



# **International Cooperation in Horizon 2020**

## **EU and Canada**

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## Excellent Science

<b>Horizon 2020 Pillar:</b>	Excellent Science
<b>Programme:</b>	Research infrastructures
<b>Call Title:</b>	E-Infrastructures
<b>Call Identifier:</b>	H2020-EINFRA-2016-2017
<b>Topic Title:</b>	Data and Distributed Computing e-infrastructures for Open Science
<b>Topic Identifier:</b>	EINFRA-12-2017
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	29-03-2017 (single-stage)

### Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/einfra-12-2017.html>

**Specific Challenge:** This topic covers two complementary areas of e-infrastructures very closely related with the objective to make research data discoverable, accessible, assessable, intelligible, useable, and wherever possible interoperable – c.f. **G8** principles on research data:

- a. Secure and agile data and distributed computing e-infrastructures: fostering the integration of a secure, permanent, on-demand service-driven, privacy-compliant and sustainable e-infrastructure incorporating distributed databases, computing resources and software.

The European data and computing e-infrastructure landscape remains very fragmented which is an obstacle for research collaboration at European and global levels and introduces additional complexity for achieving sustainable governance. The challenge is to integrate at European level the geographically and disciplinary dispersed resources to achieve economies of scale and efficiency gains in providing the best data and computing capacity and services to the research and education communities. This action is interrelated to INFRADEV-04-2016, “European Open Science Cloud for Research”.

- b. Access and preservation platforms for scientific information: supporting the integration and consolidation of e-infrastructure for reliable and permanent open access to digital scientific records, based on existing initiatives across Europe (institutional and thematic repositories, aggregators, etc.).

The European infrastructures need to respond to the emerging requirements for seamless and reliable access to publications, research data and software. These requirements are complemented by the need for long term preservation and curation of scientific information to fully support data and computing intensive science. The challenge is to support the integration at European level of a robust and sustainable e-infrastructure, based on existing initiatives across Europe (institutional and thematic publishing platforms, aggregators, etc.) and services supporting European Open Access policies. An additional challenge is the building of capacity to link all kinds of digital research objects

in order to enable a more transparent evaluation of research and reproducibility of results, enabling trust and facilitating access by innovative business actors.

**Scope:** Grants awarded under this topic will be complementary between them. The respective options of Article 2, Article 31.6 and Article 41.4 of the Model Grant Agreement will be applied. The main purpose of the collaboration agreements referred to in Article 41.4 of the Model Grant Agreement is to work on potential synergies, overlaps and gaps in the overall service offering. In addition, links should also be established with projects selected under topic INFRADEV-04-2016, to collaborate, exploit potential synergies and ensure complementarity.

Proposals will address part (a) or (b), but not both. At least one proposal for each part will be selected:

- a. Secure and agile data and distributed computing e-infrastructures (proposals should address all points below):
  1. integration of computing, software and storage resources exposing them through a dynamic registry and catalogue of services supporting European research and education communities in their tasks related with data and computing intensive science. This integration should be done by means of open and flexible architectures and include institutional, regional, national and European capabilities, packaging them in the optics of end-user needs
  2. seamless operation of highly scalable and agile data and computing platforms and services dedicated to analytics including hardware and software components, database, compilers, analytics software, supported to easy user entry points for the community of users
  3. reliably address the aspects of privacy, cybersecurity and information assurance supporting multiple compartments with private, public or industrial corpus of data, protected from unauthorized access by secure interfaces
  4. adoption of standards-based common interfaces, open source components enabling access and processing of underlying data collected/stored in different platforms and formats. Empowering users to customise application and services tailoring them to specific requirements, which will differ across disciplines, applications etc
  5. work closely with user communities (from different disciplines) to foster the use of digital infrastructures, promote the values of open science and support their data management plans. Engage and train users (researchers, educators and students) to contribute to the dynamic registry and catalogue of services improving quality of data, software and computing infrastructure that become available for re-use
  6. foster interoperability of pan-European thematic/community-driven e-infrastructures providing cost-effective and interoperable solutions for data management. The data and computing e-infrastructure should be able to interoperate with resources based on different technologies which are operated/owned by public and or private organisations
  7. support the preservation and curation of data and associated software so that the reproducibility and accuracy of the data can be verified
  8. enable seamless transition and e-infrastructure upgrades, exploiting economies of scale and promoting interoperability with similar infrastructures across and beyond Europe and operate user-friendly and comprehensive repositories of software components for research and educationThe Commission considers that proposals requesting a contribution from the EU of between EUR 10 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.

- b. Access and preservation platforms for scientific information (proposals will address all points below):
1. Deployment and maintenance of service-driven knowledge e-infrastructure responding to general and specific requirements of researchers and research organisations for open access to research digital objects, their registration and preservation. This e-infrastructure will further develop the research capacity through a coordinated and participatory architecture linking institutional and thematic repositories across Europe. It will support publishing platforms by providing essential services for scientific information that can be used by humans and machines. Such target platforms can be generic, specific for a research field or specialised on quality assurance, discoverability, archiving etc. Essential functions of this service-driven approach will include helpdesks, training and guidance to support producers and users of scientific information, community building to support research data sharing and management, as well as implementation of Open Access policies in Europe. Relevant indicators on the take-up of open access in Europe including publications and data should be elaborated and reported regularly. The project will promote a limited set of biblio- and webometrics that reflect open access policies. It will collect bibliometric data on publications, citations, data citations, etc. on all Horizon 2020 scientific output (including on the Open Research Data Pilot) and produce both standard and on-demand statistics.
  2. Supporting global interoperability of open access data e-infrastructures and linking with similar initiatives across the globe to complement the physical access to research facilities with data access and to ensure that Europe plays a leading role in international collaborations.

The Commission considers that proposals requesting a contribution from the EU of between EUR 8 and 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. It is expected that one proposal will be selected.

### **Expected Impact:**

- a. the operation of a federated European data and distributed computing infrastructure for research and education communities will optimise the access to IT equipment and services and will put all European researchers and educators in equal footing to access essential resources to express their talent and creativity. Establishing partnerships with industrial and private partners the e-infrastructure will train people in research and academic organisations preventing lack of skilled and specialised infrastructure operators. It will avoid the locking-in to particular hardware or software platforms that would jeopardise the long-term planning for capacity upgrades. With such an operational infrastructure more scientific communities will use storage and computing infrastructures with state-of-the-art services for their research and education activities. The open nature of the infrastructure will allow scientists, educators and students to improve the service quality by interacting with data, software and computing resources. It will increase the incentives for scientific discovery and collaboration across disciplinary and geographical boundaries, putting Europe in the driving seat at global level. It will further develop the European economic innovation capacity and provide stability to the e-infrastructure.
- b. a reliable operation of e-infrastructure services for access and preservation of scientific information will make the intellectual capital of Europe available to researchers, business and citizens at large. It will generate economic and scientific advances now and in the future as that capital is safely preserved for further exploitation by future generations. Open Access publications resulting from Horizon 2020 funded research are available and easily findable online. Data needed to validate published results is linked to the publications and publicly shared whenever possible. Accurate science metrics for Horizon 2020 can be produced with almost no effort. Most of the European institutional

repositories (at least 95%) as well as the principal thematic repositories are part of the same interoperable repository network.

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

## Societal Challenges

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Climate action, environment, resource efficiency and raw materials
<b>Call Title:</b>	Greening the Economy
<b>Call Identifier:</b>	H2020-SC5-2016-2017
<b>Topic Title:</b>	Closing the water gap
<b>Topic Identifier:</b>	SC5-33-2017
<b>Type of Action:</b>	ERA-NET-Cofund ERA-NET Cofund
<b>Deadline(s):</b>	07-03-2017 (single-stage)

### Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sc5-33-2017.html>

**Specific Challenge:** Growing water demands, mismanagement of water use and climate change are increasing the stress on water supply, water bodies, and associated ecosystems and existing infrastructures, and emphasise the need to close the water cycle gap, by reconciling water supply and demand in both quantitative and qualitative terms. Research needs to be deployed in a number of scientific fields to improve the knowledge base on water resources availability and use and must be systematically combined with a socio-economic approach investigating the questions of adaptation strategies, participation, behaviour and commitment of stakeholders. This challenge is of European interest and will require a concerted action. To be more effective and increase the added value of related investments, the efforts and strategic research agendas of the many funding networks and organisations existing in Europe need to be integrated to establish transnational and trans-disciplinary research and innovation actions.

