services in the new governance model and the related partnerships**, including in terms of the challenges of ensuring secure access and use. Evidence of the benefits of the full implementation of the once-only and digital-by-default principles and user centricity and the transformative impact of new technologies such as blockchain should also be taken into account.
Proposals should also lead to the development of business plans that would ensure the longterm sustainability of the new governance model. **They should engage multi-disciplinary and multi-sectoral teams to explore the complexity of this challenge and to identify the necessary changes as well as the legal, cultural and managerial risks and barriers to its implementation.**
The Commission considers that proposals requesting a contribution from the EU of between EUR 3 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.
For 2019 proposals shall include a minimum of six relevant national administrations (or legal entities designated to act on their behalf) in at least six different EU Member States or Associated Countries. The Commission expects to finance only one proposal under this action in 2019.

Expected Impact
Solutions for opening up and connecting public administration data and services will have a measurable impact for both businesses and citizens, leading to efficiency gains. The actions will provide for all the elements required to facilitate the migration of public administrations towards forward-looking models for the co-delivery of public services.
The actions will provide evidence of how the open government approach may reinforce trust in public institutions, which is strongly associated with citizens' satisfaction from full deployment of inclusive digital government. The actions will also contribute to establishing a culture of co-creation and co-delivery, transparency, accountability and trustworthiness as well as of continuous consultation promoting overall digital accessibility.
In addition, to support the implementation of the Web Accessibility Directive, enhanced cooperation on digital accessibility between various stakeholders will result in scalable and more affordable accessibility solutions. Overall, the actions will contribute to the widespread recognition of the need for and benefits of an inclusive Digital Single Market.

Type of action	Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-GOVERNANCE-2018-2019-2020
Topic information	Link

SU-GOVERNANCE-10-2019: Drivers and contexts of violent extremism in the broader MENA region and the Balkans

Specific Challenge
Parts of the broader Middle East and North Africa (MENA) region and of the Balkans have been experiencing ethnic, religious and territorial conflicts and civil wars as well as a rise in violent extremism fuelled or justified also by religious interpretations. **More empirical and interdisciplinary research is needed to understand the various historical, geopolitical, socioeconomic, ideological, cultural, psychological, and demographic factors that drive these conflicts and violent extremism in these regions**. The various ways in which these phenomena impact Europe also need closer scrutiny.

Scope
Proposals should produce country and regional analyses of the interplay between religion, politics and identity. This should include country and regional comparisons. **Religious extremism in particular should be addressed from angles such as drivers, narratives, authority figures and formal leadership**. Radical interpretations and appropriations of religion to justify violent extremism as well as their impact on individual rights (including women's rights and gender issues more broadly) should be studied. Links to recent developments with an impact on Europe - such as the issue of foreign fighters and the role of diasporas and community leaders - should be assessed.
Concrete proposals should be made on which preventive measures are effective and should be stepped up. In particular, research should examine to what extent this is the case with measures such as strengthening moderate voices among religious and other communities, fostering education and inclusion as tools for reconciliation, promoting online media literacy and countering radical propaganda. Proposals should involve relevant actors (e.g. policymakers, religious leaders, representatives of civil society) to ensure mutual learning and take-up of results.
The Commission considers that proposals requesting a contribution from the EU in the 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.

Expected Impact
The action will improve the knowledge base on violent extremism in the broader MENA region and the Balkans. It will ensure a step-up in mutual learning between the EU and third countries in light of common challenges.

Type of action	Research and Innovation action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-GOVERNANCE-2018-2019-2020
Topic information	Link

GOVERNANCE-16-2019: Reversing Inequalities

Specific Challenge
Evidence suggests that wide inequalities can be detrimental to economic growth and social cohesion. It is clear that inequalities have been rising over the last three decades both in Europe and globally albeit with considerable geographical and temporal variation. The crises and their aftermath have put this rise of inequalities centre stage. A solid evidence base is needed to design and implement policy instruments which sustainably and fairly reverse this trend. A substantial body of research on inequalities, social investment and the welfare state exists and is coming to fruition. This gives rise to a pressing need to reap, synthesise, consolidate, and enhance the impact of existing and emerging research findings and to implement recommendations. A platform needs to be established that can feed the findings into the policy process and fosters an open and pluralistic research-policy dialogue.

Scope
This coordination and support action should set up a network comprising the relevant research communities, policy makers, stakeholder representatives, non-governmental organisations, and possibly also social partners and local authorities, and ensuring broad geographical coverage. The network should draw inspiration from (emerging) theories of justice which connect with and reflect European values as well as the Pillar of Social Rights. It should take stock of data and of attitudes on the scale of accepted and acceptable inequalities, in relation to a range of dimensions such as income and wealth, education, health as well as the welfare state whereby gender and demographic aspects should be taken into account.
The network should assemble a comprehensive survey of the state of the art, including currently running research on inequalities conducted at EU and Member State level, duly taking into account historical dimensions. It should also consolidate comparative data sets on various dimensions of inequalities and, to the extent necessary, generate new data. **Proposals should consider the repercussions of rising levels of socio-economic inequalities for democracy, governance and legitimacy**. Particular attention should be paid to the young, immigrants and ethnic minorities whereby inequalities in education and health should be considered.
The network should also investigate under which conditions economic, social and cultural inequalities translate into political inequalities generally and whether and how this correlation is aggravated at EU level in comparison to Member State level. Conversely, research should ascertain under what conditions marginalised sectors of society can get their voices heard. **A central question is to what extent political inequality is driven by institutional or more fundamental social and economic structures. The role of social security, social investment and welfare policies as well as broader taxation based redistribution in tackling and reversing inequalities should be examined in a context of changing labour relations, job quality and security as well as the content of work.** Also, the impact of technological transformation on labour markets and inequalities should be considered. Living condition, spatial justice and territorial cohesion are key concerns as are the effectiveness and equitability of tax regimes as well as tax practices behaviour including tax avoidance and optimisation.
The network should also synthesise and evaluate the research conducted under the DIAL ERA-Net Dynamics of Inequalities across the Life Course on how inequalities evolve across the life-course where a particular focus should lie on the identification of crucial demographic events which may determine and influence the risk of poverty and exclusion.
The Commission considers that proposals requesting a contribution from the EU 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 action will assemble and synthesise the state of the art of the knowledge base. It will facilitate improved data collection by inter alia drawing on the EU Statistics on Income and Living Conditions (EU-SILC) database and other relevant instruments from Eurostat as needed for the design of policies and solutions required to adequately address inequalities. It will garner and formulate policy recommendations which will contribute to improving European outcomes in relation to social cohesion. By mobilising and linking experts and pertinent stakeholders, the action will foster a concrete, specific and structured dialogue between research and policy-makers with a view to reducing inequalities.
The network will also propose new research agendas.

Type of action	Coordination and support action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-GOVERNANCE-2018-2019-2020
Topic information	Link

Call – Governance for the future

GOVERNANCE-17-2019: Democratic crisis? Resolving socio-economic and political challenges to reinvigorate democracies

Specific Challenge
Almost three decades after the *End of History* essay and debates democracy faces significant challenges. Political developments have been marked by the rise of political forces and discourses promoting populism and nationalism and questioning liberalism. These are often couched in a language of anti-elitism and anti-cosmopolitanism as they seek to profit from citizens' frustration at their socio-economic situation and political shortcomings of democracies. **Social, cultural, economic, technological and political challenges related to the legitimacy, accountability, transparency, levels of engagement and effectiveness of democracies need to be addressed normatively and empirically with a view to averting a fundamental crisis in democratic standards.**

Scope
The coordination and support action should bring together the relevant research community with representatives of civil society, as well as socio-economic and policy stakeholders (at European, national and sub-national levels). Proposals should adopt a holistic approach and ensure broad geographic coverage. The network should consider the altering capacity of parties, parliaments and executives to represent citizens. At the same time, **it should address changes in voting behaviour such as growing abstention, increasing volatility and preference for extreme political discourses and their potential to sap the foundations of democracy.** The role of referenda, also in relation to traditional and social media, should be part of the reflection. Moreover, **the network should deliberate to what extent higher levels of distrust towards elected bodies and institutions and the political class could be signalling a more deep rooted shift towards a popular preference for outcomes over political participation and rights. Consideration should be given to political processes that may lead to a weakening of the institutions and laws that guarantee checks and balances, civil liberties, human rights and the rule of law. Different democratic traditions and pathways and how they affect policy responses should also be examined. A historical perspective should be adopted in tracing the political and sociological roots of current populist movements and parties.**
Attention should be given to the role of supranational institutions and the ways in which they affect democracies. The role of identities, including European identity, for democratic governance could also be considered. Gender aspects should be taken into account. Moreover, the interaction between corporations and democratic institutions, including various forms of lobbying, needs to be better understood normatively and empirically. Additionally, **the ways high levels of inequality impact political engagement and disenfranchisement should be part of the reflection and policy answers**. Lastly, attention should be paid to the opportunities for participation and openness generated by new technologies and how these could connect to citizens' movements.
Proposals should adopt a forward-looking perspective. The network should organise dialogues over the long-term dynamics of modern democracies. These dynamics should be examined against the backdrop of technological transformations and their impact on transparency, participation, the media and accountability. Moreover, developments should be considered in relation to the need for greater social and ecologic sustainability. Proposals should equally build on democratic theory and innovation in order to enhance participation and engagement and where appropriate go beyond traditional notions of representative democracy. The network should also synthesise and evaluate the research conducted under the ERA-NET "Renegotiating democratic governance in times of disruptions" (H2020-SC6- GOVERNANCE-14-2018).
The Commission considers that proposals requesting a contribution from the EU 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 network will take stock of research findings and promote wide trans- and interdisciplinary dialogues with a view to re-invigorating, modernising and enhancing democracies. The narratives, discourses and scientifically robust recommendations generated will enhance public policy debates and decision making on democracy. The network will equally propose new research agendas.

Type of action	Coordination and support action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-GOVERNANCE-2018-2019-2020
Topic information	Link

Call – Governance for the future

GOVERNANCE-18-2019: Innovation in government - building an agile and citizencentric public sector

Specific Challenge
Given the weight and importance of the public sector in driving economic growth and competitiveness, tightening government budgets, increasing expectations of greater citizen participation in the design and delivery of public services and societal challenges that require new solutions, there is an urgent need to promote innovation and experimentation in the public sector. The purpose is to improve continuously the development of public policy, as well as the efficiency and delivery of public programs and services, and to enhance thereby the creation of public value.

Scope
Governments are currently facing accelerating technological and social changes. The complexity and interdependence of today's 'wicked problems' require radically new approaches to public policy, regulation and service delivery. There is increased pressure on governments to work differently and more efficiently, to engage more with citizens and to transform their operations to harness the opportunities afforded by digital technologies and to adapt faster to emerging challenges. Driving systemic change requires change-makers and champions of innovation within the public sector, as government is the best placed to scale up meaningful solutions. This will require sweeping changes of mind-set and modus operandi in public authorities. As the role of the state evolves, governments must become proactive problem solvers and close collaborators with a wide variety of stakeholders throughout the innovation ecosystem to co-create new solutions.
A growing number of governments are strongly committed to improving their policies, programmes and services. Shifting to a user-centric focus that puts the citizen at the centre, public actors increasingly recognise the need for inclusive and sustainable responses to societal challenges. Most government innovation projects, however, stay small and never scale up to the point where they can make a difference within government administrations in the long run. Innovation is not yet considered a strategic function of government, or the core business of public administrators. There is therefore a need to support governments' internal innovation efforts through an exchange of experiences and by concrete practical support based on their needs, in order to move from sporadic innovations to systemic transformations.
Based on the achievements and work of the Observatory of Public Sector Innovation managed by the OECD, governments would benefit from further knowledge sharing in an international context, collaboration and support in the practical application of new knowledge in areas of specific interest (e.g. system thinking and systemic transformations, experimentation, cocreation with the ecosystem, stakeholder engagement, dealing with complexity; matrix organizations; organizational culture development; innovation skills development; organizational frameworks conducive to innovation, innovation in regulation, etc.) in real life contexts.
Building on this experience, the activity should focus on the following:

- **Developing and piloting practice-led reflections and learning programmes to support governments in their role as change agents (e.g. skills, mindset, organizational culture, hackathons, boot camps for public leaders and administrators);**
- **Fostering an international conversation, allowing for exchange of experiences and peer learning between governments, including intensifying collaboration among public innovation practitioners (including workshops, developing common projects for incubation in real life contexts) in order to support the development of innovators in government.**
- **Developing a new public sector innovation theory (instead of existing attempts using the business innovation logic) that will support better measurement of public sector innovation in an internationally comparative manner.**

The Commission considers that proposals requesting a contribution from the EU 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. Demonstration of applicants' own investment to complement the available Commission contribution would be an asset.

Expected Impact
The action will deliver learning programmes, (inter-governmental) collaborative projects and a growing body of practical experiences and knowledge, which will support the development of a 21st century model of innovative governance and government. The action will also contribute to embedding innovation as the new normal in government operations and to building inclusive and sustainable innovation communities in the public sector.

Type of action	Coordination and support action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-GOVERNANCE-2018-2019-2020
Topic information	Link

Call – Governance for the future

GOVERNANCE-19-2019: A European Social Catalyst Fund to scale up high performing social innovations in the provision of social services

Specific Challenge
Government funding of social services is often capped and undergoing reductions while other sources of funding are fragmented or highly uneven. There are also disparities in the delivery of social performance and difficulties in transposing regional or national best practices to other regions or Member States and in scaling up such practices to the EU level. In addition, significant geographical variation exists between Western and Central and Eastern European Countries (CEECs).

Scope
This coordination and support action will establish a consortium composed of a representative set of actors involved in the financing of social services and their provision such as venture philanthropists, foundations, social impact investors, government agencies and/or social service providers. The consortium will set up a European Social Catalyst Fund that will be funded jointly by the European Commission and the members of the consortium, i.e. the consortium will be under the obligation of signing on to the project. The Fund shall be of at least EUR 600.000, with the EU contribution accounting for a maximum of 25%, and it will put forward a call for proposals that will result in at least five social innovation implementation plans.
The proposal must clearly detail a fixed and exhaustive list of the different types of socially impactful activities supporting the priorities of the European Commission, including the European Pillar of Social Rights, for which a third party may receive financial support via the European Social Catalyst Fund. Examples of priority areas include aging, poverty and marginalisation, homelessness, vulnerable populations including people with disabilities, mental health difficulties and dementia, digital inclusiveness, employment and job creation, inequalities, education and training, skills, community development, the role and place of young people in the society, and intergenerational solidarity. Links to the Sustainable Development Goals of Agenda 2030 could be considered.
The proposal should define the organisational process for selecting the implementation plans for which financial support will be granted, including the process of selecting, allocating and reporting on the use of independent experts and ensuring no conflicts of interest. It should also clearly detail the criteria for awarding financial support and simple and comprehensive criteria for calculating the exact amount of such support. The open call must be published widely, including on the Horizon 2020 Participant Portal and through National Contact Points.
The selected implementation plans should demonstrate a capacity to valorise unexploited potential by transposing or scaling up regional or national best practices. The plans should also offer means of overcoming geographical fragmentation by being implementable in at least five EU Member States of which at least two in Central and Eastern Europe. Plans should be implementable within a maximum of two years. The network should improve the selected plans as needed—striving towards them reaching investment grade—and oversee their implementation. In the process, it should help de-risk innovations, unlock bottlenecks at system level, overcome agency problems (e.g., when no one stakeholder benefits enough to justify the cost) and stimulate projects with marginal profitability. The network should specify how it will monitor and report on call results and how it will assess the quality of the outcomes and measure the impact achieved.
The Commission considers that proposals requesting a contribution from the EU of EUR 250.000 of which at least EUR 150.000 should go to the Catalytic Fund 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 action will strengthen the capacity of organisations and/or individuals to develop and upscale innovative and effective solutions to pressing societal challenges. It will contribute to the diffusion of solutions in a timely and geographically balanced manner. It will also raise awareness on the opportunities and challenges associated to social innovation in the provision of social services.

Type of action	Coordination and support action
Deadline	**14 March 2019**
Call identifier	H2020-SC6-GOVERNANCE-2018-2019-2020
Topic information	Link

Societal challenge 7

Secure societies

Protecting freedom and security of Europe and its citizens

Net 4 Society

SU-INFRA02-2019: Security for smart and safe cities, including for public spaces

Specific Challenge
In the cities, public spaces such as malls, open crowded gathering areas and events, and non-restricted areas of transport infrastructures, constitute “soft targets”, that is potential, numerous targets spread across the urban area and subject to “low cost” attacks strongly impacting the citizens. The generation, processing and sharing of large quantities of data in smart cities make urban systems and services potentially more responsive, and able to act upon real-time data. On the one hand, smart cities provide for improving the security of open and crowded areas against threats (incl. terrorist threats) and risks, by leveraging wide networks of detection and prevention capabilities that can be combined with human response to crisis to enhance first responders' actions. On the other hand, the distinct smart technological and communication environments (urban, transport infrastructures, companies, industry) within a smart city require a common cybersecurity management approach.

Scope
The security and good operation of a smart and safe city relies on interconnected, complex and interdependent networks and systems: public transportation networks, energy, communication, transactional infrastructure, civil security and law enforcement agencies, road traffic, public interest networks and services.
Such networks provide with an efficient infrastructure for detection resources and "big data" collection. The screening of such data are being used by security practitioners to enhance their capabilities and performances. For instance, crowd protection and the security of public and government buildings can be improved through the identification of threats or of crime perpetrators, and the early detection of dangerous devices or products; first responders may get quicker on site by calculating in real time the shorter possible route to the scene of disaster.
Proposals under this topic should develop and integrate experimentally, in situ, the components of an open platform for sharing and managing information between public service operators and security practitioners of a large, smart city. The proposed pilots should consider how to combine, inter alia:

- Methods to detect weapons, explosives, toxic substances
- Systems for video surveillance
- Methods to identify, and neutralize crime perpetrators whilst minimizing intrusion into crowded areas

In designing the platform, proposals should:

- involve actively the security actors of the city area, their coordination and governance;
- solve interoperability issues, and ensure the interconnection and integration of the city smart systems with the systems supporting the security practitioners locally, including through modelling and simulating their interdependence;
- enhance the security of city smart systems, notably in terms of access control (e.g. with digital security measures such as layered authentication and access), secure communication and data storage, and address their possible misuse by criminals;
- consider new concepts of operation resulting from novel monitoring methods, data provided by extensive networks of sensors and social media;
- consider mitigation strategies in the context of a variety of scenarios in order to increase resilience;
- integrate modules to simulate security incidents, and their consequences;
- integrate modules to measure the quantitative and qualitative impact of the platform on security;
- provide for the sharing, consolidation and analysis of multi-sourced data.

The proposals should also address at least one of the following key issues:

- Simulation, detection and analysis of the additional security threats and risks created through the interconnection of smart systems (e.g. Internet of Things (IoT), in particular those IoT objects used by security practitioners) and smart infrastructures (e.g. smart (government) buildings, smart railways, smart ports, smart factories, smart bridges, smart hospitals, large gathering of people in smart infrastructure) within a smart city;
- Delivery of a cyber-security framework to ease collaboration across all smart cities stakeholders, from urban planners to infrastructure operators, security practitioners, IT supervisors and providers across smart organizations within the city;
- Support and implementation of a common approach to securing and managing in a reliable and untamperable manner the data from all the smart infrastructures and systems hosted in a smart city supporting the citizens, the public authorities, the security practitioners, and the urban economy in creating transparent, efficient, accountable cyber-secure data-handling processes, in line with data protection legislation.

Digital security awareness should be integrated into the eco-system of humans, competences, services and solutions which should be able to adapt rapidly to the evolutions of cyber-threats or even to surpass them.
The centre of gravity for technology development with actions funded under this topic is expected to be up to TRL 7 – see General Annex G of the Horizon 2020 Work Programme.
Solutions are to be developed in compliance with fundamental rights, privacy and data protection, especially as the development of big data creates specific challenges. Therefore, full compliance with data protection legislations must be ensured in exploiting big data. Societal aspects (e.g. perception of security, possible effects of technological solutions on societal resilience) have to be taken into account in a comprehensive and thorough manner.

