



International Cooperation in Horizon 2020

EU and USA

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In addition to the topics mentioned herein the European Commission flagged the following call topics (listed on page 11 in the [Roadmap for EU-USA S&T cooperation](#)) as being particularly and thematically suitable for international STI cooperation with the USA.

Excellent Science

Horizon 2020 Pillar:	Excellent Science
Programme:	European research infrastructures (including e-Infrastructures)
Call Title:	Integrating and opening research infrastructures of European interest
Call Identifier:	h2020-infraia-2018-2020
Topic Title:	Integrating Activities for Advanced Communities
Topic Identifier:	INFRAIA-01-2018-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	22-03-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/infraia-01-2018-2019.html>

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

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

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

Funding will be provided to support, in particular, the trans-national and virtual access provided to European researchers (and to researchers from **Third countries** under certain conditions^[2]), the cooperation between research infrastructures, scientific communities, industry and other stakeholders, the improvement of the services the infrastructures provide, the harmonisation, optimisation and improvement of access procedures and

interfaces. Proposals should adopt the guidelines and principles of the European Charter for Access to Research Infrastructures.

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

- i. Networking activities, to foster a culture of co-operation between research infrastructures, scientific communities, industries and other stakeholders as appropriate, and to help develop a more efficient and attractive European Research Area;
- ii. Trans-national access or virtual access activities, to support scientific communities in their access to the identified key research infrastructures;
- iii. Joint research activities, to improve, in quality and/or quantity, the integrated services provided at European level by the infrastructures.

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

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

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

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

Integrating Activities should also organise the efficient curation, preservation and provision of access to the data collected or produced under the project, defining a data management plan, even when they opt out of the extended Pilot on Open Research Data. Data management (including ethics and privacy issues), interoperability, as well as advanced data and computing services should be addressed where relevant. To this extent, proposals should build

upon the state of the art in ICT and e-infrastructures for data, computing and networking, and ensure connection to the European Open Science Cloud.

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

Integrating Activities are expected to duly take into account all relevant ESFRI and other world-class research infrastructures to exploit synergies, to reflect on sustainability and to ensure complementarity and coherence with the existing European Infrastructures landscape.

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

As the scope of an integrating activity is to ensure coordination and integration between all the key European infrastructures in a given field and to avoid duplication of effort, advanced communities are expected to submit one proposal per area.

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

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

On the basis of a multiannual plan drafted taking into account the assessment and the timing of previous grants as well as strategic priorities and needs, in term of research infrastructures services, emerging from other parts of Horizon 2020, this work programme invites proposals addressing the following areas listed under the different domains. A balanced coverage of the various domains, in line with the distribution of areas per domain, is expected as outcome of this topic.

2018 deadline

Biological and Medical Sciences

- **Microbial Resource Centres.**
This activity aims at integrating the key Microbial Resource Centres and opening them up to European researchers for biotechnology research and development. Emphasis should be on widening the user base, enlarging and strengthening the offered services, sharing resources at global level, fostering the innovation role of such

infrastructures and ensuring long term sustainability to their integration.

- Facilities for high throughput DNA sequencing.
This activity aims at integrating the key research infrastructures in Europe as well as leading-edge research infrastructures located in **third countries**, to open them up to European researchers and offer services beyond the state-of-art which is already ensured by commercial providers. Adequate consideration should be taken of the produced data and its availability for research.
- Centres for replacement, reduction and refinement (3 Rs) of non-human primate testing.
This activity aims at integrating the key non-human primate centres in Europe promoting 3 Rs, i.e. replacement, reduction, and refinement. The proposal will contribute to the objective of 3Rs, reinforcing the implementation of ethical and good practices at European level, and the protection of animals used in scientific experiments^[3]. The proposal should also develop the necessary collaborations outside Europe.
- High throughput facilities for proteome analysis.
This activity aims at integrating the key high throughput facilities in Europe for proteome analysis, based on state-of-the-art proteomics techniques and tools for data handling and analysis, including structural proteomics and structural bioinformatics. Emphasis should be on widening the user base, enlarging and strengthening the offered services, fostering the innovation role of such infrastructures and ensuring long term sustainability to their integration.

Energy

- Research Infrastructures for solar energy:
concentrating solar power. This activity should bring together the key European research infrastructures in solar concentrating systems (solar concentrators and relating research infrastructures) for carrying out energy and materials research as well as research in other fields using the extreme temperature conditions in solar concentrators, e.g. thermal storage equipment and reuse of stored energy. This topic would support the European Strategic Energy Technology Plan (SET-Plan).
- Research Infrastructures for solar energy:
photovoltaic. This activity aims at integrating and opening the key research infrastructures in Europe for all aspects of photovoltaic research: buildings, transport, new materials, grid connection, efficiency, etc. This topic would support the European Strategic Energy Technology Plan (SET-Plan).

Environmental and Earth Sciences^[4]

- Research infrastructures for forest ecosystem and resources research. This activity aims at further integrating and facilitating broad access to forest research facilities, methodologies and data on genetic and species diversity to enable environmental and biological research including biological effects of air pollution, mitigation and adaptation to climate change, and development of forest management approaches. Emphasis will be on widening the user base and ensuring long term sustainability to the service integration.
- Natural history collections. This activity aims at integrating and improving access to key European Natural History collections and to their related instrumentation facilities. Emphasis should be on improving accessibility to collections to a wide range of scientists, on developing innovative research services to answer the needs of a broader scientific community of users from climate change to human health and food security, and on ensuring long term sustainability of the integrated services.
- Research aircrafts for environmental and geo-science research. This activity aims at integrating key research aircrafts and improving their availability to European researchers from larger multidisciplinary scientific communities. It should develop a long-term strategy towards sustained integrated services and innovative synergies with complementary observing systems and models to study atmospheric processes and the Earth's surface.
- Research vessels. This activity aims at further providing, integrating and improving access to the key European research vessels and associated major equipment. It should include innovative initiatives to ensure a more efficient and coordinated operation of European fleets, to develop synergies with complementary observing systems and infrastructures and to set-up sustained integrated services to the user communities.
- Research infrastructures for Earth's climate system modelling. This activity aims at further integrating and opening the research infrastructures (e.g. data repositories, models) used by the climate modelling community in Europe, promoting the ongoing development of a common distributed modelling infrastructure. Emphasis should be on widening the user base, expanding the interdisciplinary research fields addressed, enlarging and strengthening the offered services, and ensuring long term sustainability to the service integration.
- Sites and experimental platforms of anthropogenic impacts for ecosystem functioning and biodiversity research. This activity aims at bringing together highly instrumented experimental, analytical and modelling facilities, across all major

European ecosystem types and all major pressures on them. It will optimise the collaborative use of these sites by a wider scientific community and develop efficient methods and techniques for rapid data sharing and processing at the European level.

Mathematics and ICT

- Visualisation facilities. This activity aims at further integrating and opening key virtual reality visualisation facilities, holographic image processing facilities and other computer graphics and animation facilities for advanced visualisation of scientific information and massive data, either resulting from academic research or being produced in collaboration with the industrial sector. Emphasis should be on widening the user base, enlarging and strengthening the offered services, and fostering the innovation role of such infrastructures.

Material Sciences, Analytical facilities and Engineering

- Electron Microscopies for advanced imaging, diffraction, spectroscopy and metrology of materials. This activity aims at further integrating and opening advanced electron microscopies for material research and technological development. Emphasis should be on widening the user base, strengthening and enlarging the offered services, stimulating new scientific activities, facilitating access, fostering the innovation role of such infrastructures and ensuring long term sustainability to their integration.
- High and low energy ion beam labs. This activity aims at further integrating and opening key ion beam facilities for material, biomedical and environmental research and technological development. Emphasis should be on widening the user base, enlarging and strengthening the offered services, fostering the innovation role of such infrastructures and ensuring long term sustainability to their integration.
- Infrastructures for Neutron Scattering and Muon Spectroscopy. This activity will provide and facilitate wider access to the key research infrastructures in Europe for Neutron scattering and Muon Spectroscopy. It should present a long-term sustainable perspective on the integration of these facilities and related resources.
- Facilities for research on materials under extreme temperature conditions. This activity aims at integrating research facilities in physics and materials science dealing with extreme low and high temperature conditions, e.g. nanoscience at microkelvin temperatures. Emphasis should be on widening the user base, enlarging the offered services, fostering the innovation role of such infrastructures and ensuring long term sustainability to their integration.

- Infrastructures for studying turbulence phenomena and applications. This activity aims at further integrating key facilities enabling the study of high turbulence phenomena in various areas of science and technology. Emphasis should be on combining modelling and experimental in situ testing, widening the user base, enlarging the offered services, fostering the innovation role of such infrastructures and ensuring long term sustainability to their integration.

Physical Sciences

- Research Infrastructures for hadron physics. This activity will provide and facilitate access to key research infrastructures in Europe for studying the properties of nuclear matter at extreme conditions, turning advances in hadron physics experimentation into new applications. It should present a long-term sustainable perspective on the integration of relevant facilities and related resources.
- Research Infrastructures for high resolution solar physics. This activity aims at further integrating and opening key research infrastructures in the field of high resolution solar physics. It should foster cooperation between theory and observations.

Social Sciences and Humanities

- Research infrastructures for the assessment of science, technology and innovation policies. This activity aims at further integrating and opening research data infrastructures in the field of science, technology and innovation (including social innovation). Emphasis should be on facilitating trans-national access and widening the user base, enlarging and strengthening the offered services, fostering the innovation role of such infrastructures and ensuring long term sustainability to their integration.
- Digital archives and resources for research on European history. This activity aims at further integrating and opening key data collections and services in Europe for European History. Emphasis should be on widening the user base, enlarging and strengthening the offered services, e.g. by covering further historical periods, and ensuring long term sustainability to their integration.
- Archaeological data infrastructures for research. This activity aims at further integrating and opening key archaeological data infrastructures to facilitate research in all fields of archaeology (from prehistory to contemporary society). Emphasis should be on widening the user base, enlarging and strengthening the offered services, including fields such as paleo-anthropology, bioarchaeology and environmental archaeology, sharing resources at global level, and ensuring long term sustainability to their integration.

Expected Impact:

- Researchers will have wider, simplified, and more efficient access to the best research infrastructures they require to conduct their research, irrespective of location. They benefit from an increased focus on user needs.
- New or more advanced research infrastructure services, enabling leading-edge or multidisciplinary research, are made available to a wider user community.
- Operators of related infrastructures develop synergies and complementary capabilities, leading to improved and harmonised services. There is less duplication of services, leading to an improved use of resources across Europe. Economies of scale and saving of resources are also realised due to common development and the optimisation of operations.
- Innovation is fostered through a reinforced partnership of research organisations with industry.
- A new generation of researchers is educated that is ready to optimally exploit all the essential tools for their research.
- Closer interactions between larger number of researchers active in and around a number of infrastructures facilitate cross-disciplinary fertilisations and a wider sharing of information, knowledge and technologies across fields and between academia and industry.
- For communities which have received three or more grants in the past, the sustainability of the integrated research infrastructure services they provide at European level is improved.
- The integration of major scientific equipment or sets of instruments and of knowledge-based resources (collections, archives, structured scientific information, data infrastructures, etc.) leads to a better management of the continuous flow of data collected or produced by these facilities and resources.
- When applicable, the integrated and harmonised access to resources at European level can facilitate the use beyond research and contribute to evidence-based policy making.
- When applicable, the socio-economic impact of past investments in research infrastructures from the European Structural and Investment Funds is enhanced.

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

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

^[2] See part D of the section “Specific features for Research Infrastructures”.

^[3] As framed by the directive 86/609/EEC, and by the Commission proposal for its revision, COM(2008)543

^[4] When appropriate, proposals addressing areas under this domain are encouraged to develop synergies with Copernicus data and information as well as with GEO/GEOSS.

Horizon 2020 Pillar:	Excellent Science
Programme:	European research infrastructures (including e-Infrastructures)
Call Title:	Integrating and opening research infrastructures of European interest
Call Identifier:	h2020-infraia-2018-2020
Topic Title:	Integrating Activities for Advanced Communities
Topic Identifier:	INFRAIA-01-2018-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	20-03-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/infraia-01-2018-2019.html>

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

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

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Funding will be provided to support, in particular, the trans-national and virtual access provided to European researchers (and to researchers from **Third countries** under certain conditions^[2]), the cooperation between research infrastructures, scientific communities, industry and other stakeholders, the improvement of the services the infrastructures provide, the harmonisation, optimisation and improvement of access procedures and

interfaces. Proposals should adopt the guidelines and principles of the European Charter for Access to Research Infrastructures.

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

- i. Networking activities, to foster a culture of co-operation between research infrastructures, scientific communities, industries and other stakeholders as appropriate, and to help develop a more efficient and attractive European Research Area;
- ii. Trans-national access or virtual access activities, to support scientific communities in their access to the identified key research infrastructures;
- iii. Joint research activities, to improve, in quality and/or quantity, the integrated services provided at European level by the infrastructures.

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

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

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

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

Integrating Activities should also organise the efficient curation, preservation and provision of access to the data collected or produced under the project, defining a data management plan, even when they opt out of the extended Pilot on Open Research Data. Data management (including ethics and privacy issues), interoperability, as well as advanced data and computing services should be addressed where relevant. To this extent, proposals should build

upon the state of the art in ICT and e-infrastructures for data, computing and networking, and ensure connection to the European Open Science Cloud.

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

Integrating Activities are expected to duly take into account all relevant ESFRI and other world-class research infrastructures to exploit synergies, to reflect on sustainability and to ensure complementarity and coherence with the existing European Infrastructures landscape.

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

As the scope of an integrating activity is to ensure coordination and integration between all the key European infrastructures in a given field and to avoid duplication of effort, advanced communities are expected to submit one proposal per area.

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

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

On the basis of a multiannual plan drafted taking into account the assessment and the timing of previous grants as well as strategic priorities and needs, in term of research infrastructures services, emerging from other parts of Horizon 2020, this work programme invites proposals addressing the following areas listed under the different domains. A balanced coverage of the various domains, in line with the distribution of areas per domain, is expected as outcome of this topic.

2019 deadline

The areas to be addressed under the different domains will be defined at a later stage, before the opening of the related call.

Expected Impact:

- Researchers will have wider, simplified, and more efficient access to the best research infrastructures they require to conduct their research, irrespective of location. They benefit from an increased focus on user needs.

- New or more advanced research infrastructure services, enabling leading-edge or multidisciplinary research, are made available to a wider user community.
- Operators of related infrastructures develop synergies and complementary capabilities, leading to improved and harmonised services. There is less duplication of services, leading to an improved use of resources across Europe. Economies of scale and saving of resources are also realised due to common development and the optimisation of operations.
- Innovation is fostered through a reinforced partnership of research organisations with industry.
- A new generation of researchers is educated that is ready to optimally exploit all the essential tools for their research.
- Closer interactions between larger number of researchers active in and around a number of infrastructures facilitate cross-disciplinary fertilisations and a wider sharing of information, knowledge and technologies across fields and between academia and industry.
- For communities which have received three or more grants in the past, the sustainability of the integrated research infrastructure services they provide at European level is improved.
- The integration of major scientific equipment or sets of instruments and of knowledge-based resources (collections, archives, structured scientific information, data infrastructures, etc.) leads to a better management of the continuous flow of data collected or produced by these facilities and resources.
- When applicable, the integrated and harmonised access to resources at European level can facilitate the use beyond research and contribute to evidence-based policy making.
- When applicable, the socio-economic impact of past investments in research infrastructures from the European Structural and Investment Funds is enhanced.

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

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

^[2] See part D of the section “Specific features for Research Infrastructures”.

Industrial Leadership

Horizon 2020 Pillar:	Industrial Leadership
Programme:	Information and Communication Technologies
Call Title:	Information and Communication Technologies
Call Identifier:	h2020-ict-2018-2020
Topic Title:	EU-US Collaboration for advanced wireless platforms
Topic Identifier:	ICT-21-2018
Type of Action:	CSA Coordination and support action
Deadline(s):	17-04-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/ict-21-2018.html>

Specific Challenges: Both the EU and the NSF address the challenges of advanced wireless research beyond 5G focusing on game changing technologies for wireless communications, capitalizing on existing testbeds and projects, to reach further connectivity frontiers.

Scope: To establish collaborative **TransAtlantic** work on advanced wireless platforms addressing the use of new ranges of frequencies from mmwave bands up to Terahertz bands, massive antenna arrays, new radio and signal processing techniques, optimised new usage of Spectrum and platform or testbeds for experimental research. To develop research roadmaps, workshops, scientific exchanges, development of tools for experimentations, opens source software tools and repositories, prototyping and evaluation, tools for probing and data analytics, emulation, management and cross **Atlantic** technology trials.

Proposals shall foresee twinning with entities participating in projects funded by USA to exchange knowledge and experience and exploit synergies. In particular twinning with entities participating in projects funded by the NSF under the Programme for Advanced Wireless Research (PAWR) should be addressed. The Commission considers that proposals requesting a contribution from the EU of up to EUR 2 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Support to advances in Wireless knowledge and reinforced cooperation with the US through common **TransAtlantic** experiments linking platforms and testbeds, fostering common scientific roadmap, developing

new tools and potential options for standards ahead of worldwide competition for beyond 5G connectivity systems and services.

Bridge EU and US research communities addressing this topic. In the case of US, the target community is the NSF community addressing the new "Programme for Advanced Wireless Research" (PAWR)^[1].

Cross-cutting Priorities: International cooperation

^[1] See Programme and budget at <https://www.nsf.gov/cise/advancedwireless/>

Horizon 2020 Pillar:	Industrial Leadership
Programme:	Information and Communication Technologies
Call Title:	Information and Communication Technologies
Call Identifier:	h2020-ict-2018-2020
Topic Title:	EU-US collaboration on NGI
Topic Identifier:	ICT-31-2018-2019
Type of Action:	CSA Coordination and support action
Deadline(s):	17-04-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/ict-31-2018-2019.html>

Specific Challenges: Building upon the EU-US collaboration in previous work programmes in the area of research experimentation, the aim is to reinforce cooperation and strategic partnerships in the area of Next Generation Internet, to establish a continuous dialogue among the key actors in the US and European programmes and to implement focused projects for joint developments. Proposals shall foresee twinning with entities participating in projects funded by the US to exchange knowledge and experience and exploit synergies. This collaboration will be implemented in accordance with the "Implementation arrangement between the European Commission and the government of the **United States of America** for cooperation between researchers funded separately by the European Union's and the United States framework programmes on research and innovation" signed on 17 October 2016^[1].

Scope: Coordination and Support Actions.
Proposals should cover the following areas of this sub-topic:

- Organise workshops and other support activities: to facilitate the coordination of research and innovation initiatives in the EU and US, and to promote collaboration between the research groups. Create a Next Generation Internet open ecosystem engaging relevant initiatives and key actors from the EU and the US.
- Fellowship programme: support 3 to 6 months fellowships for Internet researchers notably from hi-tech startups, SMEs, mid-caps, research centres or academia to broaden the understanding of different approaches, perspectives and values, in view to then contribute to concrete NGI services and products 'Made in Europe'. The project will

only provide financial support for travel and subsistence, and only citizens of the EU and associated countries will be eligible for funding. For grants awarded under this topic for the fellowship programme beneficiaries may provide support to third parties as described in part K of the General Annexes of the Work Programme. The support to third parties can only be provided in the form of grants. The respective options of Article 15.1 and Article 15.3 of the Model Grant Agreement will be applied

The Commission considers that proposals requesting a contribution from the EU of EUR 1 million for the first area of this sub-topic (Organise workshops and other support activities) and of EUR 1.5 million for the second area of this sub-topic (Fellowship programme) would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. At least one proposal will be selected in each of the two areas of this sub-topic.

