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1. Introduction

IST-Africa has prepared a short guide to Horizon 2020 to support African institutions in better understanding the structure, rules and expectations related to Horizon 2020. This is supported by a series of Annexes that provide a breakdown of relevant 2016 Calls[1] and historical information that was prepared and circulated separately for 2015 and 2014.

This section provides an initial introduction to Horizon 2020, the role of International cooperation including insight into African participation under FP7 and Horizon 2020 to date and summarises the key differences between FP7 and Horizon 2020.

1.1   Brief Introduction to Horizon 2020

Horizon 2020 commenced in January 2014 as the new Framework Programme to implement the Innovation Union with research and innovation funds of €80 billion from 2014 – 2020.

Horizon 2020 addresses all research and innovation funding that was previously provided through the Framework Programmes for Research and Technical Development (e.g. FP7), Competitiveness and Innovation Programme (CIP) and European Institute of Innovation and Technology.

Horizon 2020 is the largest Research and Innovation programme in Europe to date. It is designed to support the core focus of Europe's 2020 strategy of smart, sustainable and inclusive growth. It is focused around investing in jobs and growth, identifying how to access society's concerns about safety, environment and people's livelihoods and strengthening the EU's global position in research, innovation and technology.

Horizon 2020 Pillars

- The European Research Council
- Future and Emerging Technologies
- Marie Curie actions on skills, training and career development
- Research infrastructures (including eInfrastructures)

Excellent Science

- Health, demographic change and wellbeing
- Food security, sustainable agriculture, marine research & the bio-economy
- Secure, clean and efficient energy
- Smart, green and integrated transport
- Climate action, resource efficiency and raw materials
- Inclusive, innovative and Reflective societies
- Secure Societies

- Leadership in enabling and industrial technologies
- Access to risk finance
- Innovation in SMEs

Industrial Leadership

Societal Challenges

Image prepared by IST-Africa

Figure 1: Horizon 2020 Pillars

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[1] http://www.ist-africa.org/home/files/IST-Africa_Guide_2016Calls_Horizon2020.pdf

It is an integrated Programme that brings together Research and Innovation around three main pillars as outlined in Figure 1 above:

- Excellent Science, which incorporates Research Infrastructures, Marie-Sklodowska-Curie Actions, Future and Emerging Technologies, European Research Council;

- Industrial Leadership, which incorporates Leadership in enabling and industrial technologies (ICT), Innovation in SMEs and Access to new finance; and

- Societal Challenges, which incorporates Health; Food Security, Agriculture, Marine and bio-economy; Energy; Transport; Climate Action and Environment; Inclusive, Innovative and Reflective Societies and Security

Across the three pillars, it is possible to cover the full innovation chain from basic research (Excellent Science), technology research and development, demonstration, prototyping, large scale validation pilots to market uptake (see Figure 2 below).
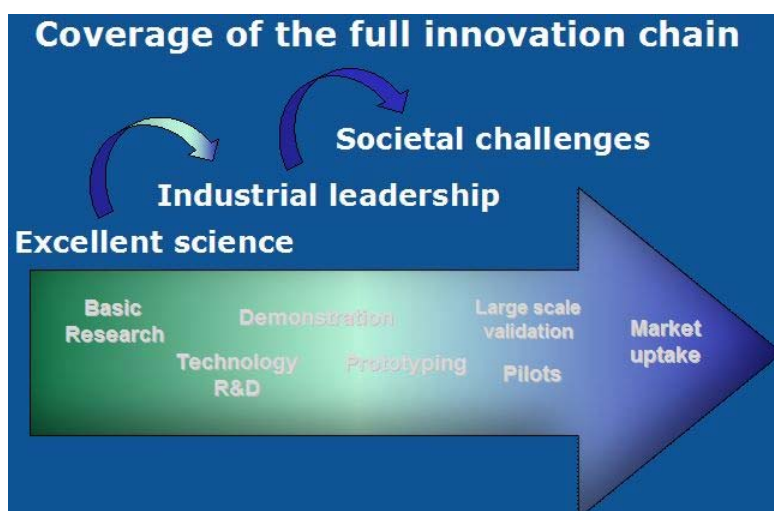

Figure 2: Horizon 2020 Coverage of Innovation Chain (Source: DG CONNECT)

Each component within the three pillars has a separate and distinct Work Programme, which is published on a bi-annual basis. Each Work Programme outlines the overall context for the thematic areas covered, the specific calls open for proposals, challenges to be addressed, funding instruments, deadlines for each call and indicative budgets.

The Work Programmes for 2014 – 2015 Calls under each thematic area were published on 11 December 2013 and subsequently updated in relation to 2015 Calls in July 2014. The individual Work Programmes for 2016 - 2017 were published on 14 October 2015. While the Calls for 2016 are fixed, 2017 Calls are provided on an indicative basis and may be updated during 2016. Each Work programme can be downloaded from the Participants Portal[2] and from the IST-Africa portal[3].

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[2] http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html - h2020-work-programmes-2016-17
[3] http://www.ist-africa.org/home/default.asp?page=horizon2020

ICT is a horizontal activity that is addressed across a number of Work Programmes within LEIT and Societal Challenges. Download the [Guide to ICT-related Activities in 2016-2017 Work Programmes](#)[4] for more insight.

1.2   International Cooperation

One of the three underlying principles of Horizon 2020 is the focus on International Cooperation. In practical terms for African research institutions, this means that African legal entities (public, private, education and research and NGOs) can participate as part of an International consortia with partners from Europe (typically a minimum of three European Partners from different EU Member States or Associated States are required) to apply for research and innovation funding as part of a collaborative research and innovation project addressing the challenges published in the Work programme.