Projects should also foresee activities and envisage resources for cooperating with other projects funded under this topic and with other relevant projects in the field funded by Horizon 2020.
The Commission considers that proposals requesting a contribution from the EU of about EUR 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

- Creation of dedicated, harmonised, advance cybersecurity solutions for smart cities adopting common approaches with all involved stakeholders (e.g. administrators of smart city/port/transport) balancing their – sometimes conflicting – goals (e.g. urban development, efficiency, growth, competitiveness, resilience).
- In situ demonstrations of efficient and cost-effective solutions to the largest audience, beyond the project participants.
- An easier level of integration by developing a holistic cyber-security framework for smart cities that benefits all smart infrastructures hosted within it (e.g. smart buildings, smart ports, smart railways, smart logistics).
- IoT ecosystems (rather than distributed IoT infrastructures) built adopting common approaches in their cybersecurity management, achieving economies of scale (e.g. avoiding duplication of efforts in the analysis of IoT data, selection of cybersecurity controls).
- Novel concepts of operations taking account of mutiple, heterogeneous data sources and the social media.
- Novel tools and systemic approaches to protect citizens against threats to soft targets in a Smart City.

Type of action	Innovation action
Deadline	**22 August 2019**
Call identifier	H2020-SU-INFRA-2018-2019-2020
Topic information	Link

SU-DRS01-2018-2019-2020: Human factors, and social, societal, and organisational aspects for disaster-resilient societies

Specific Challenge
The resilience of societies heavily depends on how their citizens behave individually or collectively, and how governments and civil society organisations design and implement policies for mitigating risks, preparing for, reacting to, overcoming, and learning from disasters. The spread of new technologies and media are inducing dramatic changes in how individuals and communities behave, and they are affecting societies in unpredictable ways. Building the resilience of society and citizens requires a better understanding and implementation of these new technologies, media and tools, and their capacity to raise disaster risk awareness, to improve citizen understanding of risks, to build a culture of risks in society, to enable an effective response from affected populations, to improve functional organisation in most fragile and vulnerable environments, and to increase the resilience of health services, social services, education, and governance, in line with target (d) of the Sendai Framework on critical infrastructure and disruption of basic services.

Scope
Proposals are invited to address related research and innovation issues, in particular:
Recent disasters related either to natural causes (including climate-related hazards) or to terrorist attacks have shown gaps in the level of preparedness of European society for disasters, and therefore highlighted the importance of increasing risk awareness, and hence resilience among people and decision-makers in Europe. There is much that can be learned from certain countries with a high level of risk of natural disasters (e.g. Japan with high-levels of risks of earthquakes, volcanic events, and tsunamis) and where risk awareness is high. **Research is required with a view to how cultural changes among individuals, business managers, government officials, and communities can create a resilient society in Europe**, in line with the Sendai Framework for Disaster Risk Reduction.
Over the past few years several ways to exploit social media and other crowd-sourced data in emergency situations have been studied, and some put in place, but their impacts are not well known. Research is needed to assess such practices for different disaster scenarios (natural hazards, industrial disasters, terrorist threats) involving different actors, including first responders, city authorities and citizens. **Research should analyse both the positive and negative roles of social media and crowd-sourced data in crisis situations.** For instance in the wake of a terror attack or natural disaster they offer a quick and easy way to relieve friends and family from worry (where networks are not down), and they generate valuable information about the affected area in the first moments after a disaster; they have been used to spread early warnings and important safety information. However, social media may also be used to spread false statements and to overstate threats, so the validation processes of information should also be addressed. Social media itself is reliant upon the functioning of critical infrastructure such as phone networks and may not always be available. Research should also address solutions for communication between first responders and the victims and citizens in the affected area.
Research on risk awareness should encompass the whole of the disaster management cycle, from prevention (e.g. through education) and preparedness (knowing how to react), emergency management (collaboration and communication before and during an event), response (empowering citizens to act efficiently by themselves according to more effective practices and following established guidelines), and recovery (knowledge to build back better). Researchers should take into account tangible and intangible cultural heritage, traditional know-how, land use, construction technologies, **and other local knowledge** which is a valuable source of information for the local communities and can help prevent the creation of new risks, to reduce existing risks, to prepare for and to respond to disasters and to build back better.
Sub-issues to be addressed are diversity in risk perception (as a result of e.g. geography (within Europe), attitudes, institutional and social trust, gender and socio-economic contexts), in vulnerabilities and in understanding responses to crises in order to propose new approaches and strategies for community awareness, for leadership, and for crisis readiness and management with a particular emphasis on the use of new technologies.
For achieving disaster-resilient societies that cope with disasters and build back better, the research community needs to transfer research outputs in an appropriate manner to meet citizen expectations given the current levels of risk acceptance, risk awareness, and involvement of civil society organisations in a mediating role.
Civil society organisations, first responders, (national, regional, local, and city) authorities are invited to propose strategies, processes, and methods to enable citizens better to access research results related to disaster resilience, and to prepare the ground for exercises involving citizens. **These strategies, processes, and methods should be tested with citizens and communities representative of European diversity and for different types of disaster, in particular with regards to citizens' individual capacities and their involvement in checking and validating proposed tools, technologies and processes for disaster management. Studies will assess the value of raising awareness about relevant research among citizens and communities.**
Proposals should be submitted by consortia involving relevant security practitioners and civil society organisations. **Research should contribute to the understanding of society's awareness to risks in Europe in order to provide recommendations for the development of a culture of improved preparedness, adaptability, and resilience to risks**, including the use of social media and crowd-sourced data, and the involvement of the citizens in the investigations and possible validation of tools and methods.
In line with the objectives of the Union's strategy for international cooperation in research and innovation (COM(2012)497), international cooperation according to the current rules of participation is encouraged (but not mandatory).

The Commission considers that proposals requesting a contribution from the EU of about EUR 5 million would allow this specific challenge to be addressed appropriately through multidisciplinary projects confronting different schools of thoughts. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact
As a result of this action, Member States and Regional authorities as well as City and Metropolitan authorities should benefit from recommendations and tools aimed at improving the adaptability and preparedness of societies to different disaster risks, including:

- Comparative analysis of the European diversity in terms of risk-perception amongst citizens, and of vulnerabilities;
- Comparative analysis of different approaches to adapt to, and be prepared for risks in different countries (both within and outside the European Union), and among communities in precarious socio-economic conditions;
- Advances through the cross-fertilisation of concepts resulting from the collision of different ways of thinking and of different approaches developed by various partners in the proposals;
- Identification of existing tools and guidelines for an improved prevention (including risk understanding and communication), preparedness (including training involving citizens), alert systems and their recognition by citizens, responses using citizen's competencies and local knowledge, and recovery;
- Improved information exchanges among different actors involved, including first responders, local authorities, schools, and citizen representatives;
- Field-validation of different approaches related to different disaster risks involving the above actors, in representative urban and non-urban environments, including in areas where precarious socio-economic conditions prevail;
- Intensive sharing, among communities, of good practices and of learnings resulting from citizen-scientist interaction;
- A consolidated, common European understanding of disaster resilience.

Type of action	Research and Innovation action
Deadline	**22 August 2019**
Call identifier	H2020-SU-SEC-2018-2019-2020
Topic information	Link

SU-DRS02-2018-2019-2020: Technologies for first responders

Specific Challenge
Resilience is critical to allow authorities to take proper measures in response to severe disasters, both natural (including climate-related extreme events) and manmade. Innovation for disaster-resilient societies may draw from novel technologies, provided that they are affordable, accepted by the citizens, and customized and implemented for the (cross-sectoral) needs of first responders.

Scope
Proposals are invited to propose novel solutions improving the protection of first responders against multiple and unexpected dangers, or enhancing their capacities by addressing related research and innovation issues, in particular:
Sub-topic 2: [2019] Innovation for rapid and accurate pathogens detection
Novel technologies are required by first responders for the rapid and accurate detection of pathogens, as well as tools for joint epidemiological and criminal risk and threat assessment and investigation.
Sub-topic 3: [2020] Methods and guidelines for pre-hospital life support and triage
Sub-topic: [2018-2019-2020] Open
Other technologies for use by first responders may be subject of proposals provided that they involve a large number of first responders' organisations (see eligibility and admissibility conditions.) For instance, but not exclusively: communicating and smart wearables for first responders and K9 units including light-weight energy sources; situational awareness and risk mitigation systems for first responders using UAV and robots, connected and swarms of drones; systems based on the Internet of Things; solutions based on augmented or virtual reality; systems communication solutions between first responders and victims; risk anticipation and early warning technologies; mitigation, physical response or counteracting technologies; etc.
Any novel technology or methodology under this topic should be tested and validated, not just in laboratories but also in training installations and through in-situ experimental deployment. They therefore need to be quick to deploy, bases on resilient and robust communication infrastructure**. First responders, including through interdisciplinary teams** (e.g. involving medical emergency services, public health authorities, **law enforcement team**, civil protection professionals, etc.) **need to be involved in these activitie**s. Proposals should address the participation of first responders in a systematic manner, and propose new methods on how to involve them and to organise their interaction with researchers when developing, testing, and validating technologies and methods.
Solutions are to be developed in compliance with European societal values, fundamental rights and applicable legislation, including in the area of privacy, personal data protection and free movement of persons. Societal aspects (e.g. perception of security, possible effects of technological solutions on societal resilience, gender diversity) have to be taken into account in a comprehensive and thorough manner.
In line with the objectives of the Union's strategy for international cooperation in research and innovation (COM(2012)497), international cooperation according to the current rules of participation is encouraged (but not mandatory), in particular with Japanese or Korean research centres.
Co-funding opportunities from the Japan Science and Technology Agency exist for Japanese partners.
For more information, please consult http://www.jst.go.jp/sicp/announce_eujoint_04_GeneralInfo.html.
Co-funding opportunities from the Korean MSIP/NRF exist for Korean partners.
For more information on Korea, please consult
http://www.nrf.re.kr/eng/main and http://www.nrf.re.kr/biz/info/notice/view?nts_no=82388&biz_no=116&search_type=ALL&search_keyword=EU&page=

The centre of gravity for technology development with actions funded under this topic is expected to be up to TRL 4 to 6 – see General Annex G of the Horizon 2020 Work Programme.
The Commission considers that proposals requesting a contribution from the EU of about EUR 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
As a result of this action, first responders should benefit from:
- Novel tools, technologies, guidelines and methods aimed at facilitating their operations
- New knowledge about field-validation of different tools, technologies and approaches involving first responders in (real-life) scenarios

Type of action	Research and Innovation action
Deadline	**22 August 2019**
Call identifier	H2020-SU-SEC-2018-2019-2020
Topic information	Link

SU-FCT01-2018-2019-2020: Human factors, and social, societal, and organisational aspects to solve issues in fighting against crime and terrorism

Specific Challenge

The free and democratic EU society, based on the rule of law, mobility across national borders, globalised communication and finance infrastructure, provides many opportunities to its people. However, the benefits come along with risks related to crime and terrorism, a significant number of which have cross-border impacts within the EU. Security is a key factor to ensure a high quality of life and to protect our infrastructure through preventing and tackling common threats. The EU must play its part to help prevent, investigate and/or mitigate the impact of criminal acts, whilst protecting fundamental rights. The consistent efforts made by EU Member States and the EU to that effect are not enough, especially when criminal groups and their activities extend far beyond national borders.

Scope

The Lisbon Treaty enables the EU to act to develop itself as an area of freedom, security and justice. The EU Security Union is now in the building, and requires an EU-wide approach to security that integrates prevention, investigation and mitigation capabilities in the area of the fight against crime.

The globalisation of communications and finance infrastructure allows crime to develop and take new forms. Trafficking in human beings for all forms of exploitation purposes is a serious and organised crime often with cross-border dimension, violating fundamental rights of the individuals and creating a security challenge. Prevention of child sexual abuse and exploitation is another area where research is acutely needed. The use of the internet as a platform for child sex offenders to communicate, store and share child sexual exploitation material and to hunt for new victims continues to be one of the internet's most abhorrent aspects. Cybercriminality, as a whole, is not satisfactorily understood nor properly addressed; the constantly expanding attack surface combined with the ever increasing number of attack vectors requires a more structured approach. Radicalisation is yet another challenge of our society that requires a multi-disciplinary approach, with policy recommendations and practical solutions to be implemented by a variety of policy-makers and practitioners.

Proposed approaches need to rely on existing knowledge and to exclude approaches that have previously failed. **The societal dimension of fight against crime and terrorism should be at the core of the proposed activities.** Proposals should be submitted by consortia involving relevant security practitioners and civil society organisations, each under only one of the following sub-topics:

Sub-topic 2: [2019] Understanding the drivers of cybercriminality, and new methods to prevent, investigate and mitigate cybercriminal behaviour

The Internet of Things, the ever increasing number of internet-facing devices may pose substantial threats to (cyber)security as the internet has become a target for cybercriminals. The key challenge in this respect is to determine what the drivers of new forms of cyber criminality are and how they might be prevented and mitigated. The dissemination of "cybercrime-as-a-service" business models is an important enabler for crime and poses significant challenges to security. The increasing variety of such services, the modalities through which they are offered and the connections with different criminal activities need to be investigated to understand their trends and thus to allow for prevention and law enforcement.

Human factors determining online behaviour as described for instance by the online disinhibition effect (individuals acting more boldly online, being less inhibited and with their judgment impaired) are drivers for cybercrime as individuals feel disconnected from the actual crime or do not even perceive it as a crime. Recent trends also indicate a growth in cyber juvenile delinquency and a rise in adolescent hacking.

These developments call for further research in domains such as psychology, criminology, anthropology, neurobiology and cyber psychology to understand better the factors contributing to it and to devise preventive and deterrence measures, including providing alternatives to harness the potential of these young talents for cybersecurity and technologies.

Sub-topic 3: [2020] Developing comprehensive multi-disciplinary and multi-agency approaches to prevent and counter violent radicalisation and terrorism in the EU

Sub-topic: [2018-2019] Open

Proposals analysing and recommending other ways to solve human, social, and societal issues in fighting against crime and terrorism, and supported by large numbers of practitioners, are invited to apply under this sub-topic (see eligibility and admissibility conditions.)

Proposals should lead to solutions developed in compliance with European societal values, fundamental rights and applicable legislation, including in the area of privacy, protection of personal data and free movement of persons. Societal aspects (e.g. perception of security, possible side effects of technological solutions, societal resilience, gender-related behaviours) have to be addressed in a comprehensive and thorough manner.

The Commission considers that proposals requesting a contribution from the EU of about EUR 5 million would allow this specific challenge to be addressed appropriately through multidisciplinary projects confronting different schools of thought. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact
Medium term:

- improved and consolidated knowledge among EU Law Enforcement Agencies officers on the issues addressed in this topic;
- exchange of experiences among EU Law Enforcement Agencies about human, social and societal aspects of security problems and their remedies;
- policy-making toolkits for security policy-makers, to support the establishment of a European Security Model;
- toolkits for EU Law Enforcement Agencies and/or civil society organisations, validated against practitioners' needs and requirements to facilitate their daily operations.

Long term:

- European common approaches for assessing risks/threats, and identifying and deploying relevant security measures, which take into account legal and ethical rules of operation, cost-benefit considerations, as well as fundamental rights such as the rights to privacy, to protection of personal data and the free movement of persons;
- support towards the implementation of the European Security Union by strengthening the perception by citizens of the EU as an area of freedom, justice and security;
- advances through the cross-fertilisation of concepts resulting from the collision of different ways of thinking and of different approaches developed by various partners in the proposals.

Type of action	Research and Innovation action
Deadline	**22 August 2019**
Call identifier	H2020-SU-SEC-2018-2019-2020
Topic information	Link

SU-FCT02-2018-2019-2020: Technologies to enhance the fight against crime and terrorism

Specific Challenge
Organized crime and terrorist organisations are often at the forefront of technological innovation in planning, executing and concealing their criminal activities and the revenues stemming from them. Law Enforcement Agencies (LEAs) are often lagging behind when tackling criminal activities supported by advanced technologies.

Scope
There is a growing need to focus on technology opportunities provided by new and emerging technologies. To this end, it is necessary to identify new knowledge and targeted technologies for fighting old, new and evolving forms of criminal and terrorist behaviour supported by advanced technologies. Challenges are numerous. In conventional investigations, rapid and near real-time forensics is often crucial for preventing subsequent attacks or crimes. A consequence of the increasing digitisation of society and ever increasing adoption levels is that virtually any type of crime has a digital forensics component, which is a challenge in itself. Money-flow tracking represents yet another challenge. The issues of location and jurisdiction need to be addressed, taking into account highly probable crossborder nature of such crimes.

Proposals should be submitted under only one of the following sub-topics:

Sub-topic 1: [2019] Trace qualification
Forensic analysis of trace material can be extremely helpful in the initial phase of investigation, if the answers are rapid (near real-time), at an acceptable cost and compliant with criminal justice. Novel robotized or automated tools for forensic analysis should be developed. There is a need for a better knowledge and interpretation of: trace composition, time when they were left, cause of their origin (crime-related or inoffensive), etc.

Sub-topic 3: [2020] Money flows tracking

Sub-topic: [2018-2019-2020] Open

Proposals addressing other issues relevant to this challenge (for instance: technologies to improve LEAs capabilities (including augmented reality); autonomous systems to improve the fight against crime and terrorism; technologies to support better protection of public figures; tracking and monitoring technologies, including automated prevention of uploading terrorism-related content; capabilities to detect the widest possible range of threats and concealments (including complex concealed weapons)) and supported by a large number of practitioners are invited to apply under this sub-topic (see eligibility and admissibility conditions).

In all sub-topics and in order to facilitate the EU-wide take-up of new technologies, proposers are encouraged to include the design of innovative curricula for LEAs training and (joint) exercises, and of information packages for the wider public and civil society organisations.
Proposals should lead to solutions developed in compliance with European societal values, fundamental rights and applicable legislation including in the area of privacy and protection of personal data. Societal aspects (e.g. perception of security, possible side effects of technological solutions, societal resilience) have to be addressed in a comprehensive and thorough manner.
The centre of gravity for technology development with actions funded under this topic is expected to be up to TRL 4 to 6 – see General Annex G of the Horizon 2020 Work Programme.
The Commission considers that proposals requesting a contribution from the EU of about EUR 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
Medium term
- novel, user-friendly technologies, tools and/or systems, addressing traditional or emerging forms of crime and terrorism at acceptable costs;
- improved investigation capabilities, especially regarding quality and speed;
- increased efficiency and effectiveness of the information sharing among EU LEAs.

Long term:
- prevention/reduction of criminal and terrorist threats;
- harmonisation of information formats at international level, improved cross-border acceptance and exchange of court-proof evidence, standardised evidence collection and harmonised procedures in the investigation of trans-border crimes in full compliance with applicable legislation on protection of personal data.

Call – Security

Type of action	Research and Innovation action
Deadline	**22 August 2019**
Call identifier	H2020-SU-SEC-2018-2019-2020
Topic information	Link

SU-FCT03-2018-2019-2020: Information and data stream management to fight against (cyber)crime and terrorism

Specific Challenge
Large amounts of data and information from a variety of origins have become available to practitioners involved in fighting crime and terrorism. Full advantage is not currently taken of the most advanced techniques for Big Data analysis, and artificial intelligence.