Expected Impact: Proposals should provide appropriate metrics for the claimed impacts.

- Enhanced EU – US cooperation in Next Generation Internet, including policy cooperation.
- Reinforced collaboration and increased synergies between the Next Generation Internet and the Tomorrow's Internet programmes.
- Developing interoperable solutions and joint demonstrators, contributions to standards
- An EU - US ecosystem of top researchers, hi-tech startups / SMEs and Internet-related communities collaborating on the evolution of the Internet.

Cross-cutting Priorities: International cooperation

^[1] http://ec.europa.eu/research/iscp/pdf/policy/eu-usa_implementing_arrangement_2016.pdf

Horizon 2020 Pillar: Industrial Leadership

Programme: Information and Communication Technologies

Call Title: Information and Communication Technologies

Call Identifier: h2020-ict-2018-2020

Topic Title: EU-US collaboration on NGI

Topic Identifier: ICT-31-2018-2019

Type of Action: RIA Research and Innovation action

Deadline(s): 28-03-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/ict-31-2018-2019.html>

Specific Challenges: Building upon the EU-US collaboration in previous work programmes in the area of research experimentation, the aim is to reinforce cooperation and strategic partnerships in the area of Next Generation Internet, to establish a continuous dialogue among the key actors in the US and European programmes and to implement focused projects for joint developments. Proposals shall foresee twinning with entities participating in projects funded by the US to exchange knowledge and experience and exploit synergies. This collaboration will be implemented in accordance with the "Implementation arrangement between the European Commission and the government of the **United States of America** for cooperation between researchers funded separately by the European Union's and the United States framework programmes on research and innovation" signed on 17 October 2016^[1].

Scope: Research and Innovation Action.

Common experiments by EU/US teams on emerging topics for the Next Generation Internet / Tomorrow's Internet programmes on top of EU/US experimental platforms.

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

The Commission considers that proposals for Research and Innovation actions requesting a contribution from the EU of EUR 3.5 million would allow this specific challenge to be addressed appropriately. As a reference, 80% of the EU funding should be allocated to financial support for the third parties. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Proposals should provide appropriate metrics for the claimed impacts.

- Enhanced EU – US cooperation in Next Generation Internet, including policy cooperation.
- Reinforced collaboration and increased synergies between the Next Generation Internet and the Tomorrow's Internet programmes.
- Developing interoperable solutions and joint demonstrators, contributions to standards
- An EU - US ecosystem of top researchers, hi-tech startups / SMEs and Internet-related communities collaborating on the evolution of the Internet.

Cross-cutting Priorities: International cooperation

^[1] http://ec.europa.eu/research/iscp/pdf/policy/eu-usa_implementing_arrangement_2016.pdf

Horizon 2020 Pillar:	Industrial Leadership
Programme:	Leadership in Enabling and Industrial Technologies - Space
Call Title:	Space 2018-2020
Call Identifier:	h2020-space-2018-2020
Topic Title:	International Cooperation Copernicus – Designing EO downstream applications with international partners
Topic Identifier:	DT-SPACE-06-EO-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	12-03-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/dt-space-06-eo-2019.html>

Specific Challenges: Copernicus, the Union's Earth observation and monitoring programme produces a wealth of data and information regarding the Earth sub-systems (land, atmosphere, oceans) and cross-cutting processes (climate change, emergency and security). Cooperation with international partners is key to promoting the uptake of Copernicus globally, exploiting possibilities for integrating in-situ, space data and information technologies. Building the Copernicus full, free and open data policy, the Commission seeks to facilitate access to Copernicus data and information for interested international partners. Administrative cooperation arrangements on Copernicus data access and earth observation data exchange have already been signed with the **United States** and Australia, and discussions towards similar cooperation have been started with other countries and regions (including Africa, Latin American countries and Asia-Pacific countries).

Cooperation with partner countries should be fostered with a view to using Copernicus data to jointly develop algorithms, services and/or products which serve local user needs and/or enhance the Copernicus global product quality.

It is encouraged to cooperate on data processing and applications using the Copernicus DIAS, integrate third-party data (including in-situ data) and envisage data assimilation into models and products made available on the Copernicus platform of the Copernicus services.

For such applications and developments to succeed in the market or with public users, the products need to be shaped according to users' needs and their value to users must be openly demonstrated to the wider user

community. This needs to be achieved in an environment integrated at the level of the user, in order for users to accept the innovative potential which the product promises. This will require also specific attention to be given to the various processes in place in the users' workflows which incorporate the EO information. Furthermore, the transition of R&D product prototypes to viable commercial product lines after the end of the EU funded phase remains a challenge to be addressed early on during product development.

Scope: Proposals shall address a wide variety of applications stemming from the use of Earth observation and their smart integration with other related technologies. Copernicus should be considered as part of the solution which may include other space or non-space inputs. This is likely to lead to greater value, opportunities and especially market uptake. Applications shall be sustained by a production process capable of delivering to the user a product which is validated and accepted as a marketable product in the international partner country. International collaboration has a key role to play in this context, as it enhances access to markets beyond the national borders, notably by enabling space application providers to absorb market-related tacit knowledge and know-how of their partners. Corresponding validations and customisations are to be undertaken, and the business case for the application is to be demonstrated. Service level models are to be developed, with appropriate quality of service definitions for the application. Application products are expected to adopt open standards for data documentation, data models and services including data processing, visualisation and cataloguing on a large scale.

Activities shall include joint cal/val activities or integration of local in-situ systems to enhance service products. It is important to exploit the added value of integration of EO observation technologies (both satellite, airborne and ground based) with positioning ones, and ICT (enhancing new frontiers opened by cloud computing) from international partner countries through the development of applications, and encourage their insertion into the market.

The choice of EO application is left to the proposer.

Applicants are advised to consult further information on the availability of Copernicus Sentinel Data, access to Copernicus Contributing Mission data, as well as issues recommended to be detailed in the proposals via the Commission's Copernicus website^[1].

For projects to be funded under this topic:

- Participation of partners from countries that have signed a Copernicus Cooperation Arrangement^[2] is required;
- Participation of industry, in particular SMEs, is encouraged;
- Participation of partners involved in international GEO initiatives is encouraged.

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

This topic contributes to the Horizon 2020 focus area "Digitising and transforming European industry and services".

Expected Impact:

- Establish sustainable supply chains for innovative EO value added products and services with demonstrated commercial value with international client communities;
- Complete integration, based on international standards, into the customer's existing business processes and processing chains, as well as the economic viability of the application is to be demonstrated;
- Enhance the European industry's potential to take advantage of market opportunities and establish leadership in the field and to boost business activity;
- Lead to new or improved products, processes or services on the market that are capable of generating within 3 years after the end of public funding a significant turnover for the participants, and create new jobs;
- Lead to an improved quality of the Copernicus global product, thereby enhancing the staving of Copernicus data and information in a global environment and GEOSS.

Cross-cutting Priorities: International cooperation

^[1] <http://www.copernicus.eu/main/data-access>

^[2] See Copernicus.eu for list of countries concerned

Societal Challenges

Horizon 2020 Pillar:	Societal Challenges
Programme:	Climate action, environment, resource efficiency and raw materials
Call Title:	Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement
Call Identifier:	h2020-lc-cla-2018-2019-2020
Topic Title:	The changing cryosphere: uncertainties, risks and opportunities
Topic Identifier:	LC-CLA-07-2019
Type of Action:	CSA Coordination and support action
Deadline(s):	19-02-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-cla-07-2019.html>

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

Scope: Actions should aim at developing innovative approaches to address the following sub-topic:

Arctic standards

The action should propose guidelines and protocols to develop 'Arctic standards', also including the legal framework, based on the translation of research outcomes into cold-climate technologies and services with commercial potential and the assessment of the sustainability of associated processes and technologies. The action should cover a wide range of technologies and services that have the potential to bring broad social and economic benefits within and beyond the Arctic region. The action should also provide requirements on how to design, build, install, and operate

equipment and services to safely perform activities in the Arctic and to respond to emergencies.

The participation of standardisation organisations is encouraged.

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

For the above sub-topic, in line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged^[1], in particular with countries – beyond the EU Member States and countries associated to Horizon 2020 – that took part in the first Arctic Science Ministerial of 28 September 2016^[2].

Expected Impact:

The project results are expected to contribute to:

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

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

^[1] Proposals should pay attention to the special call conditions for this topic.

^[2] i.e. the United States of America, Canada, the People's Republic of China, Japan, the **Russian** Federation, South Korea, New Zealand, India, Singapore, and Greenland; see https://www.arctic.gov/publications/other/supporting_arctic_science.html

Horizon 2020 Pillar:	Societal Challenges
Programme:	Climate action, environment, resource efficiency and raw materials
Call Title:	Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement
Call Identifier:	h2020-lc-cla-2018-2019-2020
Topic Title:	The changing cryosphere: uncertainties, risks and opportunities
Topic Identifier:	LC-CLA-07-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	19-02-2019, 04-09-2019 (two-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-cla-07-2019.html>

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

Scope: Actions should aim at developing innovative approaches to address only one of the following sub-topics:

a. Sea-level changes

Actions should assess the processes controlling changes to global ice mass balance - including ice dynamics - such as ice shelf-ocean and sea-ice interactions, surface components, effects of crustal de-loading (Glacial Isostatic Adjustments) on relative sea-level changes and/or gravitational effects of ice mass changes on the spatial patterns of sea-level changes. Actions should assess the status of ice sheets and glaciers, report on how their changes are likely to affect future sea-levels, and increase confidence in predicting changes in the cryosphere including through better representation of poorly represented processes. Actions should

also analyse low-probability high-impact scenarios including those associated with the collapse of ice sheets (sea-level fingerprints). Actions may be focused on specific issues which substantially contribute to sea-level changes and to the assessment of the associated major risks to and impacts on coastal communities, coastal ecosystems and critical infrastructure across the globe.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 8 to EUR 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

b. Changes in Arctic biodiversity

Actions should identify and analyse major drivers and implications of changing biodiversity in the Arctic, such as the role of invasive species, and how vulnerable land and/or marine ecosystems are with respect to combined human and natural influences. Actions should assess the ecosystems' responses to both external and internal factors and how these responses are impacting on indigenous populations and local communities at socio-economic level. Actions should also identify adaptation strategies in relation to the changes in Arctic ecosystems.

The participation of social sciences and humanities disciplines is important for addressing the complex challenges of this topic.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 5 to EUR 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

c. Sustainable opportunities in a changing Arctic

Actions should assess the viability of new economic activities – such as resource exploitation, shipping and tourism – and their ecological and socio-economic impacts and feedbacks at various scales, and their impact on the provision of ecosystem services. Actions should investigate key processes with high societal and economic impacts and provide appropriate, solution-oriented adaptation and mitigation responses, as well as capacity building for sustainable livelihoods while considering – in a co-design approach – the needs, priorities and perspectives of indigenous populations, local communities and economic actors operating in the region.

The participation of social sciences and humanities disciplines is essential for addressing the complex challenges of this topic.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 5 to EUR 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not

preclude submission and selection of proposals requesting other amounts.

For all of the above sub-topics, in line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged^[1], in particular with countries – beyond the EU Member States and countries associated to Horizon 2020 – that took part in the first Arctic Science Ministerial of 28 September 2016^[2].

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

- the implementation of the new integrated EU policy for the Arctic^[3];
- the IPCC assessments and other major regional and global initiatives;
- enhanced engagement of and the interaction with residents from local communities and indigenous societies.
- For projects addressing part d), the project results are expected to contribute to:
 - enhanced stakeholder capability to operate in cold climate environments;
 - better servicing of the economic sectors that operate in the Arctic (e.g. shipping, tourism);
 - promoting sustainable Arctic opportunities arising from climate change and supporting the leverage of regional (EU) funds into these opportunities;
 - supporting the competitiveness of European industry, particularly SMEs, engaging in sustainable development of the Arctic.

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

^[1] Proposals should pay attention to the special call conditions for this topic.

^[2] i.e. the United States of America, Canada, the People's Republic of China, Japan, the **Russian** Federation, South Korea, New Zealand, India, Singapore, and Greenland; see https://www.arctic.gov/publications/other/supporting_arctic_science.html

^[3] JOIN(2016) 21 final

Horizon 2020 Pillar:	Societal Challenges
Programme:	Climate action, environment, resource efficiency and raw materials
Call Title:	Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement
Call Identifier:	h2020-lc-cla-2018-2019-2020
Topic Title:	The changing cryosphere: uncertainties, risks and opportunities
Topic Identifier:	LC-CLA-07-2019
Type of Action:	CSA Coordination and support action
Deadline(s):	19-02-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-cla-07-2019.html>

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

Scope: Actions should aim at developing innovative approaches to address the following sub-topic:

Arctic standards

The action should propose guidelines and protocols to develop 'Arctic standards', also including the legal framework, based on the translation of research outcomes into cold-climate technologies and services with commercial potential and the assessment of the sustainability of associated processes and technologies. The action should cover a wide range of technologies and services that have the potential to bring broad social and economic benefits within and beyond the Arctic region. The action should also provide requirements on how to design, build, install, and operate

equipment and services to safely perform activities in the Arctic and to respond to emergencies.

The participation of standardisation organisations is encouraged.

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

For the above sub-topic, in line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged^[1], in particular with countries – beyond the EU Member States and countries associated to Horizon 2020 – that took part in the first Arctic Science Ministerial of 28 September 2016^[2].

Expected Impact:

The project results are expected to contribute to:

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

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

^[1] Proposals should pay attention to the special call conditions for this topic.

^[2] i.e. the **United States of America**, Canada, the People's Republic of China, Japan, the Russian Federation, South Korea, New Zealand, India, Singapore, and Greenland; see https://www.arctic.gov/publications/other/supporting_arctic_science.html

Horizon 2020 Pillar:	Societal Challenges
Programme:	Climate action, environment, resource efficiency and raw materials
Call Title:	Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement
Call Identifier:	h2020-lc-cla-2018-2019-2020
Topic Title:	The changing cryosphere: uncertainties, risks and opportunities
Topic Identifier:	LC-CLA-07-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	19-02-2019, 04-09-2019 (two-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-cla-07-2019.html>

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

Scope: Actions should aim at developing innovative approaches to address only one of the following sub-topics:

d. Sea-level changes

Actions should assess the processes controlling changes to global ice mass balance - including ice dynamics - such as ice shelf-ocean and sea-ice interactions, surface components, effects of crustal de-loading (Glacial Isostatic Adjustments) on relative sea-level changes and/or gravitational effects of ice mass changes on the spatial patterns of sea-level changes. Actions should assess the status of ice sheets and glaciers, report on how their changes are likely to affect future sea-levels, and increase confidence in predicting changes in the cryosphere including through better representation of poorly represented processes. Actions should

also analyse low-probability high-impact scenarios including those associated with the collapse of ice sheets (sea-level fingerprints). Actions may be focused on specific issues which substantially contribute to sea-level changes and to the assessment of the associated major risks to and impacts on coastal communities, coastal ecosystems and critical infrastructure across the globe.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 8 to EUR 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

e. Changes in Arctic biodiversity

Actions should identify and analyse major drivers and implications of changing biodiversity in the Arctic, such as the role of invasive species, and how vulnerable land and/or marine ecosystems are with respect to combined human and natural influences. Actions should assess the ecosystems' responses to both external and internal factors and how these responses are impacting on indigenous populations and local communities at socio-economic level. Actions should also identify adaptation strategies in relation to the changes in Arctic ecosystems.

The participation of social sciences and humanities disciplines is important for addressing the complex challenges of this topic.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 5 to EUR 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

f. Sustainable opportunities in a changing Arctic

Actions should assess the viability of new economic activities – such as resource exploitation, shipping and tourism – and their ecological and socio-economic impacts and feedbacks at various scales, and their impact on the provision of ecosystem services. Actions should investigate key processes with high societal and economic impacts and provide appropriate, solution-oriented adaptation and mitigation responses, as well as capacity building for sustainable livelihoods while considering – in a co-design approach – the needs, priorities and perspectives of indigenous populations, local communities and economic actors operating in the region.

The participation of social sciences and humanities disciplines is essential for addressing the complex challenges of this topic.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 5 to EUR 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not

preclude submission and selection of proposals requesting other amounts.

For all of the above sub-topics, in line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged^[1], in particular with countries – beyond the EU Member States and countries associated to Horizon 2020 – that took part in the first Arctic Science Ministerial of 28 September 2016^[2].

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

- the implementation of the new integrated EU policy for the Arctic^[3];
- the IPCC assessments and other major regional and global initiatives;
- enhanced engagement of and the interaction with residents from local communities and indigenous societies.
- For projects addressing part d), the project results are expected to contribute to:
 - enhanced stakeholder capability to operate in cold climate environments;
 - better servicing of the economic sectors that operate in the Arctic (e.g. shipping, tourism);
 - promoting sustainable Arctic opportunities arising from climate change and supporting the leverage of regional (EU) funds into these opportunities;
 - supporting the competitiveness of European industry, particularly SMEs, engaging in sustainable development of the Arctic.

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

^[1] Proposals should pay attention to the special call conditions for this topic.

^[2] i.e. the **United States of America**, Canada, the People's Republic of China, Japan, the Russian Federation, South Korea, New Zealand, India, Singapore, and Greenland; see https://www.arctic.gov/publications/other/supporting_arctic_science.html

^[3] JOIN(2016) 21 final

Horizon 2020 Pillar:	Societal Challenges
Programme:	Europe in a changing world – Inclusive, innovative and reflective societies
Call Title:	GOVERNANCE FOR THE FUTURE
Call Identifier:	h2020-sc6-governance-2018-2019-2020
Topic Title:	Trends and forward-looking scenarios in global governance
Topic Identifier:	GOVERNANCE-06-2018
Type of Action:	RIA Research and Innovation action
Deadline(s):	13-03-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/governance-06-2018.html>

Specific Challenges: Recent trends in nationalism, protectionism and regionalism are affecting international commitments and policies. They also put added pressure on the political and operational capacities of global governance institutions created in the mid-twentieth century for critical yet partly different purposes. This raises the prospects of shifts, including in responsibility, in global and transnational governance. The challenge is to identify coherent responses and to effectively coordinate their implementation with stakeholders.

Scope: Proposals should assess contemporary and historical developments in key institutions (e.g. United Nations, North **Atlantic** Treaty Organisation, World Trade Organisation, Organisation for Security and Cooperation), regimes, processes and partnerships that aim at contributing to collective action and sharing responsibilities in taking on global problem solving. They should also investigate the EU's role in these processes. In addition, proposals should assess challenges faced by global governance such as representativeness, diverging interests, trust, allocating responsibilities and legitimacy as well as difficulties related to the implementation of agreements. Responses to past challenges should also be assessed. Scenarios of stagnation, transformation or fragmentation should be considered. The impact on the implementation of the EU Global Strategy and on the achievement of the climate goals of the Paris Agreement and the Sustainable Development Goals of Agenda 2030 should be addressed. The role played by non-state actors, including from the civil and private sectors may also be addressed. Relevant actors (e.g. researchers, policymakers, civil society representatives) should be involved to ensure mutual learning and take-up of results. Due to the specific challenge

of this topic, participation of international partners strategically targeted by the EU is encouraged to ensure joint mapping, scenario design and policy recommendations.