**Scope:** The action will support delivering on priorities identified in the Strategic Research and Innovation Agenda of the Water Joint Programming Initiative (JPI), by pooling together the necessary financial resources from the participating national (or regional) research programmes with a view to implementing a joint call for proposals resulting in grants to third parties with EU co-funding. The joint call should address research and innovation to support the implementation of EU water policy, in particular on the thematic area “Closing the Water Cycle Gap” of the Water JPI Strategic Research and Innovation Agenda, specifically the sub-themes of Enabling Sustainable Management of Water Resources; and Strengthening Socio-economic Approaches to Water Management. Water resources observation and modelling will be required to better understand hydrological processes and to analyse and forecast the effect of management options, in order to support improved decision-making to ensure the long-term viability of water resources and to enable the integrated management of water resources at the national, basin, and global scales. Observation and modelling should also help to mobilise investments into innovation water management and use solutions in line with the objective of creating a circular economy.

In line with the EU's strategy for international cooperation in research and innovation international cooperation with international partners is encouraged. Proposals should

include other joint activities including additional joint call(s) without EU co-funding. The proposal should demonstrate that these co-funded other activities exclude any overlaps with related ongoing actions co-funded by the EC. Cooperation and coordination with other ERA-NETs and/or JPIs to increase synergies on cross-cutting issues, where appropriate, is encouraged.

Participation of legal entities from international partner countries and/or regions is encouraged in the joint call as well as in other joint activities including additional joint calls without EU co-funding. Participants from countries which are not automatically eligible for funding<sup>[1]</sup> may nonetheless request a Union contribution (on the basis of the ERA-NET unit cost) for the co-ordination costs of additional activities.

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:** Projects are expected to lead to:

- improved use of scarce human and financial resources in the area of water research and innovation;
- reduced fragmentation of water research and innovation efforts across Europe;
- improved synergy, coordination and coherence between national and EU funding in the relevant research fields through transnational collaboration;
- improved implementation of research and innovation programmes in these fields through exchange of good practices;
- strengthened international leadership of European research in this area making the Water JPI, in collaboration with the European Commission, a privileged and attractive partner for global cooperation in research and innovation, in the context of the **Belmont Forum** and other international alliances;
- contribution to the implementation of the objectives of the JPI on Water;
- contribution to the implementation of the Sustainable Development Goals (SDGs), in particular SDG 6 'Ensure availability and sustainable management of water and sanitation for all' and SDG 13 'Take urgent action to combat climate change and its impacts', as well as the conclusions of the COP21 Paris Agreement<sup>[2]</sup>.

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

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[1] [http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/international-cooperation\\_en.htm](http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/international-cooperation_en.htm)

[2] The Paris Agreement was adopted at the 21st Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change, in Paris on 12 December 2015.

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Climate action, environment, resource efficiency and raw materials
<b>Call Title:</b>	Greening the Economy
<b>Call Identifier:</b>	H2020-SC5-2016-2017
<b>Topic Title:</b>	Biodiversity scenarios
<b>Topic Identifier:</b>	SC5-32-2017
<b>Type of Action:</b>	ERA-NET-Cofund ERA-NET Cofund
<b>Deadline(s):</b>	07-03-2017 (single-stage)

**Participant Portal Weblink:**

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sc5-32-2017.html>

**Specific Challenge:** Evaluating and improving the sustainability of the management of biodiversity and ecosystem services is a major challenge of our time all over the world. Scenarios of biodiversity and ecosystem services have been a key component of forward-looking decision making as they contribute to

- i) better understanding and synthesizing a broad range of observations,
- ii) informing decision makers about future impacts of global changes such as climate change, land use change, resource overuse, invasive alien species or pollution,
- iii) providing decision support by developing adaptive management strategies, and
- iv) evaluating the implications of alternative social-economic development pathways and policy options.

Development of scenarios for biodiversity and ecosystem services, based on the understanding and modelling of their dynamics and the evaluation and reanalysis of past changes, is beginning to receive high priority in the research policy of the majority of countries worldwide. In this context, aligning research agendas and implementing them through international calls will promote synergies and optimal use of the available expertise and resources, avoiding duplication and ensuring robust outcomes of global relevance. To attain this, BiodivERsA is opening to third country partners and the **Belmont Forum** provides an excellent platform for international collaboration.

**Scope:** Proposals should pool the necessary financial resources from the participating national (and as needed local and regional) research programmes with a view to implementing a joint call for proposals with EU co-funding resulting in grants to third parties. The proposal should include other joint and follow-up activities, including possibly additional joint call(s) without EU co-funding. The proposal should demonstrate that these co-funded other activities exclude any overlaps with ongoing actions of this ERA-NET co-funded by the EC. Actions should build on the strategic roadmap of BiodivERsA ERA-NET Cofund and launch at least one international call on biodiversity and ecosystem services scenarios in collaboration with the **Belmont Forum** specifically to promote trans-continental collaboration. Cooperation and

coordination with other ERA-NETs and/or JPIs to increase synergies on cross-cutting issues, where appropriate, is encouraged.

Participation of legal entities from international partner countries and/or regions, particularly from countries participating in the **Belmont Forum**, is encouraged in the joint call as well as in other joint activities without EU co-funding. For the co-ordination costs of additional activities only, participants from countries which are not automatically eligible for funding<sup>[1]</sup> may nonetheless request a Union contribution (on the basis of the ERA-NET unit cost).

The Commission considers that proposals requesting a contribution from the EU in the range 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:** Actions are expected to lead to:

- the alignment of research and innovation agendas in the area of scenario development for biodiversity and ecosystem services and co-ordinated streamlining of the implementation of at least one call;
- enhanced excellence and global relevance of research and innovation activities on biodiversity and ecosystem services, improving the relevance and value of advances made in developing socio-economic scenarios and models of global change impacts on the dynamics of biodiversity and ecosystem services for decision makers at multiple scales;
- increased visibility of European biodiversity scientific community and research outcomes at international level;
- strong and lasting alliance with the funding agencies of key international partners for research and innovation actions on biodiversity and ecosystem services (e.g Brazil, China, India, Japan, Mexico, South Africa, USA);
- link with possible assessments as those conducted, e.g., by the IPBES to induce a wider, worldwide and regional use of scenarios to better assess future, plausible trends of biodiversity and ecosystem services and explore the role that nature-based solutions may play;
- contribution to the implementation of the Sustainable Development Goals (SDGs), in particular SDG 15 'Protection, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss'.

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

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[1] [http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/international-cooperation\\_en.htm](http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/international-cooperation_en.htm)

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Climate action, environment, resource efficiency and raw materials
<b>Call Title:</b>	Greening the Economy
<b>Call Identifier:</b>	H2020-SC5-2016-2017
<b>Topic Title:</b>	ERA-NET on Climate Services Roadmap: Cross-sector impact assessments (evaluation, comparison and integration)
<b>Topic Identifier:</b>	SC5-30-2017
<b>Type of Action:</b>	ERA-NET-Cofund ERA-NET Cofund
<b>Deadline(s):</b>	07-03-2017 (single-stage)

**Participant Portal Weblink:**

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sc5-30-2017.html>

**Specific Challenge:** Following the outcome of the European Workshop 'Towards a European Market of Climate Services' (18th March, 2014), a European Roadmap for Climate services has been prepared by an independent group of experts and presented in a subsequent European Conference on 17th March 2015. The Roadmap identifies a series of challenges and specific actions that need to be undertaken by various actors in Europe, in order to strengthen the European market of climate services. In the Horizon 2020 Work Programme of 2015 an ERA-NET Cofund action was already launched with the JPI Climate for developing scientific advances in support of climate services, involving mandated governmental research centres in the design of co-aligned actions. The challenge is to support the implementation of the Roadmap, building upon the layer of activities already launched, in order to support knowledge-based decision making, both in the public and private sector, to avoid risks and seize opportunities towards sustainable development. This requires cross-sectoral and robust impact assessments that nest climate change information into others socio-economic changes, as well as taken into account adaptation policies to reduce vulnerabilities and increase resilience in future.