Scope
The amount of data generated and gathered in the frame of (cyber)crime investigations increases exponentially, thereby creating a considerable challenge for law enforcement. The effectiveness of law enforcement action depends on capabilities to improve the quality of data, and to convert voluminous and heterogeneous data sets (images, videos, geospatial intelligence, communication data, traffic data, financial transactions related date, etc.) into actionable intelligence. These capabilities could be significantly enhanced by the use of domain-specific tools, i.e. Big Data analysis applications designed for the needs of crime investigators (pre-processing, processing and analysis, visualisation, etc.). Furthermore, predictive analytics would greatly benefit from open source intelligence gathering, social network and darknet data analysis, and allow for resource-efficient, effective and proactive law enforcement.
Examples of trends in cybercrime are numerous. The Internet of Things can potentially connect practically everything, thus also potentially making everything more vulnerable. Wearable devices make us traceable, 3D printers can produce weapons, autonomous cars provide opportunities for kidnappers, teleworking opens doors for cyber-espionage etc. Cybercriminals follow the technological development and benefit from it, while measures for countering cybercrime are often one step behind. Law Enforcement Agencies would benefit from new means of preventing and countering new kinds of crime, building on the comprehensive trend analysis of emerging cybercrime activities based on past of (cyber)criminal activities, on technological developments, and on trends in the society.
Criminal and terrorist acts are usually subsequent to patterns of abnormal behaviour. Behavioural/anomaly detection systems (using a large variety of sensors) and methodologies require the analysis and processing of enormous quantities of data, together with improved imaging techniques to allow for the identification of suspicious events or of criminals. Such systems should operate in near real-time and at similar distances as a surveillance camera. They should also comply with privacy requirements and the respect of fundamental rights such as the right to privacy and the right to protection of personal data.
Proposals are invited from consortia involving relevant security practitioners, civil society organisations, and the appropriate balance of IT specialists, psychologists, sociologists, linguists, etc. exploiting Big Data and predictive analytics that both (a) characterise trends in cybercrime and in cybercriminal organizations (based on a profound analysis of current and emerging cybercriminal organizational types and structures), and (b) enhance citizens' security against terrorist attacks in places considered as soft targets, including crowded areas (stations, shopping malls, entertainment venues, etc.).
Proposals should lead to solutions developed in compliance with European societal values, fundamental rights and applicable legislation including in the area of privacy and protection of personal data. Societal aspects (e.g. perception of security, possible side effects of technological solutions, societal resilience) have to be addressed in a comprehensive and thorough manner.
The centre of gravity for technology development with actions funded under this topic is expected to be up to TRL 5 to 7 – see General Annex G of the Horizon 2020 Work Programme.
The Commission considers that proposals requesting a contribution from the EU of about EUR 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
Medium term:
- improved support for the work of Law Enforcement Agencies in managing Big Data, i.e. in extracting, combining, analysing and visualising large amounts of structured and unstructured data in the context of criminal investigations;
- increased awareness regarding the state of the art and trends in cybercriminal activities (short-, mid- and long-term);
- in-depth knowledge of means of preventing and countering emerging and future cybercriminal activities;
- improved capabilities to combine and analyse in near-real-time large volumes of heterogeneous data to anticipate criminal events;
- shorter delays between the emergence of new cybercrime activities and the deployment of countermeasures.

Long term:
- a European, common strategic approach for preventing and countering an emerging cybercrime activity in its early stage of development;
- a European, common strategic approach for processing and combining huge amounts of data in the context of crowd protection in full compliance with applicable legislation on protection of personal data.

Call – Security

Type of action	Innovation action
Deadline	**22 August 2019**
Call identifier	H2020-SU-SEC-2018-2019-2020
Topic information	Link

SU-BES01-2018-2019-2020: Human factors, and social, societal, and organisational aspects of border and external security

Specific Challenge
Border and external security may depend on a variety of human factors, and social and societal issues including gender. The adoption of appropriate organisational measures and the deeper understanding of how novel technologies and social media impact border control are required. One main challenge is to manage the flow of travellers and goods arriving at our external borders, while at the same time tackling irregular migration and enhancing our internal security. Any novel technology or organisational measure will need to be accepted by the European citizens. For the purpose of this topic, 'migration' does not refer to persons enjoying the right of free movement under Article 21 TFUE and secondary legislation (i.e. Union citizens and their family members, independently of their nationality).

Scope
Proposals (which should take into account already existing tools) are invited to address related research and innovation issues, each under only one of the following sub-topics:

Sub-topic 2: [2019] Modelling, predicting, and dealing with migration flows to avoid tensions and violence
Better modelling and predicting migration flows, based on a sound analysis and taking into account gender aspects, is required for high-level strategic decision-making, to plan and implement operational activities. **For the management of the migratory flow,** including relocations within the EU**, it is necessary to map public sentiment, including perceptions of migration,** by analysing data available from many different governmental or public sources, and **by developing socio-economic indicators of integration strategies**. **Proposals should be solution-oriented and propose convincingly how to better deal with such flows and to reduce risks of tensions and violence among migrants and European citizens.**

Sub-topic 3: [2020] Developing indicators of threats at the EU external borders on the basis of sound risk and vulnerability assessment methodologies

Sub-topic: [2018-2019] Open

Proposals addressing other issues relevant to this challenge, based on a sound rationale, and supported by a large number of relevant practitioners are invited to apply under this sub-topic (see eligibility and admissibility conditions.)
Proposals should lead to solutions developed, tested and validated in compliance with European societal values, fundamental rights (including gender equality) and applicable legislation including in the area of free movement of persons, privacy and protection of personal data. Societal aspects (e.g. perception of security, possible side effects of technological solutions, societal resilience) have to be analysed in a comprehensive and thorough manner with a view to facilitating future acceptance of such solutions.
Proposals should pursue truly innovative approaches. They should be submitted by consortia also involving civil society organisations. **Synergies are encouraged with the work for the knowledge centre on migration and demography set up by the Commission** https://ec.europa.eu/jrc/en/migration-and-demography
The Commission considers that proposals requesting a contribution from the EU of about 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
- Knowledge and evidence-based support to policy developments, with fitness for purpose validated by policy-makers and by practitioners and in cooperation with civil-society organisations in the Member States, the Associated Countries, and abroad where appropriate.
- Methods to better manage the complexity (from reducing the incentives for irregular migration, to the analysis and sharing of best practices, and towards an effective application of common rules…) of the issues, with fitness for purpose validated by practitioners and civil-society organisations.
- Advances through the cross-fertilisation of concepts resulting from the collision of different ways of thinking and of different approaches developed by various partners in the proposals.

Call – Security

Type of action	Research and Innovation action
Deadline	**22 August 2019**
Call identifier	H2020-SU-SEC-2018-2019-2020
Topic information	Link

Topics with minor SSH relevance

SU-DS03-2019-2020: Digital Security and privacy for citizens and Small and Medium Enterprises and Micro Enterprises
Link

SU-DS05-2018-2019: Digital security, privacy, data protection and accountability in critical sectors
Link

Leadership in Enabling and Industrial Technologies

Information and Communication Technologies

Net 4 Society

ICT-09-2019-2020: Robotics in Application Areas

Specific challenge

While robots originated in large-scale mass manufacturing, they are now spreading to more and more application areas. In these new settings, robots are often faced with new technical and non-technical challenges. The purpose of this topic is to address such issues in a modular and open way, and reduce the barriers that prevent a more widespread adoption of robots. Four Priority Areas (PAs) are targeted: healthcare, inspection and maintenance of infrastructure, agri-food, and agile production.

User needs, ethical, legal, societal and economic aspects should be addressed in order to raise awareness and take-up by citizens and businesses. Privacy and cybersecurity issues, including security by design and data integrity should also be addressed, where appropriate.

Scope

a) Research and Innovation boosting promising robotics applications

Innovative approaches to hard research problems in relation to applications of robotics in promising new areas are particularly encouraged. **Proposals are expected to enable substantially improved solutions to challenging technical issues, with a view of take-up in applications with high socio-economic impact**. Driven by application needs, the work can start from research at low TRL, but proposals are expected to validate their results in realistic environments in order to demonstrate the potential for take-up in the selected application(s).

The call is open to all robotics-related research topics and to all new application areas. Excluded are the four priority areas which are already covered elsewhere in this work programme: healthcare, inspection and maintenance of infrastructure, agri-food and agile production. Proposals will be expected to plan efforts to connect and cooperate with the DIHs, Platforms and other relevant activities of this work programme, as appropriate.

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

b) Innovation Actions - Robotics for infrastructure inspection and maintenance

Establish large-scale pilots capable of demonstrating the use of robotics at scale in actual or highly realistic operating environments; showcase advanced prototype applications built around platforms operating in real or near-real environments and demonstrate high levels of socio-economic impact.

Through large-scale pilots, proposals are expected to make a significant step forward in platform development in the area of infrastructure inspection and maintenance. Starting from suitable reference architectures, platform interfaces are defined, tested via piloting, and supported via ecosystem building preparing their roll-out, and are being evolved over time into standards.

Each proposal is expected to establish large scale pilots. They are expected to: consider utilising existing infrastructure and links to other European, national or private funding-sources; identify the long-term sustainability of the pilot; develop scalable technical solutions capable of meeting performance targets; develop metrics and performance measures for the pilot; engage relevant industry stakeholders, including SMEs, in the provision and operation of the pilot. Proposals will be expected to dedicate resources to disseminate best practice and coordinate access to platforms and demonstrators, in particular in connecting with the Robotics DIHs and Core Technologies actions and other relevant activities, in H2020 and beyond.

Pilots are expected to address both technical and non-technical issues, such as socio-economic impact, novel business models, legal and regulatory, ethical and cyber-security issues and connections to Big Data and IoT.

The Commission considers that proposals requesting a contribution from the EU between €7 million and €9 million would allow this area to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

c) Robotics Competitions

Competitions aims at reducing technical and commercial risks by allowing commercial and technical performance data to be gathered and assessed. They provide a real or near-real operating environment for long-term trials and the testing of deployment strategies.

Proposals (CSA) should address the delivery of challenge-led, robotics competitions focusing on the four application areas prioritised: Healthcare, Infrastructure Inspection and Maintenance, Agri-Food, and Agile Production. **Besides the technological objectives, proposals are also expected to stimulate public engagement and engage with the Robotics DIHs. Proposals should address all aspects of running competitions as public events, and engage with the media and public. Proposals should seek to mobilise external partners in sponsoring and setting up the competitions.**

Expected impact

a)

- Strengthening European excellence in Robotics S&T
- Boosting the use of robotics in promising application areas
- Opening up new markets for robotics
- Lowering barriers in the deployment of robotics-based solutions.

b)

- Demonstration of the potential for robotics to impact at scale in the chosen application areas prioritised in this call (infrastructure inspection and maintenance).
- Reduction of technical and commercial risk in the deployment of services based on robotic actors within the selected application

area.

- Greater understanding from the application stakeholders of the potential for deploying robotics.
- Demonstration of platforms operating over extended time periods in near realistic environments and promotion of their use.
- Develop the eco-system around the prioritised application areas to stimulate deployment.
- Contribution to the development of open, industry-led or de facto standards

c)

- Greater public exposure to actual robotics capability.
- Greater engagement with competitions from commercial organisations in the four prioritised application areas: Healthcare, Infrastructure Inspection and Maintenance, Agri-Food and Agile Production.

Type of action	Research and Innovation action, Innovation action, Coordination and support action
Deadline	**28 March 2019**
Call identifier	H2020-ICT-2018-2020
Topic information	Link

ICT-10-2019-2020: Robotics Core Technology

Specific challenge
Autonomy in robotic systems is built on a combination of four core technologies:
AI and Cognition: AI provides tools to make systems cognitive. Cognition equips robots with the ability to interact with people and environments, to learn and to categorise, to make decisions and to derive knowledge.
Cognitive Mechatronics: Mechatronic systems where sensing and actuation are closely coupled with cognitive systems are expected to deliver improved control, motion, interaction, adaptation and learning, and safer systems.
Socially cooperative human-robot interaction: Cooperative human-robot interaction is critical in many work environments from collaborative support, e.g. passing tools to a worker, to the design of exo-skeletons able to provide motion that is sympathetic to the user.
Model-based design and configuration tools: Deploying robotics at scale in application areas where tasks need to be defined by the user requires easy-to-use configuration tools. Embedding and sharing of knowledge between tools is essential, as is standardisation across the interfaces to connect systems and modules (taking into account cybersecurity issues, including security by design and data integrity).

Scope
Proposals should address one of the four core technologies and target the development of core technology modules (modular, open and non-proprietary) and tool kits for use in deployable system platforms that meet the requirements of applications in the following four prioritised application areas: Healthcare, Infrastructure Inspection and Maintenance, Agri-Food and Agile Production. Proposals will be required to dedicate resource for connecting with the DIH actions arising from DT-04-2018.
The Commission considers that proposals requesting a contribution from the EU of between €5 million and €10 million would allow this area to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected impact

- Improved technical capability in each of the core technologies over the current state of the art.
- A greater range of applications in the prioritised application areas that can be demonstrated at TRL 3 and above.
- The lowering of technical barriers within the prioritised applications areas.

Type of action	Research and Innovation action
Deadline	**28 March 2019**
Call identifier	H2020-ICT-2018-2020
Topic information	Link

ICT-13-2018-2019: Supporting the emergence of data markets and the data economy

Specific challenge
The lack of trusted and secure platforms and privacy-aware analytics methods for secure sharing of personal data and proprietary/commercial/industrial data hampers the creation of a data market and data economy by limiting data sharing mostly to open data. This need strongly emerges from recent evidence from stakeholders, both for personal data platforms and for industrial data platforms. The lack of ICT and Data skills seriously limits the capacity of Europe to respond to the digitisation challenge of industry. Specific attention needs to be put in involving SMEs and give them access to data and technology. IT standardisation faces new challenges as technologies converge and federated systems arise, creating new gaps in interoperability.
All grants under this topic will be subject to Article 30.3 of the grant agreement (Commission right to object to transfers or licensing).

Scope
a) Innovation Actions for setting up and operating platforms for secure and controlled sharing of "closed data" (proprietary and/or personal data). **The actions should address the necessary technical, organisational, legal and commercial aspects of data sharing/brokerage/trading, and build on existing computing platforms**. Proposals shall address one or both of the following sub-topics:

- **Personal data platforms shall ensure respect of prevailing legislation** and allow data subjects and data owners to remain in control of their data and its subsequent use. Solutions should preserve utility for data analysis and allow for the management of privacy / utility trade-offs, metadata privacy, including query privacy. **Solutions should also develop privacy metrics that are easy to understand for data subjects and contribute to the economic value of data** by allowing privacy-preserving integration of independently developed data sources.
- **Industrial data platforms shall enable and facilitate trusted and secure sharing and trading of proprietary/commercial data assets with automated and robust controls on compliance (including automated contracting) of legal rights and fair remuneration of data owners.**

The actions are required to link to and bring in industrial data providers (not necessarily as consortium members) that will populate the platforms. Conditions of use and practical arrangements of data sharing should be regulated.
The Commission considers that proposals requesting a contribution from the EU of between EUR 4 and 6 million would allow this area to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

b) Research and Innovation Actions (…Closed…)

c) CSA (…Closed…)

Expected impact
a) and b)

- Personal data protection is improved, and compliance with the General Data Protection Regulation (and other relevant legislation) is made easier for economic operators
- **Citizens' trust is improved as privacy-aware transparency and control features are increasingly streamlined across data platforms and Big Data applications.**
- Better value-creation from personal and proprietary/industrial data.
- 20% annual increase in the number of data provider organisations in the personal and industrial data platforms
- 30% annual increase in the number of data user/buyer organisations using industrial data platforms
- 50% annual increase in number of users (data subjects) in the personal data platforms
- 20% annual increase in volume of business (turnover) channelled through the platforms

Type of action	Innovation action
Deadline	**28 March 2019**
Call identifier	H2020-ICT-2018-2020
Topic information	Link

ICT-24-2018-2019: Next Generation Internet - An Open Internet Initiative

Specific challenge

This initiative aims at developing a more human-centric Internet supporting values of openness, cooperation across borders, decentralisation, inclusiveness and protection of privacy; giving the control back to the users in order to increase trust in the Internet. It should provide more transparent services, more intelligence, greater involvement and participation, leading towards an Internet that is more open, robust and dependable, more interoperable and more supportive of social innovation.

Scope

Involving today's best Internet innovators to address technological opportunities arising from cross-links and advances in various research fields ranging from network infrastructures to platforms, from application domains to social innovation. Beyond research, the scope includes validation and testing of market traction with minimum viable products and services, of new economic, mobility and social models, and involves users and market actors at an early stage. Multi-disciplinary approaches are encouraged when relevant. Eventually this initiative should influence Internet governance and related policies.

a) Research and Innovation Actions

Each Research and Innovation Action (R&I Action) will focus on a given research domain supporting the objective of a human-centric Internet. It will build a European ecosystem of researchers, innovators and technology developers by selecting and providing financial support to the best projects submitted by third parties in a competitive manner.

Through an agile and flexible process, 'R&I Actions' will focus their support on third party projects from outstanding academic research groups, hi-tech startups and SMEs, so that multiple third parties will be funded in parallel contributing to the same research area, using short research cycles targeting the most promising ideas. Each of the selected third parties projects will pursue its own objectives, while the 'R&I Action' will provide the programme logic and vision, the necessary technical support, as well as coaching and mentoring, in order that the collection of third party projects contributes towards a significant advancement and impact in the research domain. The focus will be on advanced research that is linked to relevant use cases and that can be brought quickly to the market; apps and services that innovate without a research component are not covered by this model.

Beneficiaries shall make explicit the intervention logic for their specific research domain, their capacity to attract top Internet talents, to deliver a solid value-adding services package to the third party projects, as well as their expertise and capacity in managing the full life-cycle of the open calls transparently. They should explore synergies with other research and innovation actions, supported at regional, national or European level, to increase the overall impact.

For grants awarded under this topic for Research and Innovation actions beneficiaries may provide support to third parties as described in part K of the General Annexes of the Work Programme. The support to third parties can only be provided in the form of grants. The respective options of Article 15.1 and Article 15.3 of the Model Grant Agreement will be applied.

For the call closing in 2018 'R&I Actions' in the following three sub-topics will be called for. **Proposals should address only one of these sub-topics.**

i) Privacy and trust enhancing technologies: as sensors, objects, devices, AI-based algorithms, etc., are incorporated in our digital environment, develop robust and easy to use technologies to help users increase trust and achieve greater control when sharing their personal data, attributes and information.

ii) Decentralized data governance: leveraging on distributed open hardware and software ecosystems based on blockchains, distributed ledger technology, open data and peer-to-peer technologies. **Attention should be paid to ethical, legal and privacy issues, as well as to the concepts of autonomy, data sovereignty and ownership, values and regulations.**

iii) Discovery and identification technologies: to search and access large heterogeneous data sources, services, objects and sensors, devices, multi-media content, etc. and which may include aspects of numbering; providing contextual querying, personalised information retrieval and increased quality of experience.

For the call closing in 2019 'R&I Actions' in the following three sub-topics will be called for. **Proposals should address only one of these sub-topics**.

i-b) **Strengthening internet trustworthiness with electronic identities**: addressing critical challenges related to increasing trust in the internet such as authentication, authorisation, traceability, privacy and confidentiality in personal and non-personal interactions. This topic will engineer federated and/or decentralised technologies for supporting internet-wide e-identities with various levels of identification, reputation and trust, to serve as a basis for new business models for verifying and valuating personal data. Proposers should pay attention to the following dimensions: scalability, ease of use, deployability, sustainability, standardisation and compatibility with the eIDAS framework[1].

ii-b) **Service and data portability**: this topic will address the challenge of personal data portability on the internet as foreseen under the GDPR[2] and the data porting and service provider switching as foreseen in the proposed free flow of non-personal data regulation[3]. The topic should cover the separation of data from the services provided to the end-users, with a view to ensure seamless combination of internet services and frictionless switching. **Attention should be paid to technological developments, standardisation of personal profiles, practical handling of data sets mixing personal and non-personal data, operational and business models, as well as techno-legal constraints and the simplification of end-user contracts and terms of use.**

iii-b) **Open Internet architecture renovation**: supporting communities of developers in ensuring Internet architecture evolution towards better efficiency, scalability, security and resilience. Auditing, testing and improving protocols and open source software and

hardware that are used to manage the Internet, with renewed design goals such as isolation of contingencies, redundancy and self-repair, disruption tolerance, transparency, better real-time behaviour and energy efficiency. Ability to roll-out at Internet scale should be assessed as part of the proposed solutions.

'R&I Actions' should encourage, when relevant, open source software and open hardware design, access to data, standardisation activities, access to testing and operational infrastructure as well as an IPR regime ensuring lasting impact and reusability of results.
The Commission considers that proposals requesting a contribution from the EU of EUR 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. As a reference, 80% of the EU funding should be allocated to financial support to the third parties, through projects typically in the EUR 50 000 to 200 000[4] range with duration of 9 to 12 months. Each 'R&I Action' is expected to run several cycles of third party projects, which requires an overall duration of 24 to 36 months.

Expected impact
Proposals should provide appropriate metrics for the claimed impacts.

- **Shape a more human-centric evolution of the Internet.**
- Create a European ecosystem of top researchers, hi-tech startups and SMEs with the capacity to set the course of Internet evolution.
- **Generate new business opportunities and new Internet companies with maximum growth and impact chances.**
- For sub-topics i, ii, iii, i-b, ii-b and iii-b: Integrating research and innovation communities; development of common visions and enhanced science – industry collaborations in each of the technology domains.

