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Call Topics for International Cooperation

in Horizon 2020

EU and Africa

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Content

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Industrial Leadership

Horizon 2020 Pillar:	Industrial Leadership
Programme:	Leadership in enabling and industrial technologies (LEIT)
Call Title:	Information and Communication Technologies
Call Identifier:	h2020-ict-2018-20
Topic Title:	International partnership building between European and **African** innovation hubs
Topic Identifier:	ICT-58-2020
Type of Action:	IA Innovation action, CSA Coordination and support action
Deadline(s):	22.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ict-58-2020

Specific Challenges: To reinforce cooperation and strategic partnership with selected countries in **Africa** to support the strengthening of existing digital innovation hubs (DIHs) in **Africa** and to facilitate the collaboration between EU and **African** DIHs in order to strengthen a common EU-**Africa** innovation and start-up ecosystem

Targeted countries: Low and middle income countries[1] in **Africa**

Scope:

a. Innovation Action (IA)

Cooperation on developing and strengthening of digital innovation hubs in **Africa** actions will address:

- reinforcing the development and establishment of Pan-**African** networks of Digital Innovations/Tech Hubs through strengthening local digital innovation and startup ecosystems by:
  - providing technical capacity building and technology transfer to local SMEs, local governments and projects focused on digitalisation and the uptake of digital innovations such as the use of open data, artificial intelligence, cybersecurity, blockchain technologies;
  - fostering the development of an enabling environment for digital start-ups through establishing networks between fast growing companies, startup founders, local governments, academic institutions, early stage investors and corporates;

- providing capacity-building programmes, focused on digital and entrepreneurship skills specifically targeted to marginalised youth, women and vulnerable groups;

- developing a mutually beneficial cooperation between **African** and European Digital Innovation Hubs to strengthen the long-term sustainability of DIHs by:
  - supporting local youth employment by developing collaborative projects, that match the demand for qualified digital skills in Europe with the existing ICT professionals in **Africa**;
  - facilitating a network between **African** and European innovative entrepreneurs and start-ups with the goal to support start-up incubation, mentoring programs and facilitate increased investments in **African** start-ups and EU-**African** joint ventures;
  - carrying out capacity-building activities, such as Summer Academies bringing together successful entrepreneurs with **African** and European start-ups and ICT professionals;
  - facilitating linkages and partnerships with **African** diaspora communities in Europe with the goal to better support the creation and development of digital startups and SMEs in **Africa**

The activities will complement other European initiatives under the DCI and the ENI, such as the EU/DE/FR initiative on a Digital Innovation Bridge that will support the scale up of **African** startups.

Proposals should be submitted by a partnership complementing each other with a particular focus on the participation of relevant Member States or associated countries digital Innovation/tech Hubs, as well as **African** digital Innovation/tech Hubs. Due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, proposals shall include at least one participant from a low or middle income country in **Africa**.

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

b. Coordination and Support Action (CSA)

The aim is to foster coordination between actions taken in **Africa** and the EU to implement the recommendations of the EU-AU task force on digital economy, in particular in the area of research and innovation, through support to, engagement with, and monitoring of ICT-related activities and organisation of events in a critical mass of **African** countries.

Activities will include:

- supporting initiatives in **Africa** on the digitalisation of economy and society, including common Research, Development and Innovation priorities;
- supporting research and innovation capacity and societal challenges in participating **African** countries and future cooperation opportunities;

- promoting awareness of cooperation opportunities, including under the Horizon 2020 and Horizon Europe programmes;
- disseminating results from EU support activities (including **Africa**Connect and Digital4Development).

The activities of the CSA should be carried out over the remainder of the current EU financial framework (incl. Horizon 2020) and the initial phase of the new financial framework of the EU. Actions should take account of the networks and achievements of similar past or ongoing support actions for **Africa** while focussing on the scaling up of digital technology and services in the EU financial cooperation with **Africa** under the new financial framework. The partnership should include relevant stakeholders Member States or associated countries from the public and private sectors, including Research and Innovation systems. The partnership should as well include relevant **African** stakeholders from the public and private sectors, including Research and Innovation systems. Due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, proposals shall include at least one participant from a low or middle income country in **Africa**.

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

Expected Impact:

a. Innovation Action (IA)
   - Further development of digital innovation hubs to the support of digitalisation of SMEs and traditional sectors in **Africa** contributing to a vibrant digital economy and new job opportunities;
     - Strengthening of innovation ecosystems for digital startups at the local level;
     - Support of youth employment programs by facilitating collaboration between European and **African** DIHs and startups;
     - Enhancement of entrepreneurial and innovation skills of ICT professionals and start-ups in selected **African** countries;
   - Sustainable uptake of results within the targeted countries, beyond the project completion date;
   - Reinforced international dimension of the ICT and Innovation aspects of Horizon 2020 and contribution to the implementation of the EC digital for development strategy ;
   - Reinforcement of strategic partnerships between EU and **African** Digital Innovation Hubs in areas of mutual interest.

b. Coordination and Support Action (CSA)
   - Strengthening cooperative research and innovation linkages;
   - Reinforced international dimension of the ICT and Innovation aspects of Horizon 2020 and contribution to the implementation of the EC digital for development strategy;
   - Reinforcement of strategic partnerships between EU and **African** in ICT areas of mutual interest.

Cross-cutting Priorities: Gender, International cooperation

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[1] See World Bank country classification

Industrial Leadership, Societal Challenges

Horizon 2020 Pillar: Industrial Leadership, Societal Challenges

Programme: Secure, clean and efficient energy;Leadership in enabling and industrial technologies (LEIT)

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

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

Topic Title: Next generation of thin-film photovoltaic technologies

Topic Identifier: LC-SC3-RES-9-2020

Type of Action: IA Innovation action

Deadline(s): 11.12.2019 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-9-2020

Specific Challenges: The rapid expansion of photovoltaic solar energy conversion based on thin films of semiconductors could become subject to constraints arising from materials availability and security. For this reason, the development of alternative thin-film technologies based on earth-abundant elements has become a priority.

Scope: Proposals will demonstrate alternative thin-film (including multilayer) technologies that can yield high-efficiency devices with expanded lifetime, through simple fabrication processes and the use of earth-abundant, low-cost materials complying with the RoHS guidelines.

Proposals are expected to bring the technologies from TRL 4-5 to TRL 6-7 (please see part G of the General Annexes).

Article 30.3 of the Horizon 2020 model grant agreement on IPR protection in EU – "EU right to object to transfer or licencing" is compulsory for successful proposals – see call conditions.

The topic is particularly suitable for SMEs.

Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme[1].

The Commission considers that proposals requesting a contribution from the EU of between EUR 5 to 7 million would allow this challenge to be addressed

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

Expected Impact: The projects are expected to lower the cost and environmental impact (measured through a life-cycle assessment) of innovative thin film devices and to significantly increase their efficiency, stability, device life time (>35 years) and performance, reliability and recyclability. The cost reduction should be demonstrated and backed-up with credible data and be significantly below the cost levels at call publication date. This will allow for novel PV applications and will open new routes for strengthening the European PV manufacturing industry. The outcome of successful projects will contribute to the Implementation Plan established in the context of the SET-Plan and in particular to the Initiative for Global Leadership in PV[2]. Therefore, relevant indicators and metrics will be presented in the proposal.

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GLOBAL LEADERSHIP IN RENEWABLES

… In addition, specific actions with an international dimension are set out, notably in the context of the "Mission Innovation" initiative. A special focus is also on adapting emerging renewable energy technologies to the **African** context by fostering cooperation and concerted actions with the Member States and Associated countries (see area "Joint actions" of this work programme part). Activities are complemented by the Horizon Prize on Artificial Photosynthesis which is included in the "European Innovation Council (EIC) Pilot" part of the work programme.

Cross-cutting Priorities: Clean Energy

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

[2] https://setis.ec.europa.eu/system/files/set_plan_pv_implmentation_plan.pdf

Societal Challenges

Horizon 2020 Pillar: Societal Challenges

Programme: Health, demographic change and wellbeing

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

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

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

Topic Identifier: SC1-BHC-29-2020

Type of Action: RIA Research and Innovation action

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

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

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

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

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

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

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

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

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

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

Expected Impact:

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

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

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

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

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

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

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

Horizon 2020 Pillar: Societal Challenges

Programme: Health, demographic change and wellbeing

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

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

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

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

Type of Action: CSA Coordination and support action

Deadline(s): 07.04.2020 (single-stage)

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

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

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

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

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

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

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

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

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

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

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

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

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

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[1] http://icpermed.eu

[2] H2020 Grant Agreement 731366

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

[4] **African** Union Member States

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

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

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

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

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

Horizon 2020 Pillar: Societal Challenges

Programme: Health, demographic change and wellbeing

Call Title: Digital transformation in Health and Care

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

Topic Title: Supporting deployment of eHealth in low and lower middle income countries in **Africa** for better health outcomes

Topic Identifier: SC1-HCC-09-2020

Type of Action: CSA Coordination and support action

Deadline(s): 22.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sc1-hcc-09-2020

Specific Challenges: E-Health can contribute to better, more accessible and more efficient health and care services, in particular to remote populations and underserved communities. E-Health and mHealth technologies can only be successful, if they are supported by national governments, who have established e-Health policies and strategies and demonstrate strong ownership of the national e-Health programme. E-Health programmes will only achieve their objectives, if they are adapted to country needs, are citizen-centered and sustainable through sound public finance management. These pre-requisites will impact on the quality and accessibility of such e-Health services and their sustainability, usability, data security and interoperability, privacy and ethics issues.

Access to one's own health data and high-quality mHealth services in real-life environment are still a challenge because of a lack of government ownership, e-Health policies including enabling regulations, a sustainable and trustable infrastructure, and digital literacy.

Coordination and support is needed for taking stock of and further developing strategic partnerships on E-Health deployment together with low and middle income countries and regions in **Africa** with the aim to improve the health of the citizens.

Scope: The aim is to support the coordination of a registry of relevant existing e-Health solutions describing their services and potential for low and lower middle income **African** countries[1] or regions together with a roadmap and strategic implementation plans building on the requirements of end-user communities and policy makers in the target countries. The action should take into account

national and regional policies and (best) practices regarding health and care services and health infrastructures and also include lessons learned from existing eHealth policies and programmes at all levels of the health system. It should take into account the new **Africa**-Europa Alliance for Sustainable investment and Jobs[2] as relevant.

It should identify and build on and identify relevant existing and emerging initiatives and capacities in Europe and **Africa** which can form the basis for future cooperation and deployment.

The action should make use of and contribute to standardisation[3] as appropriate. Proposals should comply with and contribute to the development of the relevant legislation, in particular on ethics and data protection of health data. Socio-economic and gender issues should be addressed appropriately.

The action should also ensure that relevant stakeholders including end-users are engaged during the process through national, regional and international workshops and a set of communication and dissemination actions, aligned to national policies, to support the deployment of e-Health services in low and lower middle income countries in **Africa**. The action should provide an added value, to the facilitation of the cooperation between European and low and middle income countries in **Africa** for a better health for all.

For grants awarded under this topic, beneficiaries may provide support to third parties as described in General Annex K of the Work Programme either in form of grants or prizes. The respective options of Article 15 of the Model Grant Agreement will be applied.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1.5 and 2 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. At least one consortium partner must come from low and lower middle income countries in **Africa**.

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

- Higher level of international cooperation and networking in eHealth programmes and policies between European countries or regions and low and middle income **African** countries, focusing on areas that are beneficial to the target countries / regions and their citizens in eHealth;
- Increased opportunities for e-health innovators, patients, medical staff and health system stakeholders in Europe and **Africa**;
- Better accessibility of eHealth Services.

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[1] Low and lower middle income countries as defined by the World Bank in September 2016 (https://datahelpdesk.worldbank.org/knowledgebase/articles/906519):
Low income countries: Benin, Burkina Faso, Burundi, Central **African** Republic, Chad, Comoros, Democratic Republic of Congo, Eritrea, Gambia, Guinea (Conakry), Guinea (Bissau), Madagascar, Malawi, Mali, Mozambique, Niger, Rwanda, Senegal, Sierra Leone, Somalia, South Sudan, Tanzania, Togo, Uganda, Zimbabwe
Lower middle income countries: Angola, Cabo Verde, Cameroon, Congo (Brazzaville), Cote d'Ivoire, Djibouti, Egypt, Ghana, Kenya, Lesotho, Mauritania, Mauritius, Morocco, Nigeria, Sao Tome and Principe, Sudan, eSwatini (Swaziland), Tunisia, Zambia

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

[3] refer to DG DEVCO Staff Working Document on Digitalisation for Development (Council regulation November 2017) and the relevant WHO guidelines on eHealth

Horizon 2020 Pillar:	**Societal Challenges**
Programme:	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
Call Title:	Sustainable Food Security
Call Identifier:	h2020-sfs-2018-2020
Topic Title:	Diversifying revenue in rural **Africa** through bio-based solutions
Topic Identifier:	CE-SFS-36-2020
Type of Action:	RIA Research and Innovation action
Deadline(s):	22.01.2020, 08.09.2020 (two-stage)

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

Specific Challenges: In many **African** regions, agriculture is predominantly subsistence-oriented, hence most farmers lack the means to invest on improving the productivity of their exploitation activities, or to undertake basic transformation of their produce. Low productivity and lack of economic diversification makes farmers vulnerable to food insecurity, and contribute to a continuous migration towards urban areas, especially among the younger generations.

In many locations, unsustainable practices generate serious impacts on the environment, such as deforestation for energy or for new agricultural land, or soil degradation, which further aggravate the vulnerability of rural populations.

Scope: Proposals shall screen existing bio-based technologies that can be adapted and successfully transferred to rural **African** contexts. The focus should be on simple, robust technologies that can be operated and maintained locally, and suitable for operation at farm, village or rural community level (including mobile systems). A variety of end-products can be considered[1], and the business models developed should be sustainable and highly circular. Although bio-fuels or bio-energy can be part of the end-products, projects focussing mainly on these outputs are not eligible.

The selected technologies shall be integrated into one existing agri-food system[2] without compromising food production, and without fundamentally changing established agricultural practices, provided that these are sustainable. The integrated value chain should be widely replicable, based on agricultural by-products or dedicated crops that can be incorporated through multi-cropping or intercropping practices, including agro-forestry. It shall be tested and adapted in

real productive conditions, in an appropriate number of testing sites. A thorough assessment shall be performed on the agronomic, environmental, social and economic sustainability of the whole model, including gender issues and an assessment of potential risks. The project shall deliver practice guides and policy recommendations for deployment in new areas.

Projects should ensure solid collaboration between farmers, farmers associations, local industry, technology providers, research centres, extension services and policy makers. Development partners and relevant international organisations should be involved as appropriate. Proposals should include a task to cluster with other relevant projects involved in the EU-**Africa** R&I Partnership on FNSSA and with the cooperation platform established under SFS-33-2018[3]. Activities should also be foreseen to cluster with the other projects financed under this topic.