**Scope:** The action will support the implementation of the roadmap for climate services and align actions of the various national entities of Member States and Associated Countries active in climate services and climate research by developing, evaluating, and integrating impact assessments, methodologies, and models while adding to the development of Shared Socioeconomic Pathways (SSP). It requires transdisciplinary research – co-designed with key stakeholders – across key economic/societal sectors, including food, water, energy, health, finance, investment, equity and security. This action should be implemented through a close cooperation with Member States grouped around the JPI Climate, should take into account relevant actions already carried out in the first Horizon 2020 programming cycle and within other relevant JPIs, and should benefit from cooperation with advanced programmes and projects on climate regional modelling and knowledge gaps, such as the one foreseen in this work programme for 2016 (SC5-2, SC5-3). Furthermore, in line with the strategy for EU international cooperation in research and innovation (COM(2012)497), it should open

cooperation at international level with other key initiatives such as the **Belmont Forum** or at regional level in Latin America and/or Africa.

The proposal should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing a joint call for proposals with EU co-funding resulting in grants to third parties. The proposal may include, in addition, publicly-funded research performing organisations that will contribute with their own resources (in-kind contributions from their institutional funding). In this case the joint call should include a separate topic for the participating research performing organisations. They will carry out the transnational projects resulting from this topic themselves. Their participation in the ERA-NET Cofund action must be mandated by the national/regional authorities in charge (normally the responsible Ministry).

Proposals should include other joint activities including additional joint calls without EU co-funding, while demonstrating at the same time that activities exclude any contextual or financial overlaps with related ongoing actions co-funded by the EC. Cooperation and coordination with other ERA-NETs and/or JPIs to increase synergies on cross-cutting issues, where appropriate, is encouraged.

Participation of legal entities from international partner countries and/or regions, including from **Belmont Forum** members and/or Latin America or Africa, is encouraged in the joint call as well as in other joint activities including additional joint calls without EU co-funding. Participants from countries which are not automatically eligible for funding<sup>[1]</sup> may nonetheless request a Union contribution (on the basis of the ERA-NET unit cost) for the coordination costs of additional activities.

The Commission considers that a proposal requesting a contribution from the EU in the range of EUR 13 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 results of the projects launched through this ERA-NET are expected to:

- substantially increase the capability of quantifying the impacts of climate change at local/regional level in a cross sectoral risk-assessment framework including better quantification of uncertainties;
- increase the potential of using climate impact data in operational climate services;
- increase the integration of economic and impact model assessments in support of adaptation and mitigation decisions;
- align public funding on actions in support to the development of climate services within the JPI Climate member countries and beyond, including others relevant JPIs;
- support a network of key European research performing organizations;
- strengthen international leadership of European research, in particular its contribution to the Global Framework for Climate Services (WMO-GFCS), the Inter-Sectoral Impact Model Intercomparison Project (WCRP/ISI-MIP) and the Future Earth Programme, and eventually to IPCC assessments, UN-SDGs and the **Belmont Forum**;
- contribute to implementing the Sustainable Development Goals (SDGs), in particular SDG 13 'Take urgent action to combat climate change and its impacts', as well as the conclusions of the COP21 Paris Agreement.

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

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[1] [http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/international-cooperation\\_en.htm](http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/international-cooperation_en.htm)

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research, Secure, clean and efficient energy, Climate action, environment, resource efficiency and raw materials
<b>Call Title:</b>	<b>Blue Growth</b> - Demonstrating an ocean of opportunities
<b>Call Identifier:</b>	H2020-BG-2016-2017
<b>Topic Title:</b>	Interaction between people, oceans and seas: a strategic approach towards healthcare and well-being
<b>Topic Identifier:</b>	BG-06-2017
<b>Type of Action:</b>	CSA Coordination and support action
<b>Deadline(s):</b>	14-02-2017 (single-stage)

**Participant Portal Weblink:**

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/bg-06-2017.html>

**Specific Challenge:** The interaction between people, oceans, seas and coasts is a broad domain with significant impacts on human health and well-being. However, it remains fragmented, poorly understood and underexploited. As coastal populations grow worldwide, not only due to permanent dwellers but also due to increasingly larger number of tourists, the determinants and impacts of this link between oceans and people become more relevant. On the one hand, the seas provide benefits namely through food, feed and positive impacts on overall wellness. On the other hand, the risks associated with the marine environment include chemical and physical pollutants of anthropogenic origin, harmful algal blooms, and countless marine microorganisms that lead to a still poorly assessed proportion of human morbidity and mortality. Therefore, the challenge is to coordinate the existing multidisciplinary research knowledge and resources, including distributed infrastructures, across Europe. This would make it easier to take advantage of the benefits and to better manage the risks of the interaction between oceans and people using an ecosystem-based approach and to formulate evidence-based policies that can benefit citizens as well as achieving good environmental status.

**Scope:** Proposals should include a plan for the creation of a multi-stakeholder forum that would make it possible to better understand the potential health benefits of marine and coastal ecosystems including in economic terms, anticipate new threats to public health more effectively, identify ways of improving ecosystem services that the marine environment can provide and contribute to reducing the burden of diseases caused by the interplay between marine-degraded environments and human behaviour. This forum is expected to issue a strategic research agenda based on data covering the biological, cultural and socio-economic dimensions of the interaction between oceans and human health that can ultimately impact morbidity and mortality in the general population. Data should encompass sex and gender differences in the populations studied. Data should be assessed through an active

involvement of diverse stakeholders across Europe, including local marine communities, civil society, industry, and public authorities.

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

Projects funded under this topic will by default participate in the Pilot on Open Research Data in Horizon 2020, with the option to opt-out, as described in the introduction.

- Expected Impact:** In order to support key EU policies, in particular those directly related to the marine and maritime sectors, such as the EU **Blue Growth** Agenda, the Blue Tourism Communication and the Marine Strategy Framework Directive, proposals are expected to
- Create a multi-stakeholder forum that issues a strategic research agenda for oceans and human health, based on new scientific and/or technological evidence and best practices across different geographical locations and climates.
  - Highlight novel, cost-effective solutions or interventions that enable effective policy making that aims to maximise health benefits and minimising risks derived from exposure to marine and coastal ecosystems.
  - Actively involve local communities across different European maritime regions, comprising civil society, industry, public authorities in data supply, knowledge generation and solution implementation processes.
  - Improve global cooperation around oceans and human health.
  - Improve the professional skills and competences for those working and being trained to work within the blue economy.

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

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research, Secure, clean and efficient energy, Climate action, environment, resource efficiency and raw materials
<b>Call Title:</b>	<b>Blue Growth</b> - Demonstrating an ocean of opportunities
<b>Call Identifier:</b>	H2020-BG-2016-2017
<b>Topic Title:</b>	The effect of climate change on Arctic permafrost and its socio-economic impact, with a focus on coastal areas
<b>Topic Identifier:</b>	BG-11-2017
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	14-02-2017 (single-stage)

**Participant Portal Weblink:**

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/bg-11-2017.html>

**Specific Challenge:** Arctic permafrost contains twice as much carbon as the atmosphere, stored in the upper metres of the ground. Thawing of permafrost may trigger the release of this carbon and its transformation to greenhouse gases, reinforcing global warming (permafrost carbon feedback). Moreover, permafrost coasts make up 34% of the world's coasts. Increasing sea-level in combination with changing sea-ice cover and permafrost thawing expose these coastal areas to higher risks. Knowledge gaps exist in relation to the transfer of material - including organic matter - from land to sea and its fate, with the consequence that processes of accumulation and/or subsea permafrost degradation are not accounted for in global climate and Earth system models. The pressing challenge is to understand the impact of permafrost thawing on climate change and its implications for the environment, for the indigenous populations and the local communities. Finally, permafrost thawing affects the stability of built infrastructure.