Type of action	Research and Innovation action
Deadline	**28 March 2019**
Call identifier	H2020-ICT-2018-2020
Topic information	Link

ICT-30-2019-2020: An empowering, inclusive Next Generation Internet

Specific challenge

Every citizen, from all walks of life, should be able to fully take part in the Digital Single Market. This means that the Next Generation Internet will have to empower users, including its most vulnerable or disabled ones, to have access to the same digital learning opportunities, in forms that are accessible, perceivable and understandable by everybody.

Scope

The objective is to support actions on smarter, open, trusted and personalised learning solutions to optimise digital learning and to allow learners to engage and interact with content and with peers.

a. Innovation Action: Digital Learning Incubator

The objective of this action is to **advance personalised and inclusive digital learning through a fast-paced adoption cycle of** technological and **methodological solutions**. The work will build on cross-links and advances in the various NGI technologies (such as machine-learning, AR/VR, AI) research fields and foster synergies between all the relevant market players, researchers and educational agents working on promising and innovative products. The action will be based on a "push and pull" strategy whereby the research actors push the best research projects to enter the innovation cycle and the market actors pull for the ideas with best market traction.

The action will:

- set up an Incubator bringing together all relevant stakeholders to form strategic alliances that can jointly achieve fast-paced breakthroughs in the area of personalised and inclusive learning online. The Incubator will allow fast-track experimentations in the form of small scale projects, providing access to knowledge, research prototypes, learning resources and data to parties interested to conduct these experimentations.
- launch open calls for highly promising small scale projects to work on a topic/challenge set out in a roadmap. It shall foresee suitable arrangements for organizing the corresponding competitive evaluation and selection.

The action shall select these small scale projects through the use of financial support to third parties. Up to 90% of the EU funding of the action should be allocated to the financial support of these third parties, typically of the size of EUR 100 000 to 200 000 per third party and a duration of about 9 to 12 months. Financial support to third parties should be in line with the conditions set out in Part K of the General Annexes.

The Commission considers that up to 1 proposal requesting a contribution from the EU of around 7 million would allow this area to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

b. Coordination and support action in the area of Digital Learning

The action will:

- stimulate the collaboration between all EU-funded FP7 and H2020 projects on digital learning, analyse the outcomes and best practices carried out in these projects, support the dissemination of their results as well as ensure their integration within the Next Generation Initiative and link with other support measures.
- **identify: a) emerging research challenges, notably those arising from digital certification of learning outcomes and blockchain technologies and their uptake for a more inclusive and personalised learning; b) address legal, organisational and technological challenges underpinning the uptake of the proposed solutions,** notably in relation to their scalability; c) make policy recommendations in view of the priorities of the next programme for research, innovation and deployment.

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

Expected impact

- Increase in the overall uptake of technology for personalised and inclusive learning for all, regardless of their age, gender or other socioeconomic factors.
- Increase in the number of distributed learning solutions for children with special educational needs.
- Increase in the number of start-ups/SME's deploying personalised and inclusive learning solutions to the market.

Delegation Exception Footnote:

It is expected that this topic will continue in 2020.

Type of action	Coordination and support action, Innovation action
Deadline	**28 March 2019**
Call identifier	H2020-ICT-2018-2020
Topic information	Link

ICT-33-2019: Startup Europe for Growth and Innovation Radar

Specific Challenge:
The challenge is to scale up innovative businesses across the EU, detect high potential innovations and support innovators in going to market. Actions under this heading reinforce the Startup Europe and Innovation Radar initiatives and link to the activities of the European Innovation Council in a complementary way by targeting exclusively ICT innovators that are not supported by the EIC.

Scope:

Actions should help startups and scaleups achieve market success and mature the innovation excellence of high potential innovators. **Actions should support the creation of new jobs and high growth businesses and support their growth on a pan-European and international level.** Innovators identified, promoted and supported by the Innovation Radar are expected to enrich and benefit from the Startup Europe ecosystem. Projects should demonstrate sustainability of proposed actions beyond the life of the project. Where appropriate, the projects should seek synergies with ESIF funds or ESIF supported actions in order to improve the synergies between H2020 and ESIF.

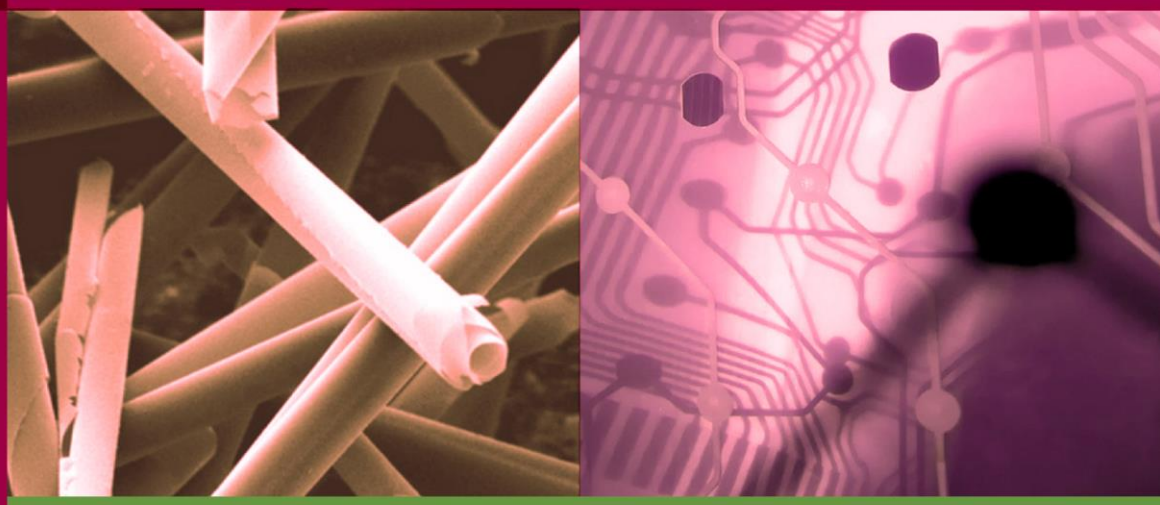
a. Innovation actions

Connecting local deep-tech startup ecosystems and supporting cross-border activities: among the 4-5 startups ecosystems connected by each project, at least half of them will be located in less developed ecosystems. Actively connect them to the **Startup Europe one-stop-shop** and involve the Digital Innovation Hubs to support individual ecosystems. **Cross-border activities will include: connecting deep-tech entrepreneurs with e.g. potential investors, business partners, accessing skills and services helping startups soft land in new markets.** Particular focus will be placed on stimulating partnerships between scaleups and corporates with a view to procurement. Special attention will be placed to support digital startups and scaleups wherever situated in Europe, to access public procurement opportunities across borders.

b. Coordination and support actions

- Provide targeted and tailored go-to-market support to SMEs, startups, scaleups, spinoffs and market-oriented researchers, who are supported by EU funded ICT projects[4] and are delivering market-creating innovations that have scale-up potential.
- Insight and intelligence from the Innovation Radar is to be used to detect EU-funded innovators who face the biggest market opportunities (enhancement of Innovation Radar data by merging with relevant third party data sources is welcomed).
- **Support for innovators is expected to include mentoring, coaching, investor readiness training, coaching on how to bid for public procurement sales opportunities, connecting innovators with potential customers, business partners and investors (Business Angels, Venture Capital, Crowdfunding and other relevant forms of financing).**

Type of action	Innovation action, Coordination and support action
Deadline	**28 March 2019**
Call identifier	H2020-ICT-2018-2020
Topic information	Link



Leadership in Enabling and Industrial Technologies

Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing

Net 4 Society

DT-NMBP-03-2019: Open Innovation Test Beds for nano-enabled surfaces and membranes

Specific challenge
Nano-enabled surfaces and membranes have a vast range of applications in final products across many industry sectors. The challenge is to enable a cost effective and sustainable industrial upscaling and deployment of nano-enabled surface and membrane technologies, including thin film architecture, coating, surface structuration for improved properties (optical, surface energy, durability, reduced friction, etc.), and nanostructured membrane's functionalities. This will require the integration of state-of-the-art nano-scale processes for modification, functionalisation, and structuring/coating of surfaces or membranes.

Scope

- Open Innovation Test Beds should upgrade or develop materials facilities and make available to industry and interested parties, including SMEs, services for the design, development, testing, safety assessment, and upscaling of new nano-enabled surfaces and membranes;
- New materials functionalities may include, among others, improved scratch and abrasion resistance, super hardness and mechanical resistance, improved corrosion, wear and friction properties, bio-functionality, bio-compatibility, control of reflectivity, sensing ability, self-cleaning, antimicrobial, permeability and selectivity properties;
- **Open access at fair conditions and cost as well as outreach and dissemination across Europe, based on a distinct methodology**;
- Applications can cover industrial as well as consumer products. Potential regulatory, economical and technical barriers should be identified and assessed;
- Quality control processes and tools should be validated to allow on-line quality controls;
- Materials should be demonstrated in relevant industrial environments;

Proposals submitted under this topic should include actions designed to facilitate cooperation, across Europe, with other projects and existing Pilot Lines; to **enhance user involvement**; and to ensure the accessibility and reusability of data produced in the course of the project.

Activities should start at TRL 4 and achieve TRL 7 at the end of the project.

The Commission considers that proposals requesting a contribution from the EU between EUR 7 and 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

- Open and upgraded facilities at the EU level for the design, development, testing, safety assessment, and upscaling of nano-enabled surfaces and membranes;
- Attract a significant number of new SME users, with at least a 20% increase for existing test beds;
- Increased access to finance (for SMEs in particular) for investing in these nano-enabled surfaces or membranes or in applications using them;
- At least 15% improved process parameters and 20% faster verification of nano-enabled surfaces or membranes performance for highly promising applications;
- At least 20% improvement in industrial productivity, reliability, environmental performance, durability, and reduction of life-cycle costs of these nano-enabled surfaces or membranes;
- At least 15% indirect reduction in energy consumption for applications using novel nano-enabled surfaces or membranes.

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

Call – Foundations for tomorrow's industry

Type of action	Innovation action
Deadline	**1st stage - 22 January 2019** **2nd stage - 03 September 2019**
Call identifier	H2020-NMBP-TO-IND-2018-2020
Topic information	Link

NMBP-15-2019: Safe by design, from science to regulation: metrics and main sectors

Specific challenge

Risk management involves quantifying hazard (toxicity) and exposure, and taking the necessary steps to reduce both to acceptable levels, ideally at an early stage of the nanomaterial development process (Safe-by-Design). Various industrial sectors, and in particular structural or functional materials, coatings and cosmetics, as well as pharma and health technology are currently searching for ways to mitigate possible risks from nanomaterials and nano-containing products. The challenge now is to distil existing methods into simple, robust, cost-effective methods for monitoring and modelling of physical-chemical properties and biological effect assessment of nanomaterials in relevant use conditions including in product-relevant matrices.

Scope

- Degradation of nano-enabled products and ageing of nanomaterials, and mixture toxicity;
- New Safe by Design methods that enable reduction of hazard and exposure through design to an acceptable risk level without affecting the material performance and guide development of safer products at different stages;
- Implementation of control measures and mitigation strategies for nanomaterials specific scenarios in various industrial sectors to reach acceptable regulatory risk level on the effectiveness of such measures, and develop computational approaches to model them;
- For this topic the parallel calls scheme is envisaged with the USA-NNI. Resulting projects should establish close cooperation mechanisms. **Legal, policy making and Responsible Research and Innovation aspects should be integrated in the proposal.**

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is particularly encouraged.

Proposals submitted under this topic should include actions designed to facilitate cooperation with other projects; to **enhance user involvement**; and to ensure the accessibility and reusability of data produced in the course of the project.

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 6 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

- Safe by design approaches and tools at an early stage of the nanomaterial development process;
- Quality workplaces that ensure maximum technical and economic performance in line with acceptable risk levels;
- Control and mitigate exposure to acceptable risk level in case after release of nanomaterials from products;
- **Develop and validate low-cost techniques for delivering an integrated exposure driven risk assessment and the associated design of the required post-use monitoring**.

Type of action	Research and Innovation action	
Deadline	**1st stage - 22 January 2019**	**2nd stage - 03 September 2019**
Call identifier	H2020-NMBP-TR-IND-2018-2020	
Topic information	Link	

DT-FOF-05-2019: Open Innovation for collaborative production engineering

Specific challenge

The transfer to industrial companies of the Do It Yourself (DIY), fablabs, micro-factories and makers approaches can pioneer ways towards engineering solutions throughout the whole value chain. These innovative methods can lead to new processes, machines and products with new functionalities and shorter time to market.

Industry is not yet widely using such innovative approaches to engage consumers and respond to societal needs, also taking into account the individual preferences of women and men. Collaborative production liaising companies, especially SMEs, with these new approaches can however create Open Innovation networks that can unroll a wide range of entirely new business opportunities for the benefit of consumers.

Scope

- **Proposals should particularly cover consumer-goods sectors and couple design, creativity and knowledge with a customer-driven production. The co-creation of products in both ends of the value chain represents customer involvement in the production. In particular, proposals should cover at least three out of the following areas:**
- Novel approaches to capitalise on the knowledge and ideas of design and engineering coming from different and even new actors;
- **Design of new strategies based on creative and agile methodologies for analysis;**
- **Development of knowledge, technologies and tools to share and analyse relevant data and demands from users** as well as to fully enable collaborative engineering in the production network, allowing all actors to propose innovative solutions;
- Development of open source product data exchange and standard representations of products and processes that ensure the compatibility of modelling and simulation with different process information systems;
- Development of new Manufacturing Demonstration Facilities (MDFs), where companies will test new technologies in cooperation with fablabs and makers in order to develop real industrial products and where training is offered.

Proposals also need to take into account Social Science and Humanities (SSH) aspects regarding creativity.

Proposals submitted under this topic should include actions designed to facilitate cooperation with other projects; to **enhance user involvement**; and to ensure the accessibility and reusability of data produced in the course of the project.

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 4 and 6 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

- Establish Open-Innovation networks for manufacturing that support customer-driven production all around Europe;
- **Creation of specific business models for the engineering of customised solutions, particularly for SMEs, rapid demand changes and shorter time to market;**
- **Improvement of the co-design and co-development capabilities towards a reduction of development costs of new products and services;**
- Increase of product variety and personalisation for higher customer satisfaction and loyalty.

Type of action	Research and Innovation action
Deadline	**21 February 2019**
Call identifier	H2020-NMBP-TR-IND-2018-2020
Topic information	Link

BIOTEC-02-2019: Boosting the efficiency of photosynthesis

Specific challenge

Agricultural productivity that does not keep up with the current population increase, the growing demand for biomass production (as feedstock for biofuels) and the nonstop rise of global CO2 emissions with its consequences for climate change, are all circumstances that make it urgent to increase the yield of biomass. Indeed, increased agricultural yield efficiency can have huge impacts in a society driven by the bio-economy.

Plants use photosynthesis to grow, converting energy from the sun into storable carbohydrates. Chloroplasts are the minute energy factories in the plant leaves that absorb the sun's energy, release oxygen into the air and use hydrogen plus CO2 to make the compounds that plants need to grow. Biotechnology has succeeded in the engineering of nuclear and chloroplasts genomes for the production of enzymes, raw materials and building blocks for the chemical industry. However, research to increase the efficiency of the enzymes that drive photosynthesis has not yet produced the desired results. Currently available ground-breaking and disruptive technologies coupled with the integration of knowledge from diverse scientific disciplines have the potential to propose new solutions to boost the efficiency of photosynthesis.

Scope

Proposals should work towards the optimisation of photosynthesis by capitalising on multidisciplinary approaches, such as functional genomics, systems biology, metabolic modelling, enzyme engineering, computational biology, synthetic biology, directed evolution and gene editing techniques.

Proposals should work with plants or algae and deal with any of the biological components underlying the diversity of photosynthesis. Proposals can involve new strategies to engineer the chloroplast genome, new strategies to engineer relevant enzymes, the development of metabolic models that contribute to a higher understanding of the properties of photosynthesis, among others.

Proposals should cover at least one of the following:

- new tools improving the performance of the catalytic enzymes involved in photosynthesis;
- new tools to increase the rate of CO2-fixation;
- engineered enzymes for novel CO2-fixation pathways.

Proposals should include Social Sciences and Humanities (SSH) elements regarding the technologies used and the environmental and socio-economic impact of the expected output.

Proposals submitted under this topic should include actions designed to facilitate cooperation with other projects; to enhance user involvement; and to ensure the accessibility and reusability of data produced in the course of the project.

Activities should start at TRL 3 and achieve TRL 5 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

- A strategy based on the new resources to obtain an enhanced photosynthetic efficiency of at least 10% under diverse environmental conditions;
- A detailed and accurate research and innovation roadmap to attain higher photosynthetic performance for applicable results in the field by 2030.
- Relevant indicators and metrics, with baseline values, should be clearly stated in the proposal.

Type of action	Research and Innovation action	
Deadline	**1st stage - 22 January 2019**	**2nd stage - 03 September 2019**
Call identifier	H2020-NMBP-TR-IND-2018-2020	
Topic information	Link	

Leadership in Enabling and Industrial Technologies

Space

Net 4 Society

DT-SPACE-01-EO-2018-2020: Copernicus market uptake

Specific challenge
Copernicus, the Union's Earth observation and monitoring programme entered into force in 2014 and produces a wealth of data and information regarding the Earth sub-systems (land, atmosphere, oceans and inland waters) and cross-cutting processes (climate change, disaster management and security). Copernicus data and information are mainly made available on a free, open and full basis. This is expected to unleash unique market opportunities. **It is important to foster market development, exploiting the added value of integration of Earth observation (EO) technologies (both satellite, airborne and ground based) other data from different sources and across different market segments through the development of applications, and encourage their insertion into the market.**
For such applications and developments to succeed in the market, the product needs to be shaped according to user needs and their value to users must be openly demonstrated to the wider user community. This needs to be achieved in an environment integrated at the level of the user, in order for users to accept the innovative potential which the product promises.
Synergies in the context of GEOSS need to be exploited where appropriate.

Scope
Proposals should address a wide variety of applications stemming from the use of Earth observation and its smart integration with other related technologies. Copernicus should be considered as part of the solution which may include other space or non-space inputs. **This should lead to greater value, opportunities and especially market uptake.** Proposals are encouraged to use the Copernicus Data and Information Access Services (DIAS), or other existing data access solutions instead of setting up their own download and processing infrastructure. They are also encouraged to integrate third-party data (including in-situ data) and envisage data assimilation into models and products made available on the Copernicus platform of the Copernicus services.
Proposals need to address the scalability and cost efficiency of the solution, demonstrating how it will work on a large region or even global scale.
Proposals should be innovative in at least one of these dimensions: market, product, process or business model.
For proposals under this topic (2019 and 2020 calls):

- Participation of industry, in particular SMEs, is encouraged;
- **Involvement of post-graduate scientists, engineers and researchers is also encouraged, for example through professional work experience or through fellowships/scholarships as applicable**
- A business plan and **evidence of user engagement shall be compulsory** and shall 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 2 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.
This topic contributes to the Horizon 2020 focus area "Digitising and transforming European industry and services".

Expected Impact

- **Establish sustainable supply chains for innovative Earth observation value added products and services with demonstrated commercial value and targeted client communities**;
- Establish sustainable supply chains for innovative Earth observation value added products and services with demonstrated innovative technology;
- Demonstrate complete integration, based on international standards, into the customer's existing business processes and processing chains, as well as the economic viability of the application;
- **Enhance European industry's potential to take advantage of market opportunities and establish leadership in the field, as well as boost business activity**;
- **Lead to new or improved products, processes or services on the market, which are capable of generating a significant turnover and creating new jobs**.

Type of action	Innovation action
Deadline	**12 March 2019**
Call identifier	H2020-SPACE-2018-2020
Topic information	Link

SU-SPACE-EGNSS-3-2019-2020: EGNSS applications fostering societal resilience and protecting the environment

Specific challenge

The aim of this topic is to develop innovative EGNSS applications to support societal resilience, safeguard the wellbeing of EU citizens, improve emergency and disaster management as a response to climate related, natural and man-made disasters and ensure green growth that protect the environment while generating economic growth.