The Commission considers that proposals requesting a contribution from the EU in the order of EUR 2.5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The action will equip relevant EU actors and partners with knowledge and tools for navigating and influencing effectively the emerging and future shifts in global and transnational governance, thereby increasing their readiness, resilience and capacities for developing globally coordinated strategies.

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

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Blue Growth
Call Identifier:	h2020-bg-2018-2020
Topic Title:	Sustainable harvesting of marine biological resources
Topic Identifier:	LC-BG-03-2018
Type of Action:	RIA Research and Innovation action
Deadline(s):	13-02-2018,11-09-2018 (two-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-bg-03-2018.html>

Specific Challenges: In the search for new biological resources, a large unexploited biomass has been identified in the mesopelagic zone (water column between 200 and 1000 m). This largely unknown zone includes micro-organisms, copepods, krill and plankton feeding fish that are lower in the food chain, as well as squids and other higher trophic level fish. This zone is known to play a significant role in the global carbon cycle, where the concentration of atmospheric carbon dioxide would be ~50% higher without its activities. If exploited at sustainable levels, without impacting upon biodiversity and compromising the oceans' role in climate regulation, this biomass could be used to produce more high quality ingredients (proteins with high nutritional value and polyunsaturated fatty acids) for human food chain (which includes farmed animals), to decrease the fishing pressure on overexploited species of higher trophic levels and potentially discover and to develop new bio-based products, including pharmaceuticals and nutraceuticals. This requires a holistic assessment of this globally important marine ecosystem and an understanding of the mechanisms controlling its biomass and its significant role in the global carbon cycle through the reduction of atmospheric CO₂. It also requires development of new monitoring and management tools able to weight the costs and benefits of the exploitation of these marine biological resources.

Scope: Activities shall provide data, information and knowledge on the potential role of mesopelagic micro- and macro-organisms for human food chain and other bio-based products and processes. While preserving biodiversity and enhancing resilience to climate change and mitigation. They shall address issues such as food safety (with regards to risks linked to emerging marine

toxins), fisheries management, fishing techniques, processing (on-board and on-shore) and consumer acceptance and marketing. Impacts of fishing and climate change on the mesopelagic populations and the wider ecosystem, including biodiversity, natural food webs and greenhouse gas sequestration shall be assessed. They shall also address the potential of mesopelagic resources including micro-organisms for marine biotechnological applications. An ecosystem-based approach to exploitation for food and other bio-based products and processes, as well as cost-effective and environmentally sustainable resource management tools shall be developed. Inclusion of societal actors and stakeholders during the whole research and innovation process shall allow for better alignment of both the process and its outcomes with the values, needs and expectations of society. Activities undertaken as part of this interdisciplinary and cross-sectorial project shall build on previous knowledge produced in EU Framework Programme projects and contribute to creating jobs, reinforcing capacity building and improving the professional skills and competences of those working within relevant blue economy sectors. The interdisciplinary and cross-sectorial nature of the project shall also apply to training activities contributing to improving the professional skills and competencies supporting the creation of new jobs in the blue economy. Proposals shall fall under the concept of the 'multi-actor approach'^[1] and allow for adequate involvement of SMEs.

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

Expected Impact: In line with the EU **Blue Growth** Strategy, the EU Common Fisheries Policy, the EU Marine Strategy Framework Directive, the EU International Ocean Governance Communication, the EU Communication for a Sustainable European Future, the EU Bioeconomy Strategy, the EU Biodiversity Strategy and the EU Food 2030^[2] process for food and nutrition security, activities shall:

In the short term:

- Increase the knowledge of mesopelagic zone ecosystems.
- Contribute to the UN SDG 14 targets to effectively regulate marine harvesting and to sustainably manage and protect marine ecosystems, including by strengthening their resilience, and to take action for their restoration in order to achieve healthy and productive oceans by 2020; further strengthen the knowledge base to support the implementation of the Paris Agreement of 2015, COP22 and UN SDG 13.
- Contribute to preserve the ecological functioning of the mesopelagic zone in line with the EU targets of halting the loss of biodiversity and ecosystem services by 2020 and restoring at least 15% of degraded ecosystems.
- Contribute to the preservation of processes regulating climate and to the mitigation of impacts of climate change.

- Foster innovation for food and nutrition security and other bio-based value chains, biodiversity preservation and climate resilience.

In the medium term:

- Contribute to enhance the conservation and sustainable use of oceans and their resources (UN SDG 14).
- Contribute to achieve the sustainable management and efficient use of natural resources, by 2030 (UN SDG 12) ensuring that fishing has no significant adverse impacts on species and ecosystems (EU Biodiversity Strategy).
- Create management tools to ensure that nutritious seafood is available, accessible and affordable for all while conserving natural resources and contributing to climate change mitigation (UN SDG 2).
- Contribute to improve the professional skills and competences of those working and being trained to work within the blue economy.
- Contribute to the creation of jobs and growth in the fishing and processing sector as well as in the marine biotech sector particularly in coastal areas.
- Contribute to policymaking in research, innovation and technology.

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

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

^[2] European Research and Innovation for Food and Nutrition Security, SWD(2016)319.
<http://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/SWD-2016-319-F1-EN-MAIN.PDF>

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Blue Growth
Call Identifier:	h2020-bg-2018-2020
Topic Title:	All Atlantic Ocean Research Alliance Flagship
Topic Identifier:	BG-08-2018-2019
Type of Action:	CSA Coordination and support action
Deadline(s):	13-02-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/bg-08-2018-2019.html>

Specific Challenges: The **Atlantic Ocean** is an invaluable shared resource. The societal value of its blue economy is enormous for countries located on its shores. There are however, still considerable gaps in our knowledge and understanding of processes related to this ocean especially with regard to its chemistry, ecology, biodiversity, impacts of climate and the potential for the sustainable exploitation of its natural resources including aquaculture. The **Atlantic Ocean** is subject to a range of pressures, such as impacts related to climate change, pollution, fishing above sustainable levels, mining and coastal eutrophication. Both remote and local forces play a role in these changes and it is necessary to consider local, regional and basin-wide drivers and factors to understand, predict and adapt to change. Furthermore, the potential of seafood to reduce food and nutrition insecurity calls for collaboration at international level. Having already demonstrated how successful research cooperation can be in the North **Atlantic Ocean**^[1] in tackling some of these issues, the objective now is to take a systemic approach to tackle the scientific and socio-economic challenges and to move towards a basin-wide cooperation from Antarctica to the Arctic, through enhanced cooperation with countries bordering the South **Atlantic**, notably Brazil and South Africa^[2].

Scope: The actions shall aim at understanding and sustainably managing the **Atlantic Ocean** as a whole, through a large-scale basin effort involving both the northern and the southern parts of this ocean and its interlinks with the adjacent areas. In order to achieve this, it is necessary to bring together and systematically connect scientists, stakeholders, data, knowledge, expertise, capacities, and resources. This is only feasible through the synergistic

cooperation among the bordering countries. With the development of a South **Atlantic Ocean Science Plan**^[3] focusing on the challenges and research needs of the South **Atlantic Ocean**, which are also interconnected with the challenges and research needs of the North **Atlantic Ocean**, this cooperation can converge towards the implementation of a systemic approach by linking and jointly tackling the climate-food-ocean challenges. Overall, activities shall contribute to upscale cooperation along and across the **Atlantic Ocean** and the creation of long-term partnerships building on on-going initiatives such as the All **Atlantic Ocean Research Alliance**. In order to realise this, proposals shall address the following sub-topic [A]:

Coordination of marine and maritime research and innovation activities in the **Atlantic Ocean**

Activities shall launch a multi-stakeholder platform to reinforce international cooperation between Europe and tropical and South **Atlantic** countries and to connect with the challenges and research needs of the North **Atlantic Ocean**, as outlined above. The platform shall address the key following points: enhance business opportunities and the up-take of innovations e.g. aquaculture production systems, marine and maritime technologies; develop common standards e.g. for deep ocean and shelf observing systems, seafloor mapping, ecosystem approaches in utilizing marine living resources; reinforce capacity building by aligning European training programmes, including through industrial apprenticeship opportunities and networking with **Atlantic** partners; promote citizen awareness and literacy on ocean issues; align and converge international research and innovation cooperation activities and other relevant initiatives and investments between the northern and southern **Atlantic** countries. It will upscale cooperation with countries bordering the South **Atlantic Ocean**, in particular Brazil and South Africa, by reinforcing the mutual benefits of science diplomacy, addressing the grand challenges and opportunities of the **Atlantic Ocean** as a system, exploiting the benefits it holds for our citizens and entering a new era of Blue Enlightenment which spans from Antarctica to the Arctic.

This action should build on past and ongoing regional, national initiatives and programmes e.g. PIRATA^[4], SAMOC^[5], SA MAR-ECO^[6], GEOTRACES^[7], SOLAS^[8], OTN^[9], ICEMASA^[10], BCLME^[11], and EU projects e.g. MAREFRAME, BIOMORE, ATLANTOS, AORAC-SA, EU POLAR Net, INMARE, PREFACE etc. as well as national initiatives across and alongside the **Atlantic Ocean**. It should also involve (or liaise with) relevant European research infrastructures such as Euro-Argo ERIC and EMSO ERIC. In agreement with the Commission services, projects should ensure appropriate flexibility so as to respond in real time to potentially fast-changing policy scenarios.

The Commission considers that proposals requesting a contribution from the EU respectively in the range of EUR 4 million for this sub-topic [A], EUR 9 million for sub-topic [B] and EUR 8 million for sub-topic [C] would allow this specific challenge to be adequately addressed. Nonetheless, this does not

preclude the submission and selection of proposals requesting other amounts.

Proposals shall include a task to cluster with other projects financed under this topic and – if possible – with other relevant projects in the field funded by Horizon 2020. Possible links with related research and innovation activities supported by the Belmont Forum^[13] on Ocean sustainability shall also be considered.

Expected Impact: In order to contribute to the implementation of the EU Integrated Maritime Policy and its related **Atlantic** Strategy and Action Plan, the EU **Blue Growth** Strategy, the EU Marine Strategy Framework Directive, the EU Maritime Spatial Planning Directive, the EU International Ocean Governance Communication, the EU Communication for a Sustainable European Future, the UN SDGs, the EU Food 2030^[14] process for food and nutrition security, as well as the **Atlantic Ocean Research Alliance**, activities shall:

In the short term:

- Contribute to the implementation of the EU-Brazil-South Africa Belém Statement on **Atlantic Ocean Research** and Innovation cooperation (sub-topics A, B & C)^[15].
- Improve the coordination and alignment of programmes/initiatives and projects between South and North **Atlantic** regions and with the EU and its Member States (sub-topic A).
- Contribute to create the right conditions for the development of better and accurate monitoring, modelling, planning, management and prediction capacities in the whole **Atlantic** (sub-topics A & B).
- Increase the competitiveness of the EU's blue economy by developing new technologies to service societal needs and new value chains (sub-topics A, B & C).
- Contribute to the sustainable management and protection of marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans (UN SDG 14) (sub-topics A & B).

In the medium term:

- Increase EU leadership in ocean technology developments (sub-topics A, B & C).
- Create a well trained workforce able to tackle the multi-sectoral, multi-disciplinary challenges and opportunities of the **Atlantic Ocean** (sub-topics A & C).
- Consolidate education and training networks including more ocean-engaged citizens and communities (sub-topic A).
- Improve the professional skills and competences of those working and being trained to work within the blue economy.
- Contribute to policymaking in research, innovation and technology (sub-topics A, B & C).

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

- ^[1] EU-Canada-US **Galway** Statement on **Atlantic Ocean** Cooperation, May 2013
- ^[2] EU-Brazil-South Africa Belém Statement on **Atlantic** Research and Innovation Cooperation, July 2017
- ^[3] South-South Framework for Scientific and Technical Cooperation in the South and Tropical **Atlantic** and Southern Ocean
- ^[4] Prediction and Research Moored Array in the **Atlantic**
- ^[5] South **Atlantic** Meridional Overturning Circulation.
- ^[6] South **Atlantic** Patterns and Processes of the Ecosystems of the southern Mid-**Atlantic** Ridge.
- ^[7] An international Study of the Marine Biogeochemical Cycles of Trace Element and their Isotopes.
- ^[8] Surface Ocean Lower Atmosphere Study.
- ^[9] Ocean Tracking Network.
- ^[10] International Centre for Education, Marine and Atmospheric Sciences over Africa.
- ^[11] Benguela Current Large Marine Ecosystem.
- ^[12] In this context, 'Aquaculture' comprises the farming of aquatic organisms (including fish, shellfish, algae and aquatic plants) in all types of controlled or natural water environments (fresh, brackish and seawater).
- ^[13] <https://www.belmontforum.org/>
- ^[14] European Research and Innovation for Food and Nutrition Security, SWD(2016)319.
<http://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/SWD-2016-319-F1-EN-MAIN.PDF>
- ^[15] EU-Brazil-South Africa Belém Statement on **Atlantic** Research and Innovation Cooperation, July 2017

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Blue Growth
Call Identifier:	h2020-bg-2018-2020
Topic Title:	All Atlantic Ocean Research Alliance Flagship
Topic Identifier:	BG-08-2018-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	13-02-2018,11-09-2018 (two-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/bg-08-2018-2019.html>

Specific Challenges: The **Atlantic Ocean** is an invaluable shared resource. The societal value of its blue economy is enormous for countries located on its shores. There are however, still considerable gaps in our knowledge and understanding of processes related to this ocean especially with regard to its chemistry, ecology, biodiversity, impacts of climate and the potential for the sustainable exploitation of its natural resources including aquaculture. The **Atlantic Ocean** is subject to a range of pressures, such as impacts related to climate change, pollution, fishing above sustainable levels, mining and coastal eutrophication. Both remote and local forces play a role in these changes and it is necessary to consider local, regional and basin-wide drivers and factors to understand, predict and adapt to change. Furthermore, the potential of seafood to reduce food and nutrition insecurity calls for collaboration at international level. Having already demonstrated how successful research cooperation can be in the North **Atlantic Ocean**^[1] in tackling some of these issues, the objective now is to take a systemic approach to tackle the scientific and socio-economic challenges and to move towards a basin-wide cooperation from Antarctica to the Arctic, through enhanced cooperation with countries bordering the South **Atlantic**, notably Brazil and South Africa^[2].

Scope: The actions shall aim at understanding and sustainably managing the **Atlantic Ocean** as a whole, through a large-scale basin effort involving both the northern and the southern parts of this ocean and its interlinks with the adjacent areas. In order to achieve this, it is necessary to bring together and systematically connect scientists, stakeholders, data, knowledge, expertise, capacities, and resources. This is only feasible through the synergistic

cooperation among the bordering countries. With the development of a South **Atlantic Ocean Science** Plan^[3] focusing on the challenges and research needs of the South **Atlantic Ocean**, which are also interconnected with the challenges and research needs of the North **Atlantic Ocean**, this cooperation can converge towards the implementation of a systemic approach by linking and jointly tackling the climate-food-ocean challenges. Overall, activities shall contribute to upscale cooperation along and across the **Atlantic Ocean** and the creation of long-term partnerships building on on-going initiatives such as the All **Atlantic Ocean Research Alliance**. In order to realise this, proposals shall address the following sub-topic [B]:

Assessing the status of **Atlantic** marine ecosystems

Activities shall enhance the knowledge on the status and dynamics of **Atlantic** marine ecosystems, quantifying main drivers of short and long-term change, examine the interactions between different stressors, including climate change, and the role of cumulative impacts on ecosystem functioning and associated ecosystem services. They shall also contribute to improve the sustainability of the exploitation of the marine resources, through extending climate based predictions as well as testing for so-called tipping points, regimes shifts or more advanced assessments of ecosystem stability. Activities may entail 3D-mapping of the water column and high resolution seafloor mapping of selected large areas (including relevant marine ecosystems), considering the feasibility/safety and sustainability of these maritime operations. Mapping shall include variables of a different nature, such as physical, biological, chemical, habitats, seafloor characteristics and integrity (including in relation to climate change) and may require the development of new technologies. Furthermore, demonstration of cost-effective approaches to management and processing of the large quantities of data, better coordinated data sharing and operability, as well as the development of improved forecasting capabilities of stressors, tipping points, recovery and changes in ecosystem state will be important. The participation of industrial and regional stakeholders is encouraged to help define ecosystem-requirements. All data collected by the projects (including in international waters) shall be made open access by the end of the project. The choices of the selected areas need to be justified. Actions shall include capacity building and training with/in countries bordering the South and Tropical **Atlantic Ocean**. Links with ongoing initiatives such as EMODNet should be considered. The activities will be carried out in close co-operation with relevant Commission services (Directorate-General for Research and Innovation), ensuring coherence with related policy initiatives.

The Commission considers that proposals requesting a contribution from the EU respectively in the range of EUR 4 million for sub-topic [A], EUR 9 million for sub-topic [B] and EUR 8 million for sub-topic [C] would allow this specific challenge to be adequately addressed. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Proposals shall include a task to cluster with other projects financed under this topic and – if possible – with other relevant projects in the field funded by Horizon 2020. Possible links with related research and innovation activities supported by the Belmont Forum^[13] on Ocean sustainability shall also be considered.

Expected Impact: In order to contribute to the implementation of the EU Integrated Maritime Policy and its related **Atlantic** Strategy and Action Plan, the EU **Blue Growth** Strategy, the EU Marine Strategy Framework Directive, the EU Maritime Spatial Planning Directive, the EU International Ocean Governance Communication, the EU Communication for a Sustainable European Future, the UN SDGs, the EU Food 2030^[14] process for food and nutrition security, as well as the **Atlantic Ocean Research Alliance**, activities shall:

In the short term:

- Contribute to the implementation of the EU-Brazil-South Africa Belém Statement on **Atlantic Ocean Research** and Innovation cooperation (sub-topics A, B & C)^[15].
- Contribute to create the right conditions for the development of better and accurate monitoring, modelling, planning, management and prediction capacities in the whole **Atlantic** (sub-topics A & B).
- Develop ecosystem assessments and forecasts as well as a deeper understanding of vulnerabilities and risk including those relating to the global climate system and the impacts of climate change (sub-topic B).
- Increase the competitiveness of the EU's blue economy by developing new technologies to service societal needs and new value chains (sub-topics A, B & C).
- Contribute to the sustainable management and protection of marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans (UN SDG 14) (sub-topics A & B).

In the medium term:

- Contribute to the development of ecosystem services to ensure the long-term sustainable management of marine resources (UN SDG 14) (sub-topic B).
- Increase EU leadership in ocean technology developments (sub-topics A, B & C).
- Improve the professional skills and competences of those working and being trained to work within the blue economy.
- Contribute to policymaking in research, innovation and technology (sub-topics A, B & C).