**Scope:** Actions should assess the impact of permafrost thawing on Arctic (natural and human) coastal systems and its effect on the availability/accessibility of resources, the stability of infrastructure, the growth of potential new economic activities, as well as on pollution and health. The research should employ a holistic and trans-disciplinary approach and in co-operation with stakeholders. It should consider the needs of and the impacts on indigenous populations, local communities and economic actors operating in this vulnerable region in the sustainable development context. Actions should address key processes of environmental change and develop appropriate adaptation and mitigation responses with an emphasis on permafrost at the interface between land and water.

Proposals should develop relevant forms of communication for EU (and possible national) services to adequately disseminate results that could be used for policy action. Trans-disciplinary and participatory approaches, including social sciences and humanities, in the process are considered necessary. In line with the strategy for EU international cooperation in

research and innovation<sup>[1]</sup>, actions will contribute to implementing the **TransAtlantic Ocean Research Alliance**. Due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, proposals should benefit from the inclusion of partners from the USA and from **Canada**<sup>[2]</sup>. International cooperation with partners from other Arctic and non-Arctic third countries is also strongly encouraged.

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 the submission and selection of proposals requesting other amounts.

Projects funded under this topic will by default participate in the Pilot on Open Research Data in Horizon 2020, with the option to opt-out, as described in the introduction<sup>[3]</sup>.

### **Expected Impact:**

- Improve the capacity to predict the impacts of permafrost thawing, both sub-sea and on land, identify and reduce uncertainties, and quantify key processes not currently or poorly represented in predictive models;
- Develop capacity to manage risks and to take advantage of opportunities emerging from Arctic changes;
- Promote the engagement of and interaction with residents of Arctic coastal communities and indigenous societies and develop a legacy of collaborative community involvement with scientific, economic, and societal actors and stakeholders on the development of Responsible Research and Innovation agendas that meet their concerns and expectations;
- Contribute to the ongoing and possible future OSPAR actions in Arctic water;
- Improve the professional skills and competences for those working and being trained to work within this subject area;
- Contribute to implementing the Sustainable Development Goals (SDGs), in particular SDG 13 'Take urgent action to combat climate change and its impacts', as well as the conclusions of the COP21 Paris Agreement<sup>[4]</sup>.

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

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[1] (COM(2012)497)

[2] Please note that participants from developed countries are not eligible for Horizon 2020 funding.

[3] Beneficiaries of projects participating in the pilot on open research data should follow the Global Earth Observation System of Systems (GEOSS) Data Sharing Principles and register in GEOSS the geospatial data, metadata and information generated as part of the project. Further information on GEOSS can be found at <http://www.earthobservations.org>.

[4] The Paris Agreement was adopted at the 21st Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change, in Paris on 12 December 2015..

**Horizon 2020 Pillar:** Societal Challenges

**Programme:** Food security, sustainable agriculture and forestry, marine and maritime and inland water research, Secure, clean and efficient energy, Climate action, environment, resource efficiency and raw materials

**Call Title:** **Blue Growth** - Demonstrating an ocean of opportunities

**Call Identifier:** H2020-BG-2016-2017

**Topic Title:** Monitoring and assessing fish stocks, other pelagic species and habitats with an automated, non-invasive, opto-acoustic system.

**Topic Identifier:** BG-14-2017

**Type of Action:** IA Innovation action

**Deadline(s):** 14-02-2017 (single-stage)

**Participant Portal Weblink:**  
<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/bg-14-2017.html>

**Specific Challenge:** Efficient implementation of EU marine and fisheries policies relies on the provision of adequate, accurate and timely data on the diversity and abundance of marine species and the functioning of marine ecosystems. Legislation such as the Data Collection Framework Regulation for the EU Common Fisheries Policy (CFP) and the Marine Strategy Framework Directive (MSFD) as well as international agreements on biodiversity require effective monitoring and reporting to assess abundance and diversity of fish stocks and to support the definition of a good environmental status and progress towards its achievement. Conventional marine monitoring through sampling and the use of research vessels is costly and often invasive or lethal for the targeted biota. Progress in remote sensing and image processing technology offers the potential possibility to characterise and quantify pelagic fish species more efficiently using a non-invasive, automated opto-acoustic system which could be deployed in a single location without the need for a support vessel.

**Scope:** Proposals should develop a non-invasive, opto-acoustic system which can simultaneously quantify fish abundance, biomass, and diversity (at least 4 species) as well as other MFSD-relevant parameters through a further set of environmental instrumentation which can be linked to these data. The optical part should use low light levels. Mechanisms should be developed that translate information from the near field and far field and to effectively blend the data. The complete system should work autonomously, continuously and non-invasively over extended periods of time to enable the collation of representative data sets. The system should be tested in at least two underwater observatories and comparable data should be used for validation and calibration. The system should be developed to a pre commercial stage (TRL6). The monitoring systems data should comply with European and international standards and respond to the needs of organisations performing fish stock and marine or freshwater biodiversity assessment. Work should take into account the existing state of the

art, including research supported within Horizon 2020 and the FP7 Programmes such as **Blue Growth** Focus Area: "Unlocking the potentials of seas and oceans" in Societal Challenge 2 Work Programme 2014-2015, focusing on optical and acoustic underwater imaging systems.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 1, 4 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Projects funded under this topic will by default participate in the Pilot on Open Research Data in Horizon 2020, with the option to opt-out, as described in the introduction.

**Expected Impact:**

Proposals will

- Improve the efficiency and reduce the cost of data collection concerning fish stocks and measurement of underwater biodiversity.
- Support data collection and monitoring to address the implementation of European marine policies including the CFP and MSFD.
- Advance the opto-acoustic technologies and their application in the field of autonomous underwater environmental monitoring, bringing them to at least technology readiness level (TRL6) to be used by monitoring performers.
- Improve the quality of measurement and monitoring techniques available to assess fish stocks, biodiversity and possibly other MSFD descriptors.
- Improve fish stock assessment and the related scientific advice offered to the EU.
- Improve the professional skills and competences of workers in European industry and in particular SMEs within the marine and maritime sectors to develop and commercialised new technologies
- Improve the provision of open access data sets concerning the underwater environmental status and fish stocks that are also compatible with existing major repositories (Emodnet etc).

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Health, demographic change and wellbeing
<b>Call Title:</b>	Personalised Medicine
<b>Call Identifier:</b>	H2020-SC1-2016-2017
<b>Topic Title:</b>	Global Alliance for Chronic Diseases (GACD) prevention and management of mental disorders
<b>Topic Identifier:</b>	SC1-HCO-07-2017
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	11-04-2017 (single-stage)

**Participant Portal Weblink:**

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sc1-hco-07-2017.html>

**Specific Challenge:** The Global Alliance for Chronic Diseases<sup>[1]</sup> (GACD) call will focus on implementation research proposals on child, adolescent and adult age onset mental disorders<sup>[2]</sup> including, but not limited to, dementia, depression, schizophrenia, bipolar disorders, alcohol- and drug-use disorders, etc., in low- and middle-income countries (LMIC) and/or in vulnerable populations<sup>[3]</sup> in **High Income Countries** (HIC).

Mental health is an integral part of health as underlined in the World Health Organisation (WHO) definition of health as a 'state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'.

Mental disorders represent an ever-increasing burden, to all ages of the population, challenging mental health and health systems. Depression affects 350 million people in all communities across the world and represents the third leading contributor to the global disease burden<sup>[4]</sup>. Dementia affects 47.5 million people worldwide with 58% of people living with dementia in low- and middle-income countries<sup>[5]</sup>. Global costs associated with mental disorders were estimated to € 2.2 trillion in 2010 and are expected to rise to € 5.3 trillion by 2030<sup>[6]</sup>.

Mental disorders place a heavy burden on individuals, families, communities and societies. They also increase the risk of co-morbidities and social exclusion. There are obstacles to achieving effective prevention, early identification and management of mental disorders and to ensuring patients' adherence to therapies. Effective management approaches exist but their implementation in LMIC and vulnerable groups in HIC is hampered by socioeconomic and contextual factors: gender; the stigma associated with mental disorders at work, in health care and communities; the role of traditional medicine in dealing with mental health including trauma; and barriers to accessing care. There is a need to strengthen the evidence base for the contextual scalability of interventions of promising or proven effectiveness for the promotion of mental health and the early identification and management of patients, taking into account the needs of different population groups across the life course.