The challenge is to make these applications more affordable, easy to use and integrated with other solutions and technologies, including for example earth observation, e.g. Copernicus services, in order to enable new targeted innovative solutions.

The following specific challenges are covered by this topic:

- EGNSS is offering additional accuracy and features, such as the Search and Rescue service (SAR). The current SAR service, provided free of charge by Cospas-Sarsat to national Rescue Coordination Centres, is used by about one million beacon owners for maritime, aviation and leisure applications and over the last 30 years has on average contributed to saving 1300 lives per year. Galileo Forward Link Service initial service was declared operational in 2016 and the unique Return Link service is planned to be launched in 2018, delivering acknowledgement of reception of the distress alarm. Emergency services, disaster early detection and efficient management can also benefit from increased accuracy and added value provided by other sensors.
- The power networks, telecommunication networks and financial transactions[1] are today synchronised, many of them using GNSS. These networks are becoming more and more distributed (e.g. distributed power generation of renewable energies), interconnected and more demanding in terms of synchronisation performances (e.g. in 4G-LTE and future internet), or requiring authenticated solutions as for the financial transaction time stamping. The specific challenge is in this case to build on the enhanced capabilities offered by Galileo that will provide high accurate timing information and authentication services, to develop a new generation of high performing, reliable and EU independent timing and synchronisation applications that can cope with these emerging and demanding needs. Integrity and trustworthiness of the synchronization mechanism offered by GNSS should also be addressed.
- Precision agriculture, mapping and surveying have been the pioneers in the use of GNSS since the early years. Innovative EGNSS applications in agriculture and surveying should take into account the possibility to minimise the adverse consequences of climate change and the impact on the environment (e.g. fertiliser use and air quality). Other EGNSS differentiators, like multiple frequencies and the Galileo High Accuracy service that will be offered free of charge are contributing to enabling EGNSS innovative solutions, including in challenging environments.

Scope

Proposals may address social and professional applications. Promising areas of activities are:

- Applications supporting e-health, safety and emergency management;
- Search and Rescue applications, including tracking of distress situations and response management;
- Emergency and disaster management;
- Management and related operation of critical infrastructure (e.g. electricity network, telecommunication networks, financial transactions), timing and synchronisation;
- Efficient Agriculture: Automated machine guidance, precision farming and machine control;
- Surveying and Mapping: Land survey, marine survey, cadastral and geodesy, and construction.

For all the professional areas, the development and innovation should build on:

- Multiple-frequencies E1, E5 and E6;
- Galileo specific signal modulation, e.g. AltBOC;
- Galileo High Accuracy service that will be offered free of charge and Authentication features that will be provided by Galileo;
- Fusion with other data, such as from EO satellites or other in-situ sensors.

Actions should deliver new innovative applications, with commercial impact and a clear market uptake perspective (a Business Plan is required as part of the proposal). EGNSS should be part and parcel of the envisaged solution(s). However, where a combination of EGNSS with other technologies is required to make the application(s) work, this is not excluded from the scope.

For proposals under this topic:

- Participation of industry, in particular SMEs, is encouraged;
- **Involvement of post-graduate researchers (engineers, scientists, and others) is also encouraged, for example through professional work experience or through fellowships/scholarships when applicable;**
- **A Business Plan and evidence of user engagement shall be compulsory and shall be provided as part of the proposal, to demonstrate the user need and sustainability of the project.**

Proposals addressing PRS (Public Regulated Service) related applications are not in the scope of this action.

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.
This topic contributes to the Horizon 2020 focus area "Boosting the effectiveness of the Security Union".

Expected Impact

- Develop highly innovative applications taking advantage of Galileo and EGNOS differentiators in order to decrease the barriers to access such professional applications, reduce the price and increase the effectiveness of the solution, facilitate its use and increase the number of users;
- Commercialise the products and services developed;
- Proposals addressing Galileo SAR service should leverage the Forward and Return Link Services **to improve the users' safety** and efficiency of the rescue activity by reducing the time to accurately locate the distress alert;
- Emergency and disaster management applications should target integration of different sensors and position sources to identify, locate and react in critical situations, as well as delivering efficient response to ensure the wellbeing of citizens and monitor the infrastructure;
- Innovative GNSS applications in agriculture improving the productivity and decreasing the negative environmental impact;
- Timing and synchronisation applications focussing on emerging network synchronisation needs in terms of accuracy and robustness, while reducing EU dependency from other GNSS.

Type of action	Innovation action
Deadline	**05 March 2019**
Call identifier	H2020-SPACE-EGNSS-2019-2020
Topic information	Link

SPACE-EGNSS-4-2019: Awareness Raising and capacity building

Specific challenge
Extensive GNSS applications combined with other technologies require innovation as well as the establishment of standards and rules. The challenge is to build a mechanism to leverage EGNSS excellence in particular of SMEs and universities, facilitate EGNSS investments and to foster market uptake. Exploiting the potential of EGNSS products by maximising and spreading the benefits of EGNSS innovation is vital for Europe's competitiveness and its ability to address societal challenges in the future. The capacity building and awareness rising around EGNSS applications, creation of strategic partnership towards commercialisation and achieving a critical mass of EGNSS applications success stories would attract investment from Europe and beyond.
The main aim of this topic is to support building of industrial relationships by gathering private and public institutions around services offered by EGNSS and related applications.

Scope
The proposals should aim at the development of EGNSS competences existing and emerging in different EU Member States and Associated Countries.
The actions should focus on EGNSS **dissemination, awareness-raising and communication**, as well as provide opportunities for the creation of networks of industrial relationships in Europe and also globally. By doing so the action should be achieving a critical mass of EGNSS applications success stories, demonstrating the advantages and differentiators of EGNSS services and making it an attractive option for private investors in Europe and also globally.
Technology promotion activities can include incentive schemes in the form of financial support to third parties for innovative applications developed by companies and entrepreneurs and based on the EGNSS that will promote the uptake of satellite navigation downstream applications across Europe and globally.
International cooperation is welcome for when adding value and increasing the impact of the action.
Proposals addressing PRS (Public Regulated Service) related applications are not in the scope of this action.
The Commission considers that proposals requesting a contribution from the EU of between EUR 0.5 and 1 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

- **Support the competitiveness of EU industry by identifying strategic partners and by developing market opportunities in Europe and also globally. The creation of a network of EGNSS products market champions will leverage the country/region's assets in terms of research, innovation, and know-how, by supporting the growth of EGNSS industry and SMEs and by fostering cooperation between SMEs, industry leaders, investors, and research organizations.**
- Foster the emergence of new downstream applications based on either Galileo and/or EGNOS and therefore to support the EU GNSS industry in Europe and also globally.

Type of action	Coordination and support action
Deadline	**05 March 2019**
Call identifier	H2020-SPACE-2018-2020
Topic information	Link

Innovation in SMEs

Net 4 Society

Call - For a better innovation support to SMEs

INNOSUP-04-2019: Workplace innovation uptake by SMEs

Specific challenge

Workplace innovations are non-technological innovations related to business structure and organisation, employee engagement and Human Resources management, managing internal process and decision making, development and planning of organisational strategies and methods, relationships with clients and suppliers, the work environment itself.

Workplace innovations improve motivation and working conditions for employees, both men and women, which leads to increased labour productivity, innovation capability, market resilience, and overall business competitiveness. Workplace innovation helps companies to anticipate and adapt faster and better to changing economic environment. This type of flexibility is even more important in the context of a new industrial revolution and quickly changing technologies and business models. Being able to react to changes rapidly requires continuous feedback from customers and users. Employees working at the customer interface have an important role in producing this information. Workplace innovation also improves learning capabilities and diffusion of knowledge, which are important for keeping workers' skills up-to-date. Finally, non-technological innovations are an integral part of the successful implementation of technological innovations.Despite obvious benefits still not many companies, especially SMEs, implement this type of innovation. Implementing workplace innovation and facing challenges related to new industrial revolution requires right managerial skills. That is often not the case for SMEs, which do not have enough knowledge resources.

The experience of the 2013-2016 European Workplace Innovation Network pilot project shows the difficulties in promoting one specific model of workplace innovation. **Successful implementation of this type of innovation depends on the national, economic and cultural context** (related e.g. to the entrepreneurship and managerial culture).

Scope

The Action will be a piloting scheme for the uptake of workplace innovation by SMEs. It will aim at creating interregional networks gathering national or regional innovation support agencies, which will work together to create pilot schemes supporting the uptake of workplace innovation in SMEs. The composition of the networks should reflect similar needs of SMEs and a comparable entrepreneurship culture in the area covered by the network. This approach will enable the creation of new, context-based workplace innovation support schemes.

Those new pilot schemes will be tested in companies selected by the interregional networks, by using financial support to third parties (at least 75% of the grant will be used for this purpose). The total number of supported companies will be taken into account in the evaluation of the proposals (please refer to the grant conditions for this topic).

The Action, by looking at existing tools, exchange of best practice and creation of new pilot schemes will help to create new, context based, long term mechanisms supporting the uptake of workplace innovation by SMEs across Europe. It will also give concrete support to SMEs interested in looking for new sources of growth through the competitive edge provided by workplace innovation related opportunities. **Thereby it will stimulate: (i) new forms of work organisation and working (including the gender dimension); (ii) stronger employee participation in innovation processes** (creation of new products, services and their production); **(iii) improvement of the managerial techniques;** (iv) it will help draw lessons for innovation support agencies.

A budget of EUR 1,5 million should allow to address this challenge (budget for a single network not exceeding EUR 300,000).

The Commission considers that proposals requesting a contribution from the EU of up to EUR 0,3 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

- New, context based mechanisms supporting uptake of workplace innovation by SMEs.
- More SMEs take advantage of the opportunities offered by workplace innovation.
- New, context-based forms of workplace innovation are created.
- Improved framework conditions for the uptake of new technologies.
- Better skilled workforce and more resilient companies.

Type of action	Coordination and support action
Deadline	**17 January 2019**
Call identifier	H2020-INNOSUP-2018-2020
Topic information	Link

Excellent Science

Future and Emerging Technologies

Net 4 Society

Call – FET Open - Novel ideas for radically new technologies

FETOPEN-01-2018-2019-2020: FET-Open Challenging Current Thinking

Specific Challenge
To lay the foundations for radically new future technologies of any kind from visionary interdisciplinary collaborations that dissolve the traditional boundaries between sciences and disciplines, including the social sciences and humanities. This topic also encourages the driving role of new actors in research and innovation, including excellent young researchers, ambitious high-tech SMEs and first-time participants to FET under Horizon 2020 from across Europe.

Scope
Proposals are sought for cutting-edge **high-risk / high-impact interdisciplinary research** with all of the following essential characteristics ("FET gatekeepers"):

- Radical vision: the project must address a clear and radical vision, enabled by a **new technology concept that challenges current paradigms**. In particular, research to advance on the roadmap of a well-established technological paradigm, even if high-risk, will not be funded.
- Breakthrough technological target: the project must target a novel and ambitious science-to-technology breakthrough as a first proof of concept for its vision. In particular, blue-sky exploratory research without a clear technological objective will not be funded.
- Ambitious interdisciplinary research for achieving the technological breakthrough and that opens up new areas of investigation. In particular, projects with only low-risk incremental research, even if interdisciplinary, will not be funded.

The inherently high risks of the research proposed shall be mitigated by a flexible methodology to deal with the considerable science-and-technology uncertainties and for choosing alternative directions and options.
The Commission considers that proposals requesting a contribution from the EU of up to 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:

- Scientific and technological contributions to the foundation of a new future technology
- **Potential for future social or economic impact or market creation**.
- Building leading research and innovation capacity across Europe by involvement of key actors that can make a difference in the future, for example excellent young researchers, ambitious high-tech SMEs or first-time participants to FET under Horizon 2020.

Type of action	Research and Innovation action
Deadline	**24 January 2019** **18 September 2019** **13 May 2020**
Call identifier	H2020-FETOPEN-2018-2020
Topic information	Link

Topics with minor SSH relevance

FETOPEN-03-2018-2019-2020: FET Innovation Launchpad
Link

Excellent Science

Research Infrastructures

Net 4 Society

Call – Development and long-term sustainability of new pan-European research Infrastructures

INFRADEV-01-2019-2020: Design Studies

Specific challenge

New leading-edge research infrastructures in all fields of science and technology are needed by the European scientific community in order to remain at the forefront of the advancement of research, and to be able to help industry strengthen its base of knowledge and its technological know-how. **The aim of this activity is to support the conceptual and technical design for new research infrastructures which are of a clear European dimension and interest. Major upgrades of existing infrastructures may also be considered if the end result is intended to be equivalent to a new infrastructure.**

Scope

Design studies should tackle all the key questions concerning the technical and conceptual feasibility of new or upgraded fully fledged user facilities (proposals considering just a component for research infrastructures are not targeted by this topic). A design study proposal should demonstrate the relevance and the advancement with respect to the state-of-art of the proposed infrastructure. It should indicate the gaps in the research infrastructure landscape the new facility will cover as well as the research challenges it will make possible to address. **All fields of research are considered.**

The main output of a design study will be the 'conceptual design report' for a new or upgraded research infrastructure, showing the maturity of the concept and forming the basis for identifying and constructing the next generation of Europe's and the world's leading research infrastructures. **Conceptual design reports will present major choices for design alternatives and associated cost ranges, both in terms of their strategic relevance for meeting today's and tomorrow's societal challenges, and (where applicable) in terms of the technical work underpinning the development of new or upgraded research infrastructures of strategic importance for Europe.**

The activities to be performed in a Design Study proposal should include both:

- Scientific and technical work, i.e. (1) the drafting of concepts, architecture and engineering plans for the construction, taking into due account resource efficiency and environmental (including climate-related) impacts, as well as, when relevant, the creation of prototypes; (2) scientific and technical work to ensure that the scientific user communities exploit the new facility from the start with the highest efficiency; (3) plans to organise the efficient curation, preservation and provision of access to data collected or produced by the future infrastructure, in line with the FAIR principles.
- Conceptual work, i.e. (1) plans to coherently integrate the new infrastructure into the European landscape of related facilities in accordance, whenever appropriate, with the EU objective of a balanced territorial development; (2) the estimated budget for construction and operation, and initial ideas on how to achieve long-term sustainability; (3) plans for an international governance structure; (4) the planning of research services to be provided at international level, (5) procedure and criteria to choose the site of the infrastructure.

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

Conceptual and technical designs of new leading edge research infrastructures are crucial to keep the European scientific community at the forefront of the advancement of research and to trigger the process leading to their establishment.

- Funding bodies for research infrastructures become aware of the strategic and funding needs of the scientific community.
- Policy bodies at the national level (e.g. funding bodies, governments), at European level (e.g. ESFRI) and internationally (e.g. the Group of Senior Officials on Research Infrastructures – GSO) have a sound decision basis to establish long-range plans for new research infrastructures of pan-European or global interest.
- The technical work carried out under this topic will contribute to strengthening the technological development capacity and effectiveness as well as the scientific performance, efficiency and attractiveness of the European Research Area.
- When relevant, the improvement of the environmental (including climate-related) impact as well as the optimisation of resource and energy use are integrated in the very early phase of development of new research infrastructures.

Type of action	Research and Innovation action
Deadline	**12 November 2019**
Call identifier	H2020-INFRADEV-2018-2020
Topic information	Link

INFRADEV-02-2019-2020: Preparatory Phase of new ESFRI projects and early phase support to ESFRI high strategic potential areas

Specific challenge

The ESFRI roadmap, updated periodically, identifies the needs of the European scientific community in terms of research infrastructures. However, inclusion in the ESFRI roadmap does not guarantee that these needed infrastructures will be built. Before proceeding with the construction and/or implementation of the identified infrastructures, many preliminary decisions need to be taken with respect to issues such as the identification of funders, the financial plan for sustainability, the governance by involved stakeholders, the site and legal form of the managing organisation (and of the research infrastructure, if different), the architecture and the service policies. The aim of this activity is to provide catalytic and leveraging support for the preparatory phase of ESFRI projects, and to new initiatives in areas of high strategic potential, leading to the construction of new research infrastructures or major upgrades of existing ones.

Scope

Following the updates of the ESFRI Roadmap, support under this work programme will be provided to:

(a) Preparatory Phase for new research infrastructure projects which enter the ESFRI Roadmap in 2018 (Coordination and Support actions)

The preparatory phase aims to bring the project for the new or upgraded research infrastructure identified in the ESFRI Roadmap to the level of legal, financial, and, where applicable, technical maturity required for implementing it. Proposal consortia should involve all the stakeholders necessary to move the project forward, to take the decisions, and to make the financial commitments, before construction can start (including, but not limited to, national/regional ministries/governments, research councils or funding agencies from the countries that have already declared their commitment in the application to ESFRI). Appropriate contacts with ministries and decision-makers should be continuously reinforced, thus further strengthening the consortia. Operators of research facilities, research centres, universities, and industry may also be involved whenever appropriate. Technical work should be carried out when necessary to complete the final technical design, providing a sound technical base for establishing a cost baseline and detailed financial planning. The financial needs of the project should be mapped out to the extent necessary for funding agencies to establish their own medium-and long-term financial planning. **Societal and economic benefits of the infrastructure should be analysed to carry out a Cost-benefit analysis.**

The preparation of the legal and financial agreements (including site, governance, internal rules, financing of the new research infrastructures) is one of the main activities and deliverables and should be finalised before the end of the project (e.g., through the signature of a Memorandum of Understanding). The detailed list of activities that can be included in a preparatory phase proposal is given in part A of the section "Specific features for Research Infrastructures". Proposals should explain any synergies and complementarities with previous or current EU grants.

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

b) Support to Early Phase for research infrastructure initiatives in high strategic potential areas of research identified in the ESFRI Roadmap 2018 (Research and Innovation Actions)

This support aims to foster the development of pan-European research infrastructures in areas demonstrating particularly high strategic potential for the European Research Area, as identified in the ESFRI Roadmap 2018. To this extent activities will include the needed scientific, technical and conceptual work: e.g. the drafting of the new research infrastructure architecture, including the role of the central coordination and the different nodes; the planning of research services to be provided at international level as well as user strategy and access policy; plans to coherently integrate the new infrastructure into the European landscape of related facilities; the estimated budget for construction and operation; plans for an international governance structure, specification of ICT and e-Infrastructure needs. Proposals should explain any synergies and complementarities with previous or current EU grants.

The Commission considers that proposals requesting a contribution from the EU of up to 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

All proposals:

- A landscape of first-class sustainable RIs and services, open to researchers, industry, and other interested groups such as policy makers and the public, is progressively established, which will impact on the acceleration of scientific discovery as well as on innovation and competitiveness.
- The technical work carried out under this topic will contribute to strengthening the technological development capacity and effectiveness as well as the scientific performance, efficiency and attractiveness of the European Research Area.
- Synergies and complementarity between the new and existing research infrastructures are developed, thus contributing to the development of a consistent European research infrastructures ecosystem.

(a) Preparatory Phase (Coordination and Support actions)

- The decision making processes leading to the construction and/or implementation of the research infrastructures identified in the

ESFRI Roadmap is triggered.

- Funding bodies are able to take funding decisions and to conclude the legal agreements necessary for the construction of new research infrastructures.

(b) Support to Early Phase (Research and Innovation actions)

- Policy bodies at the national, European and international level have a sound decision basis to establish long-term plans and roadmaps for new research infrastructures of pan-European or global interest.
- New research infrastructure initiatives in areas of high strategic potential for the European Research Area are further developed and brought to maturity.

Type of action	Coordination and support action
Deadline	**29 January 2019**
Call identifier	H2020-INFRADEV-2018-2020
Topic information	Link

INFRAIA-01-2018-2019: Integrating Activities for Advanced Communities

Specific challenge

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

'Advanced Communities' are scientific communities whose research infrastructures show an advanced degree of coordination and networking at present, attained, in particular, through Integrating Activities awarded under FP7 or previous Horizon 2020 calls.

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 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), 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.

Proposals from advanced communities will have to clearly demonstrate the added value and the progress beyond current achievements in terms of integration and services, of a new grant. The strongest impact for advanced communities is expected typically to arise from focusing on innovation aspects and widening trans-national and virtual access provision, both in terms of wider and more advanced offer of scientific services, than in terms of number of users and domains served. Furthermore, in particular for communities supported in the past under three or more integrating activities, the creation of strategic roadmaps for future research infrastructure developments as well as the long-term sustainability of the integrated research infrastructure services provided at European level, need to be properly addressed. The latter requires the preparation of a sustainability plan beyond the grant lifecycle as well as, where appropriate, the involvement of funders.