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

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- [¹] EU-Canada-US **Galway** Statement on **Atlantic Ocean** Cooperation, May 2013
- [²] EU-Brazil-South Africa Belém Statement on **Atlantic** Research and Innovation Cooperation, July 2017
- [³] South-South Framework for Scientific and Technical Cooperation in the South and Tropical **Atlantic** and Southern Ocean
- [⁴] Prediction and Research Moored Array in the **Atlantic**
- [⁵] South **Atlantic** Meridional Overturning Circulation.
- [⁶] South **Atlantic** Patterns and Processes of the Ecosystems of the southern Mid-**Atlantic** Ridge.
- [⁷] An international Study of the Marine Biogeochemical Cycles of Trace Element and their Isotopes.
- [⁸] Surface Ocean Lower Atmosphere Study.
- [⁹] Ocean Tracking Network.
- [¹⁰] International Centre for Education, Marine and Atmospheric Sciences over Africa.
- [¹¹] Benguela Current Large Marine Ecosystem.
- [¹²] In this context, 'Aquaculture' comprises the farming of aquatic organisms (including fish, shellfish, algae and aquatic plants) in all types of controlled or natural water environments (fresh, brackish and seawater).
- [¹³] <https://www.belmontforum.org/>
- [¹⁴] European Research and Innovation for Food and Nutrition Security, SWD(2016)319.
<http://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/SWD-2016-319-F1-EN-MAIN.PDF>
- [¹⁵] EU-Brazil-South Africa Belém Statement on **Atlantic** Research and Innovation Cooperation, July 2017

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Blue Growth
Call Identifier:	h2020-bg-2018-2020
Topic Title:	Blue Bioeconomy Public-Public Partnership
Topic Identifier:	BG-02-2018
Type of Action:	ERA-NET-Cofund ERA-NET Cofund
Deadline(s):	13-02-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/bg-02-2018.html>

Specific Challenges: Aquatic biomass from the seas and oceans, rivers and lakes has a large potential to ensure future food and nutrition security and to supply raw materials for other high added value chains and products, such as bioenergy, pharmaceuticals and cosmetics while factoring in environment and climate change risks. These so-called provisioning ecosystem services could ensure private and public benefits, while demonstrating synergies or trade-offs with a broader range of ecosystem services. However, this potential is currently underutilised due to a lack of synergies between sectors and of adequate investments. Consequently, EU intervention is needed to create the conditions to mobilise investments by aligning national and regional innovation research agendas across different blue bioeconomy sectors.

Scope: Activities shall pool the necessary financial resources from the participating national and/or regional research programmes with a view to implementing a joint call for proposals with EU co-funding resulting in grants to third parties. Proposers are requested to implement other joint activities, including additional joint calls without EU co-funding. Activities shall address innovative, sustainable and climate-friendly possibilities to produce, harvest and exploit aquatic biomass from different trophic levels for use in food and other value chains. The technical and economic feasibility of these possibilities should be clearly demonstrated by including in the projects industry partners that contribute a concrete and feasible business perspective. The ERA-NET Cofund shall address research and innovation gaps such as achieving zero waste by optimising the use of underutilised and waste material from fisheries and aquaculture and apply biotechnology and ICT in the blue bioeconomy to develop smart, efficient, traceable food

systems and other biomaterials and create synergies between aquaculture and fisheries (e.g. through genetic assessment); to unlock the potential of microbiomes in aquaculture, fisheries, food processing and biotechnology; to create predictive tools to improve the identification, targeting and conservation of biodiversity “hot-spots” in the oceans (e.g. through omics-based technologies); explore synergies with land-based production in areas such as food and feed processing, biorefining, bioenergy, biomaterials, chemicals and nutrients, and include waste streams from aquatic to terrestrial value chains; to improve aquaculture and fisheries by using a combination of methods, processes and technologies such as biotechnology to create innovative feeds, improve brood stock, introduce new species, improve biosecurity, define stock baselines, and assess stocks. Activities shall also build on developments derived from relevant Framework Programme projects. Activities shall also aim to implement other joint activities without EU co-funding, on issues related to fisheries, aquaculture, seafood processing and aquatic biotechnology in line with the Strategic Research and Innovation Agenda of the Joint Programming Initiative "Healthy and Productive Seas and Oceans"^[1], the COFASP Strategic Research Agenda^[2], and the Marine Biotech Strategic Research and Innovation Roadmap^[3]. Inclusion of societal actors and stakeholders at large during the whole research and innovation process shall allow to better align both the process and its outcomes with the values, needs and expectations of society while facilitating the creation of new value chains in the market. The interdisciplinary and cross-sectorial nature of the project should also apply to training activities improving the professional skills and competencies and supporting the creation of new jobs in the blue economy. Proposers have to demonstrate that the topic for the cofunded call excludes duplication with calls launched or planned under Horizon 2020.

Participation of legal entities from international partner countries will be 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 may request a EU contribution (on the basis of the ERA-NET unit cost) for the coordination costs of additional activities.

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

Expected Impact: Contributing to ongoing implementation at EU and national level of EU policies such as the Bioeconomy Strategy, the Circular Economy Strategy, the **Blue Growth** Strategy, the Common Fisheries Policy, the Marine Strategy Framework Directive, the Maritime Spatial Planning Directive, the BLUEMED Initiative and notably common priorities with the WestMED Initiative^[4] and the EUSAIR, as well as the priorities defined in the European Commission Staff Working Document FOOD 2030^[5] and international initiatives such as the **Atlantic Ocean Research Alliance**, this ERA-NET Cofund shall:

In the short term:

- Create, test, upscale and bring to the market new knowledge-intensive products and services derived from aquatic biomass, fostering job creation and economic growth in Europe.
- Provide consumers with the knowledge needed to make informed decisions about safe, healthy and sustainable food and policy makers with robust scientific advice.

In the medium term:

- Increase the efficient and sustainable use of by-products generated from blue bioeconomy sectors.
- Contribute to the UN SDG 2 target to ensure sustainable food production systems and the UN SDG 14 target to effectively regulate harvesting and end overfishing.
- Contribute to improve the professional skills and competences of those working and being trained to work within the blue economy.
- Contribute to policymaking in research, innovation and technology.

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

^[1] Joint Programming Initiative "Healthy and Productive Seas and Oceans", <http://www.jpi-oceans.eu/>

^[2] COFASP Strategic Research Agenda, <http://www.cofasp.eu/node/6674>

^[3] <http://www.marinebiotech.eu/launch-marine-biotechnology-research-and-innovation-roadmap>

^[4] Initiative for the sustainable development of the blue economy in the Western Mediterranean

^[5] European Research and Innovation for Food and Nutrition Security, SWD(2016)319.
<http://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/SWD-2016-319-F1-EN-MAIN.PDF>

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Blue Growth
Call Identifier:	h2020-bg-2018-2020
Topic Title:	Sustainable European aquaculture 4.0: nutrition and breeding
Topic Identifier:	DT-BG-04-2018-2019
Type of Action:	IA Innovation action
Deadline(s):	13-02-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/dt-bg-04-2018-2019.html>

Specific Challenges: European aquaculture^[1] provides 1.25 million tonnes of seafood annually^[2], valued at over 4 billion euro. However, Europe heavily depends on external markets to ensure consumer demands for seafood (including from fresh water) is met. EU aquaculture needs to increase the competitiveness of its food products and to respond to consumer demands for high-quality and safe food, in a challenging context of climate change, greater competition for natural resources, and conflicting interests for space and markets. To ensure food and nutrition security by 2030, European aquaculture has to sustainably expand in terms of space, production and new value chains, exploring and enhancing innovation opportunities offered by sustainable and resilient aquaculture production systems, implementing the circular economy principles and increasing social acceptance of the corresponding activities and products. European aquaculture has now a unique opportunity to address not only today's challenges of climate change and food and nutrition security, but also to implement the international commitments encompassed in the UN SDGs, while fostering economic growth and social prosperity.

Scope: Activities shall develop smart breeding programmes and/or tailor feeding formulas and technologies for conventional and organic aquaculture – for marine and/or freshwater - targeting animal health (contributing to disease resistance) and welfare, different production systems, feeding efficiency, resilience and climate change mitigation - when applicable, including related traits and possible links between them (synergies, trade-offs) -, zero waste, by-products valorisation following circularity principles and organoleptic and

nutritional values of seafood optimisation. Efforts to close the reproduction cycle of economically important species should be considered. In addition, activities shall explore the potential of the microbiome on health and productivity of farmed species.^[3] Activities shall consider sound cost-effective production methods and profitability, testing, demonstrating and upscaling of the production processes to pre-commercial product. Regulatory authority and consumers should also be consulted, addressing their concerns and demands. The use of Internet of Things (IoT) and Artificial Intelligence (AI) should be considered. The participation of deep-tech start-ups is encouraged. Activities shall develop a set of indicators to monitor and measure progress towards the expected impacts as listed in the call text and in particular the improvement of the production systems that increases productivity, resilience and sustainability. The interdisciplinary and cross-sectorial nature of the project should also apply to training activities improving the professional skills and competencies and supporting the creation of new jobs in the blue economy.

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

Expected Impact: Contributing to the ongoing implementation of EU policies such as the Bioeconomy Strategy, the Circular Economy Strategy, the **Blue Growth** Strategy, the Common Fisheries Policy, the Marine Strategy Framework Directive, the priorities defined in the European Commission Staff Working Document FOOD 2030^[4], as well as international policies and initiatives such as the UN SDGs, the EU Biodiversity Strategy, the BLUEMED Initiative, the **Atlantic Ocean Research Alliance** and the BIOEAST Initiative, activities shall:

In the short term:

- Demonstrate that investment in sustainable aquaculture research and innovation leads to the creation of new value chains, markets, growth and jobs in coastal, offshore and landlocked areas.
- Improve consumers' awareness, perceptions and acceptability of the European aquaculture products and methods.
- Contribute to the creation of improved sustainable aquaculture systems and implement productive and resilient aquaculture practices that maintain healthy aquatic ecosystems and strengthen capacity for adaptation to climate change, by 2020 (UN SDG 2).
- Contribute to ensure the genetic diversity of farmed algae (micro and macro) and farmed aquatic species (fish, molluscs and crustaceans) and their related wild species, and promote access to the utilisation of genetic resources by 2020 (UN SDG 2).

In the medium term

- Contribute to increasing available, accessible, affordable and nutritious food and feed, while conserving natural resources and contributing to climate change mitigation (UN SDG 2).
- Improve the professional skills and competences of those working and being trained to work within the blue economy.
- Contribute to policymaking in research, innovation and technology.

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

^[1] In this context, 'Aquaculture' comprises the farming of aquatic organisms (including fish, shellfish, algae and aquatic plants) in all types of controlled or natural water environments (fresh, brackish and seawater).

^[2] http://www.europarl.europa.eu/atyourservice/en/displayFtu.html?ftuid=FTU_5.3.7.html

^[3] Two other topics under the SC2 Sustainable Food Security Call will address related issues on terrestrial animal welfare and the influence of microbiomes on terrestrial livestock health (SFS-02-2020: Healthy livestock gut ecosystem for sustainable production; and SFS-09-2018-2019: Increasing animal welfare).

^[4] European Research and Innovation for Food and Nutrition Security, SWD(2016)319.
<http://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/SWD-2016-319-F1-EN-MAIN.PDF>

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Blue Growth
Call Identifier:	h2020-bg-2018-2020
Topic Title:	Towards a Baltic and North Sea research and innovation programme
Topic Identifier:	BG-01-2018
Type of Action:	CSA Coordination and support action
Deadline(s):	13-02-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/bg-01-2018.html>

Specific Challenges: The northern seas of Europe - the Baltic Sea and the North Sea - are at the forefront of the global surge to enhance and realise marine and maritime potential. This enormous economy is directly and critically dependent on the quality and extent of the ecosystem services provided by the two regional seas and their coasts. In order to foster understanding of these coastal seas and the sustainable use of their goods and services (within the context of the EU **Blue Growth** Strategy, related policies and environmental legislation) challenges need to be addressed such as: fragmentation among nations and sectors, gaps in interdisciplinary knowledge, inadequate information on potential synergies and trade-offs between different sectors and the environment (including climate change issues), insufficient exchange of knowledge among scientists, industries and policy makers, and a need to increase attention to the societal inclusiveness and human well-being. To address these challenges, it is recognised that a significant and well-coordinated research effort between these two regional seas is necessary. BONUS, the Joint Baltic Sea Research and Development Programme, implemented under Article 185 of the TFEU, has already progressed towards consolidating such efforts among the Baltic Sea Member States. There is now an expressed interest and willingness to prepare conditions for launching a broader European North Sea and Baltic Sea Research and Innovation Programme.

Scope: Activities shall focus on creating the necessary conditions for coordinated research and innovation efforts in the North Sea and Baltic Sea region in cooperation with BONUS by bringing together the main national funding

agencies (programme owners and/or managers). They shall map and engage with relevant stakeholders in the region and especially further strengthen a possible new/successor programme with a sound North Sea component. Taking into account of existing commitments in relevant fora the activity shall focus on the preparation and delivery of a Joint Baltic-North Sea Strategic Research and Innovation Agenda, the creation of conditions (governance, management, financial, legal aspects and administration) and the development of an effective mechanism for its implementation, showing a strong commitment to achieve a sound level of integration (scientific, management and financial). Furthermore, they shall ensure visibility and broad involvement of the scientific community, public authorities, decision makers, and other stakeholders (including industry) in the region. The action shall facilitate consultation, awareness and commitment by all parties involved. The action shall also prepare and launch a long-term partnership ensuring appropriate funding from all the relevant participating states and a high leveraging effect. Finally, the action shall demonstrate the rationale of the initiative, EU added value, clearly identifying the problems that it proposes to tackle, likely impacts (scientific and technological, economic, social, environmental including climate-change, administrative, impacts on SMEs and on competitiveness and innovation) and main drivers. Synergies and harmonisation should be sought with other relevant ongoing national, regional, EU and international initiatives and institutions such as the Joint Programming Initiative ‘Healthy and Productive Seas and Oceans’, the International Council for the Exploration of the Seas (ICES), the Convention for the Protection of the Marine Environment of the North-East **Atlantic** (OSPAR Convention), the Baltic Marine Environment Protection Commission (HELCOM), etc. In agreement with the Commission services, projects should ensure appropriate flexibility so as to respond in real time to potentially fast-changing policy scenarios.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 2.5 million would allow this specific challenge to be adequately addressed. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact: In order to contribute to the implementation of the EU Integrated Maritime Policy, the EU **Blue Growth** Strategy, the EU Marine Strategy Framework Directive, the EU Maritime Spatial Planning Directive, the EU International Ocean Governance Communication, the EU Communication for a Sustainable European Future and other EU initiatives such as the **Blue Growth** Agenda for the Baltic Sea Region, **Blue Growth** and North Sea related activities, the EU Strategy for the Baltic Sea Region (EUSBSR) and the UN SDGs, activities shall contribute to the following:

In the short term:

- Overcome fragmentation in research and innovation by developing a joint Baltic-North Sea Marine and Maritime Strategic Research and Innovation Agenda by the Baltic Sea and the North Sea countries.

- Create lasting marine and maritime stakeholder platforms and integration mechanisms in the area, and establishing appropriate stakeholder collaboration mechanisms between the North Sea and Baltic Sea regions.

In the medium term:

- Create a framework and deliver the necessary mechanisms, based on experience gained by the current BONUS and other equivalent initiatives, for developing a European Baltic-North Sea Research and Innovation Programme.
- Contribute to improve the professional skills and competences of those working and being trained to work within the blue economy.
- Contribute to policymaking in research, innovation and technology.

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

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Sustainable Food Security
Call Identifier:	h2020-sfs-2018-2020
Topic Title:	Improving animal welfare
Topic Identifier:	SFS-08-2018-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	13-02-2018,11-09-2018 (two-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sfs-08-2018-2019.html>

Specific Challenges: EU animal welfare legislation has evolved on the basis of scientific knowledge, improving the quality of animals' lives taking into account citizens' expectations and market demands. Nevertheless, a number of problems remain unsolved and the sector faces challenges to cope with them. Research is needed to further improve the management of animal welfare^[1], by looking into new opportunities offered by technological developments, development of appropriate business models and linking animal welfare with other production parameters, including animal health and environmental performance.

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

The special needs for animal welfare in organic and low-input production systems should be explored. Proposals will investigate how to meet organic production standards and take into account ethical and positive welfare approaches, with a focus at least on alternatives to mutilation. Such comprehensive approach should at least address issues related to mutilations, solutions for the killing of male day-old chicks and supply of robust slow-growing poultry breeds/products fit for outdoor rearing

Proposals for both sub-topics A and B should fall under the concept of the multi-actor approach^[2], ensuring that all the stakeholders, from farmers to consumers and regulators, will contribute to the building of new animal welfare approaches to further add value to EU foods of animal origin.

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

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

- a better understanding of animal welfare and associated animal behaviour;
- a broader range of animal welfare management strategies and tools;
- solving long-standing welfare related issues in organic farming, notably in poultry (sub-topic A);
- increase the range of animal welfare management strategies and tools.

In the long run, projects shall increase the sustainability of the livestock sector by better responding to consumer demands and/or increasing competitiveness of the sector.

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

^[1] Farmed aquatic animals welfare is addressed under the **Blue Growth** call topic DT-BG-04-2018-2019: Sustainable EU aquaculture 2.0.

^[2] See definition of the 'multi-actor approach' in the introduction of this Work Programme part

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Blue Growth
Call Identifier:	h2020-bg-2018-2020
Topic Title:	All Atlantic Ocean Research Alliance Flagship
Topic Identifier:	BG-08-2018-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	23-01-2019,04-09-2019 (two-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/bg-08-2018-2019.html>

Specific Challenges: The **Atlantic Ocean** is an invaluable shared resource. The societal value of its blue economy is enormous for countries located on its shores. There are however, still considerable gaps in our knowledge and understanding of processes related to this ocean especially with regard to its chemistry, ecology, biodiversity, impacts of climate and the potential for the sustainable exploitation of its natural resources including aquaculture. The **Atlantic Ocean** is subject to a range of pressures, such as impacts related to climate change, pollution, fishing above sustainable levels, mining and coastal eutrophication. Both remote and local forces play a role in these changes and it is necessary to consider local, regional and basin-wide drivers and factors to understand, predict and adapt to change. Furthermore, the potential of seafood to reduce food and nutrition insecurity calls for collaboration at international level. Having already demonstrated how successful research cooperation can be in the North **Atlantic Ocean**^[1] in tackling some of these issues, the objective now is to take a systemic approach to tackle the scientific and socio-economic challenges and to move towards a basin-wide cooperation from Antarctica to the Arctic, through enhanced cooperation with countries bordering the South **Atlantic**, notably Brazil and South Africa^[2].