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

Expected Impact: Proposed activities will deliver new and sustainable bio-based value chains that can be plugged into **African** agri-food systems. This will help rural communities to:

- Increase and diversify agricultural income and foster savings and investment.
- Enhance sustainability and reduce the environmental impact of domestic and economic activities, through e.g. reduced logging or nutrient recycling.
- Develop new economic activities and sectors, thus creating new jobs and opportunities.

In the longer term results will contribute improving livelihoods, enhancing food security, increasing community resilience, and reducing rural migration.

Projects should also contribute increasing the innovation capacities of participating organisations, and reinforcing the scientific collaboration between the EU and **Africa**.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

In 2016 the EU-**Africa High Level Policy Dialogue** on science, technology and innovation (HLPD) has adopted the roadmap (Roadmap towards a jointly funded EU-**Africa** Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture. Addis Ababa, 4-5 April 2016) for the EU-**Africa** Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA). In support of the implementation of the R&I Partnership on

FNSSA and in line with the 'Joint communication to the European Parliament and the Council for a renewed impetus to the **Africa**-EU Partnership'[[JOIN (2017) 17]], a number of actions are proposed. The actions include: for pillar I of the roadmap (Sustainable intensification) a portfolio of projects (SFS-35-2019-2020 and CE-SFS-36-2020). Pillar IV of the partnership should be considered as appropriate in each proposal.

Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: International cooperation, Gender

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[1] Examples include fertilisers or soil improvers, feed, energy or fuels, soap, building or packaging materials, etc.

[2] Agro-food system shall be understood here as a characteristic combination of farming activities and (possibly) first-level transformation or conditioning of the farming outputs.

[3] The awarded project acronym is LEAP4FNSSA

Horizon 2020 Pillar: Societal Challenges

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

Call Title: Rural Renaissance

Call Identifier: h2020-rur-2018-2020

Topic Title: Agricultural markets and international trade in the context of sustainability objectives

Topic Identifier: RUR-21-2020

Type of Action: RIA Research and Innovation action

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

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/rur-21-2020

Specific Challenges: The EU remains a staunch supporter of the multilateral trading system. In spite of its successes, the World Trade Organisation (WTO) is now facing new challenges in light of a rapidly changing world. The WTO can be further modernised, by making its trade agenda closer to citizens and ensuring that trade contributes to the pursuit of broader objectives set by the global community, in particular with regard to sustainability[1]. There are strong, complex and crucial links between trade, financial, economic and social policies, and these also reflect in agriculture. As one of the sectors with the lowest income worldwide, average farm income in the EU28 is only around 40% of average overall income[2]. In **Africa**, rural areas remain much poorer, although the urban-rural gap has narrowed[3]. The profile of the global poor shows they are predominantly rural, young, poorly educated, and mostly employed in agriculture[4]. Competition on world markets is considered by some to be the cause of poverty as it drives prices down on some sensitive commodity markets. The United Nations (UN) Sustainable Development Goals (SDG) agreed in the framework of Agenda 2030 in 2015 set out a detailed set of actions to be pursued, many of them with strong links to trade. Of particular relevance to agriculture are SDG1 "No poverty" and the closely related SDG2 "Zero Hunger" and SDG3 "Good Health and Well-being". Aspects linked to agricultural practices and standards are also included in several environmental-related SDGs: "Life on Land" (SDG 15), "Clean Water" (SDG 6) and "Climate Action" (SDG 13). Global commitments should prompt the adoption of measures attentive to the social and environmental impact of trade in agriculture. In a globalised food system[5], the impact of these measures in one part of the world may be offset by slower

progress in other parts, which would benefit from lower costs and increased competitiveness in the meantime. Consequently, a detailed analysis of the SDG targets related to the agriculture sector, and the corresponding environmental issues, should be undertaken and options through which trade policy can contribute to achieving the SDGs should be identified.

Scope: Proposals will analyse and further develop robust methods and related indicators to assess the impacts (positive and negative) of agricultural international trade on the environment and society. It will include analysis of options through which trade policies can contribute to achieving the SDGs and implementing climate and biodiversity agreements while securing the achievement of EU objectives regarding a fair standard of living for farmers and poverty eradication, which remains the primary objective of development policy under the new European Consensus[6]. Work will look in particular to relevant supply chains in the agriculture sector involved both in import and export for the European Union in relation to its major agricultural trading partners. In addition, a contrasting analysis from the **African** continent perspective - the world's poorest continent (Sub-Saharan **Africa** was hosting more than half the world's poor in 2013) – could be proposed[7]. Environmental impacts as carbon leakage[8] and other concepts will be analysed regarding agricultural trade. Activities will build upon previous studies[9] including the work done on the impact of EU consumption on deforestation[10] and related to the target 6 of the EU Biodiversity Strategy (action 17b)[11] regarding the enhanced contribution of trade policy to conserving biodiversity, ecosystems and ecosystem services. Projects will design transition paths in order to develop trade relations in sustainable and fair ways and as "equals" (SOTEU2018) while considering the role that labour plays in overall production cost and the impact of the internalisation of environmental costs on the competitiveness of agricultural productions.

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

Expected Impact:

- More evidence-based policies and improved civil society dialogue building on improved data, analysis, and methods;
- Improved coherence between EU policies (Agriculture, Environment, Trade, Climate, Food security, Development…);
- Best practices and policies for multilateral trade contributing to the Sustainable Development Goals and global agreements on environmental and climate challenges.

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

[1] http://trade.ec.europa.eu/doclib/docs/2018/september/tradoc_157331.pdf

[2] Facts and figures on EU agriculture and the CAP, Statistical annex: Agricultural and farm income

[3] https://www.un.org/**Africa**renewal/sites/www.un.org.**Africa**renewal/files/Poverty%20in%20a%20Rising%20**Africa**%20Overview.pdf

[4] Poverty and shared prosperity 2016 – Taking on inequality – World Bank Group https://openknowledge.worldbank.org/bitstream/handle/10986/25078/9781464809583.pdf

[5] Nearly one third of global arable land use is connected to international trade https://wad.jrc.ec.europa.eu/sites/default/files/atlas_pdf/2_WAD_GlobalPatternsOfHumanDomination.pdf

[6] https://ec.europa.eu/europeaid/policies/european-development-policy/european-consensus-development_en

[7] In relation to the Task Force Rural **Africa** – strengthening our partnership in food and farming

[8] Carbon leakage refers to the situation that may occur if, for reasons of costs related to climate policies, businesses were to transfer production to other countries with laxer emission constraints. This could lead to an increase in their total emissions.

[9] https://ec.europa.eu/agriculture/trade-analysis/impact-assessment_en

[10] http://ec.europa.eu/environment/forests/pdf/3.%20eport%20policies%20proposal.pdf

[11] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0244&from=EN

Horizon 2020 Pillar: Societal Challenges

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

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Biodiversity in action: across farmland and the value chain

Topic Identifier: SFS-01-2018-2019-2020

Type of Action: RIA Research and Innovation action

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

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

Specific Challenges: Agricultural biodiversity is understood to comprise all components of biological diversity that

(i) are of relevance for food and agriculture and all components of biological diversity that

(ii) constitute agro-ecosystems.

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

The way farmers manage their land has immediate effects on domesticated and native biodiversity. Specialised, intensive agriculture has generally resulted in higher productivity at the expense of decreasing levels of biodiversity, partly due to a lack of incentives for farmers to safeguard biodiversity. Ambitions to make diversity a more integral part of farming are reflected in a number of European policies and global commitments[1]. Translating these ambitions into practice will require the necessary know-how and a range of options for optimising the joint delivery of economic, environmental and social services by farming.

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

C. [2020] From agrobiodiversity to dynamic value chains (RIA)

Activities shall release the value of so far underutilised and often genetically diverse crops[6], (including landraces and varieties) and promote their broader use in breeding, farming and in food/non-food value chains. They will improve the performance of the selected crop(s) in relation to specific characteristics (e.g. agronomic such as adaptability to climate related abiotic stresses or quality related traits) and address the corresponding needs for farm and land management. Activities will feed into the development of value chains, which provide opportunities to diversify farm activities and income as well as meet consumer demands for diversified products and/or for products with a local/regional identity. This will include developing and testing marketing channels with enhanced producer-consumer links.

Proposed work should fall under the concept of 'multi-actor approach', thus allowing for adequate involvement of the farming sector and other relevant stakeholders. Consortia shall build on interdisciplinary expertise and a balanced partnership reflecting a range of geographic and socio-economic conditions.

The Commission considers that proposals requesting a contribution from the EU of up to 6 million for C would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Proposals should include a task to cluster with other projects financed under the same sub-topic.

Expected Impact: Funded activities will showcase the benefits of agro-biodiversity at various levels and develop solutions and approaches to embed these benefits more effectively into farming and breeding practices.

In the short- to medium term work will

- expand the knowledge base on the links between biodiversity and agriculture and the use of agrobiodiversity in the context of sustainable farming and breeding practices
- result in improved methods for assessing and evaluating different levels of diversity (genetic, species and ecosystem) as well as the linkages between agrobiodiversity and ecosystems services
- develop strategies for an increased and more effective use of genetic diversity in breeding and farming, in particular to introduce adaptive as well as quality and health related traits (scope C)
- create specific avenues for products, farm income and value chains from underutilised crops (scope C)

- strengthen producer – consumer links amongst others through new marketing modes (scope C)

In the longer term, funded activities will help to foster the synergies between agricultural production, biodiversity (including genetic diversity) and the delivery of ecosystem services of local, regional and global relevance. They will allow the farming sector to continue fulfilling its multiple functions under predicted, more challenging biotic and abiotic conditions.

Call information:

TARGETED INTERNATIONAL COOPERATION

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FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

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

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[1] See e.g. Common Agricultural Policy, EU Biodiversity Strategy, Convention on Biological Diversity, Sustainable Development Goals and COP 21 Paris Agreement[1] See e.g. Common Agricultural Policy, EU Biodiversity Strategy, Convention on Biological Diversity, Sustainable Development Goals and COP 21 Paris Agreement[1] See e.g. Common Agricultural Policy, EU Biodiversity Strategy, Convention on Biological Diversity, Sustainable Development Goals and COP 21 Paris Agreement

[6] No definition is proposed. Applicants are expected to explain and justify the choice of crops (including tree and other perennial crops) in relation to the proposal's and topic's ambition.

Horizon 2020 Pillar: Societal Challenges

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

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Healthy terrestrial livestock microbial ecosystems for sustainable production

Topic Identifier: SFS-02-2020

Type of Action: RIA Research and Innovation action

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

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

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

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

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

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

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

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

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

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

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

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

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

Cross-cutting Priorities: International cooperation

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

Horizon 2020 Pillar: Societal Challenges

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

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Integrated health approaches and alternatives to pesticide use

Topic Identifier: SFS-04-2019-2020

Type of Action: IA Innovation action

Deadline(s): 22.01.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-04-2019-2020

Specific Challenges: Plant protection and biocidal products (both covered under the term "pesticides") are used in agriculture to secure yield and ensure food and feed safety across agricultural production and the agri-food chain. At the same time, pesticides may have effects on the environment, non-target organisms, animal and human health. In the EU they are regulated[1] and assessed for pre-market approval but tools and methods need to be further developed to better understand the overall risks and impacts associated with their individual and combined use and possible side effects. Member States and EU policies seek to reduce reliance on pesticides by designing and implementing more integrated approaches to the use of pesticides while at the same time safeguarding competitiveness.

Scope:

B. [2020] Alternative to contentious pesticides (IA)

Activities will foster the development and testing of tools, approaches, strategies and/or products to reduce the risks associated with the use of contentious plant protection products and/or biocidal products in conventional and/or organic farming systems and/or the agri-food chain. They will seek for more sustainable alternatives to contentious (or, as appropriate, active substances used in) plant protection product(s) for integrated pest, disease and/or weed management in agriculture and/or biocidal product(s) for preventing and controlling harmful organisms occurring in facilities related to agricultural production and the agri-food chain. Activities should address the development, testing and demonstration of novel, more durable and sustainable approaches, products,

strategies and/or tools for their application within a systems approach and cultural practices.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 15 million for scope A and EUR 5 million for scope B would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

All sub-topics (A), (B): Projects should fall under the concept of the 'multi-actor approach'[2] including a range of actors to ensure that knowledge and needs from various sectors such as research, farming, advisory services and industry including SMEs are brought together. They should also seek contributions from social and economic sciences to cover the broader economic, social, behavioural and environmental issues associated with the adoption of novel management strategies, including the impact on labour, safety culture and risk management on farms and economic impact for farmers. This will include looking at gender aspects, as appropriate.

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

- establish the impacts of the use or non-use of pesticides on the environment and human health (consumers, operators, farm workers and residents in agricultural areas);
- improve farmer, consumer and citizen awareness of and trust in global health approaches through clear and transparent and integrated assessments, pest / disease / weed prevention and control strategies for EU agricultural production and / or the agri-food chain and related communication;
- introduce alternative approaches, tools, strategies and/or products for prevention and control of pests/diseases/weeds with improved environmental performance (e.g. reduced effects on non-target organisms, natural resources and the environment) in the field of plant protection and/or use of biocides related to agricultural production and activities across the agri-food chain (scope B);
- assess the potential risks and benefits of the chosen alternatives in a coherent and consistent way in view of safety and sustainability (scope B);
- improve current agronomic, ecological and cultural practices to increase the resilience of agricultural production and/or the agri-food chain against biotic stresses (scope B);
- assess the economic, social and environmental impact of the alternative proposals for the farmers and/or consumers (scope B);
- support relevant EU plant health policies and/or European risk assessments in relation to EFSA and / or ECHA activities (scope B).

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

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

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

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[1] Regulations (EC) No 1107/2009 and (EU) No 528/2012

[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 and maritime and inland water research

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: New and emerging risks to plant health

Topic Identifier: SFS-05-2018-2019-2020

Type of Action: RIA Research and Innovation action

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

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-05-2018-2019-2020

Specific Challenges: Trade and the movement of goods and people have facilitated the introduction, spread and establishment of plant pests and diseases. While new pests and diseases are likely to arise, existing ones might become more severe because of intensification, climatic variations and changes in agricultural and forest management practices. They can have a significant impact on agricultural and forest productivity, environment and economics. Appropriate and rapid responses from decision-makers need to be based on scientific knowledge which addresses pest and disease management in a comprehensive manner.