**Scope:** Proposals must focus on mental disorders as defined by the WHO (see above), and must focus on implementation research in LMIC, and/or in vulnerable populations in HIC.

Proposals must build on interventions with promising or proven effectiveness (including cost-effectiveness) for the respective population groups under defined contextual circumstances. Gender-responsive interventions should be addressed, wherever relevant.

The aim should be to adapt and upscale the implementation of these intervention(s) in accessible, affordable and equitable ways in order to improve the prevention and management of mental disorders in the community in medical health care, psychosocial, and public health and other settings and fields. Interventions should meet conditions and requirements of the local health and social system context and address any other contextual factors identified as possible barriers. When economic factors prevent access to effective, low-cost appropriate medication and other management and treatment modalities, proactive policy and strategies should be encouraged to ensure the availability of such medication or other management/treatment modality or means should be found to overcome these barriers.

Each proposal should:

- Focus on implementation research addressing prevention, and/or early identification and/or management strategies derived from existing knowledge about effective interventions.
- Include a strategy to test the proposed model of intervention and to address the socioeconomic and contextual factors of relevance to the targeted region and community.
- Lead to better understanding of key barriers and facilitators at local, national and international level that affect the prevention and management of mental disorders.
- Include health economics assessments as an integral part of the proposed research, including considerations of scalability and equity.
- Propose a pathway to embed the intervention into policy and practice addressing:
  - A strategy to include policy makers and local authorities (possibly by being part of the consortium), as well as other relevant stakeholders such as community groups, patient groups, formal and informal carers and any other group, where ever relevant from the beginning of the project, which will contribute to the sustainability of the intervention, after the end of project.
  - Relevance of project outcomes/evidence for scaling up the intervention at local, national and international level and then scaled-up appropriateness with respect to the local social, cultural and economic context.
  - Aspects of stigmatisation and potential equity gaps e.g. due to gender or age.

Proposal must address one of or combinations of the following items:

- Structural interventions or evidence based policies designed to improve mental health outcomes;
- Early case detection and other secondary or tertiary prevention strategies as well as modalities of treatment, care and access to care which are amenable to scale-up. Prevention, early identification and treatment may include validated pharmacological, psychotherapeutic, psychosocial support and other approaches of relevance to mental disorders such as accessibility to and enhancing compliance with the intervention, also considering cultural context. Wherever relevant, comorbidities and their impacts on prevention and treatment strategies should be taken into account;
- Ways to empower people with mental health problems as well as professional and informal care-givers like families according to the context are also relevant;
- Exploring the scale-up of family/community engagement in patient treatment and care, without pre-empting their living.

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:** (one of or combinations of)

- Advance prevention strategies and implementation of mental health interventions, alleviating global burden of mental disorders;
- Establish the contextual effectiveness of mental health intervention(s), including at health systems level;
- Improve tailored prevention and treatment; Develop affordable management and treatment modalities for mental disorders and expand access to care;
- Inform health service providers, policy and decision makers on effective scaling up of mental health interventions at local, national and regional levels, including affordability aspects for users and health providers;
- Reduce health inequalities and inequities, including due consideration of gender and age issues where relevant, in the prevention, treatment and care of mental disorders at both local and global levels;
- Maximise the use of existing relevant programmes and platforms (e.g. research, data, and delivery platforms);
- Contribute to the United Nations' Sustainable Development Goals 3<sup>[7]</sup>, the Global Action Against Dementia and the First World Health Organisation (WHO) Ministerial Conference on Dementia<sup>[8]</sup>, the WHO Mental Health Action Plan 2013-2020<sup>[9]</sup>, and/or the 2015 European Council Conclusions on dementia<sup>[10]</sup>.

The GACD aims to coordinate research on chronic diseases at global level in order to enhance knowledge exchange across individual projects, and to better understand the impact of socio-economic, cultural, geopolitical and policy on research findings, so as to appropriately adapt health interventions to different geographical, economic and cultural settings. Research under GACD involves regular exchange of research findings and information across participating projects by means of cross-project working groups and annual joint meetings. Wherever feasible, projects should harmonise and standardise their data collection and exchange data.

Applicants must budget for annual costs of having two team members participate in one annual face-to-face meeting of the Global Research Network (location to vary annually). Attendance at this meeting is mandatory for 2 team members, with at least one participant from the LMIC team where relevant. Teams are strongly encouraged to include one junior team member in each annual meeting.

**Cross-cutting Priorities:** International cooperation, Gender

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

[2] Mental and behavioural disorders (F00-F99) of WHO's International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10): <http://apps.who.int/classifications/icd10/browse/2016/en#/V>

[3] Applicants must demonstrate that the proposed population under investigation in HIC is considered as vulnerable.

[4] WHO Fact sheet nr 369, 2012

[5] WHO Fact sheet nr 362, 2015

- [6] Bloom, D.E., Cafiero, E.T., Jané-Llopis, E., Abrahams-Gessel, S., Bloom, L.R., Fathima, S., Feigl, A.B., Gaziano, T., Mowafi, M., Pandya, A., Prettner, K., Rosenberg, L., Seligman, B., Stein, A.Z., & Weinstein, C. (2011). The Global Economic Burden of Noncommunicable Diseases. Geneva: World Economic Forum.
- [7] <http://www.who.int/topics/sustainable-development-goals/targets/en>
- [8] <http://www.who.int/mediacentre/events/meetings/2015/global-action-against-dementia/en>
- [9] WHO Mental Health Action Plan 2013-2020, in particular Objective 2, global target 2 or Objective 3, global target 3: [http://www.who.int/mental\\_health/action\\_plan\\_2013/en](http://www.who.int/mental_health/action_plan_2013/en);
- [10] 2015 European Council Conclusions on dementia: 'Living with dementia: improving care policies and practices': [http://www.consilium.europa.eu/en/meetings/epsco/2015/12/st14968\\_en15\\_pdf](http://www.consilium.europa.eu/en/meetings/epsco/2015/12/st14968_en15_pdf)

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Secure societies - Protecting freedom and security of Europe and its citizens
<b>Call Title:</b>	SECURITY
<b>Call Identifier:</b>	H2020-SEC-2016-2017
<b>Topic Title:</b>	Pan European Networks of practitioners and other actors in the field of security
<b>Topic Identifier:</b>	SEC-21-GM-2016-2017
<b>Type of Action:</b>	CSA Coordination and support action
<b>Deadline(s):</b>	24-08-2017 (single-stage)

**Participant Portal Weblink:**

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sec-21-gm-2016-2017.html>

**Specific Challenge:** In Europe, practitioners interested in the uptake of security research and innovation (e.g. firefighters, police and intelligence communities, border guards, custom authorities, explosive specialists, forensic laboratories, medical emergency teams, etc.) are dedicated to performing their duty and to focusing on their operation. In general, practitioners' organisations have little means to free workforces from daily operations, and to dedicate time and resources to monitor innovation and research that could be useful to them. They have little opportunities to interact with academia or with industry on such issues. All stakeholders – public services, industry, academia – including those who participate in the Security Advisory Group, recognize it as an issue.

**Scope:** Practitioners are invited to associate in 4 different categories of networks:

- a. Practitioners (end-users) in the same discipline and from across Europe (some examples: firefighters; police and intelligence bodies; border guards, coast guards, and custom authorities; explosive specialists; forensic laboratories; medical emergency teams; think-tanks on security; etc.) can get together to:
  1. monitor research and innovation projects with a view to recommending the uptake or the industrialisation of results,
  2. express common requirements as regards innovations that could fill in capability and other gaps and improve their performance in the future, and
  3. indicate priorities as regards domains requiring more standardization;
- b. Practitioners (end-users) from different disciplines and concerned with current or future security or disaster risk and crisis management issues in a particular geographical area can get together to:
  1. monitor research and innovation projects with a view to recommending the uptake or the industrialisation of results,

2. express common requirements as regards innovations that could fill in capability and other gaps and improve their performance in the future, and
3. indicate priorities as regards common capabilities, or interfaces among capabilities, requiring more standardization.