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 in particular contribute to fostering the potential for innovation, including social innovation, of research infrastructures by reinforcing the partnership with industry, through e.g. transfer of knowledge and other dissemination activities, activities to promote the use of research infrastructures by industrial researchers, involvement of industrial associations 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, advanced communities are expected to submit one proposal per area.

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.

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

On the basis of a multiannual plan drafted taking into account the assessment and the timing of previous grants as well as strategic priorities

and needs, in term of research infrastructures services, emerging from other parts of Horizon 2020, this work programme invites proposals addressing the following areas listed under the different domains. A balanced coverage of the various domains, in line with the distribution of areas per domain, is expected as outcome of this topic.

(b) 2019 deadline
Biological and Medical Sciences
(…)

Energy
(…)

Environmental and Earth Sciences
(…)

Mathematics and ICT
(…)

Material Sciences and Analytical facilities
(…)

Physical Sciences
(…)

Social Sciences and Humanities
European research infrastructures for cultural heritage restoration and conservation. This activity aims at further integrating and opening facilities, located in research centres, universities and important culture institutions, for advanced diagnostics, restoration and conservation of cultural heritage. Emphasis should be on strengthening and enlarging the offered services to cover restoration and conservation in fields such as palaeontology, widening the user base, and fostering the innovation role of such facilities.

Contemporary European history: European Holocaust research infrastructure. This activity aims at further integrating and opening existing research infrastructures for research on Holocaust and expanding their services to include new material and new techniques in order to offer distributed and harmonised access of researchers to scattered material. Emphasis should be on enlarging and strengthening the offered services, widening the user base and ensuring long term sustainability to their integration.

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. There is less duplication of services, leading to an improved use of resources across Europe. Economies of scale and saving of resources are also realised due to common development and the optimisation of operations.
- Innovation is fostered through a reinforced partnership of research organisations 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 industry.
- For communities which have received three or more grants in the past, the sustainability of the integrated research infrastructure services they provide at European level is improved.
- 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**

Call – Integrating and opening research infrastructures of European interest

Type of action	Research and Innovation action
Deadline	**20 March 2019**
Call identifier	H2020-INFRAIA-2018-2020
Topic information	Link

Excellent Science

European Research Council

Net 4 Society

European Research Council (ERC)

The ERC's frontier research grants operate on a 'bottom-up' basis without predetermined priorities.

The fundamental activity of the ERC is to provide attractive, long-term funding to support excellent investigators and their research teams to pursue ground-breaking, high-gain/high-risk research. Research funded by the ERC is expected to lead to advances at the frontiers of knowledge and to set a clear and inspirational target for frontier research across Europe.

The evaluation of ERC grant applications is conducted by peer review panels composed of renowned scientists and scholars selected by the ERC Scientific Council. The panels may be assisted by independent experts working remotely. The ERC's peer review evaluation process has been carefully designed to identify scientific excellence irrespective of the gender, age, nationality or institution of the Principal Investigator and other potential biases, and to take career breaks, as well as unconventional research career paths, into account. The evaluations are monitored to guarantee transparency, fairness and impartiality in the treatment of proposals. ERC calls are expected to be competitive.

The ERC puts particular emphasis on the frontiers of science, scholarship and engineering. In particular, it encourages proposals of a multi- or interdisciplinary nature which cross the boundaries between different fields of research, pioneering proposals addressing new and emerging fields of research or proposals introducing unconventional, innovative approaches and scientific inventions.

The Starting, Consolidator and Advanced Grants will support projects carried out by individual teams which are headed by a single Principal Investigator. ERC Synergy Grants will support small groups of two to four Principal Investigators and their teams with a designated Corresponding Principal Investigator. The constitution of the research teams is flexible. Depending on the nature of a project the research team may involve team members from other research organisations situated in the same or a different country (see "Eligible host institution"[1]). The nature of the collaboration within an ERC Synergy Group is expected to be fundamentally different from that of a network or consortium of undertakings, universities, research centres or other legal entities (see "Synergy Grant profile "). The ERC supports individual Principal Investigators. Support for consortia is provided by other calls under Horizon 2020.

The ERC encourages in particular proposals that cross disciplinary boundaries, pioneering ideas that address new and emerging fields and applications that introduce unconventional, innovative approaches.

WP 2019 Main Changes

1. Evaluation criteria of Frontier Research Grants[2]
2. Synergy Grant:
    a. Synergy Grant Group can include up to one Principal Investigator based in a third country
    b. Clarification on the impact of intervening changes to a Synergy Grant Group3.
3. Lump sum pilot for ERC Proof-of-Concept Grant
4. Calculation Adjustments for Starting and Consolidator Grants Eligibility Windows
5. Open Access:
    a. Preprints are highlighted as accepted publication type as part of applicants' track records

[1] http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/erc/h2020-wp19-erc_en.pdf
[2] https://erc.europa.eu/sites/default/files/content/pages/pdf/ERC-2019-Work-Programme-main-changes.pdf

Indicative summary of main calls from the 2019-20 budget

	Starting Grant	*Consolidator Grant*	*Advanced Grant*	*Synergy Grant*	*Proof of Concept Grant*
Call Identifier	**ERC-2020-StG**	**ERC-2019-CoG**	**ERC-2019-AdG**	**ERC-2020-SyG**	**ERC-2019-PoC**
Call Opens	End of July 2019	24/10/2018	21/05/2019	End of July 2019	16/10/2018
Deadline or cut-off dates for PoC	Beginning of October 2019	07/02/2019	29/08/2019	Beginning of November 2019	22/01/2019 25/04/2019 19/09/2019
Budget € million (estimated grants)	TBD	602 (314)	390 (166)	TBD	25 (167)

ERC Consolidator Grant

Objectives
ERC Consolidator Grants are designed to support excellent Principal Investigators at the career stage at which they may still be consolidating their own independent research team or programme. Applicant Principal Investigators must demonstrate the ground-breaking nature, ambition and feasibility of their scientific proposal.

Size of ERC Consolidator Grant
Consolidator Grants may be awarded up to a maximum of **EUR 2 000 000** for a period of **5 years** (The maximum award is reduced pro rata temporis for projects of a shorter duration. This does not apply to ongoing projects).

However, up to an **additional EUR 750 000** can be requested in the proposal to cover (a) eligible "start-up" costs for Principal Investigators moving to the EU or an Associated Country from elsewhere as a consequence of receiving the ERC grant and/or (b) the purchase of major equipment and/or (c) access to large facilities (As any additional funding is to cover major one-off costs it is not subject to pro-rata temporis reduction for projects of shorter duration. All funding requested is assessed during evaluation).

Profile of the ERC Consolidator Grant Principal Investigator
The Principal Investigator shall have been awarded their first PhD **over 7 and up to 12 years prior to 1 January 2019**. The effective elapsed time since the award of the first PhD can be reduced in certain properly documented circumstances (see ERC Work Programme 2019).

A competitive Consolidator Grant Principal Investigator must have already shown research independence and evidence of maturity, for example by having produced **several important publications as main author or without the participation of their PhD supervisor**. Applicant Principal Investigators should also be able to demonstrate a promising track record of early achievements appropriate to their research field and career stage, including significant publications (as main author) in major international peer-reviewed multidisciplinary scientific journals, or in the leading international peer-reviewed journals of their respective field. They may also demonstrate a record of invited presentations in well-established international conferences, granted patents, awards, prizes etc.

Type of action	ERC-COG Consolidator Grant
Deadline	**7 February 2019**
Call identifier	ERC-2019-COG
Topic information	Link

ERC Proof of Concept Grant

Objectives[3]

Frontier research often generates unexpected or new opportunities for commercial or societal applications. The ERC Proof of Concept Grants aim to maximise the value of the excellent research that the ERC funds, by funding further work (i.e. activities which were not scheduled to be funded by the original ERC frontier research grant) to verify the innovation potential of ideas arising from ERC funded projects. Proof of Concept Grants are therefore on offer only to Principal Investigators whose proposals draw substantially on their ERC funded research.

The ERC Proof of Concept call aims at supporting ERC grant-holders to establish the innovation potential of their idea during the pre-demonstration phase.
This would help among others:

- establishing viability, technical issues and overall direction
- clarifying IPR position and strategy
- providing feedback for budgeting and other forms of commercial discussion
- providing connections to later stage funding
- covering initial expenses for establishing a company

Eligible Principal Investigator

All Principal Investigators in an ERC frontier research project, that is either ongoing or has ended less than 12 months before 1 January 2019, are eligible to participate and apply for an ERC Proof of Concept Grant. This action is open to Principal Investigators (PI) already benefitting from an ERC frontier research grant (Starting, Consolidator, Advanced and Synergy) of any nationality who intends to conduct their Proof of Concept activity in any EU Member State or Associated Country Principal Investigators may submit only one proposal under Work Programme 2019. If multiple submissions are made at different cut-off dates under the Work Programme 2019 only the first eligible proposal will be considered. A Principal Investigator whose proposal was rejected on the grounds of a breach of research integrity in the calls for proposals under Work Programmes 2017 or 2018 may not submit a proposal to the calls for proposals made under Work Programme 2019.

Maximum size of grant and grant assessment

The financial contribution will be awarded as a lump sum of **EUR 150 000** for a period of **18 months**. The ERC expects that normally proof of concept projects should be completed within 12 months. However, to allow for those projects that require more preparation time, projects will be signed for 18 months. Given this initial flexibility, extensions of the duration of proof of concept projects may be granted only exceptionally. The lump sum offered will cover the beneficiaries' direct and indirect eligible costs for the project: if the project is implemented properly the amounts will be paid regardless of the costs actually incurred. Specifically, the lump sum has been designed to cover 100% of the eligible direct costs and indirect costs calculated by applying a flat-rate of 25% to the direct cost categories.
The indicative budget for this call for 2019 is **EUR 25 000 000** (approximately one-third of which will be for each of the three evaluation rounds following three specific cut-off dates -proposals submitted before each cut-off date will be evaluated with the proposals submitted before the same cut-off date).

[3] http://ec.europa.eu/research/participants/data/ref/h2020/other/guides_for_applicants/h2020-guide19-erc-poc_en.pdf

ERC – Proof of Concept Grant

Type of action	ERC-POC Proof of Concept Grant
Deadline	**ERC-2019-PoC-1: 22 January 2019** **ERC-2019-PoC-2: 25 April 2019** **ERC-2019-PoC-3: 19 September 2019**
Call identifier	ERC-2019-PoC
Topic information	Link

Excellent Science

Marie Skłodowska-Curie Actions

Marie Skłodowska-Curie Actions

The Marie Skłodowska-Curie actions (MSCA) support researchers at all stages of their careers, irrespective of nationality.

MSCA are entirely bottom-up and are open to all domains of research and innovation from basic research up to market take-up and innovation services.

MSCA-ITN-2019: Innovative Training Networks

Objective

The Innovative Training Networks (ITN) aim to train a new generation of creative, entrepreneurial and innovative early-stage researchers, able to face current and future challenges and to convert knowledge and ideas into products and services for economic and social benefit.

ITN will raise excellence and structure research and doctoral training in Europe, extending the traditional academic research training setting, incorporating elements of Open Science and equipping researchers with the right combination of research-related and transferable competences. It will provide enhanced career perspectives in both the academic and non-academic sectors through international, interdisciplinary and intersectoral mobility combined with an innovation-oriented mind-set.

Scope

ITN supports competitively selected joint research training and/or doctoral programmes, implemented by partnerships of universities, research institutions, research infrastructures, businesses, SMEs, and other socio-economic actors from different countries across Europe and beyond.

Partnerships take the form of collaborative European Training Networks (ETN), European Industrial Doctorates (EID) or European Joint Doctorates (EJD).

Each programme should have a clearly identified supervisory board co-ordinating network-wide training and establishing active and continuous communication and exchange of best practice among the participating organisations to maximise the benefits of the partnership.

The programme should exploit complementary competences of the participating organisations, and enable sharing of knowledge, networking activities, the organisation of workshops and conferences.

Training responds to well identified needs in defined research areas, with appropriate references to inter- and multidisciplinary fields and follows the EU Principles for Innovative Doctoral Training. It should be primarily focused on scientific and technological knowledge through research on individual, personalised projects.

In order to increase the employability of the researchers, the research training should be complemented by the meaningful exposure of each researcher to the non-academic sector. Secondments of the researcher to other beneficiaries and partner organisations are encouraged, but should be relevant, feasible, beneficial for the researchers and in line with the project objectives.

Substantial training modules, including digital ones, addressing key transferable skills common to all fields and fostering the culture of Open Science, innovation and entrepreneurship will be supported.

In order to reflect the new modus operandi of research supporting the development of open science, training should prepare early-stage researchers for increased research collaborations and information-sharing made possible by new (digital) technologies (e.g. collaborative tools, opening access to publications and to research data, FAIR data management, public engagement and citizen science, etc.).

A Career Development Plan should be established jointly by the supervisor(s) and each early-stage researcher recruited by the selected network. In addition to research objectives, this plan comprises the researcher's training and career needs, including training on transferable skills, teaching, planning for publications and participation in conferences.

Attention is paid to the quality of supervision and mentoring arrangements as well as career guidance. Joint supervision of the researchers is mandatory for EJD and for EID, and encouraged in ETN. In EID, the joint supervision of the researcher must be ensured by at least one supervisor from the academic sector and one supervisor from the non-academic sector. These arrangements will be taken into account during the evaluation of the proposal.

In EID and EJD, fellowships offered to early-stage researchers should lead to a doctoral degree. EJD result in joint, double or multiple doctoral degrees awarded by institutions from at least two different countries, primarily within Europe.

In EID and EJD, enrolment in a doctoral programme and the creation of a joint governance structure - with joint admission (EJD only), selection, supervision, monitoring and assessment procedures - is mandatory. These arrangements will be taken into account during the evaluation of the proposal.

Expected impact

At researcher level:

- Increased set of skills, both research-related and transferable ones, leading to improved employability and career prospects both in and outside academia (leading in the longer-term to more successful careers)
- Increase in higher impact R&I output and more knowledge and ideas converted into products and services
- Greater contribution to the knowledge-based economy and society

At organisation level:

- Enhanced cooperation and better transfer of knowledge between sectors and disciplines
- Improvement in the quality of training programmes and supervision arrangements
- Creation of new networks and enhanced quality of existing ones
- Boosting R&I capacity among participating organisations
- Increased internationalisation of participating organisations

At system level:

- Increase in international, interdisciplinary and intersectoral mobility of researchers in Europe
- More structured and innovative doctoral training, enhanced implementation of the European Charter and Code and the EU Principles for Innovative Doctoral Training
- Stronger links between the European Research Area (ERA) and the European Higher Education Area (EHEA), notably through supporting the knowledge triangle between research, innovation and education
- Improvement in the working and employment conditions for doctoral candidates in Europe
- Increased societal and economic relevance of European higher education
- Strengthening Europe's human capital base in R&I with a new generation of more entrepreneurial and highly-skilled early career researchers
- Increase in Europe's attractiveness as a leading research destination, accompanied by a rise in the numbers of talented researchers attracted and retained from abroad
- Better quality research and innovation contributing to Europe's competitiveness and growth

Type of action	MSCA-ITN-ETN European Training Networks , MSCA-ITN-EJD European Joint Doctorates , MSCA-ITN-EID European Industrial Doctorate
Deadline	**15 January 2019**
Call identifier	H2020-MSCA-ITN-2019
Topic information	Link

MSCA-IF-2019: Individual Fellowships

Objective

The goal of the Individual Fellowships is to enhance the creative and innovative potential of experienced researchers, wishing to diversify their individual competence in terms of skill acquisition through advanced training, international and intersectoral mobility.

Individual Fellowships provide opportunities to researchers of any nationality to acquire and transfer new knowledge and to work on research and innovation in Europe (EU Member States and Horizon 2020 Associated Countries) and beyond. The scheme particularly supports the return and (re)integration of European researchers from outside Europe and those who have previously worked here, as well as researchers displaced by conflict outside the EU and Horizon 2020 Associated Countries. It also promotes the career restart of individual researchers who show great potential.

Scope

Support is foreseen for individual, trans-national fellowships awarded to the best or most promising researchers of any nationality, for employment in EU Member States or Horizon 2020 Associated Countries. It is based on an application made jointly by the researcher and the beneficiary in the academic or non-academic sectors.

Only one proposal per individual researcher per call will be evaluated.

Fellowships take the form of European Fellowships or Global Fellowships. European Fellowships are held in EU Member States or Horizon 2020 Associated Countries and are open to researchers either coming to Europe from any country in the world or moving within Europe. The researcher must comply with the rules of mobility in the country where the European Fellowship is held.

Direct return to and long-term reintegration of researchers in Europe, including in their country of origin, is supported via a separate multi-disciplinary reintegration panel of the European Fellowships. For the reintegration panel, there must be direct mobility to the country of the beneficiary in Europe from a third country (compulsory national service and/or short stays such as holidays are not taken into account).

Support to individuals to resume research in Europe after a career break, e.g. after parental leave or due to recent migration, is ensured via a separate multi-disciplinary career restart panel of the European Fellowships. To qualify for the career restart panel, researchers must not have been active in research for a continuous period of at least 12 months within the 18 months immediately prior to the deadline for submission.

Researchers seeking to work on research and innovation projects in an organisation from the non-academic sector will be supported via a separate multi-disciplinary society and enterprise panel of the European Fellowships. The objective of this panel is to facilitate career moves between the academic and non-academic sectors, to stimulate innovation, and to open attractive career opportunities for researchers outside academia.

The Widening Fellowships implemented through Work Programme part 15, Spreading Excellence and Widening Participation, provide specific support to researchers to undertake their fellowship in a widening country. This will help spread excellence and close the still apparent research and innovation gap within Europe.

Global Fellowships are based on a secondment to a third country and a mandatory 12 month return period to a European host. The researcher must comply with the rules of mobility in the country where the Global Fellowship secondment takes place, not for the country of the return phase.

Researchers receiving an Individual Fellowship may opt to include a secondment phase in Europe, notably in the non-academic sector, within the overall duration of their fellowship. For a fellowship of 18 months or less, the secondment phase may last up to three months. For a fellowship of more than 18 months, the secondment phase may last up to six months. The secondment phase can be a single period or be divided into shorter mobility periods. The secondment should significantly add to the impact of the fellowship. In the Global Fellowships, such a secondment can also take place at the start of the action at the beneficiary or a partner organisation in Europe for a maximum of 3 months, allowing the researcher to spend time there before moving on to a partner organisation in a third country.

A Career Development Plan should be established jointly by the supervisor(s) and the researcher. In addition to research or innovation objectives, this plan comprises the researcher's training and career needs, including training on transferable skills, teaching, planning for publications and participation in conferences.

Researchers participating in the Individual Fellowships may opt to work part-time in order to pursue supplementary activities. These might include creating a company, or engaging in advanced studies not related to the MSCA grant. Any supplementary activities carried out part-time in parallel with the MSCA action must be agreed upon by the researcher and the beneficiary.

Expected impact

At researcher level:

- Increased set of skills, both research-related and transferable ones, leading to improved employability and career prospects
- both in and outside academia
- Increase in higher impact R&I output, more knowledge and ideas converted into products and services
- Greater contribution to the knowledge-based economy and society

At organisation level:

- Enhanced cooperation and stronger networks
- Better transfer of knowledge between sectors and disciplines
- Boosting of R&I capacity among participating organisations

At system level:

- Increase in international, interdisciplinary and intersectoral mobility of researchers in Europe
- Strengthening of Europe's human capital base in R&I with more entrepreneurial and better trained researchers
- Better communication of R&I results to society
- Increase in Europe's attractiveness as a leading destination for R&I
- Better quality research and innovation contributing to Europe's competitiveness and growth

Type of action	Career Restart panel, Reintegration panel, Standard European Fellowships, Society and Enterprise panel, Global Fellowships
Deadline	**11 September 2019**
Call identifier	H2020-MSCA-IF-2019
Topic information	(call opens on 11 April 2019)

MSCA-RISE-2019: Research and Innovation Staff Exchange

Objective

The RISE scheme promotes international and cross-sector collaboration through exchanging research and innovation staff, and sharing knowledge and ideas from research to market (and vice-versa).