Scope: The actions shall aim at understanding and sustainably managing the **Atlantic Ocean** as a whole, through a large-scale basin effort involving both the northern and the southern parts of this ocean and its interlinks with the adjacent areas. In order to achieve this, it is necessary to bring together and systematically connect scientists, stakeholders, data, knowledge, expertise, capacities, and resources. This is only feasible through the synergistic

cooperation among the bordering countries. With the development of a South **Atlantic Ocean Science** Plan^[3] focusing on the challenges and research needs of the South **Atlantic Ocean**, which are also interconnected with the challenges and research needs of the North **Atlantic Ocean**, this cooperation can converge towards the implementation of a systemic approach by linking and jointly tackling the climate-food-ocean challenges. Overall, activities shall contribute to upscale cooperation along and across the **Atlantic Ocean** and the creation of long-term partnerships building on on-going initiatives such as the All **Atlantic Ocean Research Alliance**. In order to realise this, proposals shall address the following sub-topic [C]:

New value chains for aquaculture^[12] production

Activities shall explore new species, products and/or processes for aquaculture production (including algae). They shall consider existing, emerging and potential markets, take into consideration sound cost-effective production methods, sustainability and profitability. Consideration shall be given to the design of Internet of Things (IoT) approaches in the development of innovative production technologies, including new/improved biosensors, the circularity of the processes with the objective of zero waste and consider consumers' concerns and demands. The development of monitoring programmes for risk assessment including emerging pollutants and climate change resilience and mitigation will be essential. Activities shall contribute to reduce risks to human health. They will also foster higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors. Finally, it will be important to reinforce capacity building by aligning training programmes, including through industrial apprenticeship opportunities and networking along and across the **Atlantic Ocean**, in particular, but not exclusively, with South Africa and Brazil and other **Atlantic Ocean** coastal states. Reinforcing links between industrial partners is also crucial to exchange best practices and to facilitate the creation of business opportunities, therefore the SME participation in this topic is encouraged.

Consortia submitting proposals to this Flagship are encouraged to include participants from countries bordering the **Atlantic Ocean** as their active participation is key to the success of the proposals.

The Commission considers that proposals requesting a contribution from the EU respectively in the range of EUR 4 million for sub-topic [A], EUR 9 million for sub-topic [B] and EUR 8 million for sub-topic [C] would allow this specific challenge to be adequately addressed. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Proposals shall include a task to cluster with other projects financed under this topic and – if possible – with other relevant projects in the field funded by Horizon 2020. Possible links with related research and innovation

activities supported by the Belmont Forum^[13] on Ocean sustainability shall also be considered.

Expected Impact: In order to contribute to the implementation of the EU Integrated Maritime Policy and its related **Atlantic** Strategy and Action Plan, the EU **Blue Growth** Strategy, the EU Marine Strategy Framework Directive, the EU Maritime Spatial Planning Directive, the EU International Ocean Governance Communication, the EU Communication for a Sustainable European Future, the UN SDGs, the EU Food 2030^[14] process for food and nutrition security, as well as the **Atlantic Ocean Research Alliance**, activities shall:

In the short term:

- Contribute to the implementation of the EU-Brazil-South Africa Belém Statement on **Atlantic Ocean Research** and Innovation cooperation (sub-topics A, B & C)^[15].
- Increase the competitiveness of the EU's blue economy by developing new technologies to service societal needs and new value chains (sub-topics A, B & C).
- Create a lasting partnership on sustainable aquaculture business opportunities for industrial partnerships between Europe and countries bordering the South **Atlantic** (sub-topic C).
- Contribute to creating sustainable food production systems and implementing resilient aquaculture practices that increase productivity and production, help maintain healthy and productive aquatic ecosystems and strengthen capacity for adaptation to climate change (UN SDG 2) (sub-topic C).

In the medium term:

- Ensure that nutritious and safe food is available, accessible and affordable for all while conserving natural resources and contributing to climate change mitigation (UN SDG 2 and SDG 13) (sub-topic C).
- Contribute to achieving a zero waste European aquaculture system by strengthening the sustainability, resilience and robustness of industry, by 2030 (sub-topic C).
- Increase EU leadership in ocean technology developments (sub-topics A, B & C).
- Increase consumers' trust and confidence in seafood products (sub-topic C).
- Create a well trained workforce able to tackle the multi-sectoral, multi-disciplinary challenges and opportunities of the **Atlantic Ocean** (sub-topics A & C).
- Improve the professional skills and competences of those working and being trained to work within the blue economy.
- Contribute to policymaking in research, innovation and technology (sub-topics A, B & C).

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

- ^[1] EU-Canada-US **Galway** Statement on **Atlantic Ocean** Cooperation, May 2013
- ^[2] EU-Brazil-South Africa Belém Statement on **Atlantic** Research and Innovation Cooperation, July 2017
- ^[3] South-South Framework for Scientific and Technical Cooperation in the South and Tropical **Atlantic** and Southern Ocean
- ^[4] Prediction and Research Moored Array in the **Atlantic**
- ^[5] South **Atlantic** Meridional Overturning Circulation.
- ^[6] South **Atlantic** Patterns and Processes of the Ecosystems of the southern Mid-**Atlantic** Ridge.
- ^[7] An international Study of the Marine Biogeochemical Cycles of Trace Element and their Isotopes.
- ^[8] Surface Ocean Lower Atmosphere Study.
- ^[9] Ocean Tracking Network.
- ^[10] International Centre for Education, Marine and Atmospheric Sciences over Africa.
- ^[11] Benguela Current Large Marine Ecosystem.
- ^[12] In this context, 'Aquaculture' comprises the farming of aquatic organisms (including fish, shellfish, algae and aquatic plants) in all types of controlled or natural water environments (fresh, brackish and seawater).
- ^[13] <https://www.belmontforum.org/>
- ^[14] European Research and Innovation for Food and Nutrition Security, SWD(2016)319.
<http://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/SWD-2016-319-F1-EN-MAIN.PDF>
- ^[15] EU-Brazil-South Africa Belém Statement on **Atlantic** Research and Innovation Cooperation, July 2017

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Blue Growth
Call Identifier:	h2020-bg-2018-2020
Topic Title:	Coordination of marine and maritime research and innovation in the Black Sea
Topic Identifier:	LC-BG-09-2019
Type of Action:	CSA Coordination and support action
Deadline(s):	23-01-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-bg-09-2019.html>

Specific Challenges: The Black Sea is going through rapid changes in response to closely interlinked natural and anthropogenic pressures. Climate change is influencing the physical dynamics and hydrological structure of the Black Sea, while nutrient and pollutant loads are flowing from growing urban areas, inland and coastal activities. Increasing maritime traffic is also leading to safety concerns, water and air pollution and the introduction of invasive alien species. Fishing activities in the Black Sea are unsustainable. The area's marine heritage and its ecosystem services are also at risk. The geo-political complexity of the area further complicates the establishment of favourable framework conditions to support the growth of the blue economy (e.g. in trans-border cooperation on sea-related activities, including maritime spatial planning). Coordinated and integrated actions need to be carried out by countries bordering the Black Sea individually and together in order to create synergies and complementarities between sectors and countries. A common marine and maritime R&I strategy needs to be developed in order to achieve knowledge-based, sustainable and long-lasting **Blue Growth** in the region.

Scope: Proposals shall develop a Strategic Research and Innovation Agenda and Implementation Plan and contribute to the further alignment and convergence of national research and innovation activities and other relevant initiatives and investments by and with the different actors and across different sectors in primis between the countries bordering the Black Sea coasts and the whole EU. Activities shall establish and consolidate an operational network of marine and maritime research funders and other key players. Activities shall support the design and implementation of new transnational joint activities

This action shall build on past and on-going regional, international as well national and EU projects/initiatives (e.g. SEAS-Era ERA-NET, PERSEUS, COCONET, European research infrastructures such as EMBRC, Euro-Argo ERIC, ICOS ERIC and EMSO ERIC, Black Sea Economic Cooperation, DANUBIS-RI etc.). It must integrate research, policy, industry (including aquaculture) and society (including the preservation of local coastal cultures). It shall also contribute to pooling different funding streams at national and EU level, and combine them in an effective way. In agreement with the Commission services, projects should ensure appropriate flexibility so as to respond in real time to potentially fast-changing policy scenarios.

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

Expected Impact: Contributing to the implementation of the EU Bioeconomy Strategy, the EU Integrated Maritime Policy and its environmental pillar, the EU Marine Strategy Framework Directive, the EU Maritime Spatial Planning Directive, the EU Common Fisheries Policy and the EU **Blue Growth** Strategy, activities shall

In the short term:

- Deliver a Strategic and Innovation Research Agenda, structuring and consolidating research and innovation around the Black Sea and in cooperation with the rest of the EU.
- Boost the knowledge base and contribute to creating the right conditions for the development of new technologies and services and to improve human capacity and infrastructure in the Black Sea region.

In the medium term:

- Boost the blue economy and contribute to creating more jobs in the Black Sea region by coordinating and aligning EU, national and regional marine and maritime research programmes.
- Increase the competitiveness of EU researchers, industry and SMEs within the marine and maritime sectors.
- Maximise the impact of science diplomacy through enhanced marine cooperation in the Black Sea region.
- Improve the professional skills and competences of those working and being trained to work within the blue economy.
- Contribute to making the Black Sea healthier, more productive, resilient, better known and valued.
- Contribute to policymaking in research, innovation and technology.

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

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Blue Growth
Call Identifier:	h2020-bg-2018-2020
Topic Title:	Multi-use of the marine space, offshore and near-shore: pilot demonstrators
Topic Identifier:	BG-05-2019
Type of Action:	IA Innovation action
Deadline(s):	23-01-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/bg-05-2019.html>

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

Scope: Activities shall develop pilots by involving industrial actors and by integrating the available knowledge, technologies and facilities, in particular capitalising on the results of EU and national projects for the development of multi-use platforms or co-location of different activities in a marine space, and relevant support offshore vessels and autonomous vehicles. Pilots could include the reconversion/reuse of decommissioned platforms. The pilots shall aim to demonstrate in a real environment the viability (economic, social and environmental) of the multi-uses of a marine space for the output of at least two economic activities (such as renewable energy, aquaculture, marine bio-resources and biotechnologies, maritime activities and related services or

tourism). The aim is to demonstrate the economic, social and environmental added-value of the multi-use of a marine space around coastal or deep sea environments and should include a business plan and a commercial economic feasibility assessment (informed by the Pilot's results), addressing possible trade-offs and costs for other sectors, for the combined activities to generate revenue. The pilots should also address health and safety issues, including for the logistics, ancillary infrastructure and maintenance services. Societal acceptance should also be integrated, especially by involving local communities. The interdisciplinary and cross-sectorial nature of the project should also apply to training activities improving the professional skills and competencies and supporting the creation of new jobs in the blue economy.

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

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

In the short term:

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

In the medium term:

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

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

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Blue Growth
Call Identifier:	h2020-bg-2018-2020
Topic Title:	Sustainable European aquaculture 4.0: nutrition and breeding
Topic Identifier:	DT-BG-04-2018-2019
Type of Action:	IA Innovation action
Deadline(s):	23-01-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/dt-bg-04-2018-2019.html>

Specific Challenges: European aquaculture^[1] provides 1.25 million tonnes of seafood annually^[2], valued at over 4 billion euro. However, Europe heavily depends on external markets to ensure consumer demands for seafood (including from fresh water) is met. EU aquaculture needs to increase the competitiveness of its food products and to respond to consumer demands for high-quality and safe food, in a challenging context of climate change, greater competition for natural resources, and conflicting interests for space and markets. To ensure food and nutrition security by 2030, European aquaculture has to sustainably expand in terms of space, production and new value chains, exploring and enhancing innovation opportunities offered by sustainable and resilient aquaculture production systems, implementing the circular economy principles and increasing social acceptance of the corresponding activities and products. European aquaculture has now a unique opportunity to address not only today's challenges of climate change and food and nutrition security, but also to implement the international commitments encompassed in the UN SDGs, while fostering economic growth and social prosperity.

Scope: Activities shall develop smart breeding programmes and/or tailor feeding formulas and technologies for conventional and organic aquaculture – for marine and/or freshwater - targeting animal health (contributing to disease resistance) and welfare, different production systems, feeding efficiency, resilience and climate change mitigation - when applicable, including related traits and possible links between them (synergies, trade-offs) -, zero waste, by-products valorisation following circularity principles and organoleptic and

nutritional values of seafood optimisation. Efforts to close the reproduction cycle of economically important species should be considered. In addition, activities shall explore the potential of the microbiome on health and productivity of farmed species.^[3] Activities shall consider sound cost-effective production methods and profitability, testing, demonstrating and upscaling of the production processes to pre-commercial product. Regulatory authority and consumers should also be consulted, addressing their concerns and demands. The use of Internet of Things (IoT) and Artificial Intelligence (AI) should be considered. The participation of deep-tech start-ups is encouraged. Activities shall develop a set of indicators to monitor and measure progress towards the expected impacts as listed in the call text and in particular the improvement of the production systems that increases productivity, resilience and sustainability. The interdisciplinary and cross-sectorial nature of the project should also apply to training activities improving the professional skills and competencies and supporting the creation of new jobs in the blue economy.

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

Expected Impact: Contributing to the ongoing implementation of EU policies such as the Bioeconomy Strategy, the Circular Economy Strategy, the **Blue Growth** Strategy, the Common Fisheries Policy, the Marine Strategy Framework Directive, the priorities defined in the European Commission Staff Working Document FOOD 2030^[4], as well as international policies and initiatives such as the UN SDGs, the EU Biodiversity Strategy, the BLUEMED Initiative, the **Atlantic Ocean Research Alliance** and the BIOEAST Initiative, activities shall:

In the short term:

- Demonstrate that investment in sustainable aquaculture research and innovation leads to the creation of new value chains, markets, growth and jobs in coastal, offshore and landlocked areas.
- Improve consumers' awareness, perceptions and acceptability of the European aquaculture products and methods.
- Contribute to the creation of improved sustainable aquaculture systems and implement productive and resilient aquaculture practices that maintain healthy aquatic ecosystems and strengthen capacity for adaptation to climate change, by 2020 (UN SDG 2).
- Contribute to ensure the genetic diversity of farmed algae (micro and macro) and farmed aquatic species (fish, molluscs and crustaceans) and their related wild species, and promote access to the utilisation of genetic resources by 2020 (UN SDG 2).

In the medium term

- Contribute to increasing available, accessible, affordable and nutritious food and feed, while conserving natural resources and contributing to climate change mitigation (UN SDG 2).
- Improve the professional skills and competences of those working and being trained to work within the blue economy.
- Contribute to policymaking in research, innovation and technology.

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

^[1] In this context, 'Aquaculture' comprises the farming of aquatic organisms (including fish, shellfish, algae and aquatic plants) in all types of controlled or natural water environments (fresh, brackish and seawater).

^[2] http://www.europarl.europa.eu/atyourservice/en/displayFtu.html?ftuid=FTU_5.3.7.html

^[3] Two other topics under the SC2 Sustainable Food Security Call will address related issues on terrestrial animal welfare and the influence of microbiomes on terrestrial livestock health (SFS-02-2020: Healthy livestock gut ecosystem for sustainable production; and SFS-09-2018-2019: Increasing animal welfare).

^[4] European Research and Innovation for Food and Nutrition Security, SWD(2016)319.
<http://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/SWD-2016-319-F1-EN-MAIN.PDF>

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Blue Growth
Call Identifier:	h2020-bg-2018-2020
Topic Title:	Sustainable solutions for bio-based plastics on land and sea
Topic Identifier:	CE-BG-06-2019
Type of Action:	IA Innovation action
Deadline(s):	23-01-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/ce-bg-06-2019.html>

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

Scope: Activities shall focus on sustainability strategies and solutions for bio-based products. They shall include innovative product design and business models facilitating efficient reuse and recycling strategies and solutions, including ensuring the safety of recycled materials when used for toys or packaging food stuffs. They shall address the technical and economic barriers to bio-based plastics recycling as regards established and/or alternative recycling options. The risk, impact and solutions to cross-contamination with conventional plastics waste streams or other contaminants shall also be

addressed. Additionally, activities shall contribute to building a biodegradable plastics^[1] sustainability framework by mapping and focusing on the applications where biodegradable and compostable solutions could support public policies. Work on the biodegradable sustainability framework could include pre-normative research including field tests on land and at sea. Lastly, in line with the requirements of responsible research and innovation, activities shall support the development of international fora and platforms that would facilitate systemic innovation and uptake of results by enabling different actors of the value chains, from industry to civil society and public authorities, to cooperate towards more circularity in the bio-plastics economy. Activities shall build on the results and ongoing developments of EU projects funded under Framework Programmes FP7 and Horizon 2020 as well as on available and on-going standardisation results and activities including work within CEN TC 411 or under ISO. The interdisciplinary and cross-sectorial nature of the proposal should also apply to training activities improving the professional skills and competencies and supporting the creation of new jobs in the blue economy and in the bioeconomy.

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

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

In the short term:

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

In the medium term:

- Demonstrate solutions and develop strategies for circular innovation of the whole bio-plastics system, building on a shared vision and enhancing cooperation between all stakeholders on land and at sea.
- Contribute to the development of EU-harmonised criteria for biodegradability (in open-air and in oceanic conditions) and a

sustainability framework that increase market transparency and improves waste management practices on land and sea.

- Contribute to the assessment of the impact of plastics on terrestrial and aquatic flora and fauna and on human health.
- Improve the professional skills and competences of those working and being trained to work within the blue economy and the bioeconomy.
- Improve framework conditions and foster innovations that enable the plastics value chains to become more circular, resource-efficient and reduce their carbon and GHG footprint, in line with climate, energy and sustainable development goals (e.g. UN SDG 14).
- Contribute to policymaking in research, innovation and technology.

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

^[1] Oxo-degradable plastic fragments over time into small particles which remain in the environment and may increase pollution. They are not considered biodegradable plastics in the framework of this topic.

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Blue Growth
Call Identifier:	h2020-bg-2018-2020
Topic Title:	The Future of Seas and Oceans Flagship Initiative
Topic Identifier:	BG-07-2019-2020
Type of Action:	IA Innovation action
Deadline(s):	23-01-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/bg-07-2019-2020.html>

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

Scope: Proposals shall address one of the following sub-topics: blue cloud services, or ocean observations and forecasting^[4], or technologies for observations (in

2020). Actions shall demonstrate integration, capacity and (scientific, economic etc) potential. They shall complement and build on existing observation tools and systems such as EuroGOOS/EOOS, IOOS, GEO/GEOS, COPERNICUS Marine Service or EMODnet, European research infrastructures such as Euro-Argo ERIC and EMSO ERIC as well as funded H2020 projects such as SeaDataCloud^[5]. The interdisciplinary and cross-sectorial nature of the proposal should also apply to training activities improving the professional skills and competencies of workers and supporting the creation of new jobs in the blue economy.

[A] 2019 - Blue Cloud services

Activities shall develop cloud services for applications that are specific for oceans, seas and fresh water bodies and are necessary for marine ecosystems research, conservation, forecasting and innovation in the Blue Economy, building and implementing also Blue Cloud demonstrators as needed. Blue Cloud demonstrators should integrate the Essential Ocean Variables^[6], notably the biological variables, including plankton biomass and diversity. They shall build on ongoing efforts (data, tools, EOSC, including its Pilot Blue Cloud, Data and Information Access Services (DIAS) of COPERNICUS, etc) and take account of the parallel EOSC thematic initiatives being developed – such as the Food Cloud Demonstrator.^[7] The action shall contribute to unlocking the innovation potential of the Blue Cloud, and demonstrate its potential in promoting the blue economy shortening the time span between research and innovation in frontier fields, such as micro-organisms and genomics-enabled innovations^[8]. Activities shall build on existing research infrastructures, take advantage of existing data sharing activities (for example EMODnet), and build on relevant results of past and on-going global, national and EU projects such as SeaDataCloud^[9], BlueBridge, the EOSC Pilot and other relevant projects funded under Horizon 2020, including those under Information and Communication Technologies^[10]. Proposals should include a task to cluster with other projects financed under this topic and – if possible – with other relevant projects in the field funded by Horizon 2020.