Scope: Proposals will target one or more new or emerging plant pests (the term "pests" includes weeds) and/or diseases (regulated or non-regulated, introduced or native) that are causing, or likely to cause, significant (socio)economic and/or environmental losses to European agriculture and/or forestry. The choice of target pest and/or disease will consider the potential threat in terms of development and spread, its potential exacerbation under climate change as well as the potential impact on agricultural production, forestry, trade and the wider environment. Proposals will increase knowledge of the biology, pathways of entry and spread of pest(s)/disease(s) and clarify the dependencies on abiotic factors. They will improve methods and strategies for early detection, prevention and control as well as enlarge the range of tools for integrated, sustainable and effective pest/disease management. International cooperation with countries affected or threatened by the same pest(s)/disease(s) is encouraged. Proposals should fall under the concept of the 'multi-actor approach'[1] including a range of actors to ensure that knowledge and needs from various sectors such as

research, plant health services and the farming/forestry sector are brought together.

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

Expected Impact: Activities will contribute to finding adequate responses to new and/or emerging plant pests/diseases. More specifically knowledge and solutions generated by these actions will contribute to:

- the understanding of drivers of plant pest/disease emergence including the influence of climate change;
- the development of efficient tools for the prevention, detection and control of pests/diseases;
- the development of environmentally sound and long-lasting solutions for effective pest/disease management in farming and forestry in line with the principles of Integrated Pest Management within a systems approach;
- the reduction of economic, social and/or environmental losses for Europe;
- support for relevant EU plant health data management and policies.

In the longer term, project outputs will help the agricultural/forestry sector to remain productive and contribute to sustainable agriculture and/or forest health.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: International cooperation, RRI

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

Horizon 2020 Pillar: Societal Challenges

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

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Stepping up integrated pest management

Topic Identifier: SFS-06-2018-2020

Type of Action: CSA Coordination and support action

Deadline(s): 22.01.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-06-2018-2020

Specific Challenges: There is a need to develop and promote more cost-effective and sustainable Integrated Pest Management (IPM) options which are based on a holistic view of agro-ecosystems. IPM is part of EU legislation promoting the sustainable use of plant protection products (SUD[1]). The various IPM solutions being developed across Europe all differ depending on the crops, the available climate monitoring systems, the underlying knowledge of pest populations, on pedo-climatic conditions and on the agro-ecological environment. IPM decision support systems and models developed as part of national or regional research projects usually only deal with limited aspects of crop production and are validated in regional circumstances. As a consequence, it often remains unclear what the value of such a model/system may be in other parts of Europe and what the impact of climate change could be on the validity of the model. Sharing IPM decision supporting tools at European level therefore has great potential for synergies.

Furthermore, on-farm demonstration of novel IPM tools would boost peer-to-peer learning across Europe and help farmers with daily management practices. The challenge is incorporating IPM into the entire farming system, and searching for synergies that result from taking a holistic approach in shaping farming systems.

Scope:

B. [2020] European-wide demonstration farm network (CSA)

Activities shall fuel a European-wide network of IPM demonstration farms, which make a direct link between research and practical farm management, thereby facilitating IPM uptake and knowledge-sharing among advisors and farmers. The

network should consist of normal farms where farmers can learn in a peer-to-peer mode from their colleagues. Practical information on the farm techniques should be made readily available to all, using open source and open data management to enable wide and long-term sharing, possibly according to specific typologies and areas. Links with administrative databases (e.g. IACS-LPIS system in Member States) and other data sources (e.g. Copernicus earth observations) should be explored. The project should in particular incentivise the uptake of IPM practices by advisors who are using a holistic farm approach. Organic farming practices could also provide a possible source of inspiration, and forestry may be included. Besides making use of the developed decision support tools under scope A and other monitoring and warning systems, the proposals should also help promoting the variety of other existing IPM practices, comparing emerging new IPM techniques, and covering various diagnostic tools and efficient pest monitoring methods. Organic farming practices may provide a possible source of inspiration, and forestry may be included. Proposals will support the development and European-wide sharing of training modules for farmers and for advisors, including from various national/regional sources and demonstration farm programmes. These training modules should feed into the national Agricultural Knowledge and Innovation Systems (AKIS)[3]. Projects shall seek synergies with the national or regional EIP networks and EIP Operational Groups, and provide input to and coordinate their strategy with the SCAR-AKIS Strategic Working Group. Proposals may include other IPM issues covered under the SUD such as application equipment, risk communication to society, etc. All collected knowledge should feed into the existing dissemination channels most consulted by farmers. As many “practice abstracts” prepared in the common EIP-AGRI format should be delivered as possible, including audio-visual material wherever possible. It is strongly recommended to cover as many Member States and regions as possible and to seek synergies with similar activities financed through other sources, e.g. the Common Agricultural Policy. Forestry may also be included. Proposals should fall under the concept of the 'multi-actor approach'[4], with a consortium based on a balanced mix of actors with complementary knowledge, including participation and activation of farmers, farmers' groups and advisors to create co-ownership. In this way, in the long run, results will contribute to more sustainable agriculture by reducing exposure to pesticides of humans and animals, terrestrial and aquatic ecosystems, drinking water and the food chain.

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

Expected Impact: Activities should create added value to existing projects by giving farmers throughout Europe a broader understanding of the existing knowledge on integrated pest management. This will support relevant plant health policies, more specifically the implementation of the SUD[5] by demonstrating that IPM strategies work in a "real world" application, and in particular by

- helping farmers to incorporate IPM solutions in existing agricultural systems, with a focus on taking into account costs and benefits and interactions / with other aspects of agricultural management, thereby building resilience;
- supporting European platforms (such as the one created under scope A) for sharing and further developing IPM decision support systems, covering the various bio-geographical areas of Europe;
- broadening and adding value to the partnerships between actors, which are developing cost-effective IPM decision support systems ready for practice;
- creating an open European network of IPM demonstration farms in all EU Member States/Associated Countries and regions, sharing data and information with a long term effect available to all, where farmers can learn in a peer-to-peer mode from their colleagues on normal farms;
- increasing awareness of the available IPM toolbox and extending the range of applications, including by incentivising the take up of IPM techniques and related advisory tools by holistic oriented advisors in their daily services;
- increasing on-farm use of IPM techniques
- developing European-wide IPM training for farmers and advisors, with modules adaptable to the regional/national contexts , the various farmers' profiles and advisory services.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

In 2016 the EU-**Africa High Level Policy Dialogue** on science, technology and innovation (HLPD) has adopted the roadmap (Roadmap towards a jointly funded EU-**Africa** Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture. Addis Ababa, 4-5 April 2016) for the EU-**Africa** Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA). In support of the implementation of the R&I Partnership on FNSSA and in line with the 'Joint communication to the European Parliament and the Council for a renewed impetus to the **Africa**-EU Partnership'[[JOIN (2017) 17]], a number of actions are proposed. The actions include: for pillar I of the roadmap (Sustainable intensification) a portfolio of projects (SFS-35-2019-2020 and CE-SFS-36-2020). Pillar IV of the partnership should be considered as appropriate in each proposal.

Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: RRI

[1] Directive 2009/128/EC on the sustainable use of pesticides

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

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

[5] Directive 2009/128/EC on the sustainable use of pesticides

Horizon 2020 Pillar: Societal Challenges

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

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

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

Topic Identifier: SFS-10-2020

Type of Action: RIA Research and Innovation action

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

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

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

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

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

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

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

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

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

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Blue Growth

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

Horizon 2020 Pillar: Societal Challenges

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

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Genome and epigenome enabled breeding in terrestrial livestock

Topic Identifier: SFS-13-2020

Type of Action: RIA Research and Innovation action

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

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

Specific Challenges: Genetics is currently one of the important levers for efficient livestock production, not only to increase performance and productivity, but also to ensure resilience and to reduce resource use and environmental impact, to ensure health and welfare of the animals, while maintaining or improving longevity of animals and product quality. Understanding of the biological mechanisms underpinning traits, including epigenetic responses to the environment and non-genetic inheritance, remains relatively limited and underexploited, notably when several complex traits need to be targeted simultaneously, while avoiding or reducing trade-offs. In addition, improving livestock breeding programmes in both cosmopolitan and local breeds requires an optimal level of genetic diversity that needs to be measured and exploited. There is a need also for new knowledge and tools to open up new prospects for the measurement, conservation and exploitation of genetic diversity in farm animal species, for optimal genetic diversity in farm animal breeding programmes in both cosmopolitan and local breeds and to inform and develop strategies to provide for cost-effective in vivo conservation of endangered genetic resources.

Scope: The selected projects will assist in the exploitation of existing knowledge on the genome sequence and its regulation and expression. They will do so by providing

(i) analysis of the genome and the epigenome in relation to combinations of traits (including intermediate and/or indicators) important for efficient terrestrial livestock production and

(ii) tools to improve breeding schemes, both for cosmopolitan and local breeds of terrestrial livestock, striving to ensure optimal genetic and epigenetic diversity, at least within breeds.

The projects will encompass development of methods, tools and models to assist both industry and policy makers as well as to respond to social challenges. Proposals should fall under the concept of 'multi-actor approach'[1], involving representatives of breeders, biodiversity conservation and other relevant professionals from animal production, the food chain and decision-makers, as appropriate.

The activities may address:

- Study of the genetic relationship between animal performance traits to tackle some potential trade-offs between different phenotypes of interest that may alter long-term selection strategies to improve lifetime efficiency.
- Assessment of the relevance of
  (i) epigenetic mechanisms as a potential source of phenotypic variance unaccounted by genomic selection, and
  (ii) improving genomic prediction models with better integration of environmental and non-genetic inheritance factors.
- Development of
  (i) appropriate deep phenotype indicators and their genomic and epigenomic determination that reflect different ways of improving resource-use efficiency, health, welfare, quality and resilience of terrestrial livestock and
  (ii) multi-trait genomic and epigenomic prediction models that can efficiently utilize these indicators.
- Assessment of the potential, including benefits and risks, of both
  (i) genome editing for cross-species and/or inter-breed transmission of specific traits without affecting other selected characteristics or specificities and
  (ii) targeted epigenome editing for improved animal welfare and/or product quality.
- Study of the opportunity and feasibility of integration of genome editing in genomic selection (specifics and comparison with introgression: theoretical and practical applications).
- Development of refined genomic and epigenomic strategies for management of biodiversity.

The projects are encouraged to interact as appropriate with relevant Horizon 2020 projects.

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

Expected Impact: Methods for biology-driven selection of livestock with more balanced performances for production, robustness, and/or quality, taking into account environmental variability.

Set of phenotypes as well as the molecular tools available to farmers and farm advisers to assess and simultaneously drive animal traits related to efficiency, for a long-time evaluation of breeding strategies.

Set of options for conservation of genetic diversity among and within breeds.

More generally, the projects will contribute to the diversity and sustainability of livestock production.

Call information:

TARGETED INTERNATIONAL COOPERATION

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FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

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

Horizon 2020 Pillar: Societal Challenges

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

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Emerging challenges for soil management

Topic Identifier: SFS-21-2020

Type of Action: RIA Research and Innovation action

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

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-21-2020

Specific Challenges: Sustainable soil management is paramount to keep soils in a good status for both agriculture and environmental needs. Over the past years, our understanding of the various threats to soil functions has increased. The recent, more in depth analysis of the importance of soil biodiversity for delivering important ecosystem services has identified major knowledge gaps on its role for the degradation of waste materials and for agricultural productivity. The extensive use of plastics, products containg plastic and other emerging contaminants in daily life has not only impacts on oceans but also on soils. The understanding of the impact and fate of micro- and nano-plastics and other stressors on soils is very limited and needs assessing. Following recent assessments of land degradation by IPBES and IPCC, there is also a need to evaluate the economic, social and environmental costs of soil and land degradation.

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

A. [2020]: Emerging challenges for soil management: Soil biodiversity assessment (RIA)

Proposals shall cover soil biodiversity analysis, including relevant microbes and invertebrates for soil-mediated ecosystem services. Proposals shall address soil management, exploring the links between soil biodiversity, its functions and land degradation to increase economic, environmental and social wellbeing of biogeographical regions of Europe. Proposals shall cover ecosystem stressors on soil and more particularly on soil biodiversity and its potential impact on ecosystem functions.

Work shall build on the existing initiatives[1] and provide support to relevant Member State commitments under the Global Soil Partnership. If relevant cooperation and complementarities could also be sought with projects funded by other Societal Challenges[2]. International cooperation is encouraged.

B. [2020]: Emerging challenges for soil management: use of plastic in agriculture (RIA)

Proposals shall cover analysis of the use of plastic in agricultural production and its impact on soil. The particular focus of the proposals should be on the micro-plastic after harvest and its fate in the environment. The potential future impact of micro-plastic on soil biodiversity and its potential transfer to other parts of the environment and beyond should be analysed.

Activities shall also analyse the impact of micro- and nano-plastics on soil properties and its ecosystem services function. In addition the focus of this analysis should be concentrated on the use of plastic during agricultural production at the field level but also at the farm level. Proposals should fall under the concept of the 'multi-actor approach'[3]

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

Expected Impact:

- Understand the current status, challenges and potential of soil biodiversity (sub-scope A);
- Understand the impact of micro- and nano-plastics on soil biodiversity and ecosystem services (sub-scope B);
- Understand the impact of micro- and nano-plastics and other stressors in soil on agricultural productivity and ecosystem services (sub-scope B);
- Understand and assess the chemical changes and disaggregation of micro- and nano-plastics in soils, their impacts and further behaviour in soils (including soil physics) (sub-scope B);
- Quantify the economic, environmental and social consequences of unsustainable soil management in different biogeographical regions (sub-scopes A and B);
- Contribute towards understanding, management and conservation of soil biodiversity for the global soil assessment (sub-scope A);

In the long term, funded activities will contribute to European and international soil biodiversity assessments such as initiatives under the Food and Agricultural Organization of the United Nations.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: International cooperation

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[1] European Soil Biodiversity Atlas prepared by of the European Commission's Joint Research Centre and the Global Soil Biodiversity Atlas prepared by the European Commission's Joint Research Centre and Global Soil Biodiversity Initiative.

[2] Societal Challenge 1 (Health, Demographic Change and Wellbeing), Societal Challenge 5 (Climate Action, Environment, Resource Efficiency and Raw Materials)

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

Horizon 2020 Pillar: Societal Challenges

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

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Genetic resources and pre-breeding communities

Topic Identifier: SFS-28-2018-2019-2020

Type of Action: IA Innovation action

Deadline(s): 22.01.2020 (single-stage)

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

Specific Challenges: Genetic resources (GenRes) play a crucial role in agricultural activities and sustainable forest management in Europe. They hold the key to the adaptation of plants and animals to a changing and more variable climate, yet their diversity remains largely underused in current breeding, farming and forest management. Conservation efforts (in-situ, ex-situ) aim to capture, preserve, evaluate and make available a substantial share of these global assets. However, access to resources is often limited by the quality of the material and the information provided by the various conservation sites. With increasing concerns over biodiversity loss and genetic erosion, there is a need to step up collaborative efforts to expand and improve the preservation, evaluation and the use of plant and animal GenRes in farming and forestry.