The scheme fosters a shared culture of research and innovation that welcomes and rewards creativity and entrepreneurship and helps to turn creative ideas into innovative products, services or processes.

Scope

RISE involves organisations from the academic and non-academic sectors (in particular SMEs), based in Europe (EU Member States and Horizon 2020 Associated Countries) and outside Europe (third countries).

Support is provided for the development of partnerships in the form of a joint research and innovation project. This is aimed at knowledge sharing via international as well as intersectoral mobility, based on secondments of research and innovation staff (exchanges) with an in-built return mechanism.

The organisations constituting the partnership contribute directly to the implementation of a joint research and innovation project by seconding and/or hosting eligible staff members. Secondments shall always take place between legal entities independent from each other.

RISE should exploit complementary competences of the participating organisations, as well as other synergies, and enable networking activities, organisation of workshops and conferences to facilitate sharing of knowledge, new skills acquisition and career development for research and innovation staff members.

RISE proposals can focus either on one dimension of mobility (intersectoral / international), or include a combination of both.

Exchanges can be for both early-stage and experienced researchers and can also include administrative, managerial and technical staff directly involved in the research and innovation activities of the proposal.

Support for the exchanges between institutions within Europe (EU Member States and Horizon 2020 Associated Countries) covers only intersectoral secondments.

Exchanges with institutions from and to third countries can be intersectoral as well as within the same sector.

Secondments between institutions established in third countries or within the same EU Member State or Horizon 2020 Associated Country will not be supported.

Expected impact

At staff member level:

- Increased set of skills, both research-related and transferable ones, leading to improved employability and career prospects both in and outside academia
- Increase in higher impact R&I output, more knowledge and ideas converted into products and services
- Greater contribution to the knowledge-based economy and society

At organisation level:

- Enhanced cooperation and transfer of knowledge between sectors and disciplines
- Strengthening of international and intersectoral collaborative networks
- Boosting of R&I capacity among participating organisations

At system level:

- Increase in international, interdisciplinary and intersectoral mobility of researchers in Europe
- Strengthening of Europe's human capital base in R&I
- Increase in Europe's attractiveness as a leading destination for R&I
- Better quality R&I contributing to Europe's competitiveness and growth

Type of action	MSCA-RISE RISE
Deadline	**02 April 2019**
Call identifier	H2020-MSCA-RISE-2019
Topic information	Link

MSCA-COFUND-2019: Co-funding of regional, national and international programmes

Objective

The COFUND scheme aims to stimulate regional, national or international programmes to foster excellence in researchers' training, mobility and career development, spreading the best practices of the Marie Skłodowska-Curie actions.

This will be achieved by co-funding new or existing regional, national, and international programmes to open up to, and provide for, international, intersectoral and interdisciplinary research training, as well as transnational and cross-sectoral mobility of researchers at all stages of their career.

Scope

Each proposal funded under the COFUND scheme must have a sole beneficiary that will be responsible for the availability of the necessary complementary funds to execute the proposal.

Applicants submit multi-annual proposals for new or existing doctoral programmes or fellowship programmes which are expected to have an impact on enhancing research- and innovation related human resources on regional, national or international level.

Applicants having benefited from COFUND under previous calls (under the Seventh Framework Programme or under Horizon 2020) must explain how their proposal adds value in relation to the excellence and/or the impact award criteria, compared to their previous grant(s). As an example, added value could take the form of increased networking with organisations in less represented countries or capacity building measures there to further structure the European Research Area.

Researchers supported under this scheme shall comply with the mobility rules of the Marie Skłodowska-Curie actions.

Limitations regarding the researchers' origin and destination should be avoided. Support cannot be awarded to researchers who are already permanently employed by the organisation hosting them.

Proposed programmes are encouraged to cover all research disciplines ("bottom-up"), but can also focus on specific disciplines. In this case the range of covered disciplines should allow reasonable flexibility for the researchers.

Programmes that prioritise specific research disciplines based on national or regional Research and Innovation Strategies for Smart Specialisation (RIS3 strategies) can also be supported. Synergies with the European Structural & Investment Funds (ESIF) are encouraged10.

COFUND takes the form of:

A) Doctoral programmes

Doctoral programmes address the development and broadening of the research competencies of early-stage researchers. The training follows the EU Principles on Innovative Doctoral Training. Substantial training modules, including digital ones, addressing key transferable skills common to all fields and fostering the culture of Open Science, innovation and entrepreneurship will be supported. Collaboration with a wider set of partner organisations, including from the non-academic sector, which may provide hosting or secondment opportunities or training in research or transferable skills, as well as innovative and interdisciplinary elements of the proposed programme, will be positively taken into account during the evaluation.

Each researcher must be enrolled in a doctoral programme. Attention is paid to the quality of supervision and mentoring arrangements as well as career guidance. The selection procedure for doctoral candidates must be open, transparent and merit-based. The vacancy notice must include the minimum gross salary offered to the researcher, as set out in the proposal.

B) Fellowship programmes

Fellowship programmes fund individual research training and career development fellowships for experienced researchers. The programmes supported should have regular selection rounds following fixed deadlines or regular cut-off dates, allowing fair competition between the researchers applying. The selections should be based on open, widely advertised competition (the vacancy notice must include the minimum gross salary offered to the researcher, as set out in the proposal), with transparent international peer review and the selection of candidates on merit. Mobility types supported by fellowship programmes may be similar to the ones supported under Marie Skłodowska-Curie Individual Fellowships. On top of transnational mobility, applicants are encouraged to include elements of cross-sectoral mobility and interdisciplinarity into their programmes. Fellowship programmes should be based on individual-driven mobility, i.e., researchers should be able to freely choose a research topic and the appropriate organisation to host them, fitting their individual needs.

Given that the aim of the co-funded fellowship programmes is the support of individual fellows, research teams will not be funded.

Expected impact

At researcher level:

- Augment and diversify the set of skills, both research-related and transferable ones, that will lead to improved employability and career prospects both in and outside academia
- Forge new mind sets and approaches to research and innovation work through interdisciplinary and intersectoral experience
- Enhance networking and communication capacities with scientific peers, as well as with the general public, that will increase and broaden the research and innovation impact

At organisation level:

- Increasing the attractiveness of the participating organisation(s) towards talented researchers
- Boosting research and innovation output among participating organisations
- Strengthening of international, intersectoral and interdisciplinary collaborative networks that will reinforce the organisation's position and visibility at a global level, but also at a regional/national level by helping them become key actors and partners in the local socio-economic ecosystems

At system level:

- Aligning of practices and policies in the context of the EU Human Resources Strategy for Researchers (HRS4R), enhanced implementation of the Charter and Code and the EU Principles for Innovative Doctoral Training at regional, national or international level
- Supporting the practice of Open Science through targeted training activities
- Increase in international, interdisciplinary and intersectoral mobility of researchers in Europe
- Improvement in the working and employment conditions for researchers in Europe at all levels of their career, starting from the doctoral stage
- Strengthening of Europe's human capital base in research and innovation and structuring of a stronger European Research Area
- Increase in Europe's attractiveness as a leading destination for research and innovation
- Better quality research and innovation contributing to Europe's competitiveness and growth, including by supporting regional or national smart specialisation strategies when appropriate.

Type of action	MSCA-COFUND-FP Fellowship programmes , MSCA-COFUND-DP Doctoral programmes
Deadline	**26 September 2019**
Call identifier	MSCA-COFUND-2019
Topic information	Link

Science with and for Society

Net 4 Society

SwafS-01-2018-2019: Open schooling and collaboration on science education

Specific challenge

At the moment, Europe faces a shortfall in science-knowledgeable people at all levels of society. This is a good time to expand opportunities for science learning, in formal, non-formal and informal settings[1]. Evidence shows that European citizens, young and old, appreciate the importance of science and want to be more informed, and that citizens want more science education. Over 40% believe science and technological innovation can have a positive impact on the environment, health and medical care, and basic infrastructure in the future. Therefore, collaboration between formal, non-formal and informal science education providers, enterprises and civil society should be enhanced to ensure relevant and meaningful engagement of all societal actors with science and increase the uptake of science studies, citizen science initiatives and science-based careers, employability and competitiveness.

Scope

The proposed action targets the creation of new partnerships in local communities to foster improved science education for all citizens. **This action aims to support a range of activities based on collaboration between formal, non-formal and informal science education providers, enterprises and civil society in order to integrate the concept of open schooling**, including all educational levels, **in science education**.

"Open schooling" where schools, in cooperation with other stakeholders, become an agent of community well-being shall be promoted; families should be encouraged to become real partners in school life and activities; professionals from enterprises and civil and wider society should actively be involved in bringing real-life projects to the classroom. Relevant policy makers should also be involved, to encourage policy buy-in and the mainstreaming of good practices and insights into policies, and hence sustainability and impact beyond the lifetime of funding. Partnerships that foster expertise, networking, sharing and applying science and technology research findings across different enterprises (e.g. start-ups, SMEs, larger corporations) should be promoted. **Gender, socio-economic and geographical differences should be considered**.

The Commission considers that proposals requesting a contribution from the EU of the order of € 1.50 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 in the short term the development of partnerships between schools, local communities, Civil Society Organisations, universities and industry should contribute to a more scientifically interested and literate society and students with a better awareness of and interest in scientific careers. In the medium term the activities should provide citizens and future researchers with the tools and skills to make informed decisions and choices and in the long-term this action should contribute towards the ERA objectives of increasing the numbers of scientists and researchers in Europe.

Type of action	Coordination and support action
Deadline	**1st stage - 02 April 2019** **2nd stage - 07 November 2019**
Call identifier	H2020-SWAFS-2018-2020
Topic information	Link

SwafS-08-2019: Research innovation needs & skills training in PhD programmes

Specific challenge
Within the New Skills Agenda (adopted in June 2016) and in the Modernisation Agenda (adopted in May 2017) specifications on innovative employment-oriented curricula recommendations are described. The Open Science Agenda incorporates activities which makes it crucial for Higher Education Institutions to integrate new or existing skills courses into PhD programmes and to train data stewards. Especially the formal integration of skills courses developed with and by non-academic actors and provided in non-academic surroundings into curricula, will be a specific challenge.

Scope
A broad package of skills-related training, integration and intelligence for researchers and scientists in all career stages will need to be developed. Preferably pilots will be organised by (or in cooperation with) experienced projects which already received EU funding or are currently funded under Erasmus+, Horizon2020, ITN, MSCA. In all cases, partners should be able to demonstrate proof of concept and initial impact of the PhD training and reasoning for improving and formally integrating skills training. **Initial postgraduate tracking exercises have to be integrated in the proposal, to demonstrate ability to trace postgraduates during employment (including sex-disaggregated data). Counselling initiatives of PhD candidates and PhD graduates into focussed careers in and outside academia should be provided.**

The Commission considers that proposals requesting a contribution from the EU between EUR 0.75 million and 1.00 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
Impact is expected on post-graduate candidates and early stage researchers, careers, in closing the skills gap between research employment in academia and beyond academia. Expected impact also on the improvement of the innovation potential of future PhD candidates, by joint design of skills training courses and curricula of consortium partners into modernised PhD programmes. Expected impact on the joint collaboration between academia and stakeholders in the regions (hubs) by improving skills intelligence, skills visibility and comparability for better career choices; learning about future skills needs and employment potential of scientists of all (interdisciplinary) fields. Expected impact on the interdisciplinary and international mobility of researchers working under Open Science in line with the Innovative Doctoral Training Principles (IDTP).

Type of action	Coordination and support action
Deadline	**02 April 2019**
Call identifier	H2020-SWAFS-2018-2020
Topic information	Link

SwafS-09-2018-2019: Supporting research organisations to implement gender equality plans

Specific challenge
Gender equality is a key priority set with the Member States and Associated countries in the European Research Area. Research funding and performing organisations and universities are invited to implement institutional change through Gender Equality Plans (GEPs). The Council conclusions of 1/12/2015 acknowledged the contribution of gender equality to the quality of research and innovation. It reaffirmed the need for sustainable cultural and institutional change along the three following objectives:
1. Removing barriers to the recruitment, retention and career progression of female researchers;
2. Addressing gender imbalances in decision making processes;
3. Integrating the gender dimension in research and innovation content[2].
The GEAR tool developed by the European Commission and EIGE[3] regrouped the state of the art knowledge and practices on institutional change and provided a step-by-step guide on how to set up and implement GEPs.

Scope
The action should focus on implementing Gender Equality Plans (GEPs) in research organisations and universities, as "drivers" for systemic institutional changes. The GEPs should be developed using a coherent approach, referring to the GEAR tool step-by-step guide. **The proposed GEPs structure will include at least the following**:
• **Conduct assessment / audit of procedures and practices with relevant data to identify gender bias at organisation level**;
• Implement effective actions to be developed over time, according to the identified bias;
• Set targets and monitor progress via indicators at organisation level.
The proposals will explain the planned GEPs in the context of existing national provisions and national action plans (legislation, specific incentives, etc.) relating to gender equality in research and innovation. The proposal should also explain previous steps taken by the organisation for gender equality.
The proposal will provide proof of long term commitment in the implementation of GEPs from their highest management level. The role of middle management and relevant departments of the partner organisations in the implementation of the GEPs shall be described.
The proposals will include a methodology for impartially evaluating the progress made on the impact the gender equality plans had on structural change throughout the duration of the project. A specific work package(s) and deliverable(s) should be introduced in the proposal for this purpose.
Special emphasis will be placed on the sustainability of the GEPs to be implemented and on project follow-up initiatives.
The allocation of resources within the consortium will focus on the implementation of GEPs in the partner organisations. These partner organisations must be at a starting/initial stage in the setting-up and implementation of gender equality plans. It is recommended that the proposals should allocate the majority of funding to setting-up and implementing GEPS. The proposal will explain the role of partners not implementing GEPs and their specific contribution in line with the text and requirements of the topic.
Participation of professional associations in the consortium is recommended.
Project duration of at least 48 months is recommended.
The Commission considers that proposals requesting a contribution from the EU between EUR 2.50 million and 3.00 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 proposed action will contribute to increasing the number of research organisations and higher education establishments implementing gender equality plans. The individual implemented GEPs should be shared on the GEAR tool[4].
The expected impacts are:
- Increase in the participation of women in research and innovation and improvement of their careers prospects;
- Improvement of gender balance in decision-making bodies in research organisations;
- Inclusion, where relevant, of the gender dimension in research content and increase in the quality and societal relevance of produced knowledge, technologies and innovations.
In the medium to long term, the implementation of Gender Equality Plans will contribute to the achievement of the ERA.

Type of action	Coordination and support action
Deadline	**02 April 2019**
Call identifier	H2020-SWAFS-2018-2020
Topic information	Link

Dedicated Topic

SwafS-11-2019: Scenarios for an award/certification system for gender equality in research organisations and universities in Europe

Specific challenge
Through the implementation of Gender Equality Plans (GEPs) in the last years in research organisations and universities a substantial knowledge base and a wide set of practices were established which is accessible in particular in the Gender Equality in Academia and Research - GEAR tool.
Gender Equality Plans are now common in some Member States and Associated Countries, but in others they are in their infancy. The implementation of the Plans as a key instrument for gender equality in the European Research Area and the institutional change they entail in research organisations and universities need to be further promoted and evaluated.
A promising option which is implemented in some countries, could be gender equality award schemes for R&I organisations. Some awarding schemes are also used as drivers for competition in attracting students and researchers and/ or as prerequisite to access funding.

Scope
The action will consist of a feasibility study of a European award/certification system for gender equality in research organisations, including universities. Several options should be investigated.
Based on the experiences of existing schemes and outcomes of previous research and initiatives (e.g. Horizon 2020 projects such as GEDII, and EFFORTI, FP7 ERA-Net Gender-NET) , the action will:
- Conduct an in-depth qualitative and quantitative assessment of existing national award/certification schemes for gender equality in research organisations and universities. Particular attention will be given to the national context in terms of legislation, policy and research funding environment to understand the intended and non-intended impacts of each evaluated award scheme.
- Provide a clear framework for at least 3 different options of a European award/certification scheme encompassing the three objectives for gender equality in the ERA, i.e. gender equality scientific careers, gender balance in decision-making positions and in the integration of the gender dimension in R&I content. The options should take into account the possible synergies and linkages with the current Human Resources Strategy for Researchers (HRS4R).

A project duration of maximum 24 months is recommended.

The Commission considers that proposals requesting a contribution from the EU of the order of EUR 1.50 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
Strengthen the incentives for research organisations and universities to set up Gender Equality Plans. Make progress on gender equality along the three objectives set in the European Research Area, i.e. in scientific careers, in decision-making and in the integration of the gender dimension in R&I content.

Type of action	Research and Innovation action
Deadline	**02 April 2019**
Call identifier	H2020-SWAFS-2018-2020
Topic information	Link

SwafS-12-2019: The gender perspective of science, technology and innovation (STI) in dialogue with third countries

Specific challenge
In its Conclusions of 1 December 2015 on advancing gender equality in the European Research Area, the Council invited the Commission and the Member States to consider including, among others, a gender perspective in dialogues with third countries in the area of science, technology and innovation (STI).
The EU Member States and many countries outside the European Union are facing similar challenges in terms of gender equality in STI: gender-related biases are leading to horizontal (disparities among different scientific disciplines) and vertical (low levels of women representation on top positions) segregation. The perception of and support for gender equality varies significantly across cultures. Cultural and institutional barriers turn women away from STI and affect their careers. Also the take up of the gender dimension in research and innovation content is still limited. The EU has developed a strategy for gender equality along three objectives relating to equality in careers, gender balance in decision-making and the integration of the gender dimension in R&I content.
The Commission has pledged reinforced cooperation with third countries under one of the three goals set by the current Commissioner, i.e. Open to the World. There is increasing interest from third countries to cooperate with the EU in the field of STI and encourage the mobility of researchers. It is therefore important to develop common solutions for common challenges regarding gender inequalities in STI.

Scope
The project will investigate how gender equality matters are taken into consideration at different levels of international cooperation in the area of science, technology and innovation between the EU and a selected set of third countries, along three objectives, i.e. equality in scientific careers, gender balance in decision making, and the integration of the gender dimension in R&I content. The project will build on the work done by the ERA-related groups in charge of gender equality and international cooperation as well as EU funded projects. It will provide a mapping and a subsequent analysis of how gender equality is taken into account and promoted:

1. in the formal bilateral and multilateral agreements in the STI area between the EU Member States and Associated Countries on one side and the selected third countries on the other side;
2. in the bilateral and multilateral STI implementation activities, including access to grants and the evaluation process;
3. in the dissemination and promotion of the results of international dialogues and cooperation.

The project will also formulate recommendations to enhance the integration of gender equality objectives at the various stages mentioned above.
In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged.
The Commission considers that proposals requesting a contribution from the EU of the order 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
Improve awareness and implementation of gender equality objectives in the bilateral and multilateral activities between EU Member States and third countries in the area of STI. Contribute to removing potential barriers to the equal treatment of women and men scientists and to integrate the gender dimension in R&I content in international dialogues and cooperation.

Type of action	Research and Innovation action
Deadline	**02 April 2019**
Call identifier	H2020-SWAFS-2018-2020
Topic information	Link

SwafS-14-2018-2019: Supporting the development of territorial Responsible Research and Innovation

Specific challenge

The Responsible Research and Innovation (RRI) approach supported by the European Commission since 2011 aims to encourage societal actors to work together during the whole research and innovation (R&I) process to better align R&I and its outcomes with the values, needs and expectations of society. Experience shows that strategies and practices based on RRI can open up R&I to all relevant actors, and improve co-operation between science and society, fostering the recruitment of new talent, and pairing scientific excellence with social awareness and responsibility.

Territories have a specific advantage to address the complexity of the challenges set by the interplay between science and society. Indeed local actors have an intimate knowledge of the physical territorial setting, and local ecology, i.e. the status quo of the complex relationships between cultural, social, economic and political actors, of the local dynamics, history, expectations and requirements as well as specific concerns.

During the last century, local and regional development policies have slowly, unevenly, but surely, integrated dimensions related to science, technology, and innovation (STI). For example, the European Commission supported regional technology plans in the 1990s and regional innovation strategies during the 2000s. Since 2010 the Commission has encouraged regions to develop smart specialisation strategies, based on comprehensive stakeholder involvement, to identify specific fields of industrial and research strengths with a potential for competitive advantages for the region. A more comprehensive approach involving citizens and communities is likely to result in positive impacts on STI and local and regional development.