[B] 2019 - Observations and forecasting

The action shall contribute to the development and demonstration of the feasibility of the European component of a future Global Ocean Observing System in line with the **G7 Tsukuba Communiqué**^[11]. It will support activities in the different EU sea basins and the **Atlantic Ocean**, including the deep sea (below 2000 m), also supporting the needs of food security and safety as outlined in Food 2030^[12]. It will also support the future Collaborative Research Action on Oceans of the Belmont Forum^[13]. It will underpin forecasting of the state of the ocean, climate change impact and weather. Activities shall include the demonstration of methods and technologies and their integration in existing systems to collect information on the state and variability of European seas and the **Atlantic Ocean**, including the impact of stressors and marine litter, and underpin

sustainable management of the marine environment and its resources (e.g. the effect of networks of protected areas and other spatial protection measures). They shall take account of the needs deriving from the **G7** Future of the Seas and Oceans Initiative^[14], from actions such as the **Atlantic Ocean Research Alliance** and its related South **Atlantic** Flagship, the BLUEMED Initiative, and notably common priorities with the WestMED Initiative^[15] and the EUSAIR^[16], and actions addressing other European regional seas. The inclusion of forecasting tools (for example to protect aquaculture installations or to inform fisheries decision making) shall be an advantage. Similarly, the sustainability of the approach selected, the integration of innovative observations solutions and existing systems, the smooth storage of data in open access data centres and the improvement of the predictive capability shall be demonstrated. Observations and data handling may also include pilots for Essential Ocean Variables (EOVs)^[6] under consideration (for example, nutrients, carbonate, sound and microbes/omics) and variables that are of importance in European regional seas as well as the integration of “augmented” observatories (i.e. genomic-enabled multidisciplinary observatories)^[17]. Flow of information across variables and disciplines shall be included. Data collected shall be in line with agreed standards, be openly available via portals (including EMODnet) and feed into the Pilot Blue Cloud (part of the European Open Science Cloud). International cooperation with Third Country partners is encouraged.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 6 million for sub-topic [A] and EUR 12 million for sub-topic [B] would allow this specific challenge to be adequately addressed. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Proposals shall include a task to cluster with other projects financed under this topic and – if possible – with other relevant projects in the field funded by Horizon 2020. Possible links with related research and innovation activities supported by the Belmont Forum^[18] on Ocean sustainability shall also be considered.

Expected Impact: Contributing to the ongoing implementation of EU Policies such as the Bioeconomy Strategy, the Circular Economy Strategy, the European Open Science Cloud Initiative, the **Blue Growth** Strategy, the Common Fisheries Policy, the Maritime Spatial Planning Directive, the Marine Strategy Framework Directive, the International Ocean Governance Communication and the UN SDGs, activities shall:

In the short term:

- Support the implementation of the Future of the Oceans Initiative of the **G7** Science Ministers.
- Deliver cloud services with work starting at technology readiness level (TRL) between 4 and 5 and achieving TRL between 6 and 7 or higher (sub-topic A).

- Achieve at least TRL 6 for ocean observations' systems and tools (sub-topic B).
- Contribute to regularly measure 50% of biological and biogeochemical EOVs, including in the sea below 2000 m, and predict negative impacts of ocean acidification and other selected stressors to take timely prevention, notably to protect aquaculture resources by 2020 (sub-topic B).
- Lay the foundations for and contribute to the sustainable management and protection of marine and coastal ecosystems to avoid significant adverse impacts (UN SDG 14) (sub-topic).

In the medium term:

- Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health (UN SDG 14).
- Improve forecasting of climate change, weather and ocean conditions to protect human activities in support of UN SDG 14 and other relevant goals, and of the objectives of related Conventions (for example, on biodiversity).
- Shorten the time span between research and innovation and foster economic value in the blue economy.
- Improve the professional skills and competences of those working and being trained to work within the blue economy and in the context of open data sharing.
- Contribute to policymaking in research, innovation and technology.
- Increase data sharing and increase integration of data.

Delegation Exception Footnote: This topic is expected to continue in 2020.

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

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

^[2] Belmont Forum <https://www.belmontforum.org/>

^[3] (JOIN(2016) 49)

^[4] All proposals under B) must include an observation part.

^[5] This will also include mutual feedback processes with the Copernicus Programme and other relevant actions such as those undertaken by IOC/IODE or the Marine Environment Monitoring Service.

^[6] http://gooscean.org/index.php?option=com_content&view=article&id=14&Itemid=114

^[7] See topic DT-SFS-27-2019 under this Work Programme's SC2 Sustainable Food Security Call.

^[8] Following up on the Communication "European Cloud Initiative – Building a competitive data and knowledge economy in Europe", the European Open Science Cloud (EOSC) will soon become an important tool for scientists, citizens and policy makers <https://ec.europa.eu/digital-single-market/en/news/communication-european-cloud-initiative-building-competitive-data-and-knowledge-economy-europe>

^[9] This will also include mutual feedback process with the Copernicus Programme and other relevant actions such as those undertaken by IOC/IODE or the Marine Environment Monitoring Service.

^[10] <https://ec.europa.eu/digital-single-market/en/information-communication-technologies-horizon-2020>

^[11] http://www.japan.go.jp/G7/_userdata/common/data/20160517communique.pdf

^[12] European Research and Innovation for Food and Nutrition Security, SWD(2016)319.
<http://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/SWD-2016-319-F1-EN-MAIN.PDF>

^[13] <https://www.belmontforum.org/collaborative-research-actions>

^[14] Recommendations 1, 3 and 4 on ocean observations and data sharing

^[15] Initiative for the sustainable development of the blue economy in the Western Mediterranean

^[16] <http://www.adriatic-ionian.eu/>

^[17] The development of such laboratories is not part of this call.

^[18] <https://www.belmontforum.org/>

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Sustainable Food Security
Call Identifier:	h2020-sfs-2018-2020
Topic Title:	European Joint Programme on agricultural soil management
Topic Identifier:	LC-SFS-20-2019
Type of Action:	COFUND-EJP COFUND (European Joint Programme)
Deadline(s):	23-01-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-sfs-20-2019.html>

Specific Challenges: Good agriculture soil management contributes to food security, climate change mitigation/adaptation and ecosystem services. Preserving and increasing fertility of soils, not least through their organic content and water retaining capacity, increases agricultural production. Soils and their carbon content are also important for climate change mitigation. A number of good soil management practices have been developed to deal with some of the challenges; however serious knowledge gaps exist, e.g. on the characteristics of soils in various regions of Europe, the factors influencing their fertility or their capacity to store carbon, depending on different climate and environment conditions. The European Union is committed to addressing climate change with ambitious targets. An integrated framework for soil research in Europe is required to overcome current fragmentation and unleash the potential of agricultural soils to contribute to climate change mitigation/adaptation, while preserving or increasing agricultural functions.

Scope: The European Joint Programme will boost soil research with main emphasis on agricultural soil contribution to climate change mitigation and adaptation. The aim is to construct a sustainable framework for an integrated community of research groups working on related aspects of agricultural soil management^[1]. The activities should look at how management of agricultural soils can reduce degradation of land and soils (in particular soil erosion and loss of organic matter), preserve and increase fertility of soils and how the processes related to organic content and water retaining capacity can support mitigation and adaptation to climate change. The EJP will evaluate and foster implementation of novel technologies for soil management and carbon sequestration. The aim of the EJP is also to look for synergies between

different approaches used in Europe for farm level accounting of emissions and removals from agricultural activities and particularly of carbon storage. In doing so, activities will contribute to improving inventories, measurements, reporting and accounting activities at different scales. Sustainable agricultural productivity and environmental aspects will also be targeted in connection with climate change mitigation and adaptation, so that optimisation of land management is ensured.

The European Joint Programme will include joint programming and execution of research and other joint integrative activities such as education and training (e.g. short-term missions, workshops), knowledge management, access to experimental facilities and databases, including also harmonisation, standardisation.

State-of-art technologies for mapping and soil sampling (physical, chemical and biological parameters) should be explored for wider and simple use from national level to farm level. In return, by e.g. developing new ICT tools, this could help farmers to protect and manage soils in line with current scientific understanding of processes. The EJP should also facilitate sampling and further development of LUCAS^[2] –European Soil Database as well support EU contribution to global soil mapping activities.

Participating legal entities must have research funding and/or management responsibilities in the field of agriculture soil management.

The proposal should include a five-year roadmap describing the key priorities and governance processes as well as the first annual work plan.

The acquired knowledge should support policy making in the domain of agricultural soil management and related policies, such as agriculture, climate and environment, and when feasible and appropriate transfer of science to practice for better agricultural soil management by farmers should be envisaged.

The activities will need to be coordinated as appropriate with the Global Soil Partnership and more particularly with European Soil Partnership node, with the **Global Research Alliance** on agricultural greenhouse gases, the project selected under SFS-50-2017, 4/1000, GACSA, JPI FACCE, JPI CLIMATE, Belmont Forum, and soil activities coordinated by the JRC^[3] when relevant and appropriate. The work of the EJP will also support number of policies: Common Agricultural Policy, Climate Change related policy and relevant environmental policies, in particular the implementation of the EU Soil Thematic Strategy^[4].

Considering the budget available, the scope covered and the potential entities for the EJP, the Commission considers that an EU contribution to a maximum 50% of the total eligible costs of the action or up to 40 million EUR would allow this specific challenge to be addressed appropriately.

Expected Impact: The project will lead to significant long term alignment of research strategies and activities at national and EU level by:

- fostering understanding of soil management and its influence on climate mitigation and adaptation, sustainable agricultural production and environment;
- understanding how soil carbon sequestration can contribute to climate change mitigation at regional level including accounting for carbon;
- strengthening scientific cooperation at European level including training of young scientists;
- development of agreed knowledge base and database for European contribution towards international reporting;
- contributing to the European Soil Data Centre with harmonised European soil information for international reporting.

^[1] Agro-forestry is included in the topic.

^[2] Land use/cover area frame statistical survey, abbreviated as LUCAS, is a European field survey program funded and executed by Eurostat http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Land_use/cover_area_frame_survey_%28LUCAS%29

^[3] European Soil Data Centre; EIONET - European Environment Information and Observation Network – soil network

^[4] COM(2006)231

Horizon 2020 Pillar:	Societal Challenges
Programme:	Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy
Call Title:	Sustainable Food Security
Call Identifier:	h2020-sfs-2018-2020
Topic Title:	Improving animal welfare
Topic Identifier:	SFS-08-2018-2019
Type of Action:	IA Innovation action
Deadline(s):	23-01-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sfs-08-2018-2019.html>

Specific Challenges: EU animal welfare legislation has evolved on the basis of scientific knowledge, improving the quality of animals' lives taking into account citizens' expectations and market demands. Nevertheless, a number of problems remain unsolved and the sector faces challenges to cope with them. Research is needed to further improve the management of animal welfare^[1], by looking into new opportunities offered by technological developments, development of appropriate business models and linking animal welfare with other production parameters, including animal health and environmental performance.

Scope:**B. [2019] Precision livestock farming (IA)**

Proposals should address various stages of the terrestrial livestock production system (e.g. breeding, rearing, fattening, transport and slaughter). Proposals should build on state of the art animal welfare approaches to develop innovative technologies, while also considering the needs to reduce emissions of air pollutants from agriculture. Work on indicators should be pursued, especially on those with potential for inclusion in efficient and impactful animal welfare management models. Innovative business models should be developed in order to make it easier for consumers to identify and choose enhanced welfare-friendly products. Projects may cover development of early warning systems; increased monitoring of behaviour, stress or other animal-based welfare indicators and effects on production efficiency; development of related intervention mechanisms.

Proposals for both sub-topics A and B should fall under the concept of the multi-actor approach^[2], ensuring that all the stakeholders, from farmers to consumers and regulators, will contribute to the building of new animal welfare approaches to further add value to EU foods of animal origin.

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

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

- a better understanding of animal welfare and associated animal behaviour;
- a broader range of animal welfare management strategies and tools;
- developing innovative approaches to measuring animal welfare at various stages of the production system (sub-topic B);
- increase the range of animal welfare management strategies and tools.

In the long run, projects shall increase the sustainability of the livestock sector by better responding to consumer demands and/or increasing competitiveness of the sector.

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

^[1] Farmed aquatic animals welfare is addressed under the **Blue Growth** call topic DT-BG-04-2018-2019: Sustainable EU aquaculture 2.0.

^[2] See definition of the 'multi-actor approach' in the introduction of this Work Programme part

Horizon 2020 Pillar:	Societal Challenges
Programme:	Health, demographic change and wellbeing
Call Title:	Better Health and care, economic growth and sustainable health systems
Call Identifier:	h2020-sc1-bhc-2018-2020
Topic Title:	Creation of a European wide sustainable clinical research network for infectious diseases
Topic Identifier:	SC1-HCO-08-2018
Type of Action:	CSA Coordination and support action
Deadline(s):	18-04-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sc1-hco-08-2018.html>

Specific Challenges: Infectious diseases pose a serious threat to global health. Emerging epidemics, pandemics and rising levels of antimicrobial resistance require a strong and coordinated response to protect citizens in Europe and beyond as indicated in the European One-Health Action Plan against AMR. There is a need to establish a clinical research network across Europe that has the capacity and capability to directly enrol patients with infectious diseases, to increase efficiency for testing and developing new diagnostic, preventive and/or therapeutic strategies and therapies. This should allow generating rigorous evidence to improve the diagnosis, prevention and treatment of infections and to better respond to infectious disease threats, and contribute to the **G7** aim concerning the need to establish a global clinical studies network on drug resistance that provides access to a large clinical research infrastructure for the design, coordination and conducting of clinical trials and studies in cooperation with the existing global experts networks and infrastructures such as ECRIN^[1] to ensure the common benefit of the outcomes^[2].

Scope: Proposals should build on successful European collaborative initiatives such as PREPARE^[3] and COMBACTE^[4] and further advance clinical research in the field of infectious disease by supporting the establishment of a European wide multidisciplinary clinical research network. Such a network should be capable of performing all clinical trial aspects encompassing study design, execution and reporting (sex and gender differences analysis to be included where relevant). It should develop and allow for innovative research approaches and enable flexibility in responding to unpredictable events and

signals. The network should provide clear and direct access for stakeholders including academic organizations, SMEs and larger industry to perform clinical studies. The proposal should develop a business plan to ensure the sustainability of the network. The network should actively disseminate information and contribute to awareness rising. Furthermore, it should also create synergies with global initiatives, enabling quick and smooth interactions and collaboration across the world.

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

Expected Impact:

- Reduce the cost and time of clinical trials for diagnosis, prevention and treatment of infections.
- Attract industry back to invest in the development of anti-infectives.
- Strengthen the operational capacity and the required infrastructures for clinical research.
- Increase information exchange between sectors and scientific disciplines.
- Maintain Europe's leading role in combating AMR and controlling infectious diseases.
- Ensure global collaboration between networks in Europe and other countries/regions to optimise a coordinated response to infectious diseases.

Cross-cutting Priorities: Open Science, Gender

^[1] <http://www.ecrin.org/>

^[2] http://www.mhlw.go.jp/seisakunitsuite/bunya/hokabunya/kokusai/G7kobe/KobeCommunique_en.pdf

^[3] <https://www.prepare-europe.eu/>

^[4] <https://www.combacte.com/>

Horizon 2020 Pillar:	Societal Challenges
Programme:	Health, demographic change and wellbeing
Call Title:	Better Health and care, economic growth and sustainable health systems
Call Identifier:	h2020-sc1-bhc-2018-2020
Topic Title:	Global Alliance for Chronic Diseases (GACD) - Scaling-up of evidence-based health interventions at population level for the prevention and management of hypertension and/or diabetes
Topic Identifier:	SC1-BHC-16-2018
Type of Action:	RIA Research and Innovation action
Deadline(s):	18-04-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sc1-bhc-16-2018.html>

Specific Challenges: The Global Alliance for Chronic Diseases^[1] (GACD) aims to coordinate research on chronic diseases at a 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 interventions and scale-up to different geographical, economic and cultural settings. The GACD call will support research associated with the scale-up of interventions for the prevention and/or management of hypertension and/or diabetes in low- and middle-income countries (LMIC^[2]) and/or in vulnerable populations in **High Income Countries** (HIC).

Hypertension affects one billion people worldwide and is a major contributor to the growing global pandemic of cardiovascular disease and stroke. It is estimated that raised blood pressure indirectly currently kills approximately 8 million people every year^[3], while cardiovascular disease accounts for approximately 18 million deaths a year^[4], nearly one third of total deaths. Not only is hypertension more prevalent in LMIC, there are also more people affected because a larger proportion of the population live in those countries than in HIC.

Poor hypertension control and the absence of strategies to maintain normal blood pressure, particularly in LMICs and in vulnerable populations in HIC, reflect the challenges of effective and affordable implementation in healthcare and other sectors.

In the past twenty years the global death rate from diabetes has doubled and the World Health Organisation is predicting that this will increase by two thirds by 2030. It is currently estimated that 422 million adults worldwide suffer from diabetes of which 80% are from LMIC. In 2012, an estimated 1.5 million deaths were directly caused by diabetes and another 2.2 million deaths were attributable to high blood glucose^[5].

Identifying and evaluating interventions to assess efficacy is not always enough to ensure their wide uptake in the real-world. Even when information, tools and interventions have been tested within real-world effectiveness studies, the development of knowledge to support their broader uptake^[6] has often remained outside the remit of research. Effectively implementing and scaling-up interventions, programmes, and policies to the regional and national levels are persistent challenges.

It is essential that policy makers, communities, families, caregivers, patients, as well as healthcare practice and other settings are equipped with evidence-based strategies to integrate scientific knowledge and effective interventions into everyday use. Researchers have found it challenging to ensure that tools and interventions deemed efficacious within clinical or community-based trials are readily adopted and implemented. Scaling-up interventions to large populations is not a straightforward task. In practice, translation from a pragmatic trial to the real-life commissioning and continuous delivery of an intervention across a health system is a huge political and economic challenge. Without intentional, guided efforts to scale-up, a new evidence-based intervention might not be broadly implemented.

Scope: Proposals must focus on the scale-up of interventions at population level for hypertension and/or diabetes prevention and/or management in LMIC, and/or in vulnerable populations in HIC. Proposals addressing comorbidities with either hypertension or diabetes, including between them, are encouraged.

Proposals must align with commitments or planned commitments at a regional or country level to implement evidence-based interventions (including evidence of cost-effectiveness and affordability) across health or other sectors. Policymakers, intervention payers (excluding research funding agencies), researchers (including local researchers), implementers and beneficiaries should be involved at all stages of the intervention development and implementation design to identify the challenges to intervention delivery in real settings. Such partners will be integral to the success and sustainability of the programme and it is essential that they are engaged early, and participate actively in the design of the research proposal. Researchers should collaborate closely with the authorities responsible for the programme's delivery. Those authorities must pay for and provide the interventions, possibly through loans contracted from development banks or other financial providers. Proposals will carry out the research associated with the scale-up of the intervention.