Scope: A range of activities implemented by a wide range of stakeholders will seek to enhance management and use of GenRes and implement global commitments in this area. While the focus of activities is on Europe, international resources and activities shall be taken into account.

C. [2020]: The GenRes-user interface and pre-breeding activities (IA)

Activities will accelerate the mobilization of GenRes from in-situ and/or ex-situ collections to benefit plant breeding and the delivery of new varieties which are better adapted to variable environments and consumer demands. They will tackle the GenRes-user interface, i.e. propose improvements to the information available to users with regard to characteristics of accessions and also to the visualisation of this information. Major resources shall be devoted to pre-breeding activities implemented in close cooperation between public, private and non-for profit sectors. The involvement of SMEs is crucial and will be

fostered through targeted calls and financial support to third parties[1]. Due attention shall be given to pre-breeding activities undertaken across Europe ad covering different pedo-climatic regions

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

Expected Impact: Activities will enhance the status of genetic resources and increase effectiveness of conservation efforts, in particular in Europe.

In the short to medium term work will:

- improve tools to display user-friendly information on accessions and their characteristics (scope C)
- speed up the introduction of useful characteristics from GenRes into breeding (scope C)
- promote the delivery of new varieties which are fit for purpose as regards changing environmental / climatic conditions and consumer demands (scope C)

In the long term activities will allow tapping into the vast potential of GenRes more effectively in order to meet current and future needs of food security, the delivery of non-food products from primary production and support the different functions of forestry.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by

previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Open Science, International cooperation

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[1] In line with Article 23(7) of the Rules for participation the amount referred to in the last paragraph of Article 204 of the Financial Regulation may be exceeded, where achieving the objectives of the action would otherwise be impossible or overly difficult.

Horizon 2020 Pillar: Societal Challenges

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

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Agri-Aqua Labs

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

Type of Action: RIA Research and Innovation action

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

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

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

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

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

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

Scope:

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

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

More specifically work will allow to better understand and determine

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

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

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

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

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

In the short to medium term work will:

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

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

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

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

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

Horizon 2020 Pillar: Societal Challenges

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

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Sustainable Intensification in **Africa**

Topic Identifier: SFS-35-2019-2020

Type of Action: RIA Research and Innovation action

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

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-35-2019-2020

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

Environmental modifications such as climate change and globalisation are increasing the risk of infectious animal diseases emerging in new locations with greater frequency, and this is particularly relevant with vector borne diseases. These diseases have a major impact not only on livestock production and related economy but also on global food security and trade. Some of these emerging diseases also threaten human health (zoonoses). The **African** continent suffers from a number of vector-borne diseases, sometimes with heavy burden, although it is not always fully ascertained. A number of these diseases occur or do present a risk of introduction and spread also in Europe. The complex transmission cycles can make it difficult to assess risk and organise control. We need to get further knowledge on these diseases, not least on their vectors, in order to improve their control, and assess their potential spread all over Europe.

Scope:

C.[2020]: Vector-borne diseases in **Africa** (RIA)

The proposals should aim to develop knowledge on selected vector-borne diseases affecting terrestrial livestock, whether they also affect humans or not. The proposals may address one or more diseases. Priority should be given

to diseases with either a serious impact in **Africa**, or a risk of spread to Europe with significant consequences, or both. Activities should cover the ecology of the pathogens and vectors, and epidemiological features, including the risk of short and long distance transmission and the capacity for the disease to establish in and spread to new areas, with potentially features different from the original area. The burden of disease in animals (and humans if relevant), and the socio-economic impact should be further assessed as appropriate. Systems and/or networks to improve epidemiological surveillance strategies in domestic and wild species should be developed/strengthened. Activities should also address detection and control tools, including prevention, monitoring, diagnostics and:

- Vector competence studies including exploration of vector-pathogen interactions simulating field conditions.
- Map, explore and predict vector densities and spread and the role of the vector in spreading the disease.
- Study the relationship between immunity and pathogen spread including the role of pre-existing immunity and the role of vaccinations.
- Exploration of livestock species, both **African** and European breed, for susceptibility to the diseases.
- New diagnostic methods for pathogen or specific antibody detection.

Projects should include capacity-building and training activities. The projects should build on results and experiences from related EU projects and existing networks in this field.

Proposals should include a task to cluster with other projects financed under this scope and with the cooperation platform established under SFS-33-2018[4].

The Commission considers that proposals requesting a contribution form the EU of up to EUR 7.5 million for sub-topic A, EUR 5 million for sub-topic B and up to EUR 6 million for sub-topic C would allow this specific challenge to be addressed properly. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

In the short to medium term:

Funded activities will contribute to better prevention and minimisation and mitigation of selected vector-borne diseases of livestock (sub-topic C). More specifically they will:

- enable strengthened surveillance systems/networks and allow an improved view on occurrence and burden of selected disease(s);
- improve assessment of the risks of introduction and spread among livestock and humans of the selected disease(s) in new areas;
- provide improved tools for rapid detection of selected pathogens, preferably on-site;
- improve prevention and control of the selected disease(s);

- enable a more focused targeting of resources for controlling the selected disease(s);

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

In 2016 the EU-**Africa High Level Policy Dialogue** on science, technology and innovation (HLPD) has adopted the roadmap (Roadmap towards a jointly funded EU-**Africa** Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture. Addis Ababa, 4-5 April 2016) for the EU-**Africa** Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA). In support of the implementation of the R&I Partnership on FNSSA and in line with the 'Joint communication to the European Parliament and the Council for a renewed impetus to the **Africa**-EU Partnership'[[JOIN (2017) 17]], a number of actions are proposed. The actions include: for pillar I of the roadmap (Sustainable intensification) a portfolio of projects (SFS-35-2019-2020 and CE-SFS-36-2020). Pillar IV of the partnership should be considered as appropriate in each proposal.

Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

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

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[4] The awarded project acronym is LEAP4FNSSA

Horizon 2020 Pillar: Societal Challenges

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

Call Title: Sustainable Food Security

Call Identifier: h2020-sfs-2018-2020

Topic Title: Healthy soils for healthy food production

Topic Identifier: SFS-40-2020

Type of Action: RIA Research and Innovation action

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

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-40-2020

Specific Challenges: The EU and China are facing similar challenges of increasing soils health and producing more high quality food for increasing population. At the same time soils are facing a lot of pressures from use of fertilizers (manure and mineral), historical management of soils and increasing land degradation. To achieve certain quality of food production management of soils at the farm level needs to incorporate techniques for soil remediation/soil quality restoration and balanced fertilizer application. For the long-term increase of soil quality land management techniques should adopt and enhance quality of soils.

Scope: The proposals shall analyse soil remediation strategies and assess sustainable use of fertilizers for agricultural production including social-economic and environmental aspects. The evaluation of tools and methods for increasing the quality of soils and of food produced is included in the scope. Proposals shall also address land degradation aspects and prevention of further degradation. They shall cover the evaluation of agricultural systems (e.g. organic farming, agro-ecology, agroforestry) and their suitability to achieve a good status of soils for sustainable food production. The proposals shall build on the past projects financed under the EU-China cooperation on soil. The proposals will fall under the concept of 'multi-actor approach'[1]. Proposals shall promote balanced research and innovation cooperation between the EU and China. China-based entities that will participate in joint projects with European partners under Horizon 2020 have also the possibility to apply for funding under the Chinese co-funding mechanism.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 5 million would allow this specific challenge to be addressed

appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Contributions for Chinese participants will come in addition and will be made available by China.

Expected Impact:

- Identification of tools and methods, mainly at the farm level for soil remediation and balanced fertilizers application;
- Identification of agricultural system approach that can enhance quality of soils for food production;
- To raise public awareness about soil as a crucial global resource:
- Enhance EU-China long-term cooperation in land use optimization for global food and environmental security.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: International cooperation

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

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Demonstration of innovative technologies for floating wind farms

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

Type of Action: IA Innovation action

Deadline(s): 11.12.2019 (single-stage)

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

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

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

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

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

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

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Blue Growth, Clean Energy

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

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Demonstration of advanced biofuels production from aquatic biomass

Topic Identifier: LC-SC3-RES-27-2020

Type of Action: IA Innovation action

Deadline(s): 11.12.2019 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-27-2020

Specific Challenges: The security of feedstock supply is essential for the large-scale production of advanced biofuels which is a prerequisite for improving their competitiveness. The specific challenge is to increase the reliability of processes through diversifying and securing the sustainable supply of seaborne feedstock at large scale.

Scope: Proposals will demonstrate aquatic advanced biofuel pathways which improve the economic viability of the subsequent energy production, including the upgrading technologies and valorisation of co-products. Proposals will address processes and technologies for advanced biofuels at a scale of 100-1000 tonnes from seaborne aquatic biomass such as macro-algae and/or fish residues in an energy-driven integrated biorefinery concept. Projects will demonstrate the full value chain with achievement of at least 70% energy output (fuel, heat and power) and environmental sustainability based on a life-cycle assessment. Long-term potential for large scale biofuel production should be considered.

Proposals are expected to bring the technology from TRL 5 to 6-7 (please see part G of the General Annexes).

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

Expected Impact: Supported projects are expected to enlarge the feedstock basis and improve the viability of technologies for sustainable fuels and energy production.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Clean Energy

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Market Uptake support

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

Type of Action: CSA Coordination and support action

Deadline(s): 11.12.2019 (single-stage)

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

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

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

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

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

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

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

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

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

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

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

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Increase performance and reliability of photovoltaic plants

Topic Identifier: LC-SC3-RES-33-2020

Type of Action: IA Innovation action

Deadline(s): 11.12.2019 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-33-2020

Specific Challenges: To accurately predict and measure the contribution of PV systems (including floating PV) to the power network, and to increase their lifetime, reliability and profitability, it is necessary to establish accurate operation (and fault diagnostic) models in both "utility - large commercial" and "medium-size commercial - residential" scale plants. Reliability assessment and improvement (with all it entails for the distribution network reliability) can be achieved by identifying and minimising risk factors and failure rates of the PV system and its components.

This challenge contributes to the Implementation Plan for PV[1] established in the context of the SET-Plan and in particular to the Initiative for Global Leadership in PV.

Scope: Proposals will develop and demonstrate technical solutions, processes and models, which increase a PV system's operational stability and reliability, allowing for higher PV penetration levels. Proposals are expected to address specific objectives such as the reliability of system components, advanced and automated functions for data analysis, diagnosis and fault detection, forecasting and model-predictive control frameworks, ancillary services for the stability of the network; maintenance planning and/or reporting; interoperability of plants and components; business models; etc.

Proposals are expected to bring the technologies from TRL 6-7 to TRL 7-8 (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 6 to 10 million would allow this challenge to be addressed

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

Expected Impact: Projects are expected to increase utility-friendly integration of PV generation at high-penetration levels and the performance and profitability of PV systems.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

In 2016 the EU-**Africa High Level Policy Dialogue** on science, technology and innovation (HLPD) has adopted the roadmap (Roadmap towards a jointly funded EU-**Africa** Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture. Addis Ababa, 4-5 April 2016) for the EU-**Africa** Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA). In support of the implementation of the R&I Partnership on FNSSA and in line with the 'Joint communication to the European Parliament and the Council for a renewed impetus to the **Africa**-EU Partnership'[[JOIN (2017) 17]], a number of actions are proposed. The actions include: for pillar I of the roadmap (Sustainable intensification) a portfolio of projects (SFS-35-2019-2020 and CE-SFS-36-2020). Pillar IV of the partnership should be considered as appropriate in each proposal.

Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Clean Energy

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

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Reduce the cost and increase performance and reliability of CSP plants

Topic Identifier: LC-SC3-RES-35-2020

Type of Action: IA Innovation action

Deadline(s): 11.12.2019 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-35-2020

Specific Challenges: Several research and innovation activities are set out in the SET Plan's Implementation Plan for Concentrated Solar Power (CSP)[1] to reduce the cost and increase performance and reliability of CSP plants. Promising innovative solutions that have been already validated in laboratories and/or in relevant environment need to be developed further to bring them to a higher TRL.

Scope: The proposals will demonstrate innovations that reduce the cost and/or increase the performance and/or the reliability of CSP plants, in relation to any of the plant subsystems.

The proposals have to state clearly to which R&I Activity (or Activities) of the Implementation Plan for CSP they contribute. The possible impacts on the environment of the proposed innovations shall be assessed during the execution of the project.

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

The Commission considers that proposals requesting a contribution from the EU of between EUR 5 to 10 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The project is expected to improve the competitiveness of the CSP technology, by demonstrating cost reductions and increased performance and reliability of CSP plants, therefore strengthening the European industrial

sector and improving the prospects for CSP deployment in Europe. The project will contribute to executing the SET Plan's Implementation Plan for CSP.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Clean Energy

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[1] https://setis.ec.europa.eu/system/files/set_plan_-_csp_initiative_implementation_plan.pdf

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Smart Airports

Topic Identifier: LC-SC3-SA-1-2020

Type of Action: IA Innovation action

Deadline(s): 29.01.2019 (single-stage)

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

Specific Challenges: The aviation transport sector is growing fast and air traffic is expected, at current rates, to double its volume during the next 25-30 years. This would lead to aviation generating in excess of 10% of the global greenhouse gas emissions by 2050. Sustainable biofuels are the only currently available and tested alternative for reducing the carbon footprint of aviation. Two barriers are at stake:

(i) the supply of sustainable biofuels at competitive market pricing to become commercially attractive to airlines, notably enabling to overcome the economic gaps evolving from the fact that fuel represents circa one-third of the operational costs of an airline;

(ii) the operation and logistics of handling such biofuels in the operational context of a major airport – including procurement, blending, fuelling, quality control and safety due processes - as a condition sine-qua-non for its penetration within the aviation's supply-chain. This challenge is designed to tackle this latter deadlock. It is in line with the Renewable Energy Directive (RED II) and the specific targets for commercialization of advanced biofuels identified in the Declarations of Intent in the context of the SET-Plan, Alternative Fuels Infrastructure Directive and Strategic Transport Research and Innovation Agenda (STRIA).

In addition airports are commercial sites with significant greenhouse gas emissions contributing to climate change. Novel concepts and solutions aimed for enhancing the capability of airports communities in reducing greenhouse gas emissions and adapt to climate change are needed in meeting the 2050 policy targets. Specific solutions based on a holistic perspective that integrates the

airport physical and operational infrastructure with their users, business and logistics operators, peripheral businesses, and ultimately with the whole transportation system that uses and commutes to the airport, as well as the physical environment it is embedded in.

Scope: Proposals will demonstrate novel concepts and solutions aimed at developing effective solutions for the take-up of biokerosene and other relevant alternative fuels by aviation. The actions should be designed towards ensuring a strong demonstration component involving an exchange of best-practice within the airports participating in the project.