Geographical priorities include:

- the Mediterranean region (including the Black Sea): to enable an EU joint network concept for border protection and other security- and disaster-related tasks, so that the entities in the network share information, collaborate better, and establish joint border surveillance scenario. The network should provide with human infrastructure organizing operations more efficiently and enable the coordinated use of interconnected information systems and national infrastructure in the whole region;
- the Arctic and North **Atlantic** region: to prepare to cope as a network with the security threats that will result from the opening of the Northern passages, which are very important for the development of the region, but from which seaborne disasters are likely to arise. The current lack of infrastructure makes dealing with catastrophic incidents quite a challenge. The region needs to prepare, taking into account geographical specificities (climate-related, demographic, topologic, and in relation with the functioning of space-based systems;)
- the Danube river basin: to enable an EU joint network concept for disaster resilience, so that the countries of the region, which faces natural disasters, particularly flooding in a repetitive manner, can benefit at most from the EU civil protection mechanism;
- the Baltic region: to enable innovative border control cooperation e.g. with respect to smuggling and other security related issues, to the trafficking in human beings, to maritime surveillance, and to macro-regional risk scenarios and gaps identification; to support the Baltic Sea Maritime Functionalities flagship initiative

These networks should gather the largest number of Member States or Associated Countries.

- c. Entities from around Europe that manage demonstration and testing sites, training facilities, including simulators or serious gaming platforms in the area of CBRN and for first responders or civil protection practitioners, can get together to: 1) establish and maintain a roster of capabilities and facilities, and 2) organize to share expertise, and 3) plan to pool and share resources with a view to optimize investments.

Opinions expressed and reported by the networks of practitioners should be checked against what can be reasonably expected, and according to which timetable, from providers of innovative solutions.

- d. In addition, support will be given in 2017 to a consortium of formally nominated NCPs in the area of security research. The activities will be tailored according to the nature of the area, and the priorities of the NCPs concerned. The network should focus on issues specific to the "Secure societies ..." challenge and follow up on the work of SEREN 3.<sup>[1]</sup>

Indicative budget: The Commission considers that proposals requesting a contribution from the EU of about € 3.5 million per action for a duration of 5 years (recommended duration) for Parts a), b) and c); about € 2 million per action for a duration of 3 years (recommended duration) for Part d) would allow for this topic to be addressed appropriately. Nonetheless this does not preclude submission and selection of proposals requesting other amounts.

### Expected Impact:

- Common understanding of innovation potential, more widely accepted understanding, expression of common innovation and standardization needs among practitioners in the same discipline.

- More articulated and coordinated uptake of innovative solutions among practitioners from different disciplines who are often called to act together to face major crisis.
- More efficient use of investments made across Europe in demonstration, testing, and training facilities for first responders.
- Synergies with already established European, national and sub-national networks of practitioners, even if these networks are for the time being only dedicated to aspects of practitioners' work unrelated to research and innovation (in general, to the coordination of their operations).
- An improved and professionalised NCP service, consistent across Europe, thereby helping simplify access to Horizon 2020 calls, lowering the entry barriers for newcomers, and raising the average quality of proposals submitted.

**Delegation Exception Footnote:** This activity directly aimed at supporting the development and implementation of evidence base for R&I policies and supporting various groups of stakeholders is excluded from the delegation to the Research Executive Agency and will be implemented by the Commission services.

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

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[1] [http://cordis.europa.eu/project/rcn/194868\\_en.html](http://cordis.europa.eu/project/rcn/194868_en.html)

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Secure, clean and efficient energy
<b>Call Title:</b>	COMPETITIVE LOW-CARBON ENERGY
<b>Call Identifier:</b>	H2020-LCE-2016-2017
<b>Topic Title:</b>	Measuring, monitoring and controlling the potential risks of subsurface operations related to CCS and unconventional hydrocarbons
<b>Topic Identifier:</b>	LCE-27-2017
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	05-01-2017 (single-stage)

**Participant Portal Weblink:**

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lce-27-2017.html>

**Specific Challenge:** Geo-energy applications such as carbon capture and storage (CCS), the development of unconventional hydrocarbons (in particular shale gas) and to some extent also geothermal operations, can have an impact on the subsurface. Consequently, advanced and cost effective monitoring is vital for the sustainable management of the subsurface and its resources.

In CCS, continuous and sophisticated monitoring, imaging and control of the growth of the CO<sub>2</sub> plume is a prerequisite for the safe and sustainable storage of significant volumes of CO<sub>2</sub> in the subsurface. In addition, CO<sub>2</sub> injection in CCS but also water (re-)injection in geothermal operations may lead to induced seismicity.

Recently, the development of unconventional hydrocarbon resources - in particular shale gas - has resulted in new opportunities, but also bears environmental and public health risks, which need to be better understood, monitored, managed and communicated appropriately. These risks relate mainly to water pollution (in particular stemming from insufficient underground characterisation, inappropriate well casing, the use of chemicals in the fracking process, and waste management), but also air emissions, induced seismicity and local impacts linked to transport, land and water use.

Research is needed to better understand and quantify possible (natural and engineered) leakage pathways for CO<sub>2</sub> and natural gas, the rates of leakage into aquifers and escape at surface, the impacts that leakage can have on fresh groundwater resources, soil and biodiversity, and the time frame in which emissions will return to baseline values. The effective detection and quantification of leakage requires a scientifically robust method for determining natural background concentrations of CO<sub>2</sub> and natural gas in the soil and at the surface. Uniform, unbiased and independent data are needed to manage and mitigate the risks of subsurface geo-energy related operations.

**Scope:** An integrated R&D project to gain a better understanding of the possible risks related to CCS and the exploration and exploitation of unconventional hydrocarbons. Focus should be on the detection and monitoring of induced seismicity and stray gases (CO<sub>2</sub> and natural gas),

and on the mitigation and remediation of their possible negative impacts. A comprehensive R&D programme should combine laboratory experiments, modelling and short- and longer-term field investigations that could include observation wells for the deployment of monitoring equipment. The drilling of exploration and production wells, hydraulic fracturing or other well stimulation and intentional subsurface release of fluids or gases to the groundwater or the atmosphere are strictly outside the scope of this topic.

Issues to be addressed include:

- Characterisation and lab testing of well seals, analysis of possible leakage pathways and rates, their time-related evolution as well as the mitigation of leakage;
- Geochemical and microbial interactions with host rocks, overburden, engineered seals such as cement and casing, groundwater, soil and biodiversity;
- Significantly improved detection limits for CO<sub>2</sub>, natural gas and natural or human-introduced substances (e.g. metals, chemicals, organic compounds) that may be released through subsurface operations;
- Determination and validation of the optimal spatial and temporal resolution of a wide range of monitoring techniques, including for microseismicity;
- Sophisticated, scientifically robust method for determining natural background concentrations of CO<sub>2</sub> and natural gas in the soil and at the surface, and for distinguishing between biogenic and thermogenic methane emissions;
- Development of groundwater remediation methods and protocols;

The project should establish the following:

- One or more field sites for the deployment of a comprehensive suite of detection and monitoring methods (geophysical, seismic, chemical, biological, surface and subsurface, ...);
- A programme for international cooperation to improve and cross-validate highly sophisticated detection and monitoring technologies for subsurface diffusion of CO<sub>2</sub> and natural gas and other substances that may be released through subsurface operations. Focus should be on cooperation and networking with comparable projects in the US and **Canada**, including the exchange of researchers;
- A well-documented contribution to the establishment of best practices for baselining, monitoring, mitigation and remediation methods and technologies;
- A continuous training programme for researchers and students.

The project should take into account the on-going development by the Commission of a Best Available Techniques (BAT) Guidance document on upstream hydrocarbon exploration and production<sup>[1]</sup>, as well as the results of relevant EU supported studies and projects<sup>[2]</sup>.

Responsible Research and Innovation (RRI) and Social Sciences and Humanities (SSH) have to be taken on board in all areas of H2020. In the context of this topic, this includes multi-actor and public engagement in research and innovation, enabling easier access to scientific results, the take up of ethics in the research and innovation content and process, and formal and informal science education.