Proposals must build on evidence-based interventions (including evidence of cost-effectiveness and affordability) for the respective population groups under defined contextual circumstances and should seek to replicate and scale-up interventions. The selected interventions to be scaled-up should have been proven to be equitable, safe, effective, and efficient as well as making local health systems and health services more responsive and person-centred. In particular, proposals should:

- Be targeted at the regional or national level.
- Identify, develop, test, evaluate and/or refine strategies to scale-up evidence-based practices^[7] into public health, clinical practice, and community settings.
- Identify, understand, and develop strategies for overcoming barriers to the adoption, adaptation, integration, scale-up and sustainability of evidence-based interventions, tools, policies, and guidelines. They should address a range of scale-up challenges, including complex processes, inefficient use of resources, inequitable allocation of resources, and supply and demand barriers to scaling-up and sustainability.
- Identify, understand, and develop strategies for measuring the unintended consequences of intervening at a system level.
- Use scale-up methods, tools, and approaches to enhancing equity, efficiency, people-centred, and responsive health systems, promoting a culture of evidence-informed learning, engaging stakeholders, and improving decisions on policies and programmes to achieve better health outcomes.
- Be aligned with existing policies, programme management, monitoring and evaluation processes. They may include important shifts in the practices, incentives, and engagement of global, national and regional health policy, regulatory frameworks, management, research, publication, and civil society stakeholders.
- Include health economic assessments as an integral part of the proposed research.
- Demonstrate that policy makers and health authorities are supportive of, and have been engaged in designing the research proposal.

Proposals should be multidisciplinary and cross-sectorial. Relevant gender and cultural aspects, as well as vulnerable populations, should be taken into account. Proposals may build on previous hypertension and diabetes projects supported under the GACD that have demonstrated the potential for impact.

The proposal will cover the research around the scaling up of the interventions. The research may cover:

- Identification of the best evidence-based interventions;
- Definition and implementation of optimum scale-up methods (e.g. pilots in multiple settings, defining a scalable unit);
- Embed real time monitoring/evaluation to refine protocols and ensure adaptability and effective uptake;
- Evaluation of health outcomes;

- Where appropriate, make recommendations for the replication of the applied scale-up interventions to other countries or very large regions.

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

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

Expected Impact:

(one of or combinations of):

- Enhanced programmes and policies that can significantly reduce the numbers of patients with hypertension and/or diabetes through prevention.
- Enhanced programmes and policies that can significantly increase the number of patients for whom hypertension and/or diabetes was previously undetected.
- Enhanced programmes and policies that can significantly increase the number of patients for whom hypertension and/or diabetes is controlled.
- Enhanced effective, efficient, equitable and sustainable health systems, to lesser inequalities and greater health equity and additional societal benefits, in the medium and long-term.
- Improved health services more responsive to the need of the comorbidities of hypertension and diabetes and other non-communicable diseases.
- Recommendations to translate findings to other countries or very large regions.
- Contribute to the attainment of the sustainable development goals for non-communicable diseases^[8].

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

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

^[2] World Bank country classification based on estimates of gross national income per capita: databank.worldbank.org/data/download/site-content/CLASS.xls

^[3] Forouzanfar et al. JAMA. 2017;317(2):165-182. doi:10.1001/jama.2016.19043

^[4] Roth et al. J Am Coll Cardiol. 2017 May 15. pii: S0735-1097(17)37244-3.

^[5] WHO Global report on diabetes: <http://www.who.int/diabetes/global-report/en/>

^[6] For instance: cost and financing of the intervention, provider training, availability of resources, integration into healthcare systems, delivery to vulnerable or difficult-to-reach populations, monitoring the quality of intervention delivery

^[7] For instance: behavioural interventions; prevention, early detection, diagnostic, treatment and disease management interventions; quality improvement programmes

^[8] <https://sustainabledevelopment.un.org/sdg3>

Horizon 2020 Pillar:	Societal Challenges
Programme:	Health, demographic change and wellbeing
Call Title:	Digital transformation in Health and Care
Call Identifier:	h2020-sc1-dth-2018-2020
Topic Title:	Digital health and care services – support for strategy and (early) adoption
Topic Identifier:	SC1-HCC-04-2018
Type of Action:	CSA Coordination and support action
Deadline(s):	24-04-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sc1-hcc-04-2018.html>

Specific Challenges: Health and care service providers and users are increasingly facing complex decisions when exploring and investing in new health and care solutions. There is a need to support cross-border cooperation in preparation of procurement of research and innovative digital solutions, including on how to balance innovation risks with improved outcomes. Further support is also needed for implementing high quality policies, strategies and practises in a concerted manner and providing more confidence in addressing key areas of interventions and related unmet needs, procedures and other measures. In addition there is a need to facilitate an appropriate dialogue with the supply side and academic stakeholders to understand the constraints and possibilities.

Scope: Create favourable framework conditions for cross-border Communities of Practise (CoP) and create a network that will assist the health & care research and innovation ecosystems in taking investment decisions on future procurement of research and innovation and, eventually, on (large scale) deployment of eHealth systems and new care delivery models. The network should support existing ecosystems, create capacities, promote, co-ordinate, collaborate with other innovation accelerators and investors, and focus on adoption and scale of health innovation European wide. To facilitate sufficient knowledge brokerage all appropriate actors in the innovation chain and systems should be engaged

The consortium should represent a well-designed network of procurers and demand side actors e.g., European regions, national care authorities, NGOs, patient and consumer organisations that have proven experience in the field

and the capacity to engage and consult objectively all relevant actors. The consortium should also connect to investors, National Promotional Banks and Economic Development Agencies.

Additionally, diverging expectations and risk management in innovation chain should be addressed by offering a set of support activities beyond the innovation procurement procedures including access to finance and investor networks.

Approaches addressing consumer health should be interlinked in those cases where the institutional health and care services are expected to contribute.

The consortium is expected to assist those procurers that intend to prepare for a cross-border innovation procurement e.g., guiding them to address well-defined unmet needs of users in health and care, use the repositories of best practises and implementation guidelines and providing opportunities for networking.

The findings in earlier co-ordination and support actions for procurers e.g., EPP eHealth^[1], Inspire^[2] and EAFIP^[3] should be taken on-board. Networking with supply and consumer market actors, investors and business accelerators should be well established (e.g. eHealth hub^{[4][5]}, EIT-KIC^[5], EIP-AHA^[6], AAL^[7], ENoLL^[8], National Promotional Banks, Economic Development Agencies). The progress in Blueprint Digital Transformation of health and care^[9] and EU-US MoU on health IT innovation eco-systems^[10] should be incorporated.

The proposal should include parallel activities building up on the competences and capacities of the network including but not limited to:

1. Co-ordinate the development of a multi-collaborative growth policy & strategy of the European health & care procurers and other demand side actors in the quadruple helix^[11] systemic context. The knowledge brokerage should facilitate easy migration of competences benefitting the ecosystems at various maturity levels in the innovation chain in thematic Communities of Practise and other professional networks.

In particular, the following elements should be taken into account:

- facilitating the development of key areas of interventions in knowledge brokerage settings to get validated and accepted in health & care delivery services integrating data strategy as a fuel of novel digital health services;
 - linking research institutions, university hospitals in the context of thematic CoP;
 - education of new collaborative innovation principles and practises;
 - building upon national initiatives, however, taking into account the Lisbon treaty^[12] and
 - developing the existing or building up repositories of methodologies and set-ups of CoPs
2. Tailored assistance for procurers, regions, cities, national authorities and users to foster sustainable adoption e.g., by developing case specific innovation/business models, giving legal aid, addressing regulation,

managing risks, sharing best practises, training and education, access to finance, addressing procurement events etc., interlinking with innovation acceleration of digital health and care industries, other actors.

3. The network should undertake activities that investigate the feasibility and facilitate the concrete preparation of a cross-border PCP for at least one shared common user and procurement need.

The Commission considers that proposals requesting a contribution from the EU of up to €3M over three years would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting other amounts or duration.

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

- Concerted approach and solutions to the challenges faced by the health ecosystems as perceived by service providers and users in several countries. Increased opportunities for health and care services providers to address unmet needs. Reduced fragmentation of service providers' demands.
- Evidences of support and collaboration with consortia developing unmet needs for innovation procurement and implementation aspects beyond the innovation procurement procedures.
- Concrete preparation of a cross-border PCP for at least one shared common procurement need.

Cross-cutting Priorities: Innovation Procurement, Open Innovation

^[1] European Procurers Platform - eHealth - Transforming the market for eHealth Solutions
<http://innovationhospitals.com/>

^[2] International Network Supporting Procurement of Innovation via Resources and Education,
<http://inspirecampus.eu/>

^[3] European Assistance for Innovation Procurement (EAFIP) <http://eafip.eu/>

^[4] eHealth Hub: Integrated Support for eHealth SMEs and stakeholders, <https://ec.europa.eu/digital-single-market/en/news/ehealth-hub-integrated-support-ehealth-smes-and-stakeholders>

^[5] European Institute of Innovation & Technology - Health, <https://eit.europa.eu/eit-community/eit-health>

^[6] European Innovation Partnership on Active and Healthy Ageing,
http://ec.europa.eu/research/innovation-union/index_en.cfm?section=active-healthy-ageing

^[7] <http://www.aal-europe.eu/>

^[8] European Network of Living Labs <http://openlivinglabs.eu/>

^[9] Blueprint Digital Transformation of health and care:
<http://ec.europa.eu/research/conferences/2016/aha-summit/index.cfm?pg=blueprint>

^[10] EU-US EHEALTH/ HEALTH IT MOU UPDATED ROADMAP Webinar New Roadmap Work-stream "Supporting **TransAtlantic** eHealth/Health IT Innovation Ecosystems", 2016
https://www.healthit.gov/sites/default/files/final_eu-us_updated_roadmap_webinar_22516_v2-1_as_delivered.pdf

^[11] Open Innovation, Open Science, Open to the World – a vision for Europe, EC, 2016, p.12

^[12] Treaty of Lisbon amending the treaty on European Union and the treaty establishing the European Community (2007/C 306/01), see notably Articles 2C(k), 2E(a), 5a, 136a (section on Public Health), 188c(b)

<http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:12007L/TXT&from=en>

Horizon 2020 Pillar:	Societal Challenges
Programme:	Health, demographic change and wellbeing
Call Title:	Digital transformation in Health and Care
Call Identifier:	h2020-sc1-dth-2018-2020
Topic Title:	Support to further development of international cooperation in digital transformation of health and care
Topic Identifier:	SC1-HCC-03-2018
Type of Action:	CSA Coordination and support action
Deadline(s):	24-04-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sc1-hcc-03-2018.html>

Specific Challenges: Citizens in ageing populations wish to stay in their homes for as long as possible. They are however at risk of age related impairments such as poor health, cognitive impairment, frailty and social exclusion with considerable negative consequences for their independence, quality of life, that of those who care for them, and for the sustainability of health and care systems.

There is an increasing global interest in cooperation on research and innovation addressing this issue with digital solutions and services. It is however necessary to identify the future areas for international cooperation which have the highest potential as well as support the identification and networking of the potential funding organisations which can promote future cooperation. In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged, in particular with the **US**, Canada, Japan, South Korea and China.

Scope: The action should develop and deliver a roadmap for international cooperation which outlines key relevant research and innovation areas in digital solutions and services for active and healthy ageing. The selection of topics and potential funding schemes should be based on a clear methodology which also takes into account the European added value and identifies relevant existing and emerging initiatives which can form the basis for such a cooperation. The action should also ensure that relevant stakeholders are engaged during the process through regional and international workshops and a set of communication and dissemination actions.

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

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

- Increased awareness of relevant research and innovation initiatives by European and International stakeholders;
- Increased international cooperation in research and innovation on ICT for active and healthy ageing through a roadmap of priority areas and potential funding schemes;
- Increased networking of European and international stakeholders interested in international cooperation in the field;
- Improve competitiveness of European industry by opening up international open innovation possibilities and gaining access to future markets.

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

Horizon 2020 Pillar:	Societal Challenges
Programme:	Health, demographic change and wellbeing
Call Title:	Better Health and care, economic growth and sustainable health systems
Call Identifier:	h2020-sc1-bhc-2018-2020
Topic Title:	Implementation research for maternal and child health
Topic Identifier:	SC1-BHC-19-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	02-10-2018,16-04-2019 (two-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sc1-bhc-19-2019.html>

Specific Challenges: Each year, an estimated 213^[1] million women become pregnant and 140 million newborn babies are delivered. However, many of the women and infants receive no appropriate care or care that is below evidence-based standards; others suffer from over-medicalisation. Access to quality care, during and after pregnancy, is essential to ensure good maternal health and the favourable early development of the child.

The gap between countries with the lowest and highest maternal mortality rates has doubled between 1990 and 2013 and huge differences exist within countries in Europe and globally. The burden of maternal mortality in both contexts falls disproportionately on the most vulnerable groups of women and girls: Every day approximately 830 women die from preventable causes related to pregnancy and childbirth; 99% of maternal deaths occur in developing countries^[2]

Although there is a consolidated evidence base of what works in improving maternal and newborn health, the "knowledge-do" gap has not been bridged and evidence based guidelines are insufficiently implemented or integrated in routine training and service provision. Therefore, more and better targeted implementation research is needed.

Scope: Proposals should focus on implementation research^[3] for improving maternal and child health with a focus on the first '1000 days' from pregnancy until two years of age.^[4] This research can take place in either **High Income Countries** or low and middle income countries, or in a combination thereof.

The implementation research in the first 1000 days may cover:

- new or improved health service delivery interventions that strengthen maternal and child health; and/or
- the scaling up and/or adapting of existing evidence-based interventions to new contexts.

Neither pre-clinical research nor clinical trials in the context of product development are within the scope of this call.

The research should take into account the specificities of different contexts and situations. The research should be integrated from different perspectives, e.g. recognising the interdependent relationship between mother and child; addressing prevention, health promotion and treatment; allowing for the specific needs of vulnerable groups (e.g. preterm infants, adolescents, migrants); addressing different concurrent pathologies; avoiding the creation of parallel or vertical programmes, etc;. Research may cover physical and/or mental health, as well as communicable and non-communicable diseases. The integration of social sciences including gender analysis and the use of mixed methods research^[5] is strongly encouraged. In addition, particular attention should be given to equity issues.

The interventions should build on but may go beyond existing state-of-the-art knowledge on biological, psychological and social determinants of maternal and child health. Research is expected to be carried out in continuous partnership, in particular with the end-users, i.e. the concerned women, the fathers, and their community, in addition to policy makers, politicians, and the media, to ensure that evidence can be translated into policy and practice.

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

Expected Impact:

- Research-supported solutions to maternal and child health challenges.
- Providing evidence of successful and/or innovative approaches for bridging the "knowledge-do" gap in improving maternal and child health.
- Better understanding of scaling-up processes with regard to different contexts and resource requirements.
- Contribution to the achievement of SDGs 2 on improved nutrition (target 2), Goal 3 on health (targets 1 and 2 on maternal and child health) and Goal 5 on gender equality (targets 1 and 6) and Goal 10 (on reducing inequality within and between countries).

Applicants may be interested in a separate but connected call topic on "Food systems Africa" under Societal Challenge 2.

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

^[1] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4727534/>

^[2] WHO, Maternal mortality fact sheet (n. 348), Nov 2015 - <http://www.who.int/mediacentre/factsheets/fs348/en/> Lancet Series on Maternal Health (2016).

^[3] Implementation Research is the scientific study of methods to promote the systematic uptake of clinical research findings and other evidence-based practices into routine practice, and hence to improve the quality (effectiveness, reliability, safety, appropriateness, equity, efficiency) of health care. It includes the study of influences on healthcare professional and organisational behaviour

^[4] Lancet Series on Maternal and Child Nutrition (2013).

^[5] broadly defined as research in which the investigator collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry <http://journals.sagepub.com/doi/pdf/10.1177/2345678906293042>

Horizon 2020 Pillar:	Societal Challenges
Programme:	Health, demographic change and wellbeing
Call Title:	Better Health and care, economic growth and sustainable health systems
Call Identifier:	h2020-sc1-bhc-2018-2020
Topic Title:	The Human Exposome Project: a toolbox for assessing and addressing the impact of environment on health
Topic Identifier:	SC1-BHC-28-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	16-04-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sc1-bhc-28-2019.html>

Specific Challenges: Despite the general acknowledgement by the scientific community that 'Genetics load the gun but environment pulls the trigger'^[1] when it comes to the causation of major non-communicable diseases (NCDs)^[2], there is persistent uncertainty as to the global burden of disease attributable to environmental (including life-style and climatic) factors, including healthcare costs and negative economic impact. Deciphering the human exposome^[3] is a novel way of addressing the challenge to improve health and reduce the overall burden of disease. This will require improved knowledge of health risks, including combinations of several risk factors, and the mechanisms by which they affect health at different stages throughout the life course, including exposures in foetal life. Effective preventive action will need to be designed, building on knowledge of various risk factors, including exposure to pollutants in daily life, individual behaviour and the social context, taking into account gender issues.

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

Scope: Applicants should take advantage of the last decade's rapid technological advances which have opened up new opportunities to collect, combine and analyse large data sets offering new possibilities to understand the

contribution of environmental factors to the global health burden of common chronic diseases. Proposals should use innovative approaches to the systematic and agnostic identification of the most important environmental risk factors for the development of major NCDs across the life course (including in utero), leading to preventive interventions at the individual, group or population level and contribute to sustainable healthcare. Well-designed retrospective epidemiological studies may be included and proposals may envisage the creation of a prospective Europe-wide exposomics cohort and biobank, integrating behavioural, socio-economic factors and clinical records.

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

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

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

The Commission considers that a proposal requesting an EU contribution between EUR 8 to 12 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Innovation in environmental health sciences, in particular for external and internal exposure assessments and data management.
- Enabling researchers and policy makers to continuously include new knowledge in the policy making processes by using the toolbox to generate data and information.

- Better prediction of disease risk by acquisition of new knowledge on the influence of external exposures on biological pathways at different life-stages and identification of early signs of health damage caused by environmental factors.

Cross-cutting Priorities: Gender; Socio-economic science and humanities

^[1] Dr. Francis Collins, Director of the **U.S.** National Institutes of Health (NIH)
www.ncbi.nlm.nih.gov/pmc/articles/PMC2675383

^[2] <http://www.who.int/mediacentre/news/releases/2016/deaths-attributable-to-unhealthy-environments/en/>

^[3] The concept of the exposome refers to the totality of environmental exposures (diet, lifestyle, occupational and environmental factors) from conception onwards, including its external and internal components.

Horizon 2020 Pillar:	Societal Challenges
Programme:	Smart, green and integrated transport
Call Title:	2018-2020 Mobility for Growth
Call Identifier:	h2020-mg-2018-2019-2020
Topic Title:	Harnessing and understanding the impacts of changes in urban mobility on policy making by city-led innovation for sustainable urban mobility
Topic Identifier:	LC-MG-1-3-2018
Type of Action:	RIA Research and Innovation action
Deadline(s):	30-01-2018,19-09-2018 (two-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-mg-1-3-2018.html>

Specific Challenges: Urban mobility is in transition. This is a result of, for example, changing user needs; emerging transport technologies; new transport services using new business models; and new institutional and financing structures. Greater data availability provides new opportunities for evidence-based policy and policymakers aim at an ever-increasing integration of urban mobility policy with other sectorial policies. The impacts of this change will go far beyond the transport sector and influence other sectors that are transport-reliant.