Herein, Lighthouse Airports (the airport that leads the consortium and where the demonstration actions will be implemented) are expected to closely collaborate with Fellow Airports (the airports that participate in the consortium and follow closely the developments and demonstration actions at the Lighthouse airports) in supporting the transfer and tailoring of best-practice solutions tuned to the specific local conditions of the latter.

Each consortium will have one Lighthouse Airport that will demonstrate the novel concepts and solutions and a further two "Fellow Airports" that will follow closely the demonstration actions and are committed to implementing the best practices identified in the project. The Lighthouse Airport must be in a different EU Member State or Country associated to Horizon 2020 than at least one of the Fellow Airports. To increase the impact beyond the airports participating in a consortium, the project will develop a bold vision for the future Smart Airport of 2050. This should cover the relevant sustainable mobility, technical, operational, economic, environmental and social aspects that are expected to shape the airports of the future as well as their integration in the urban hinterland. In addition, the projects should also include a handbook on how to move from planning through implementation to replication and scaling-up of the successful demonstrated solutions in such an over-arching context.

- All biofuels and other relevant alternative fuels must meet the EU sustainability criteria as these are defined under the Renewable Energy Directive[1] (RED) and its recast[2] (REDII). In this context, advanced sustainable biofuels of EU or local or regional origin are highly preferable.

In such a wide context, it is necessary that projects guarantee a holistic perspective in tackling the questions at stake, by systematically addressing all aspects mentioned in the following activity areas:

A. Smart use of biofuels in airports and other relevant alternative fuels in aircraft:

   Proposals will address all of the following:

   - Integration of sustainable bio-kerosene and other relevant alternative fuels in the fuelling infrastructure and associated fuel handling logistics of the airport, including blending operations resulting in blends compliant with the ASTM standards.

- Promote decarbonisation of aviation, and airports while improving local air quality by stimulating the uptake of sustainable biokerosene and other relevant alternative fuels blends;
- Ensure the development of scalable solutions –replicated/gradually scaled-up to larger or scaled-down to smaller airports, together with the demonstration of their environmental sustainability and technical, operational, and economic, reliability;
- Incorporate field performance monitoring of the deployed solutions starting at least 6 months before the innovative solutions are applied to be followed for a period of at least 1 year within the project duration. This will allow comparing the effectiveness of the deployed solutions.

Projects should deliver all of the following:

- Projects should include specification of the following key quantities for each of the participating airports: blending percentage; total volume of fuel to be blended with bio-kerosene and total fuel consumption.
- Guidelines and metrics to support the transfer of best-practice results into other airports, in particular for purposes of:
  - Quality control of the sustainable bio-kerosene and of the blended fuel supplied to the airlines, including consideration of aspects such as source and seasonal variations.
  - Aircraft fuelling logistics, including relevant procedures and associated due processes – e.g. fuel handling, safety considerations.
  - Collecting feedback from airlines on the impact of using sustainable bio-kerosene and other relevant alternative fuels blends on commercial operations – notably, in engine performance and maintenance.
  - Notification by the airport to the national authorities regarding the use of bio-kerosene in compliance with the prevailing environmental and transport regulations in force –volumes and qualities of biofuels, certification schemes used, GHG reduction, number of flights fuelled with bio-kerosene.
  - Key economic indicators associated with a fully-fledged commercial scenario of bio-kerosene and other relevant alternative fuels –price of the bio-kerosene and other relevant alternative fuels and final blends, price variations and trends, market availability of bio-kerosene and other relevant alternative fuels, security of supply. If possible, collect feedback from airlines regarding bio-kerosene and other relevant alternative fuels differential cost coverage.
  - Gathering passenger perception on using flights operated with a blend of sustainable biokerosene and other relevant alternative fuels.

To enable a widest dissemination of the lessons learned the solutions demonstrated should be monitored, analysed and eventually elaborated in accessible best-practice handbooks and tools, covering:

1. The state-of-the-art and reliable sustainable solutions for aircraft fuelling with bio- kerosene, addressing notably:
   - the procurement of bio-kerosene;

- the assessment of its impact on the airport energy system;
- the airport planning requirements and operational processes to support large scale roll-out – e.g. handling, quality control, safety;
- the availability of fit-for-purpose storage and blending facilities.

2. Practical recommendations arising from the project experience on issues relating to
   - regulatory, legal and data security/protection aspects, including those that might hamper the adoption of the solutions demonstrated for sustainable biokerosene;
   - Description of effective business models for the different sustainable solutions, that reflect the relevant technical, operational, economic, social and legal/regulatory implications of their adoption;

B. Smart Energy in airports:

Projects will demonstrate novel concepts and solutions aimed at improving the reduction of greenhouse gas emissions and facilitating adaption to climate change.

Projects will address all of the following aspects:

- Promote decarbonisation of aviation, airports and terminals while improving air quality, such as by using smart solutions for aircraft taxiing (electrification);
- Integrate planning and management of the energy and transport infrastructures at airports, developing planning and infrastructure management tools supported by intelligent networks improve the energy and resource efficiency at airports, and the use of renewable electricity that integrates airport-specific infrastructures and energy uses (e.g. taxiing, ground handling, including through e-mobility) with other infrastructure and uses (e.g. heating, electricity);
- Ensure the development of scalable solutions –replicated/gradually scaled-up to larger or scaled-down to smaller airports, together with the demonstration of their environmental sustainability and technical, operational, and economic reliability;
- Promote governance that addresses the interactions between airport authorities, local communities and local authorities and particularly city planning departments;
- Incorporate field performance monitoring of the deployed solutions starting at least 6 months before the innovative solutions are applied to be followed for a period of at least 1 year within the project duration. This will allow comparing the effectiveness of the deployed solutions;
- Practically tested and proven solutions to maximise use of sustainable e-mobility solutions of the airport operations (e.g. taxiing, passenger logistics, fuelling logistics, etc);
- Effective innovative ways of increasing energy efficiency (waste heat recovery, battery storage etc.) and renewable energy in all relevant areas of the airport activities based on a thorough analysis of energy and resource flows (e.g. with the involvement of energy service companies,

ESCOs). Increased sourcing of electricity and heat from renewable energy sources (e.g. through own generation or power purchasing agreements) can be combined with energy efficiency through smart grid approaches.

These solutions should be monitored, analysed and elaborated in accessible best-practice handbooks and tools including existing state-of-the-art and reliable sustainable solutions related to:

- electro-mobility; the assessment of its impact on the energy system within the boundaries of the airport, notably as support to air operations – e.g. aircraft taxiing, ground handling, emergency control.
- Infrastructure management and planning tools that are able to gather and combine data from different sources and allow optimisation of energy and resources;
- Best practice examples of transport solutions within and around the airport.

Proposals must foresee a work package for cooperation with other similar actions and earmark appropriate resources (at least 3% of the requested EU contribution) for coordination and communication efforts and relevant research work with other projects and initiatives.

The Commission considers that proposals requesting a contribution from the EU of EUR 12 million would allow this specific challenge to be addressed appropriately (of which around 2/3 must be dedicated to aspects relating to "SMART use of biofuels in airports" and around 1/3 must be dedicated to aspects relating to "Smart Energy in airports"). Typically, projects should have a duration of 48 to 60 months. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts or durations. At least 15% of the requested EU contribution should be for the Fellow airports.

The technology related to the utilisation of biokerosene in airports will move the TRL from 6 to 8 (see part G of the General Annexes). The TRL refers to infrastructure and biokerosene logistics, blending, fuelling et al. and not to technology for fuel production.

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

- foster innovative overall energy systems integration;
- demonstrate effective integration of transport modes within and around the airport;
- foster wider use of electrification at airports.

Costs of commercial technologies are not eligible, for example:

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

- Biokerosene or biokerosene blends, or other relevant alternative fuels: direct purchase.

Expected Impact: The supported projects are expected to facilitate the deployment of advanced biofuels, e-mobility, energy storage and waste heat recovery in airports and reduce greenhouse gas and other air pollutants (e.g. sulphur oxides and particulates) emissions by airports. Projects should measure the reduction in GHG emissions due to actions demonstrated. Projects should measure the improvements in ambient air quality by the reduction of emissions due to the actions demonstrated.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

In 2016 the EU-**Africa High Level Policy Dialogue** on science, technology and innovation (HLPD) has adopted the roadmap (Roadmap towards a jointly funded EU-**Africa** Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture. Addis Ababa, 4-5 April 2016) for the EU-**Africa** Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA). In support of the implementation of the R&I Partnership on FNSSA and in line with the 'Joint communication to the European Parliament and the Council for a renewed impetus to the **Africa**-EU Partnership'[[JOIN (2017) 17]], a number of actions are proposed. The actions include: for pillar I of the roadmap (Sustainable intensification) a portfolio of projects (SFS-35-2019-2020 and CE-SFS-36-2020). Pillar IV of the partnership should be considered as appropriate in each proposal.

Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Clean Energy, Open Innovation

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[1] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009

[2] Directive 2018/2001 of the European Parliament and of the Council of 11 December 2018

Horizon 2020 Pillar:	Societal Challenges
Programme:	Secure, clean and efficient energy
Call Title:	Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy
Call Identifier:	h2020-lc-sc3-2018-2019-2020
Topic Title:	Smart Cities and Communities
Topic Identifier:	LC-SC3-SCC-1-2018-2019-2020
Type of Action:	IA Innovation action
Deadline(s):	29.01.2019 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-scc-1-2018-2019-2020

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

To achieve the necessary energy transition in cities, it is essential to increase energy systems integration and to push energy performance levels significantly beyond the levels of current EU building codes and to realize Europe wide deployment of Positive Energy Districts by 2050[1].

This call will also contribute to the specific objectives of the SET Plan action 3.2 - Smart cities and communities - focussing on positive-energy blocks/districts[2].

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

Lighthouse Cities will closely collaborate with Fellow Cities[3] and should act as exemplars helping to plan and initiate the replication of the deployed solutions in the Fellow cities, adapted to different local conditions.

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

Definition:
Positive Energy Blocks/Districts consist of several buildings (new, retro-fitted or a combination of both) that actively manage their energy consumption and the energy flow between them and the wider energy system. Positive Energy Blocks/Districts have an annual positive energy balance[4]. They make optimal use of elements such as advanced materials (e.g. bio-based materials), local RES, local storage, smart energy grids, demand-response, cutting edge energy management (electricity, heating and cooling), user interaction/involvement and ICT.

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

To increase impact beyond the demonstration part of the project, each Lighthouse City and Fellow City will develop during the project, together with the consortium partners, its own bold city-vision for 2050[5]. The vision should cover urban, technical, financial and social aspects. Each vision will come with its guide for the city on how to move from planning, to implementation, to replication and scaling up of successful solutions.

Proposals should also:

- Focus on mixed use urban districts and positively contribute to the overall city goals;
- Develop solutions that can be replicated/gradually scaled up to city level. The technical, financial, social, environmental and legal feasibility of the proposed solutions should be demonstrated in the actual proposal.
- Make local communities and local governments (particularly city planning departments) an active and integral part of the solution, increase their energy awareness and ensure their sense of ownership of the smart solutions. This should ensure sustainability of Positive Energy Blocks/Districts;
- Promote decarbonisation, while improving air quality, also assessing the benefits of the implemented solutions by means of Life Cycle Assessment and air quality modelling.

Projects will incorporate performance monitoring of at least 2 years of deployed solutions from the earliest feasible moment[6]. All relevant performance data must be incorporated into the Smart Cities Information System database (SCIS)[7].

Projects should also deliver:

- Effective business models for sustainable solutions;
- Practical recommendations arising from project experience on:
  - regulatory, legal aspects and data security/protection;
  - gender and socio-economics (Social Sciences and Humanities);
  - storage solutions (from short-term to seasonal);

- big data, data management and digitalisation;
- electro-mobility:
  i) its impact on energy system and
  ii) appropriate city planning measures to support large scale roll-out;

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

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

Costs of commercial technologies are not eligible, for example:

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

Projects are expected to cooperate with other Smart Cities and Communities projects funded under Horizon 2020[8] in the Smart city Lighthouse group as well as the European Innovation Partnership on Smart Cities and Communities (EIP-SCC)[9].

Therefore, proposals will foresee a work package for cooperation with other selected projects and earmark appropriate resources (5% of the requested EU contribution) for coordination and communication efforts and research work associated with cross-cutting issues.

Projects can make use of financial support to third parties for up to 5% of the EU contribution to the project for the incorporation of relevant innovation boosting activities/actions (e.g. SMEs, start-up competitions, Prizes, etc).

The Commission considers that proposals requesting a contribution from the EU of between EUR 15 to 20 million[10] would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Typically, projects should have a duration of 48 to 60 months.

Expected Impact: Projects should contribute to:

- Meeting EU climate mitigation and adaptation goals and national and/or local energy, air quality and climate targets, as relevant;
- Increased share of

  i) renewable energies,
  ii) waste heat recovery and
  iii) storage solutions (including batteries) and their integration into the energy system;

- Lead the way towards wide scale roll out of Positive Energy Districts;
- Significantly improved energy efficiency, district level optimized self-consumption, reduced curtailment;
- Increased uptake of e-mobility solutions;
- Improved air quality.

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

Call information:

TARGETED INTERNATIONAL COOPERATION

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FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

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

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[1] See also: Communication on Accelerating Clean Energy Innovation – http://ec.europa.eu/energy/sites/ener/files/documents/1_en_act_part1_v6_0.pdf

[2] For further information please consult the SETIS website: https://setis.ec.europa.eu/actions-towards-implementing-integrated-set-plan

[3] Formerly called Follower cities

[4] The data filled in the BEST table (available on the 'Funding & tender opportunities' portal) will be used by the evaluators to assess and compare the level of ambition of the technical measures for Positive Energy Blocks/Districts of the project proposals.

[5] Building on and further concretising their i) Sustainable Energy Action Plans (SEAP) or ii) Sustainable Energy (and Climate) Action Plans (SECAP) or iii) a similar, at least equally ambitious plan. These shall be approved by the corresponding authorities by the end of the project.

[6] In case of the same solution being implemented in different buildings, monitoring for 2 years must be done at least for one building of each category in the same city. Monitoring must in all cases be at least one year.

[7] http://www.smartcities-infosystem.eu/

[8] See also https://www.smartcities-infosystem.eu/scc-lighthouse-projects

[9] http://ec.europa.eu/eip/smartcities/

[10] Indicatively, EUR 6 to 8 million for a Lighthouse city and between EUR 0.5 and 1.0 million for a Fellow city.