The Commission considers that proposals requesting a contribution from the EU of between EUR 5 and 10 million would allow this specific challenge to be addressed appropriately. This does not preclude submission and selection of proposals requesting other amounts. Industry participation is strongly encouraged to facilitate access to existing sites and data, and to allow extending the operating period of the research infrastructure beyond the project duration. In order to allow a timely use of the results, the duration of the project itself should ideally be limited to 3 years.

The project should take account of the review of the effectiveness of the Commission Recommendation of 22 January 2014 on minimum principles for the exploration and production of hydrocarbons (2014/70/EU) (such as shale gas) using high-volume hydraulic fracturing. For the purpose of any testing and demonstration activities, proposals should clearly describe how the project will comply with all relevant environmental legislation, in particular the Water Framework Directive<sup>[3]</sup>, the enforcement of which is the responsibility of permitting authorities in the concerned Member States.

**Expected Impact:** Projects should deliver the unbiased and independent scientific evidence to assist policy making for CCS and unconventional hydrocarbons development. This topic is expected to provide European and (in particular) **North American** researchers, industry and policymakers with a platform to enhance and deepen **TransAtlantic** dialogue on environmental issues related to CCS and unconventional hydrocarbons development, to accelerate learning and to provide advanced training. Connecting pilots and projects across the **Atlantic** should bring the benefits of cross-validation of technologies, sharing results, distributing tasks, bundling expertise and expanding professional networks. For optimal impact, the research and training infrastructure should ideally remain available and operational beyond the duration of the EU support.

**Cross-cutting Priorities:** International cooperation

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[1] [http://ec.europa.eu/environment/integration/energy/hc\\_bref\\_en.htm](http://ec.europa.eu/environment/integration/energy/hc_bref_en.htm)

[2] <https://ec.europa.eu/jrc/en/event/conference/uh-network-annual-conference>

[3] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Smart, green and integrated transport
<b>Call Title:</b>	2016-2017 Mobility for Growth
<b>Call Identifier:</b>	H2020-MG-2016-2017
<b>Topic Title:</b>	Potential of the Physical Internet
<b>Topic Identifier:</b>	MG-5-4-2017
<b>Type of Action:</b>	CSA Coordination and support action
<b>Deadline(s):</b>	01-02-2017 (single-stage)

**Participant Portal Weblink:**

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/mg-5-4-2017.html>

**Specific Challenge:** Ongoing research efforts show that the translation of the working principles of the Digital Internet to the routing of freight, thus creating the Physical Internet (PI), has the potential to be a real game-changer. In the PI world freight travels from hub to hub in an open network rather than from origin to destination directly. Each parcel is routed automatically and at each section it is bundled for efficiency. In the PI network of networks many (if not all) transport and logistics services would be accessible on demand to all users.

This will however require the successful integration of many innovative concepts and non-the-least the mental-shift to adopt a very different governance structure. The Internet of Things for example, which could link every future container, load unit or parcel to the internet, can be considered a pre-requisite for the Physical Internet to work as there will be an increased need to track all goods in a freight environment lacking a fixed and known transport route. The main challenge is to model a future Physical Internet network topology and assess the benefits it could generate in terms of carbon footprint, throughput times and cost reductions. Additionally the concept of the Physical Internet, already identified by ALICE<sup>[1]</sup>, needs to be detailed into a strategic and operational vision which has the capability to get industry-wide endorsement of all stakeholders.

**Scope:** Proposals should cover all the following issues:

- Develop a roadmap towards the Physical Internet (milestones, first implementation opportunities, etc.) defining which changes are required for migrating to a PI and how these could take place (e.g. current vs future logistic practices, IT applications and enabling technologies, business models, mental shift, integration of SMEs, customer behaviour, etc.).
- Monitor logistics and freight transport initiatives and research projects from relevant European programmes (H2020, TEN-T, etc.), and their impacts and contributions to Physical Internet. Fostering the links between ALICE and other transport and manufacturing focused ETPs with the aim to identify barriers and opportunities for the deployment of research results and improvement of framework conditions.

- Create support and consensus between public bodies, research and industry stakeholders on opportunities, barriers and next steps towards a PI. Organise workshops to present and discuss results, trends, exchange experience and foster innovation aspects
- Explore the need for legislative initiatives by authorities, including a legal contractual framework for participants to the Physical Internet.

In line with the Union's strategy for international cooperation in research and innovation<sup>[2]</sup>, international cooperation, in particular with US, **Canada** and Hong Kong, is encouraged.

The Commission considers that proposals requesting a contribution from the EU of between EUR 0.5 to 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:** To achieve the benefits resulting from the paradigm change proposed by the Physical Internet, actions are expected to demonstrate how the following aspects can be achieved:

- Kick-Start the development of the Physical Internet through building industry-wide support.
- Improved asset utilisation.
- 30% reduction in terms of congestion, emissions and energy consumption.

**Delegation Exception Footnote:** The Coordination and Support Actions, directly aimed at supporting the development and implementation of evidence base for R&I policies and supporting various groups of stakeholders, are excluded from the delegation to the Innovation and Networks Executive Agency (INEA) and will be implemented by the Commission services.

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

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[1] Alliance for Logistics Innovation through Collaboration in Europe  
(<http://www.etp-logistics.eu>).

[2] COM(2012)497

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Smart, green and integrated transport
<b>Call Title:</b>	2016-2017 Mobility for Growth
<b>Call Identifier:</b>	H2020-MG-2016-2017
<b>Topic Title:</b>	Potential of the Physical Internet
<b>Topic Identifier:</b>	MG-5-4-2017
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	26-01-2017, 19-10-2017 (two-stage)

**Participant Portal Weblink:**

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/mg-5-4-2017.html>

**Specific Challenge:** Ongoing research efforts show that the translation of the working principles of the Digital Internet to the routing of freight, thus creating the Physical Internet (PI), has the potential to be a real game-changer. In the PI world freight travels from hub to hub in an open network rather than from origin to destination directly. Each parcel is routed automatically and at each section it is bundled for efficiency. In the PI network of networks many (if not all) transport and logistics services would be accessible on demand to all users.

This will however require the successful integration of many innovative concepts and non-the-least the mental-shift to adopt a very different governance structure. The Internet of Things for example, which could link every future container, load unit or parcel to the internet, can be considered a pre-requisite for the Physical Internet to work as there will be an increased need to track all goods in a freight environment lacking a fixed and known transport route. The main challenge is to model a future Physical Internet network topology and assess the benefits it could generate in terms of carbon footprint, throughput times and cost reductions. Additionally the concept of the Physical Internet, already identified by ALICE<sup>[1]</sup>, needs to be detailed into a strategic and operational vision which has the capability to get industry-wide endorsement of all stakeholders.

**Scope:** Proposals should cover all the following issues:

- Set up a case study, based on real situation, to identify the position, size and number of hubs needed for efficiently linking the long distance network and providing sufficient access points to urban areas.
- Map the influence sphere of each node and its benefits across borders to fuel future shared investments.
- Develop simulation and modelling tools to assess the possible impact of the PI, including the socio-economic aspects.
- Identify criteria for potential pilot implementations of physical internet concepts.
- Define possible business models to support the development of the PI concept.

In line with the Union's strategy for international cooperation in research and innovation<sup>[2]</sup>, international cooperation, in particular with US, **Canada** and Hong Kong, is encouraged.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 to 3 million each for Research and Innovation Actions, and between EUR 0.5 to 1 million for Coordination and Support Actions would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** To achieve the benefits resulting from the paradigm change proposed by the Physical Internet, actions are expected to demonstrate how the following aspects can be achieved:

- Kick-Start the development of the Physical Internet through building industry-wide support.
- Improved asset utilisation.
- 30% reduction in terms of congestion, emissions and energy consumption.

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

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[1] Alliance for Logistics Innovation through Collaboration in Europe  
(<http://www.etp-logistics.eu>).