The policy impacts, individually and in combination, of new solutions, which are at different levels of maturity, are not clear yet. There are many open questions about how policymakers should react and how Sustainable Urban Mobility Plans (SUMP), and other sectorial policies that affect urban mobility, should respond and adapt to these potential disruptive changes. Therefore, research is necessary to improve the understanding of the impacts of new urban mobility solutions on policy making.

This topic covers passenger transport and freight transport. It covers urban and peri-urban areas. Special attention should be paid to the needs of vulnerable groups and users with different cultural backgrounds taking into account gender issues; and to the specific context of areas that are undergoing rapid economic change.

Scope: This topic will be implemented through two sub-topics with different types of actions: Proposals should address the following:

a. Research and innovation actions:

This sub-topic asks to examine the impacts of new mobility solutions, addressing the changing mobility patterns and set up of mobility services, including possible negative effects, and covers all relevant transport modes (including active modes) and vehicle types. City-led proposals should address one or more of the following aspects:

- investments in and management of the transport network, with attention for facilities for recharging; transport system resilience; and transport demand management tools (such as pricing; low emission zones; parking management; one way traffic);
- the specific challenges in areas undergoing rapid economic change, for example in institutional setup; policy coherence; policymakers mind-set; outdated or incomplete legislation/methodologies; and data/statistics;
- new operating and business models in collective public and private transport;
- pathways to tackling congestion and reducing levels of car use through decoupling economic growth and high mobility from traffic growth;
- implications for and interaction with urban planning and design including inputs for developing SUMP.

Proposals should incorporate new data-driven planning approaches.

The actions will also deliver at least three validated test cases (small pilot projects with quantified objectives in which public stakeholders and economic actors participate) that take into account different political and socio-economic contexts. The active participation of a small number of representatives from authorities of small and medium-sized cities in proposals should be ensured.

In line with the Union's strategy for international cooperation in research and innovation^[1] international cooperation is encouraged, especially with the **USA**, China and India

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 to 4 million each for Research and Innovation actions, and of up to EUR 3 million for the Coordination and Support Action, could address this specific challenge appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Proposals addressing sub-topic A) above, will produce new, practice-based knowledge on how to navigate urban mobility policy through transition taking into account legacy systems and the need to integrate new solutions that are at different levels of maturity. They will provide added-value inputs and contribute to evidence-based policy making at local, regional, national and EU levels. Proposals should demonstrate how their work will support effectively mobility policies in the cities' efforts to follow a viable transformation path towards sustainable mobility.

The results of the actions will feed into future EU initiatives, for example on Sustainable Urban Mobility Planning (SUMP); cooperative-ITS; travel and traffic information; low-emission logistics; and future infrastructure networks, including links to the TEN-T and can help improve Air Quality Plans.

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

^[1] COM(2012)497

Horizon 2020 Pillar:	Societal Challenges
Programme:	Smart, green and integrated transport
Call Title:	2018-2020 Mobility for Growth
Call Identifier:	h2020-mg-2018-2019-2020
Topic Title:	Harnessing and understanding the impacts of changes in urban mobility on policy making by city-led innovation for sustainable urban mobility
Topic Identifier:	LC-MG-1-3-2018
Type of Action:	CSA Coordination and support action
Deadline(s):	04-04-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-mg-1-3-2018.html>

Specific Challenges: Urban mobility is in transition. This is a result of, for example, changing user needs; emerging transport technologies; new transport services using new business models; and new institutional and financing structures. Greater data availability provides new opportunities for evidence-based policy and policymakers aim at an ever-increasing integration of urban mobility policy with other sectorial policies. The impacts of this change will go far beyond the transport sector and influence other sectors that are transport-reliant.

The policy impacts, individually and in combination, of new solutions, which are at different levels of maturity, are not clear yet. There are many open questions about how policymakers should react and how Sustainable Urban Mobility Plans (SUMP), and other sectorial policies that affect urban mobility, should respond and adapt to these potential disruptive changes. Therefore, research is necessary to improve the understanding of the impacts of new urban mobility solutions on policy making.

This topic covers passenger transport and freight transport. It covers urban and peri-urban areas. Special attention should be paid to the needs of vulnerable groups and users with different cultural backgrounds taking into account gender issues; and to the specific context of areas that are undergoing rapid economic change.

Scope: This topic will be implemented through two sub-topics with different types of actions: Proposals should address the following:

b. Coordination and support actions:

This sub-topic addresses the facilitation of knowledge exploitation and support to the cooperation between projects and stakeholders involved in the projects under the first sub-topic, and from across CIVITAS 2020. This Coordination and Support Action should also consolidate the common ‘CIVITAS Process and Impact Evaluation Framework’ and ensure the continuity of a ‘CIVITAS Secretariat’ as well as financing of CIVINets.

Proposals should present innovative approaches for all of the following needs:

- local capacity building and training in deploying innovative mobility solutions;
- networking cities and engaging with stakeholders working at the local level, overcoming language and contextual barriers;
- reinforcing the involvement of the CIVITAS cities from different CIVITAS-Phases in the CIVITAS network;
- partnering with industry and civil society in navigating through transition and change;
- implementing a communication and dissemination strategy with high impact actions.

In order to maximise impacts, and in the context of CIVITAS 2020, all projects funded under this topic and other relevant topics (for example dealing with SUMP) shall work together and exchange information and practical experiences

In line with the Union’s strategy for international cooperation in research and innovation^[1] international cooperation is encouraged, especially with the **USA**, China and India

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 to 4 million each for Research and Innovation actions, and of up to EUR 3 million for the Coordination and Support Action, could address this specific challenge appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Proposals addressing sub-topic B) will help to promote the take up of innovation that leads to more effective and efficient transition of urban mobility systems by strengthening the mechanisms for urban mobility policy making and planning. A ‘CIVITAS Secretariat’ will be continued. Capacity building; engaging; partnering; and communication and dissemination actions will aim at a maximum impacts and reach of target audiences.

This results in a developing knowledge-base, technical capacity, harmonised evaluation activities, and support for up-scaling and knowledge transfer which is available to cities and other interested parties. Clear commitments and contribution from the action's participants to Europe-wide take up are expected. The Coordination and Support Action must ensure both

continuation of CIVITAS support activities and also support for future CIVITAS-type actions.

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

^[1] COM(2012)497

Horizon 2020 Pillar:	Societal Challenges
Programme:	Smart, green and integrated transport
Call Title:	2018-2020 Mobility for Growth
Call Identifier:	h2020-mg-2018-2019-2020
Topic Title:	Innovative technologies for improving aviation safety and certification in icing conditions (InCo flagship)
Topic Identifier:	MG-2-5-2018
Type of Action:	RIA Research and Innovation action
Deadline(s):	04-04-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/mg-2-5-2018.html>

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

Aviation is inherently and increasingly international. Aviation impacts globally the atmosphere, and vice-versa. Aviation emissions to the atmosphere are increasing. In-flight weather hazards are also increasing worldwide.

Meanwhile, the demand for aviation keeps growing globally. Commercial Air-Transport (CAT) fatal and non-fatal accidents are continuously decreasing with EASA Member States accident rate much lower than the world-wide one^[1].

However, in-flight weather hazards, in particular icing conditions, are a contributing factor in accidents and incidents world-wide. In line with ACARE Strategic Research & Innovation Agenda, further advancements in understanding, modelling, detection, avoidance and mitigation of in-flight performance degradation are necessary towards enabling harmonised certification with less flight trials.

Scope: Although several research activities addressed the issue of ice accretion on aircraft, resulting in improved understanding of icing phenomena, and also in promising strategies to detect and to remove ice accretion, those advancements were mostly focused on airframe. Future advancements should also include engines as well as rotorcrafts. In addition, reduction of power consumption of in-flight anti/de-icing devices and of the negative environmental impact of anti/de-icing processes is necessary, both in-flight and on the ground.

The proposals may aim at addressing several or all of the following areas:

- Further advancements in the detection, understanding, sensing, modelling, simulation and testing of icing, de-icing and anti-icing of all types in aviation (e.g. mixed-phase, ice crystals, super cooled large droplets, etc).
- Explore/propose/validate new certification methods, means of compliance, standards and protection systems (e.g. either active or passive, including coatings) for all types of icing and air vehicles, engines and on-board systems.
- Address the overall system integration, including operational and maintenance aspects.

The range of TRLs to address is broad, from fundamental research up to TRL 5 (at the end of the project). In line with the strategy for EU international cooperation in research and innovation^[2], multilateral international cooperation is encouraged, in particular with countries such as **United States**, Canada, Russia, Japan, Brazil and Australia. International cooperation can include work towards global monitoring of in-service events and icing hazards and towards joint tests, standards and certification, taking into account the activities of bodies such as the European Aviation Safety Agency (EASA), Federal Aviation Administration (FAA), EUROCAE and United Nations' International Civil Aviation Organisation (ICAO). Proposals may include the commitment from the European Aviation Safety Agency to assist or to participate in the action.

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

Expected Impact:

- Contribute to increase passenger safety by fewer accidents and less in-flight events worldwide.
- Contribute to decrease costs for all parties (e.g. industry, authorities, research & test centres) by improved and internationally accepted certification, standards and means of compliance, covering all types of icing hazards.
- Contribute to decrease delays in operations thanks to more efficient avoidance of icing hazards and to fewer damages in need of inspection and repair.

Cross-cutting Priorities: International cooperation

^[1] EASA, Annual Safety Review, 2016

^[2] (COM(2012)497

Horizon 2020 Pillar:	Societal Challenges
Programme:	Smart, green and integrated transport
Call Title:	2018-2020 Digitising and Transforming European Industry and Services: Automated Road Transport
Call Identifier:	h2020-dt-art-2018-2019-2020
Topic Title:	Support for networking activities and impact assessment for road automation
Topic Identifier:	DT-ART-02-2018
Type of Action:	CSA Coordination and support action, RIA Research and Innovation action
Deadline(s):	04-04-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/dt-art-02-2018.html>

Specific Challenges: Besides technological progress in developing new automated driving functions, there are still many challenges and uncertainties related to the deployment of connected and automated vehicles. Many of these challenges can be better addressed when European partners work together and cooperate with international partners. Therefore, a coordinated and harmonised approach to support the deployment of automated driving systems at European and international level is needed. More cooperation is also necessary to assess the impacts of connected and automated driving systems. Several methodologies to assess impacts of connected and automated transport systems have already been developed and applied. However, a commonly agreed methodology to assess the impacts of connected and automated driving systems that would allow for informed decision making does not exist.

Scope: This topic will be implemented through two sub-topics (two types of actions). Proposals should address only one of the two.

Subtopic 1) Research and innovation action: Assessment of impacts, benefits and costs of connected, cooperative and automated driving systems

Proposals should address all the following aspects:

- Assess the short, medium and long term impacts, benefits and costs of different scenarios/use cases for connected, cooperative and automated driving systems (for passengers cars, automated urban

transport and goods transport) considering the full range of impacts including, but not limited to, driver behaviour, mobility behaviour, recharging and refuelling behaviour, accessibility, safety, traffic efficiency, emissions, energy consumption, use of resources, impact on employment, required skills, infrastructure wear and land use.

- Establish a solid multidisciplinary methodology to assess the long-term impacts of connected and automated driving systems.
- Provide a public toolkit for assessing impacts, benefits and costs of connected and automated systems (including required infrastructures) and decision support system to help authorities to evaluate strategic decisions on urban regulations and planning.

Specific attention should be paid to the transition phase towards higher levels of automation when individual vehicles may operate at different automation levels given the circumstances, and where human and machine operated vehicles are both present in varying penetration degrees.

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

The Commission considers that proposals requesting a contribution from the EU between EUR 4 and 6 million would allow this sub-topic to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Subtopic 2) Coordination and support action: Networking activities to support connected, cooperative and automated driving

Proposals should address all the following aspects:

- Explore ways to strengthen cooperation and experience exchange amongst European and international stakeholders of connected, cooperative and automated driving in areas such as: research and innovation (e.g. human-machine interface, social acceptance of automated driving technologies, digital technologies for automation, impact assessment), global framework and international standards for connectivity and automation technologies, sharing of knowledge and data of large-scale European and national demonstration projects, foster a common evaluation framework across the demonstrations, education and training needs.
- Support programme owners and managers to better coordinate national and multi-national funding programmes in the area of connected, cooperative and automated driving, building on past coordination efforts.
- Support ongoing and extend international cooperation activities in the area of cooperative, connected and automated driving (including road

automation, standardisation harmonisation and connectivity issues). An extension of the cooperation to countries and regions beyond US and Japan should be explored.

- Provide a forum for European and international stakeholders of road automation to exchange experiences and knowledge on the development and deployment of cooperative, connected and automated mobility systems and to discuss future challenges. Organise conferences and workshops on connected, cooperative and automated driving in Europe. Interactions fostering discussions on best practices and lessons learned of automated transport solutions across all transport modes are encouraged.

In line with the Union's strategy for international cooperation in research and innovation, international cooperation is encouraged. In particular, proposals should consider cooperation with projects or partners from the **US**, Japan, South Korea, Singapore, and/or Australia. Proposals should foresee twinning with entities participating in projects funded by **US DOT**^[1] to exchange knowledge and experience and exploit synergies.

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

Expected Impact:

- Enable decision makers to promote the most promising scenarios of connected, cooperative and automated driving systems based on a comprehensive impact assessment and knowledge base.
- Demonstrate the expected socio-economic and environmental benefits of future connected, cooperative and automated driving systems and raise awareness and acceptance.
- Minimise uncertainties related to the development and acceptability of different scenarios of connected, cooperative and automated driving.
- Understand which factors and measures can better unlock and foster the adoption of connected, cooperative and automated vehicles.
- Better visibility, comparability and transferability of research and demonstration activities in Europe and worldwide.
- Closer cooperation between stakeholders within Europe and worldwide on common challenges in the area of connected and automated driving. Better coordination of national and multi-national funding programmes will create synergies and reduce overlaps when setting R&I priorities.
- Support to EU Member States and stakeholders that are undertaking, or planning, larger scale public road tests with connected, cooperative and automated vehicles to exchange learnings and data, exploit synergies and propose common ways on how to leverage pilots towards deployment.
- Higher penetration of automated driving functions in the market, resulting in both increased safety on the roads and lower emissions, and stronger market position of European industry in systems for vehicle automation, including through Galileo and EGNOS.

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

^[1]United States Department of Transportation.

Horizon 2020 Pillar:	Societal Challenges
Programme:	Smart, green and integrated transport
Call Title:	2018-2020 Mobility for Growth
Call Identifier:	h2020-mg-2018-2019-2020
Topic Title:	InCo Flagship on Integrated multimodal, low-emission freight transport systems and logistics
Topic Identifier:	MG-2-9-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	16-01-2019,12-09-2019 (two-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/mg-2-9-2019.html>

Specific Challenges: Global as well as regional and local freight transport is massively changing due to accelerating technological changes, the establishment of new players in global trade, the rise of protectionism, and the slowing down of economic growth of important partners such as China. New logistics concepts (such as the Physical Internet) and new disruptive technologies, such as Blockchain, Industry 4.0, vehicle automation and truck platooning or new business models, like 'crowdshipping' and the circular economy models will have an impact on global freight transport, its optimisation and its environmental footprint that needs to be better understood and assessed. Furthermore new trade routes from and to Europe will probably change the traditional pattern of freight movement and will need new connections with European corridors and hubs at a time of budget limitation on investment for transport infrastructure.

Sustainable integrated multimodal freight transport is particularly important for the development of countries in special situations – least developed countries, landlocked developing countries, and small island states and outermost regions - which face common problems resulting from the under-resourcing of transport infrastructure and services, traffic-related air pollution and high accident levels, but also diverse geopolitical and trade situations. These countries/regions also have an enormous potential for sustainable development. International cooperation can support their economies both domestically and globally for a global benefit and ensuring better integration of these regions into the world economic landscape.

Scope:

Proposals should address one or more of the following aspects:

- Understanding how new concepts in logistics, in combination with new national strategies to organize freight flows in ports and airports have an impact on global freight transport, and on related greenhouse gas emissions. Multimodal transfer zones from ports and airports from long-haul to last mile logistics need to be better analysed in order to find appropriate measures and for ensuring seamless door-to-door transport, exploiting the full potential of modularization and other innovative logistics concepts. International cooperation with major trade partner countries is essential to ensure the smooth transfer at all levels of the transport chain. Proposals should also address solutions that enable peripheral regions and landlocked developing countries to have proper accessibility to international trade.
- Speed up the process and transition towards the Physical Internet paradigm, demonstrating how different technologies, business cases and standards come together in real-world applications, and are able to deliver added value to the users and have positive impacts in terms of emissions and energy consumption. Priority partners should be USA, Canada, China, Japan. Demonstrations of satellite-based applications using EGNOS and Galileo are also suggested.
- Research the range of new issues and questions emerging with the new trade routes to and from Europe, such as the Northern Sea Route (across an ice-free Arctic in summer months) or the new Silk Road routes and the Chinese One Belt One Road strategy; the effect of the development of these new routes on trans-continental freight modal split; the additional interfaces needed between the new overland routes and the EU internal transport networks / corridors. Priority partners are those along the routes. The geopolitical and trade aspects of these developments, in particular on countries affected by these developments, should be considered.
- Understand new disruptive trends emerging as on-demand logistics solutions such as crowd-sourcing of deliveries (or ‘crowdshipping’) which have the potential to be a logistics ‘game-changer’, evidencing different impacts in both emerging and industrialized countries, including the possible integration of passengers and freight flows. Research on the crowd-sourcing of logistics would benefit from international collaboration, partly to compare the development of the phenomenon in different markets, but also to explore whether it can be extended to long-haul / cross border freight delivery, taking in consideration economic, regulatory and security constraints.
- Assess the impact of emerging technologies in other sectors than freight transport (e.g. Blockchain, Industry 4.0, 5G, 3D printing, unmanned aerial vehicles (UAV's)) on the logistics operational system, and identify the potential development paths that lead to the optimal exploitation of their positive effect.

- Collect best case models and develop decision support systems aimed at helping public authorities and private companies to determine the most likely scenarios and to promote a higher level of collaboration between the different stakeholders, including new emerging ones.
- Consideration of aspects of governance, privacy and cybersecurity of and with regard to cargo.

The Commission considers that proposals requesting a contribution from the EU between EUR 3 and 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

In line with the Union's strategy for international cooperation in research and innovation^[1], international cooperation is encouraged. In particular proposals should consider cooperation with projects or partners from the **US**, Japan, Canada, China, Latin America.

In particular, proposals should foresee twinning with entities participating in projects funded by US DOT to exchange knowledge and experience and exploit synergies.

Expected Impact: Main impact from the R&I activities should be the improved integration of the European transport network (both hard – TEN-T – and soft – logistics and IT) with the global network, through the sustainable development of the transport nodes likely to benefit from the emergence of new trade routes and harmonised platforms and new and revised 'nodes', also in support of the sustainable development of new logistics routes and their link with national/regional markets. Better understanding of the impact of emerging technologies on freight flow and subsequent guidelines to optimize vehicle, infrastructure and operation accordingly. Facilitate the development of disadvantaged regions and their inclusion into the international trading system. Better understanding of links between technological development, trade and geopolitics. Research should be validated in a selected number of case studies through pilot demonstration, trials and testing involving service providers and end-users.

Cross-cutting Priorities: International cooperation

^[1] (COM(2012)497)