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Long Term EU-**Africa** Partnership for Research and Innovation actions in the area of renewable energy

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

Type of Action: RIA Research and Innovation action

Deadline(s): 26.03.2020 (single-stage)

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

Specific Challenges: Following the EU commitments under the Paris Agreement, Agenda 2030 on Sustainable Development and the Cotonou Agreement, the renewed objective to evolve current forms of cooperation into equal footing partnership between **Africa** and Europe, the current research and innovation cooperation between Europe and **Africa** in the field of renewable energy needs to be strengthened and further developed. The challenge is to establish and jointly implement activities that contribute to a mutual beneficial Research and Innovation agenda and its related Research Capacity Building agenda. Through this action EU member states/ Associated Countries and **African** states interested parties (public and private) will carry out joint research activities between the two continents, will develop synergies and will push forward research capacity building activities in the field of renewable energy production and use, to promote mutual empowerment and to enhance co-designed innovation.

Coordination of the already existing bilateral activities between MSs/ACs and **African** countries is advisable.

Scope: The proposal will establish a long term partnership through the implementations of a series of strategic and joint research and innovation actions, and their related research capacity building actions, whose development has been conceptualised and whose essential elements have been so far developed by the project PRE_LEAP_RE http://www.leap-re.eu/ granted under topic LC-SC3-JA-2-2018. The scope of the research activities supported under the long term partnership would include adaptation of renewable energy technologies to the

African environmental, social and economic conditions through joint research efforts on renewable energy technologies.

The range of activities supported shall address the broad range elements identified in the preparatory phase and shall include a well-balanced set of research projects, demonstration projects, technology transfer projects, and also include provisions for exchange of researchers between MSs/ACs and **African** actors. A rolling annual programme of activities will be an annual deliverable detailing the breakdown of activities for each year based on the overall programme of activities. The action might also include financial support to third parties.

It is also expected that the activities proposed under this long term partnership create synergies with existing research, innovation and development programmes.

Inclusiveness of a broad range of MSs/ACs and **African** partners will be considered an asset. In addition, due to the synergic effect that the coordination of public and private investments and activities can have on accelerating the fast market introduction of innovative solutions, the inclusion in the consortium of private sector stakeholders will be considered a positive asset.

The estimated duration of the project in order to achieve the establishment of the long term and sustainable collaboration is 5 years.

The EU estimates that a EU contribution of 15 million EUR would sufficiently allow the establishment of the intended long term partnership. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

Expected Impact: The expected impacts are firstly the creation of long lasting research and development cooperation through common understanding and trust between MSs/ACs and **African** stakeholders and its related mechanisms,that will be able to continue after the project. Secondly, the contribution to the development of local vibrant research and industrial frameworks, boosting in particular **African** innovation capacity and significantly improve **African** stakeholders ability to be included in research and collaboration future networks, improving local innovation capacity. Finally, a strong contribution to the fast development and market introduction of sustainable renewable energy solutions in the **African** continent.

Delegation Exception Footnote: This activity directly aimed at supporting public-public partnerships with Member States and Associated Countries, technology platforms with industrial partners is excluded from the delegation to Executive Agencies and will be implemented by the Commission services.

Call information:

TARGETED INTERNATIONAL COOPERATION

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: International cooperation, Clean Energy

Horizon 2020 Pillar:	Societal Challenges
Programme:	Secure, clean and efficient energy
Call Title:	Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy
Call Identifier:	h2020-lc-sc3-2018-2019-2020
Topic Title:	Pre-Commercial Procurement for a 100% Renewable Energy Supply
Topic Identifier:	LC-SC3-RES-10-2020
Type of Action:	PCP Pre-Commercial Procurement
Deadline(s):	26.03.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-10-2020

Specific Challenges: The integration of technologies to achieve a 100% share of renewable energy generated and consumed in existing public buildings requires innovative approaches in order to develop efficient and low-cost systems that are easily run by operators and occupants. Furthermore, existing public buildings should be in line with the requirements of the Energy Performance of Buildings Directive, including national definitions of Nearly Zero-Energy Buildings (NZEBs).

This specific challenge targets consortia of procurers with similar procurement needs of common European interest, to drive innovation from the demand side and reduce fragmentation.

Scope: The objective is to bring radical improvements to the quality and energy performance of existing public buildings by encouraging the development and validation of breakthrough solutions through Pre-Commercial Procurement. Support will be given for developing novel components and configurations to generate in an existing public building energy from renewable sources so that 100% of the energy consumption of the building (electricity, heat and cooling) is fulfilled by means of renewable energy and the yearly energy demand is followed to the largest extent possible. In order to achieve such an ambitious integration of renewable energy, buildings should start from a high level of energy efficiency.

The Commission considers that proposals requesting a contribution from the EU of between EUR 8 to 15 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Please see part E of the General Annexes for a description of the specific requirements for PCP actions.

Expected Impact: The expected impacts are, on the one side, an effective integration of renewable energy technologies, and on the other side a reduced fragmentation of demand for renewable energy solutions in public buildings. In particular, procurers will be enabled to implement PCPs in areas which - due to their nature - are better addressed jointly, or which they would not have been able to tackle independently.

Delegation Exception Footnote: This pilot is excluded from the delegation to Executive Agencies and will be implemented by the Commission services.

Call information:

TARGETED INTERNATIONAL COOPERATION

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Clean Energy, Innovation Procurement

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Developing the next generation of renewable energy technologies

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

Type of Action: RIA Research and Innovation action

Deadline(s): 21.04.2020 (single-stage)

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

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

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

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

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

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

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

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

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

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

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

In 2016 the EU-**Africa High Level Policy Dialogue** on science, technology and innovation (HLPD) has adopted the roadmap (Roadmap towards a jointly funded EU-**Africa** Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture. Addis Ababa, 4-5 April 2016) for the EU-**Africa** Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA). In support of the implementation of the R&I Partnership on FNSSA and in line with the 'Joint communication to the European Parliament and the Council for a renewed impetus to the **Africa**-EU Partnership'[[JOIN (2017) 17]], a number of actions are proposed. The actions include: for pillar I of the roadmap (Sustainable intensification) a portfolio of projects (SFS-35-2019-2020 and CE-SFS-36-2020). Pillar IV of the partnership should be considered as appropriate in each proposal.

Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by

previous Horizon 2020 work programmes and those funded by the EU's development budget.

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

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[1] COM(2016) 763

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

Horizon 2020 Pillar:	Societal Challenges
Programme:	Secure, clean and efficient energy
Call Title:	Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy
Call Identifier:	h2020-lc-sc3-2018-2019-2020
Topic Title:	Advanced drilling and well completion techniques for cost reduction in geothermal energy
Topic Identifier:	LC-SC3-RES-18-2020
Type of Action:	RIA-LS Research and Innovation action Lump Sum
Deadline(s):	21.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-18-2020

Specific Challenges: To achieve or maintain global leadership in geothermal energy technology cost reductions are crucial for existing and new technologies. In particular, well construction represents a considerable component of geothermal power plants' overall investment. Consequently, lowering well cost (in terms of €/MWh) and reducing drill time or non-productive time would greatly facilitate their development. Advanced drilling technologies, currently not used in geothermal well construction, should therefore be developed and optimized.

This specific challenge is in line with the deep geothermal cost reduction targets stated in the SET-Plan Deep Geothermal Energy Implementation Plan[1].

Scope: Proposals will address novel non-mechanical drilling technologies required for applications on all types of geological formations and with the ability to reach cost-effectively greater depths and higher temperatures (i.e. beyond 5 km and 250°C) or develop new mechanical-drilling operation technologies making use of digitisation, automation, machine learning, and innovative instrumentation.

Risk assessment and lifetime analysis of new technologies are expected to be part of the work. Innovative systems to avoid and/or reduce discharge of geothermal fluids into the environment should be considered, as well as horizontal - multilateral wells clusters in various geological formations. For this reason, appropriate technology transfer from the oil and gas sector on horizontal well drilling is encouraged, although it is not compulsory.

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

Finally, proposals will have to clearly address relevant social acceptance and related socioeconomic issues.

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

Please note that this topic is part of the lump sum funding pilot scheme. Funding for grants awarded under this topic will take the form of lump sums as defined in the Commission Decision C(2017)7151 of 27 October 2017[2]. Details of the lump sum funding pilot scheme are published on the Funding & tender opportunities website[3] together with the specific Model Grant Agreement for Lump Sums[4] applicable".

Expected Impact: The proposed solution will contribute to meet key targets for drilling of the Deep Geothermal Implementation Plan of the SET-Plan[5]: reducing the unit cost of drilling (€/MWh) by 30% by 2030 and reducing drill time or non-productive time by 20% by 2025 and a total cost reduction on well completion of 20%.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

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

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

[2] http://ec.europa.eu/research/participants/data/ref/h2020/other/legal/lump_sum/lumpsumdecision_en.pdf

[3] https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home

[4] http://ec.europa.eu/research/participants/data/ref/h2020/mga/lumpsum/h2020-mga-lumpsum-pilot-multi_en.pdf

[5] https://setis.ec.europa.eu/system/files/setplan_geoth_ip.pdf

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

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

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

Type of Action: RIA Research and Innovation action

Deadline(s): 21.04.2020 (single-stage)

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

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

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

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

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

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

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

In 2016 the EU-**Africa High Level Policy Dialogue** on science, technology and innovation (HLPD) has adopted the roadmap (Roadmap towards a jointly funded EU-**Africa** Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture. Addis Ababa, 4-5 April 2016) for the EU-**Africa** Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA). In support of the implementation of the R&I Partnership on FNSSA and in line with the 'Joint communication to the European Parliament and the Council for a renewed impetus to the **Africa**-EU Partnership'[[JOIN (2017) 17]], a number of actions are proposed. The actions include: for pillar I of the roadmap (Sustainable intensification) a portfolio of projects (SFS-35-2019-2020 and CE-SFS-36-2020). Pillar IV of the partnership should be considered as appropriate in each proposal.

Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Blue Growth, Clean Energy

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Offshore wind basic science and balance of plant

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

Type of Action: RIA Research and Innovation action

Deadline(s): 21.04.2020 (single-stage)

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

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

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

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

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

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

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

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

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

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Clean Energy, Blue Growth

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

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

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

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

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

Type of Action: RIA Research and Innovation action

Deadline(s): 21.04.2020 (single-stage)

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

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

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

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

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

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 to 5 million would allow this challenge to be addressed appropriately. No-netheless, this does not preclude submission and selection of proposals requesting other amounts.

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

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Blue Growth, Clean Energy

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

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Combined clean biofuel production and phytoremediation solutions from contaminated lands worldwide

Topic Identifier: LC-SC3-RES-37-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 21.04.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-37-2020

Specific Challenges: Dedicated biofuel production at large scale depends on sustainable land availability that does not compete with other uses. Phytoremediation is a holistic approach that best de-contaminates lands from a vast variety of pollutants. The challenge is to bridge the gap between phytoremediation strategies and clean biofuel production in a sustainable and optimum manner that will overcome the indirect land use change (iLUC) issue for biofuels and restore lands for agricultural uses.

The proposed solution will contribute towards the Mission Innovation Challenge 4[1].

This is a global challenge that calls for international cooperation.

Scope: Proposals will bridge the gap between phytoremediation strategies and clean liquid biofuel production. They will optimise energy crops for phytoremediation by targeting different classes of known soil pollutants and integrate in the conversion process to biofuels a strategy to extract these pollutants in concentrated form. The overall process will be optimized in terms of cost and sustainability. Pilot-scale, small trials are expected for both clean biofuel production and phytoremediation processes.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), and given the world-wide applicability of this specific challenge, international cooperation is encouraged.

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

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

Expected Impact: It is expected that a win-win situation will be created for bringing polluted land back to agricultural production and for low-iLUC risk liquid biofuel production from energy crops. Through cost reduction and improved phytoremediation, contribution to several sustainable development goals (SDGs) beyond the Energy is anticipated.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Clean Energy, International cooperation

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

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Geological Storage Pilots

Topic Identifier: LC-SC3-NZE-6-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 01.09.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-nze-6-2020

Specific Challenges: The total geological storage capacity in Europe is estimated to be over 300 billion tonnes (Gt) of CO2[1]. This is sufficient to permanently hold all the CO2 that could be captured in the EU for decades to come. The significant lead time for the development and permitting of geological storage, which is in the order of 7-10 years, demands speeding-up storage site identification and characterisation in Europe. The appraisal and development of storage capacity in promising regions has to provide the necessary confidence that the required CO2 storage capacity will be available when needed. In addition, storage pilots will play a crucial role in unlocking European CO2 storage capacity, assessing the potential risks and visualising CCS technology to the wider public. A portfolio of pilot storage sites in different geological settings, onshore or offshore, either in depleted hydrocarbon fields or in deep saline aquifers, is therefore needed to catalyse full-scale deployment of CCS in the medium to longer term.

This topic responds to the targets in the SET-Plan CCUS Implementation Plan[2] to have at least 3 new CO2 storage pilots operating in different settings, and SET Plan countries having completed feasibility studies on applying CCS to a set of clusters of major industrial and other sources by 2025-2030.

Scope: The objective is to carry out the identification and geological characterisation of new prospective storage sites for CO2 (including the 3D architecture of the storage complex) in promising regions of future demonstration and deployment (onshore or offshore) through the implementation of new CO2 storage pilots. This will result in new data, knowledge and detailed models of potential storage complexes and their response to dynamic pressurisation. Important aspects include (but are not limited to): detailed geological characterisation, including

faults and facture systems; analysis of initial stress field and geomechanical behaviour of the storage formations and seals under varying stress and pore-pressure conditions; estimation of storage capacity; accurate modelling of injectivity; overall storage risk assessment, including induced seismicity and blow-out or blockage during injection, and including proposed mitigation action. Detailed plans should propose site-specific solutions for CO2 injection strategies, pressure management, mitigation of induced seismicity, and MMV (measurement, monitoring and verification).

For geological storage, in particular onshore, public acceptance is paramount. Therefore projects are expected to identify and engage relevant end users and societal stakeholders and analyse their concerns and needs using appropriate techniques and methods from the social sciences and humanities, noting the significant differences in potential regional consequences where the CO2 stored comes from power versus industry.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 7 to 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Detailed geological characterisation and development planning of promising and safe storage sites and successful realisation of storage pilots will facilitate the subsequent application for storage permits and the kick-start of CCS in the concerned Member States and Associated Countries. Such a ‘pipeline of sweet spots’ can provide a baseline for estimation of storage cost, increase public awareness and help prepare the ground for full and active development into operational storage sites in the mid 2020's.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

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Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Socio-economic science and humanities

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[1] http://www.geology.cz/geocapacity/publications/D42%20GeoCapacity%20Final%20Report-red.pdf

[2] https://setis.ec.europa.eu/implementing-integrated-set-plan/carbon-capture-utilisation-and-storage-ongoing-work

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Efficient combination of Concentrated Solar Power and desalination (with particular focus on the Gulf Cooperation Council (GCC) region)

Topic Identifier: LC-SC3-RES-20-2020

Type of Action: IA Innovation action

Deadline(s): 01.09.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-20-2020

Specific Challenges: Several arid and semi-arid regions of the world are highly dependent on desalination and the demand for desalination is projected to grow. Many of these regions have also an abundant solar resource, which is suitable for the application of Concentrated Solar Power (CSP). Several technical aspects need to be addressed to match the thermal cycle of a CSP plant to the energy needs of a desalination system in an effective way.