[2] COM(2012)497

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Smart, green and integrated transport
<b>Call Title:</b>	2016-2017 Mobility for Growth
<b>Call Identifier:</b>	H2020-MG-2016-2017
<b>Topic Title:</b>	Protection of all road users in crashes
<b>Topic Identifier:</b>	MG-3.2-2017
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	26-01-2017, 19-10-2017 (two-stage)

**Participant Portal Weblink:**

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/mg-3.2-2017.html>

**Specific Challenge:** The continued introduction of active safety systems has the potential to reduce accidents. Nevertheless, the risk of collision and particular crash situations will still remain. An approach will be needed that will ensure improved crash safety in those circumstances. A number of societal trends add to this challenge such as the ageing population, an increase in the number of powered and non-powered two-wheelers and the introduction of green, light, sub-compact cars.

An important step forward will be to develop fully integrated safety systems and deploy them so that they provide better protection for all road users. Emerging new vehicle types and the possible use of Cooperative Intelligent Transport Systems (C-ITS) would need to be considered. The application of advanced safety features and the development of personal safety equipment can also be seen as ways to reduce fatalities and injuries to pedestrians, cyclists and riders of Powered Two Wheelers (PTWs). In addition, simulation tools (including new virtual human body models) will need to be developed to assess new safety systems and determine their effectiveness and potential impact.

With respect to competitiveness, user protection has been an area where European industry has exhibited technology leadership, but this is now being increasingly challenged worldwide.

**Scope:** Proposals should focus on one or several of the following aspects:

- Vehicle based systems such as: solutions for improved crash compatibility; optimisation of restraint systems by including pre-crash information; and methods and requirements to assess safety performance in traffic of extremely low-mass vehicles.
- Personal protection such as: development and testing of focused personal safety equipment for various road user categories, to warn them adequately and/or protect them in the most safety critical situations; and integrated assessment methods for the overall safety of road users and solutions that enhance their protection.
- Crash simulation such as: computationally efficient and robust crash simulation tools; implementation of virtual testing; and development of virtual human body models of road users and situations not currently available.

Proposed actions should focus on fully integrated safety systems.

Consideration should be taken of gender aspects such as body structure and stature and other demographic factors such as the disabled (persons of reduced mobility), ageing, obesity, etc.

Participation of SMEs with proven experience in these areas is encouraged.

Links with Member State initiatives in this area are encouraged.

In line with the strategy for EU international cooperation in research and innovation<sup>[1]</sup>, international cooperation is encouraged, in particular with **Industrialised Countries** (i.e. US, Japan, **Canada**, Australia) and emerging economies (primarily China, India, Brazil). Proposals should foresee twinning with entities participating in projects funded by US DOT<sup>[2]</sup> to exchange knowledge and experience and exploit synergies.

The Commission considers that proposals requesting a contribution from the EU of between EUR 4 and 9 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:** By providing an integrated approach to safety systems, actions are expected to make a direct contribution to the reduction of fatalities and severity of injuries, as well as the number of injured persons. They will deliver measures that will make the 'triangle' of European road users, vehicles and infrastructure safer. In this way, actions are expected to contribute to important savings in the health system linked with the reduction of accidents and injuries.

Proposers are expected to demonstrate how the project results will have a significant impact on road safety casualties and injuries and how they will make an effective contribution to the standardisation of products and testing techniques.

A credible strategy is expected to demonstrate the future full scale manufacturing of critical products developed in the project in Europe.

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

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[1] COM(2012)497

[2] United States Department of Transportation (<http://www.dot.gov>).

## Societal Challenges, Industrial Leadership

<b>Horizon 2020 Pillar:</b>	Societal Challenges, Industrial Leadership
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research, Climate action, environment, resource efficiency and raw materials, Leadership in enabling and industrial technologies (LEIT)
<b>Call Title:</b>	Sustainable Food Security – Resilient and resource-efficient value chains
<b>Call Identifier:</b>	H2020-SFS-2016-2017
<b>Topic Title:</b>	Supporting international cooperation activities on agriculture soil contribution to climate change mitigation and adaptation
<b>Topic Identifier:</b>	SFS-50-2017
<b>Type of Action:</b>	CSA Coordination and support action
<b>Deadline(s):</b>	14-02-2017 (single-stage)

### Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sfs-50-2017.html>

**Specific Challenge:** Climate change is among one of the threats for the future capacity of agriculture to cope with increased demands on food production. This challenge can be addressed, among other options, by changes in land and soil management at the farm level. There is a strong direct link between the soil management and a significant contribution of agriculture sector to climate change mitigation and adaptation (i.e. outcome of the COP21, 4 per 1000 initiative, links to SDGs). There is a strong need to develop synergies on research in this area at EU and global level. The results of this activity should contribute to climate change mitigation and adaptation debate and consider the ongoing work on Sustainable Development Goals implementation.

**Scope:** Proposals should cover the topic of soil carbon sequestration and its links with climate change mitigation from the perspective of agricultural sector. Other areas to be tackled should include land (use) management within the scope of this topic. Participation of initiatives such as the **Global Research Alliance** (GRA), the Joint Programming Initiative on Sustainable Agriculture, Food Security and Climate Change (FACCE) or the 4 per 1000 initiative is encouraged.

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 the submission and selection of proposals requesting other amounts.

### Expected Impact:

- Improved understanding of agricultural soil carbon sequestration in different pedo-climatic conditions.

- International Research Community on agricultural soil strengthened
- Provide the basis for a more structured approach towards the issue, for instance with the establishment of an International Research Consortium (IRC).

**Cross-cutting Priorities:** International cooperation

<b>Horizon 2020 Pillar:</b>	Societal Challenges, Industrial Leadership
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research, Climate action, environment, resource efficiency and raw materials, Leadership in enabling and industrial technologies (LEIT)
<b>Call Title:</b>	Sustainable Food Security – Resilient and resource-efficient value chains
<b>Call Identifier:</b>	H2020-SFS-2016-2017
<b>Topic Title:</b>	Advancing basic biological knowledge and improving management tools for commercially important fish and other seafood species
<b>Topic Identifier:</b>	SFS-21-2016-2017
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	14-02-2017, 13-09-2017 (two-stage)

**Participant Portal Weblink:**

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sfs-21-2016-2017.html>

**Specific Challenge:** More efficient fisheries management, based on science, is needed to support the continued SFS-20-2017 need to manage European fisheries, the global rise in seafood demand and the need to maximise fish production sustainably. Our understanding of the biology and ecology of several fish and other seafood species is far from complete for stocks fished in European seas and in particular for multi-species fisheries. This also applies in some areas outside EU waters where EU fleets fish. Relevant stocks include species in international waters or in the waters of third countries with which the EU has signed sustainable fisheries partnership agreements. For species fished outside EU waters, the challenge often extends beyond gathering knowledge of biological characteristics to include research on management tools and appropriate stock assessment models.

**Scope:** Proposals should focus on an identified number of fisheries that are important for the fishing fleets of multiple EU countries and should respond to the priorities of Regional Fisheries Management Organisations (RFMOs) and of the Common Fisheries Policy (CFP). The proposals should review existing knowledge and perform multidisciplinary research to help close important knowledge gaps that have a significant impact on the management of key target and by-catch species and that currently limit the advice that relevant bodies can give. Research results should be able to be applied immediately to provide a more solid knowledge base and advice on fisheries management.

Proposals should cover one of the following geographical scopes:

Strengthening the knowledge base for resilient and resource-efficient fisheries in EU waters and in international waters covered by the North-East **Atlantic** Fisheries Commission and the General Fisheries Commission for the Mediterranean.

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

Projects funded under this topic will by default participate in the Pilot on Open Research Data in Horizon 2020, with the option to opt-out, as described in the introduction.

**Expected Impact:** To improve fisheries management under the Common Fisheries Policy, including outside of EU waters, proposals should:

- Increase the knowledge base, share new findings, provide new tools and promote their uptake by end-users to more efficiently manage fish stocks of interest to the EU, both inside and outside EU waters.
- Increase the long-term profitability of the EU fleet and increase the number of jobs in the fishing sector.
- Improve market supply and food security in Europe through a significant, predictable and sustainable provision of seafood from all areas in which EU vessels operate.
- Contribute to adjusting fishing exploitation to levels that ensure the maximum sustainable yield.
- Improve the professional skills and competences of those working and being trained to work within the blue economy.