Territories can work towards the establishment of self-sustaining R&I ecosystems that are characterised by a high degree of openness, democratic accountability, and responsiveness to need by taking action to promote all parts of RRI (i.e. gender equality, science education, open access/open data, public engagement, and ethics). This requires them to bring relevant R&I actors together, for instance citizens and civil society organisations (CSOs), universities, research institutions, formal and informal education institutions (including primary and secondary schools), governments and public authorities (including regional and local administrations and science policy institutions), businesses (including industry, the service sector and social entrepreneurs) and science mediators. New R&I working methods within and between organisations, including novel and transparent governance relations, would promote greater sustainability and inclusiveness at local, national, EU and global levels.

Scope

For the present topic, 'territory' should be understood broadly. Territories may be defined by any particular area characterised by certain geographical features, or any area with shared cultural, environmental or economic ties.

Consortia should focus activities in more than one territory in Europe (and possibly also in Third Countries**), with a view to developing and promoting shared learning and diffusion of governance innovations**. Local and regional authorities should be active partners of the consortia, in particular those institutions or parts of institutions responsible for research and innovation. The RRI approach should be integrated in regional development policies, e.g. spatial planning, land use planning, coastal planning, urban development and urban structuring activities (list not exhaustive). Consortia should make strong efforts to ensure the involvement of all kind of citizens, irrespective of their age, gender, ethnicity and socio-economic background.

Consortia should lay out a sequence of actions that open up and transform the R&I ecosystem and governance systems so that they are more open and inclusive.

Consortia will:

- Map their current territorial R&I ecosystem, taking into account and complementing existing mapping exercises such as the Smart Specialisation Platform, the European Cluster Observatory, and the Regional Innovation Scoreboard,
- **Reflect on how the system could be more open and inclusive**, and
- **Consider their place within larger societal, geographical, economic and environmental framework**.
- Consequently, **proposals should develop concrete actions within individual beneficiaries' organisations (e.g. agenda setting and institutional changes in the fields of gender, ethics, public engagement, science education and open access) and in the territorial context (e.g. local and regional governance relations and decision-making processes)**.

Changes should be sustainable (i.e. last beyond the lifetime of funding), for instance through the introduction of new forms of decision making, development of business plans or co-operation agreements, and institutional changes in participating organisations.

The actions should avoid duplicating the analytical and data collection activities of the Smart Specialisation Platform. Previous project findings and good practices should be considered as and when appropriate. Projects such as ONLINE-S3 and SEiSMIC could be useful in this regard. The ONLINE-S3 project aims to assist national and regional authorities in the EU to elaborate and revise their smart specialisation agendas, in terms of policies and strategy, whereas the SEiSMiC project helps tackle Europe's biggest urban problems by engaging citizens, identifying social innovation needs, and contributing to future urban policies and research strategies.

The Commission considers that proposals requesting a contribution from the EU of the order of € 2.00 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

Consortia are expected to elaborate and implement a more open, transparent and democratic R&I system in their defined territories. Consortia are expected to evaluate their activities and provide evidence of societal, democratic, environmental, economic and scientific impacts. Involvement in the project should have a measurable transformative and opening effect on organisations involved, which should be sustainable beyond the lifetime of funding. Consortia are expected to contribute to one or more of the MoRRI indicators (for

instance GE1, SLSE1, SLSE4, PE1, PE2, PE5, PE7, PE8, E1, OA6, GOV2), and to the Sustainable Development Goals (for instance goals 4, 5, 9, 11, 12, 13, 16 or 17).

Type of action	Coordination and support action
Deadline	**02 April 2019**
Call identifier	H2020-SWAFS-2018-2020
Topic information	Link

SwafS-15-2018-2019: Exploring and supporting citizen science

Specific challenge

Citizen science is blooming across all scientific disciplines and the humanities. It can potentially bring a wide variety of benefits to researchers, citizens, policy makers and society across the research and innovation cycle, e.g; it can accelerate and sometimes even make possible the production of new scientific knowledge; it can help policy makers monitor implementation and compliance with regulations; it can increase public awareness about science and feeling of ownership of policies; and it can enable faster and evidence-informed reactions to events and better territorial coverage.

At the same time there are difficulties setting up citizen science initiatives – in terms of choosing the optimum methodologies; in terms of quality assurance and validation of the outcomes; in terms of linking the various governance levels, from local to global; in terms of ensuring balanced participation of citizens (e.g. regardless of background, gender and age); in terms of integrity of methods and data; in terms of recognising the work of citizens participating in citizen science initiatives; in terms of managing large numbers of volunteers for many months or even years (and keeping them motivated and responding to their questions).

Furthermore, questions remain unanswered about the potentials of citizen science for society e.g: what is the potential number of citizen scientists and who are they? What are the costs and benefits of citizen science (e.g. in terms of scientific excellence and the economy)? What relationship can and does citizen science have to informal and formal science education? Are there limits to citizen science, and if so what are they?

For the present topic citizen science should be understood broadly, covering a range of different levels of participation, from raising public knowledge of science, encouraging citizens to participate in the scientific process by observing, gathering and processing data, right up to setting scientific agenda and co-designing and implementing science-related policies. It could also involve publication of results and teaching science.

Scope

There are the two sub-topics:

A, Coordination and Support Action - CSA (1 project in 2018): This will provide support to citizen science at the European level. It will also create a mutual learning space where citizen science projects/participants can exchange experiences and successful strategies. **It will raise awareness of citizen science among the general public, provide co-ordination support between citizen science initiatives (in particular those funded by SwafS but also working in a spirit of co-operation with established networks of citizen scientists), identify training needs with a view to developing and implementing training to help citizen scientists**, and support communication between citizen science and science journalists/science media. It will also identify good practices that incentivise career scientists to engage with citizen science activities.

B, Research and Innovation Actions - RIA (multiple projects in 2018-2019): This will support hands-on citizen science activities. Proposals may focus on one particular area of scientific enquiry or tackle several, though transdisciplinary approaches should be favoured. The intended activities should be clearly defined and result in the development of new knowledge, new technologies, or new means of using existing technological or social innovations better. **Activities can explore how citizen science develops scientific skills and competences, act as a tool for informal and formal science education of young people and adults, counter perceived anti-intellectual attitudes in society, raise the scientific literacy of European citizens, and promote social inclusion and employability. Gender, geographical and socio-economic factors should be taken into account so as to ensure activities are open to people from all backgrounds. Effort should be made to evaluate the impacts on society, democracy, the economy, science itself, and the individual citizen scientists involved in the activities**. Lines of communication should be established with other relevant SwafS projects in order to share evaluation data and data arising from the citizen science in the spirit of open science.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged.

The Commission considers that proposals requesting a contribution from the EU in the order of € 2.00 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

A. Coordination and Support Action: Strengthened networks, co-ordination and communication among citizen science projects (particularly, but not limited, to those funded by SwafS). Availability of tools, guidelines, or other materials useful to actors inexperienced in organising and supporting citizen science initiatives. Increased awareness amongst the general public of citizen science. Delivery of training to citizen scientists (or potential science practitioners) and resultant increased skills, competences, and scientific excellence. Consortia should choose a basket of indicators to measure the impact of their work against. In particular, consortia are expected to contribute to one or more of the MoRRI indicators (for instance PE1 to PE10) and to the Sustainable Development Goals.

B. Research and Innovation Actions: Development of new knowledge and innovations by citizen scientists. Availability of evaluation data concerning the societal, democratic and economic costs and benefits of citizen science. Consortia should choose a basket of indicators to measure the impact of their work against. In particular, consortia are expected to contribute to one or more of the MoRRI indicators (for instance PE1 to PE10) and to the Sustainable Development Goals.

Call - Science with and for Society

Type of action	Research and Innovation action
Deadline	**02 April 2019**
Call identifier	H2020-SWAFS-2018-2020
Topic information	Link

SwafS-16-2019: Ethics of Innovation: the challenge of new interaction modes

Specific Challenge

Innovation, from idea to product, and including social innovation, is a main driver for change, a pillar of EU growth and globally for socio-economic development. It addresses key challenges in fields such as the environment and health and improving the quality of life and well-being of citizens.

Over the past years, the modes of interaction between the different stakeholders have evolved significantly. Active participation of citizens in science and innovation has gained prominence. At the same time, new IT tools have profoundly impacted the way in which researchers work and interact. These developments are promising and have numerous advantages. At the same time, however, these **new modes of innovation** also **raise ethical and regulatory considerations, including concerns regarding the protection of participating citizens, their potential exploitation, the collection of big data and related privacy considerations, as well as intellectual property issues.**

Scope

In order to maximise the social benefits derived from innovation, **the action will assess the ethical, regulatory and governance issues potentially arising in this context. The action should identify what the distinctive elements of innovation ethics would be in this dynamic context**.

The role of citizen participation in innovation (**including social innovation**) must be analysed in order to maximise the effectiveness of this participation for all stakeholders, taking into account possible gender differences. Best practices for an active involvement of citizens and relevant stakeholders in the innovation processes should be identified. The design and use of IT tools should also be considered in order to optimise stakeholder participation.

In addition, **the existing legal environment applicable to citizen participation in research and innovation should be identified, mapped and analysed. Potential regulatory and legal gaps** (concerning for example IP rights and ownership of data) **should be described and concrete proposals should be presented** to address the highlighted gaps.

The analytical work should not be limited to the legal aspects, but also cover current practices (in the EU and beyond) with a view to discussing their ethics and values dimensions and taking into account the lessons learned so as to be able to identify best practices. In doing so, business ethics practices should also be considered.

The action must propose an ethics framework, based on accepted principles, **which aim to ensure that innovation remains a process which responds to citizens' needs and values, improves access and avoids a technological divide**. Such a framework should focus on the elaboration and implementation of publicly funded research and innovation programmes, as well as public–private partnerships. It should be developed, validated and translated into a set of practical guidelines that enable the effective handling of the identified ethical and regulatory issues.

Such a framework and guidelines must be compatible with and aim to complement the new European code of conduct for research integrity and include, where applicable, measures for benefit sharing. This process necessitates the active involvement of relevant stakeholders to ensure an effective take-up. The effectiveness of the guidelines should be assessed and tested, notably via workshops and focus groups (such science cafes, etc.) involving citizens, industry, researchers and policy makers. In addition, the resulting guidelines should be applied in real-life pilots with quantifiable results. Piloting needs to be carried out in a representative set of Member States in order to test different cultural/socio-political context.

The action should involve innovation agencies and/or research and innovation funding organisations, which are called to apply the results of the project into their internal procedures.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged.

The Commission considers that proposals requesting a contribution from the EU of the order of EUR 3.00 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

Overall, this action will enable more effective handling of the ethical dimension of innovation, in particular regarding the new modes of interaction and participation. It will offer a practical and operative tool for all stakeholders confronted with the challenges related to co-design and to new (IT-based) interaction modes. It will practically support the work of a) the designers and funders of research and innovation policies/programmes, b) the ethics committees tasked with evaluating and monitoring innovative programmes and projects, and c) the research integrity bodies responsible for promoting research integrity and research quality. The implementation of the guidelines in pilots are expected to increase their uptake and overall the impact of the action.

Type of action	Coordination and support action
Deadline	**02 April 2019**
Call identifier	H2020-SWAFS-2018-2020
Topic information	Link

SwafS-17-2019: Consolidating and expanding the knowledge base on citizen science

Specific challenge
Grassroots initiatives related to citizen science are blooming across the world. **Citizen science** has the potential to bring a wide variety of benefits to researchers, citizens, policy makers and society and across research and innovation (R&I) cycles. **It can make science more socially relevant, accelerate and enable production of new scientific knowledge, help policy makers monitor regulatory implementation and compliance, increase public awareness about science and ownership of policy making, and increase prevalence of evidence-based policy making.**

The growth of citizen science brings with it a need to understand its breadth and consequences. How is citizen science conducted, who is involved and in what way(s), and what effect(s) does it have on R&I systems, scientists and the citizens involved? What are the different incentives and disincentives for career scientists to get involved in citizen science? What are the enablers and the barriers of citizen science, what are good practices, and what are its limits? **It is also important to identify the democratic, societal, economic and scientific benefits of citizen science**. Moreover, the deep and profound implications on science as a discipline, a profession and as a practice, and also on science's relationship with and for society, need to be considered.

Scope
This topic will deepen scientific knowledge on citizen science. It will work very closely with and examine and synthesise data arising from existing citizen science projects (in particular, but not limited to, those funded by SWAFS) **to better understand participation patterns in citizen science**, the types of activities conducted, the transformative potentials of participating in citizen science, **challenges faced by citizen scientists, enablers and barriers to participating in citizen science (e.g. in terms of socio-economic status, gender, age**, and in terms of R&I policies), and a strengthened knowledge base on its benefits. It will place developments in global and European historical contexts, and develop understanding about the implications of citizen science on science itself, and on science's relationship with and for society. It will involve stakeholders from local to European levels, from all parts of the quadruple helix, and **taking into account gender, geographical and socio-economic differences**, to develop policy messages that work towards an enabling R&I policy environment for citizen science and maximisation of the benefits of citizen science.
In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged.
The Commission considers that proposals requesting a contribution from the EU of the order of EUR 2.5 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
Consortia should aim to consolidate and expand the scientific and policy knowledge base about citizen science. They should identify key incentives, disincentives, barriers and enablers to involvement of citizens and scientists. **They should document, synthesise, and present evidence about the societal, democratic, economic and scientific benefits (and potential caveats) of citizen science**. They should aim to impact on R&I policies by developing implementable policy recommendations and targeting them at key stakeholders. They should aim to indirectly work towards MoRRI indicators (e.g. SLSE4, PE1, PE2, PE3, PE5, PE6, PE7, PE8, PE9, PE10, OA6) and identified and appropriate Sustainable Development Goals

Type of action	Research and Innovation action
Deadline	**02 April 2019**
Call identifier	H2020-SWAFS-2018-2020
Topic information	Link

SwafS-19-2018-2019: Taking stock and re-examining the role of science communication

Specific challenge

Science and innovation are undergoing deep and fundamental changes, in particular thanks to digitalisation (e.g. social media and citizen science). Science communication, which is a discipline, an activity conducted by scientists and other R&I stakeholders, and a career path followed by journalists, informs citizens about science and innovation, opens up R&I to society, and empowers citizens to participate in activities and debate.

Two concurrent developments lead to the growing need to ensure the quality and reliability of science communication: firstly, dwindling resources in science journalism lead to reduced critical assessment and reporting of science[1]; secondly, the rapid diffusion of open access publications and science-related news through social media increase opportunities for all citizens and civil society groups to reach large audiences about science-related issues but sometimes without the editorial oversight and fact-checking established in the traditional media.

Scope

This topic aims to better understand how results from research and scientific methodologies are communicated and perceived by citizens (taking into account age, gender, and socio-economic status), develop improved ways to measure and assess science communication, and identify good practices and policy guidelines to increase the accuracy of (and therefore trust in) science communication. It will increase knowledge about science communication at international, EU and member state levels. It will propose innovative ways to open up science and innovation broadly to society by improving the quality and effectiveness of interactions between scientists and other R&I stakeholders, the media and the public. **It will examine the teaching of science communication within scientific disciplines and as a dedicated academic discipline. It will also give attention to existing incentive (and disincentive) structures for scientists and other R&I stakeholders to engage in science communication, for instance in terms of career and scientific reputation**. Applicants are welcome to propose other innovative ideas in relation to the above specific challenge.

To address this specific challenge, proposals will include a multi-disciplinary team able to explore well defined communication strategies (journalists, science communicators, scientists and other R&I stakeholders, educators, enterprises, economists, civil society/citizens, legal experts, etc.). Specificities related to gender, culture, territorial context and the environment should also be considered.

The Commission considers that proposals requesting a contribution from the EU of the order of EUR 1.2 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

Dissemination of the results should increase the communication of science in terms of quantity and quality, favour the opening of R&I, and the up-take of RRI. It should eventually improve the quality and effectiveness of interactions between scientists, general media and the public.

Type of action	Research and Innovation action
Deadline	**02 April 2019**
Call identifier	H2020-SWAFS-2018-2020
Topic information	Link

SwafS-20-2018-2019: Building the SwafS knowledge base

Specific challenge

Understanding the evolution of science and society will help proactive and anticipatory policy making. This includes **examining how societal actors**, including young people, **behave, understand, react to and interact with science and scientific developments, and their motives for engaging in science-related activities. It encompasses investigating science communication and science advocacy in the digital world, and how science and technology studies and different disciplines (e.g. behavioural sciences, communication studies, gender studies, linguistics, and social anthropology) – and multi/transdisciplinary approaches – can help explain interactions between science and society**. This includes a focus on blind spots of research and innovation in relation to people's needs and concerns and in any of the areas or dimensions covered by RRI. Moreover, consideration could be given to rewarding achievement in RRI in its various dimensions to signal the organisations that are more RRI aware (answering questions such as how such a reward could work and based on which criteria). Another area is implications of deep changes in science and innovation and their interactions with society and the economy, such as the transition to open science and open innovation, and resultant changes in the relationships between science and society

Scope
The present topic is completely bottom-up. Research and innovation actions are invited, using the above specific challenge to help stimulate ideas about where research is most needed.
The Commission considers that proposals requesting a contribution from the EU of the order of € 1 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
Consortia should choose a basket of indicators to measure the impact of their work against. In particular, consortia are expected to contribute to one or more of the MoRRI indicators[1] and/or to the Sustainable Development Goals[2]. R&I outcomes should help build effective cooperation between science and society, foster the recruitment of new talent for science, and pair scientific excellence with social awareness and responsibility. Scientific and other types of publication should be foreseen.

Type of action	Research and Innovation action
Deadline	**1st stage - 02 April 2019** **2nd stage - 07 November 2019**
Call identifier	H2020-SWAFS-2018-2020
Topic information	Link

Topics with minor SSH relevance

SwafS-05-2018-2019: Grounding RRI practices in research and innovation funding and performing organisations
Link

Spreading Excellence and Widening Participation

Net 4 Society

WF-02-2019: Widening Fellowships

Specific challenge

The Marie Skłodowska-Curie actions (MSCA) contribute to **boosting jobs, growth and investment by equipping researchers with the new knowledge, skills and international and inter-sectorial exposure to fill the top positions of tomorrow and solve current and future societal challenges.** They are based on the principle of mobility, and researchers can receive funding on the condition that they move from one country to another to acquire new knowledge. The results from the first years of MSCA in Horizon 2020 also revealed the existence of a mobility gap across Europe and discrepancies between European countries in their ability to attract funding. To specifically address this gap in participation Widening Fellowships will provide an additional opportunity to researchers of any nationality to acquire and transfer new knowledge and to work on research and innovation in Widening countries.

Scope

Support is foreseen for individual, trans-national fellowships awarded to researchers of any nationality, in Widening countries. Applications to the 2019 call for Marie Skłodowska-Curie actions Individual Fellowships (MSCA-IF), where the host organisation is located in an eligible widening country, will be automatically resubmitted to this call in case their proposal fails to reach an adequate place in the ranking to be funded in the regular MSCA-IF call26. Applicants who do not wish to be considered for this funding opportunity may opt out during the application stage.

The proposals submitted under the Widening Fellowships must fulfil all the admissibility and eligibility conditions of the Marie Skłodowska-Curie actions Individual Fellowships and pass all the thresholds for that call.

The award criteria, scoring and threshold for Marie Skłodowska-Curie actions apply to eligible proposals. Proposals will be ranked according to the 2019 MSCA-IF call scores and evaluation procedure and will retain scores and comments included in the Evaluation Summary Report (ESR) of the MSCA-IF call. The MSCA-IF model grant agreement and the unit costs applicable to MSCA-IF will also apply to the Widening Fellowships.

Expected impact

The expected impact indicated for the MSCA-IF-2019 Individual Fellowships call under the MSCA Work Programme will apply to this call.
In addition, the Widening Fellowships are expected to lead to the following:
1. Enhanced cooperation and stronger networks including widening countries.
2. Boosting of R&I capacity among participating organisations.
3. Increase in international, interdisciplinary and intersectoral mobility of researchers in Widening countries.

Type of action	Career Restart panel, Reintegration panel, Society and Enterprise panel, Standard European Fellowships
Deadline	**11 September 2019**
Call identifier	H2020-WF-2018-2020
Topic information	Link