Scope: Support will be given to demonstrate efficient solutions that couple the thermal cycle of a CSP plant to a water desalination system.

The proposals are expected to bring technologies to TRL 6 (please see part G of the General Annexes) at the end of the project activities.

The Commission considers that proposals requesting a contribution from the EU of between EUR 6 to 10 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged, in particular with Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. The participation of organisations from these countries as partners in the project will be positively evaluated.

Expected Impact: The expected impacts are a substantial reduction of CO2 emissions from desalination and strengthened international cooperation. This will support the objectives of the many international initiatives that are currently addressing the crucial nexus between energy and water systems.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

In 2016 the EU-**Africa High Level Policy Dialogue** on science, technology and innovation (HLPD) has adopted the roadmap (Roadmap towards a jointly funded EU-**Africa** Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture. Addis Ababa, 4-5 April 2016) for the EU-**Africa** Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA). In support of the implementation of the R&I Partnership on FNSSA and in line with the 'Joint communication to the European Parliament and the Council for a renewed impetus to the **Africa**-EU Partnership'[[JOIN (2017) 17]], a number of actions are proposed. The actions include: for pillar I of the roadmap (Sustainable intensification) a portfolio of projects (SFS-35-2019-2020 and CE-SFS-36-2020). Pillar IV of the partnership should be considered as appropriate in each proposal.

Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Clean Energy, International cooperation

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: International cooperation with Japan for Research and Innovation on advanced biofuels and alternative renewable fuels

Topic Identifier: LC-SC3-RES-25-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 01.09.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-25-2020

Specific Challenges: Disruptive conversion technologies are needed for replacing completely the use of fossil fuels in the transport and heating sectors with advanced biofuels and alternative renewable fuels. International collaboration is mutually beneficial in strategic areas where knowledge can be exchanged and Europe can obtain leadership together with its international partners.

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

Scope: Proposals will aim at international cooperation with Japan[2] involving Japanese organisations in the consortia for the development of disruptive catalytic technologies, by developing novel catalysts and linked lab-scale components/systems with significantly improved performance for conversion efficiency and specific marginal cost reduction for obtaining low-cost bioenergy carriers, non-food/feed based advanced biofuels and alternative renewable fuels (excluding hydrogen) and maximizing GHG abatement.

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

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

Expected Impact: It is expected that the exchange of knowledge through the targeted research activities with Japan will progress the technology state-of-the-art and in addition it will strengthen the European and Japanese technology base. At the same time, it is expected that the development of renewable fuels that outperform the best fossil fuel alternatives is accelerated.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

In 2016 the EU-**Africa High Level Policy Dialogue** on science, technology and innovation (HLPD) has adopted the roadmap (Roadmap towards a jointly funded EU-**Africa** Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture. Addis Ababa, 4-5 April 2016) for the EU-**Africa** Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA). In support of the implementation of the R&I Partnership on FNSSA and in line with the 'Joint communication to the European Parliament and the Council for a renewed impetus to the **Africa**-EU Partnership'[[JOIN (2017) 17]], a number of actions are proposed. The actions include: for pillar I of the roadmap (Sustainable intensification) a portfolio of projects (SFS-35-2019-2020 and CE-SFS-36-2020). Pillar IV of the partnership should be considered as appropriate in each proposal.

Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Clean Energy, International cooperation

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

[2] The Japan Science and Technology Agency (JST) is the expected funding Japanese authority

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: International Cooperation with USA and/or China on alternative renewable fuels from sunlight for energy, transport and chemical storage

Topic Identifier: LC-SC3-RES-3-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 01.09.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-3-2020

Specific Challenges: Decarbonisation of the energy and transport systems requires the ultimate replacement of fossil fuels in the long-term and the flexibility to store sustainable energy on a large scale and for a long time in new kind of energy storage compounds. To achieve this goal, the production of clean forms of storable chemical energy carriers from direct sunlight will be necessary.

International collaboration is mutually beneficial in strategic areas where knowledge can be exchanged. The specific challenge is for Europe to precede together with its international partners in global development of specific disruptive technologies for the ultimate replacement of fossil fuels.

Scope: Proposals will aim at international cooperation with the USA and/or China on targeted research activities for obtaining advanced biofuels and alternative renewable fuels for energy and transport through photochemical/ photobiological or electrochemical reaction. The ranking of the successful proposals will ensure that a balanced portfolio of activities is covering both cooperation with USA and China (please see call conditions).

The proposals will develop breakthrough artificial photosynthesis technologies in terms of sunlight conversion efficiency for the production of energy carriers (other than electricity) with either de-novo synthetic biological and artificial/biochemical hybrid systems or novel photo-catalysis or photo-electro catalysis coupled with CO2 reduction.

At least one of the following technology-specific challenges has to be addressed:

- Improved light-harvesting and efficient charge separation in photocatalytic systems;
- Photoelectrochemical cells – PECs and catalyst development
- Improved light harvesting coupled with improved CO2 reduction efficiency in synthetic biological systems

Use of external renewable electricity or electricity generated by sunlight with PV or CSP to produce the carriers is excluded from this topic.

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

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

Expected Impact: It is expected that the exchange of knowledge through the targeted research activities with USA and/or China will progress the scientific understanding and the technology state-of-the-art and in addition strengthen the European and international partners' technology base. At the same time, it is expected that the development of renewable fuels that outperform the best fossil fuel alternatives is accelerated.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), actions will contribute to implementing Mission Innovation Challenge[1] 4 and 5.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

In 2016 the EU-**Africa High Level Policy Dialogue** on science, technology and innovation (HLPD) has adopted the roadmap (Roadmap towards a jointly funded EU-**Africa** Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture. Addis Ababa, 4-5 April 2016) for the EU-**Africa** Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA). In support of the implementation of the R&I Partnership on FNSSA and in line with the 'Joint communication to the European Parliament and the Council for a renewed impetus to the **Africa**-EU Partnership'[[JOIN (2017) 17]], a number of actions are proposed. The actions include: for pillar I of the roadmap (Sustainable intensification) a portfolio of projects (SFS-35-2019-2020 and CE-SFS-36-2020). Pillar IV of the partnership should be considered as appropriate in each proposal.

Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by

previous Horizon 2020 work programmes and those funded by the EU's development budget.

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

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

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

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

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

Type of Action: RIA Research and Innovation action

Deadline(s): 01.09.2020 (single-stage)

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

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

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

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

Proposals should address at least one of the following issues:

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

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

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

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

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

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

In 2016 the EU-**Africa High Level Policy Dialogue** on science, technology and innovation (HLPD) has adopted the roadmap (Roadmap towards a jointly funded EU-**Africa** Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture. Addis Ababa, 4-5 April 2016) for the EU-**Africa** Research and Innovation Partnership on Food and Nutrition Security & Sustainable Agriculture (FNSSA). In support of the implementation of the R&I Partnership on FNSSA and in line with the 'Joint communication to the European Parliament and the Council for a renewed impetus to the **Africa**-EU Partnership'[[JOIN (2017) 17]], a number of actions are proposed. The actions include: for pillar I of the roadmap (Sustainable intensification) a portfolio of projects (SFS-35-2019-2020 and CE-SFS-36-2020). Pillar IV of the partnership should be considered as appropriate in each proposal.

Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

Cross-cutting Priorities: Clean Energy, International cooperation

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

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

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

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

Topic Title: Positive Energy Districts and Neighbourhoods for urban energy transitions

Topic Identifier: LC-SC3-SCC-2-2020

Type of Action: ERA-NET-Cofund ERA-NET Cofund

Deadline(s): 01.09.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-scc-2-2020

Specific Challenges: The ambition of the SET-Plan Action 3.2 is the planning, deployment and operation of 100 Positive Energy Districts/Neighbourhoods (PED/PEN) in Europe by 2025. This requires integrated and holistic sustainable system approaches including technological, social, urban planning, economic, financial and legal/regulatory perspectives. Tackling such challenges, calls for integrated and innovative solutions to spur the implementation of Positive Energy Districts and Neighbourhoods on larger scale. The aim is to accelerate the ongoing energy transition and to support the parties to the Paris Agreement to reach their national greenhouse gas emissions targets, and so contribute to achieve sustainable urban transformation process to decrease greenhouse gas emissions and ensure high liveability and affordability for citizens.

Scope: Proposals will mobilise networks of national (and/or regional) research, innovation and demonstration programmes in the field of smart and sustainable cities and sustainable decarbonised integrated energy systems. They will pool the necessary financial resources with a view to implementing a joint call for proposals resulting in grants to third parties with EU co-funding in this area, and for related programme management, synthesis and dissemination of the results. Activities funded through the joint calls should focus on a circular, resource efficient and low carbon integrated system perspective. The joint calls should include the following three formats, which should be interlinked and integrated to achieve highest impact.

The joint calls will firstly include applied research, strategic innovation and demonstration projects to develop specific innovative approaches and solutions

for the planning, implementation and operation of PED/PENs, which are relevant in many European cities and urban areas. Strategic innovation projects resulting from the joint calls should create opportunities for cross-linking and collaboration and target more than one of the following aspects:

- increasing energy efficiency of neighbourhoods and reduction of performance gaps, reducing climate impact and facilitating energy transition at urban scale promoting integrated and holistic approaches through optimization of the energy system in the built environment, innovative building solutions and innovative approaches for interoperability of new and existing technologies;
- integrating renewable energy production and transformation technologies to support and optimize storage and transfer of locally produced energy to other parts of the districts for synthetic on-site energy production and supply, including flexibility and resilience of PED/PENs through concepts for seasonal transferability of energy as well as PED/PEN integration in regional energy systems through flexible and optimised energy consumption within the district and through compensation measures and smart interfaces to balance real time energy supply and promotion of the prosumer concept;;
- support integration and development of integrated and smart solutions for sector-coupling in PED/PENs with focus on innovation need across energy, mobility, and ICT in a systemic setting, including user involvement and different socio-cultural target groups, local governance aspects and balancing urban green-blue-grey infrastructures;
- streamlining and alignment of the spatial planning processes and developing digital planning strategies and optimization tools (e.g. using building/neighbourhood information modelling (BIM)) along the entire life cycle of PED/PENs;
- developing societal innovation, social entrepreneurship and citizen participation aiming to integrate all relevant stakeholders to spur the implementation of PED/PENs within an integrated urban transformation process, where relevant, aspects of gender and diversity, inclusiveness and accessibility should be addressed and
- developing business models for implementing and operating PED/PENs on full scale that consider the whole process of planning, operation and operation of PED/PENs; as well as for refurbishment of existing housing stocks to safeguard accessible and affordable housing and sustainable mobility; engaging all actors such as users, owners, city authorities, real estate developer, operators of the energy infrastructure, and investors to create economically viable models for all parties.

The joint calls will secondly include the establishment of transdisciplinary and transnational innovation labs, innovation platforms and experimental areas for PED/PENs that facilitate the testing of prototypes, the co-creation and piloting of new concepts, approaches and urban designs, innovative formats and services in the planning, implementation and operation and replication phase of PED/PENs covering TRL 3-7. This should enable feasibility studies, field testing, sharing of test facilities, development of use cases and replication profiles for different PED/PEN types (e.g. new construction and retrofitting of neighbourhoods) to speed up the technology and service learning curves over the whole value chain.

Particularly the PED/PEN innovation labs, innovation platforms and experimental areas shall bring together city administrations, PED/PEN business and industry, service developers/providers, and research organisations tying together actors bridging the whole value chain in different countries and regions.

The joint calls will thirdly include the development of formats to build local capacity and institutional learning in PED/PEN planning, development and operation with the aim to replicate and mainstream PED/PENs in a local, national and European environment. It should take into account the need to develop new public services and public innovation governance, in particular concerning effective public participation and challenge driven approaches in practice. This should enable sharing of experience, development of standardised packages, adaptation of regulations, human capacity building/trainings etc.

Proposers are requested to include other joint activities including additional joint calls without EU co-funding.

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

Expected Impact: The ERA-NET Cofund will significantly support and contribute to:

- the testing, implementation and replication of 100 Positive Energy Districts and Neighbourhoods in Europe by 2025 as set out in the SET-Plan Action 3.2 Implementation Plan;
- transitions towards sustainable urban development, as set out in the UN SDGs and the Urban Agenda of the EU;
- the fulfilment of the role of Europe in Challenge 7 of Mission Innovation, where PED/PENs - a physical aggregator of technologies/solutions collaborating each other with the aim of promoting the transition to a sustainable urbanization - would be a decisive asset for the climate and energy performance of the European built environment; and
- an enhancement of European capacities and knowledge to become a global role model and market leader for the development of PED/PENs.

Call information:

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

FNSSA **Africa**:

In 2016 the EU-**Africa High Level Policy Dialogue** on science, technology and innovation (HLPD) has adopted the roadmap (Roadmap towards a jointly funded EU-**Africa** Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture. Addis Ababa, 4-5 April 2016) for the EU-**Africa** Research and Innovation Partnership on Food and Nutrition Security & Sustainable

Agriculture (FNSSA). In support of the implementation of the R&I Partnership on FNSSA and in line with the 'Joint communication to the European Parliament and the Council for a renewed impetus to the **Africa**-EU Partnership'[[JOIN (2017) 17]], a number of actions are proposed. The actions include: for pillar I of the roadmap (Sustainable intensification) a portfolio of projects (SFS-35-2019-2020 and CE-SFS-36-2020). Pillar IV of the partnership should be considered as appropriate in each proposal.

Proposals are expected to establish relevant links with other projects funded in support of the EU-**Africa** R&I Partnership on FNSSA, including those funded by previous Horizon 2020 work programmes and those funded by the EU's development budget.

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

Horizon 2020 Pillar: Societal Challenges

Programme: Smart, green and integrated transport

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

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

Topic Title: Setting up a common European research and innovation strategy for the future of road transport

Topic Identifier: LC-GV-09-2020

Type of Action: CSA Coordination and support action

Deadline(s): 21.04.2020 (single-stage)

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

Specific Challenges: The objective of this topic is to define R&D roadmaps for a sustainable and efficient road transport system in Europe. It calls for a Coordination and Support Action to support ERTRAC (the European Technology Platform for Road Transport), future Partnerships relevant to road transport in Horizon Europe and the European Commission in defining the research needs for their upcoming research and innovation programmes, and by then helping to achieve the targets set at EU and global level (EU Transport White Paper, COP21 for decarbonisation, etc.).

International cooperation with developing and emerging economies should also be developed in order to increase efficient mobility for all, reduce local (air and noise) and CO2 emissions, and tackle health and safety issues, and increase attractiveness and competitiveness in particular in urban areas.

Scope: Proposals should take a comprehensive approach ranging from components up to system integration, and include enabling technologies where relevant. Both passenger mobility and freight transport should be addressed and covering urban mobility as well as inter-urban and long-distance transport. They should address all the following aspects:

- Updating of research agendas and roadmaps developed by the European Technology Platform ERTRAC (European Road Transport Research Advisory Council) and supporting the definition of research priorities of future Horizon Europe Partnerships relevant to road transport, covering all transport research fields.
- Facilitating cooperation between cities in Europe, Asia, Latin America and **Africa**. Actively support policy and knowledge exchange and establish a peer-

to-peer exchange and capacity building programme that takes advantage of the results of a large number of relevant cities. Cooperation between EU and international projects on urban mobility. Develop implementation concepts for sustainable mobility including shared private vehicles (e.g. light-duty vehicles and 2-, and 3-wheelers), logistics (e.g. e-Trucks, cargo bikes), public transport systems (e.g. Bus Rapid Transit Systems, buses, soft modes) and new mobility services.

- Liaise with international financing institutions to foster the take-up and implementation of the concepts developed, support the European Commission in international discussions and specialised sectorial Fora related to Mobility for All, Climate Change and the New Urban Agenda. Track global progress on urban electric mobility and support UN activities, such as the Urban Electric Mobility Initiative (UEMI).

The implementation requires close collaboration with the leading European stakeholders in transport research, including vehicles manufacturers, supply industry, and research and engineering organisations, as well as strong links with other relevant European initiatives and associations. In line with the strategy for EU international cooperation in research and innovation, international cooperation is encouraged with key emerging countries, in particular with Asia, Latin America and **Africa**.

The Commission considers that proposals requesting a contribution from the EU of between EUR 0.8 to 1 million each would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: This action will bring together the leading European stakeholders in road transport research to develop roadmaps and support international cooperation. It will contribute to a further harmonisation of research and innovation, and therefore contribute to the European Research Area, in particular also in the view of innovation, as well as to the European strategies for a future transport system.

Proposals are expected to contribute to:

- The objective of the European Union for climate action and sustainable development.
- The objectives set by the Paris Agreement (COP21) and the New Urban Agenda.
- The fulfilment of post 2020 emission targets in road transport (at least 30% by 2030 compared to 2021)
- The EU's long-term goal of moving close to zero fatalities and serious injuries by 2050 ("Vision Zero")
- UN's Sustainable Development Goals 11 "Sustainable cities and communities" (with particular attention to 11.2) and 13 "Climate Action"
- Strengthening the collaboration of the European Union with Asia, Latin America and **Africa**.

Horizon 2020 Pillar: Societal Challenges

Programme: Climate action, environment, resource efficiency and raw materials

Call Title: Greening the economy in line with the Sustainable Development Goals (SDGs)

Call Identifier: h2020-sc5-2018-2019-2020

Topic Title: Understanding the transition to a circular economy and its implications on the environment, economy and society

Topic Identifier: CE-SC5-25-2020

Type of Action: RIA Research and Innovation action

Deadline(s): 13.02.2020, 03.09.2020 (two-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ce-sc5-25-2020

Specific Challenges: The transition to a circular economy entails a systemic transformation of entire value chains, covering design, production and consumption phases, so that the value of products, materials and resources can be maintained in the economy for as long as possible, while reducing environmental impact. It also aims at increasing material productivity, including de-materialisation, and exploring new representations and practices of property for individuals and collectives. Such a deep transformation is unlikely to happen suddenly and would rather follow some transition processes and pathways. Understanding, in critical and thoughtful way, the transition to a circular economy and its positive and negative implications on the environment, economy and society (including human health), will be important for the development and adoption of circular economy approaches, including the design of well-targeted transitional policy measures. Moreover, the identification and analysis of best practices of the transition to a circular economy in- or outside Europe, on a citizen, business sectorial and macroeconomic level, possibly covering different cooperation models (including B2B, B2C, P2P, etc.) will serve as an inspiration for specific projects. They also can inform new and adapted policies and policy tools including regulation, taxation and financing, incentives, strategic governance mechanisms and soft tools (e.g. communication and awareness raising tools) to further disseminating the concept of circularity.

Scope: The research will assess the current state of transition towards the circular economy in relevant economic sectors (public, private and non-profit) and

analyse possible transition scenarios, as well as their outcomes and impacts. It will identify the key factors (regulatory, governance-based, market, technological, cultural, societal, gender, etc.) that can stimulate or hinder this transition. The selected sectors should be among the ones identified in the EU Circular Economy Action Plan. Additional sectors could also be selected, considering criteria such as environmental footprint, health issues, complexities of value-chain, dependency on imported materials and relevance for European economy. Implications of the transition, both positive and negative, for the economy, the environment and the society will be assessed qualitatively and as much as possible quantified. For that reason, appropriate models for analysing and quantifying the various implications and trade-offs and assessing the sustainability of circular economy should be developed. The implications considered should include social, economic and environmental aspects, such as trade flows, value-chains, labour demand, European industry competitiveness, regulatory frameworks, policy and governance mechanisms, public and occupational health, greenhouse gas emissions, use of energy, land, water, minerals and other resources), flows of resources at all relevant geographical scales, human health, social and territorial cohesion, and value distribution across society. The role of public awareness and acceptance and other social aspects, including gender issues, need to be considered. Where relevant, particular attention should be paid to the issue of hazardous materials in a circular economy. Policy recommendations for policy-makers at the local, national, European and global levels, including recommendations on governance issues, will be derived from the research. Involvement of relevant social sciences and humanities disciplines and expertise in behavioural economics and gender issues, is deemed important.

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

This topic is in support of the European Strategy for Plastics in a Circular Economy. Selected projects under this topic as well as projects selected under other topics in H2020 supporting the Plastics Strategy are strongly encouraged to participate in joint activities as appropriate. These joint activities could take the form of clustering of projects, participation in workshops, common exploitation and dissemination etc. The proposals are expected to demonstrate support to common coordination and dissemination activities. Applicants should plan the necessary budget to cover those activities without the prerequisite to define concrete common actions at this stage.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 3-4 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The project results are expected to contribute to:

- more systemic policy decisions to further facilitate the transition to a safe, environmentally friendly, efficient and effective circular economy in selected sectors;

- efficient and effective use of both primary and secondary resources in Europe, reducing waste generation, negative health impacts, environmental pollution and greenhouse gas emissions;
- new business opportunities for European industries and SMEs;
- creating new tools and methodologies oriented to companies, to consider social, environmental and economic aspects when they design circular business models;
- creating incentives and support the development of strategic governance mechanisms that enable the transition to a Circular Economy and contribute to the effective implementation of the Sustainable Development Goals in Europe;
- supporting the achievement of climate commitments and specific quantitative targets on resources efficiency, recycling rates or waste disposal quotas.

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

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: Centres/Networks of European research and innovation

Topic Identifier: GOVERNANCE-20-2020

Type of Action: CSA Coordination and support action

Deadline(s): 12.03.2020 (single-stage)

Participant Portal Weblink:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/governance-20-2020

Specific Challenges: To extend the network of (currently three) centres in the world's most dynamic and innovative countries and regions that connect and support European researchers and entrepreneurs globally, in order to establish their presence in third countries and strengthen the position of Europe as a science, technology and innovation leader.

This call topic builds on the results of the 2016 Call topic ENG-GLOBALLY-09-2016, focusing specifically on innovation.

Scope: To establish new centres, or networks of centres, in close cooperation with local technology and innovation structures located in third countries and regions.

A maximum of three proposals will be supported including one for India and one for **Africa**. These centres/networks will engage in activities with a focus depending on the country/region addressed, including activities such as:

- Providing services such as incubator co-working space, advice and support directly to European innovators that want to soft-land in the partner country/region and/or to engage in co-creation with local innovators;
- Building/linking to an eco-system of stakeholders including early adopters, potential customers, partners etc. in the country/region;
- Supporting the transfer and internationalisation of demonstrated technologies and know-how, both to and from the country/region;
- Launching local market development programmes to deploy European technology;
- Offering mentorship, training and promoting staff exchange to increase capacities of innovators;

- Leveraging private and public investors' resources to sustain the activities of the centre(s).

The proposed work should seek to establish the centres/networks in cooperation with local actors based on a sound business plan that is expected to include clear commitments from multiple funding sources, such as corporates, investors, or local governments making available soft-landing spaces. The business plan and the intended governance (including type of legal entity to be established) shall be presented as part of the proposal. The involvement of European and local incubators or accelerators must be described.

Each proposal shall target one country or region that is an emerging or developing technology or innovation partner; proposals addressing India and all or part of **Africa** are strongly encouraged without excluding other countries with similar characteristics.

For India, the centre(s) should target mature start-ups and SMEs from both Europe and India and promote matchmaking for adaptation of European technologies and innovative solutions to the Indian context.

For **Africa** the centre(s) with the network of incubators and accelerators should target at least five sub-Saharan **African** countries, build on existing local incubators and accelerators, and focus on technology transfer/adaptation (from Europe to **Africa** or vice-versa), staff exchanges and training.

Consortia are expected to include business development as well as technology expertise in the target country or region and ensure adequate involvement of European stakeholders from existing structures in the addressed countries/regions. Proposals should build on previous work of bilateral and regional international cooperation projects where appropriate.

The Commission considers that proposals requesting an EU contribution of around EUR 2-3 million for a duration of 3-4 years would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Under this topic, legal entities established in the target country/region are eligible for funding from the Union.

Eligibility and admissibility conditions: Under this topic, legal entities established in the target country/region are eligible for funding from the Union.

Expected Impact:

- Reinforced cooperation between European innovators and those of the Union's international partners;
- Higher visibility and prestige for European research and innovation and its actors in international partner countries/regions;
- Stronger presence of European organisations in the innovation environment of the partner country/region;
- Enhanced impact of results from research and innovation projects, including those under Horizon 2020, through increased access to excellence and to markets across the world.

Cross-cutting Priorities: Open Innovation, International cooperation

Horizon 2020 Pillar: Societal Challenges

Programme: Europe in a changing world - inclusive, innovative and reflective Societies

Call Title: Migration

Call Identifier: h2020-sc6-migration-2018-2019-2020

Topic Title: Inclusive and innovative practices for the integration of recently arrived migrants in local communities

Topic Identifier: Migration-04-2020

Type of Action: RIA Research and Innovation action, IA-LS Innovation action Lump Sum

Deadline(s): 12.03.2021 (single-stage)

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

Specific Challenges: The arrival of migrants contributes to diversifying the demographic, cultural, linguistic, ethnic and religious makeup of already diverse European cities and suburbs and rural communities. This may represent an opportunity, but also a significant challenge if taking place in an unorderly manner, as occurred in Europe since 2014. The challenge is to provide policy makers at local, regional, national and supra-national level, civil society organizations and other relevant actors with effective, responsive, flexible, context-specific and culture-specific proposals for measures to promote socio-economic integration and inclusion as well as access to rights and services. This includes sustainable and participatory strategies, also with the involvement of citizens, civil society actors, education institutions and the private sector.

Scope:

a. Innovation action-Lump Sum contribution

The further improvement of the effective integration of newly arrived migrants into societies requires an understanding of existing integration policies and practices. Proposals should examine the provisions for migrants' rights and their access to social services in the host countries, in particular, in the aftermath of the recent unorderly migration flows since 2014. Special attention should be paid to past, existing and potential mechanisms to support the integration of migrant men and women, through participatory practices, social innovation and entrepreneurship, diaspora communities and local civil society initiatives. This Innovation action will develop and test

potentially viable approaches through pilots. It will closely involve migrants, members of the host communities, public authorities and researchers, from preparing the concept over their implementation to their evaluation.

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

Please note that this topic will take the form of lump sums as defined in Commission DecisionC(2017)7151 of 27 October 2017. Details of the lump sum funding pilot scheme are published on the Funding & Tenders Portal together with the specific Model Grant Agreement for Lump Sums applicable

b. Research and Innovation Action

Proposals should comparatively assess the effectiveness of integration policies and practices in major migrant-receiving spaces, in local communities, ranging from urban spaces to rural areas. This should include migrants' access to civic and social rights, social services and facilities (e.g. language tuition and healthcare) in accordance with their legal status, as well as intercultural interaction (including gender aspects) and adaptation to increased diversity of the population. Proposals should also explore social cohesion and societal fragmentation, and how these aspects are accounted for in migrant integration policies. The urban and rural governance of integration processes should be analysed and assessed against the backdrop of a broader multi-level governance framework, whereby potential and real tensions between the local and other levels of governments should be explored. Attitudes to migration and integration by both migrants and the host communities should be studied as well. The role of religious communities could also be examined in relation to outcomes of integration processes. The incorporation of historical and comparative insights from migrant integration processes in relevant non-European societies is strongly encouraged. Cooperation with non-European scholars is also encouraged. This could be done by cooperating with scholars from **Africa** and the Middle East given the migration relations these regions have in migration policies and dynamics with the EU, as well as with Canada with which strong international cooperation on migration research in ongoing. Processes of exclusion, actions and initiatives to redress them, as well as mutual influences between host and migrant communities could be studied, including the analysis of the impact of these dynamics with relations of migrants with their origin countries. Projects should compare the different practices and experience on their viability, efficiency and transferability. They should deliver policy recommendations. Projects should establish a regular exchange with the stakeholders from the different communities and municipalities.

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

The outputs of MIGRATION-04-2020 should also be made readily available for cooperation and synergy with MIGRATION-10-2020, a CSA which will compile the outputs of existing research on integration, including such RIAs and IAs.

Expected Impact: Projects will enhance the knowledge base on integration of migrants in local communities. The actions will contribute to improved practices, policies and strategies at local, national and EU level for the integration of migrants in European urban and local settings. This will help increase the possibilities for migrants to thrive and flourish in the labour market and in society. They will advance the implementation of the EU Urban Agenda (building on the specific Partnership on Inclusion of Migrants and refugees [1] and of the UN Sustainable Development Goals related to making cities inclusive, safe, resilient and sustainable.

The pilots developed with the Innovation Action will offer new tools for enhancing the integration of migrants across Europe. This will provide actors working in this multilevel system of governance with already tested options that should be scalable and replicable in different environments with the context specific adaptations. Their evaluation will provide conclusions and recommendations for policy making at local level as well as for the regional, national and European level to create best possible conditions in which local authorities and their stakeholders can operate.

The Research and Innovation Action should deliver analysis for better understanding the phenomenon. Projects should identify approaches and practices, which can be applied in both cities and rural communities, as well as those that would be specific to one or the other. This will expand the knowledge both of dynamics of integration and of the policies managing such process, shedding light on potential gaps and needs which should be addressed by policymakers. The actions will contribute to finding new ways to integrate migrants into European societies, to ensure their cohesion and thus exploit the potential opportunities of migration.

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

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[1] https://ec.europa.eu/futurium/en/inclusion-of-migrants-and-refugees