IST-Africa has undertaken a number of complimentary activities to support African participation in the Framework Programme (FP7 and Horizon 2020):

- Supported the establishment of National Contact points in IST-Africa Partner countries[5] as local multipliers

- Organised a series of national FP7 Training Workshops in IST-Africa partner countries from 2007 - 2012

- Organised a series of national Horizon 2020 Training Workshops in IST-Africa partner countries during 2013 - 2014[6], including targeted workshops focused on ICT-39-2015

- Provided Helpdesk support to African and European organisations preparing proposals and looking for relevant partners to cooperate with

- Organised workshops in Europe within relevant conferences raising awareness of African research and innovation capacity and opportunities under specific calls (e.g. ICT-39)

- Prepared and circulated a Guide to 2014 Calls for Horizon 2020 Proposals[7], Guide to 2015 Horizon 2020 Calls for Proposals[8] and Guide to 2016 Horizon 2020 Calls for Proposals[9] to assist research team to identify relevant calls and deadlines across the LEIT, Research Infrastructures and Societal Challenges Work Programmes.

- Provided DG CONNECT with the evidence required to justify the inclusion of ICT-39-2015 and ICT-39-2016-2017 Calls for Africa in the Horizon 2020 LEIT Work Programmes

- Actively promoted and supported proposals to be submitted under ICT-39-2015

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[4] http://www.ist-africa.org/home/files/GuideICTinWPs2016-17.pdf

[5] H2020 NCPs in Cameroon (NCP Coordinator), Egypt (ICT NCP), Ethiopia (ICT NCP), Kenya (ICT NCP), Lesotho (NCP Coordinator), Malawi (ICT NCP), South Africa, Tunisia (NCP Coordinator), Uganda (ICT NCP) - see
http://ec.europa.eu/research/participants/portal/desktop/en/support/national_contact_points.html

[6] http://www.ist-africa.org/home/default.asp?page=horizon2020ws

[7] http://www.ist-africa.org/home/files/IST-Africa_Guide_2014Calls_Horizon2020.pdf

[8] http://www.ist-africa.org/home/files/IST-Africa_Guide_2015Calls_Horizon2020.pdf

[9] http://www.ist-africa.org/home/files/IST-Africa_Guide_2016Calls_Horizon2020.pdf

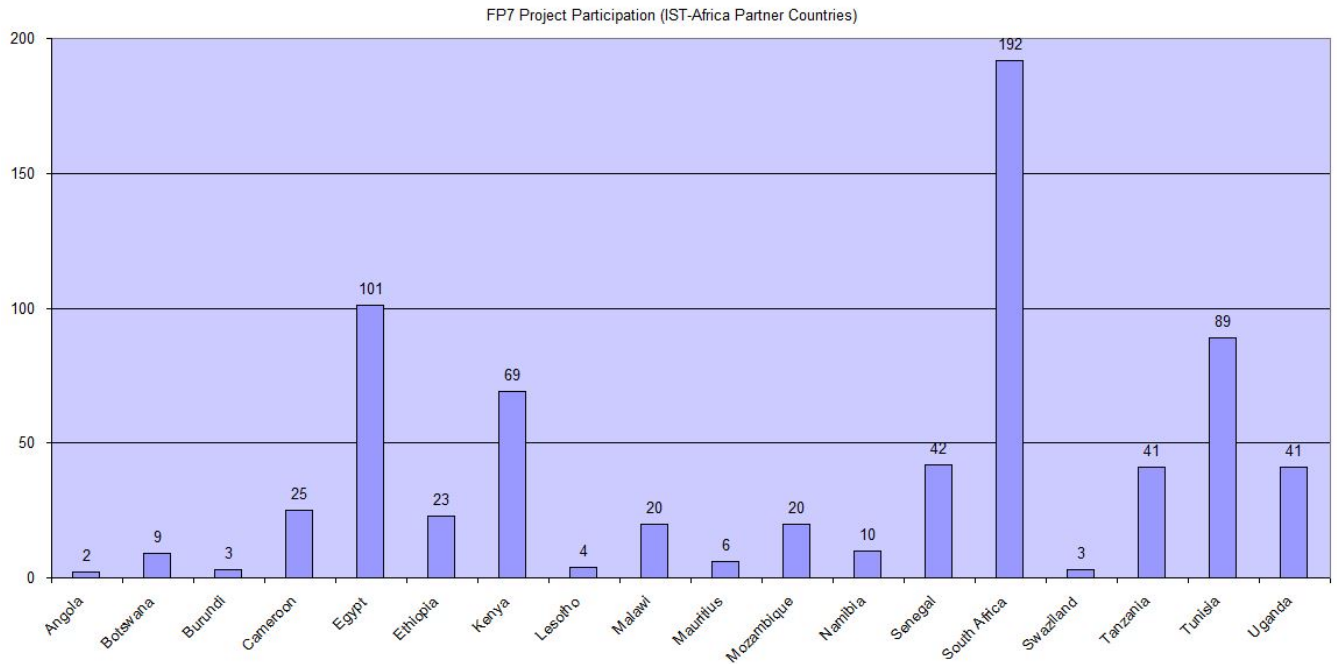FP7 Project Participation (IST-Africa Partner Countries)

Figure 3: Number of FP7 projects per IST-Africa partner country

There was a phenomenal increase in African participation over the life of FP7 (2007 - 2013) with research funding of €171.5 million going into African research institutions in 45 African Member States[10]. Figure 3 above outlines the number of FP7 projects with participants from 18 IST-Africa partner countries.

FP7 Research Funding - Top 20 African Beneficiary Countries
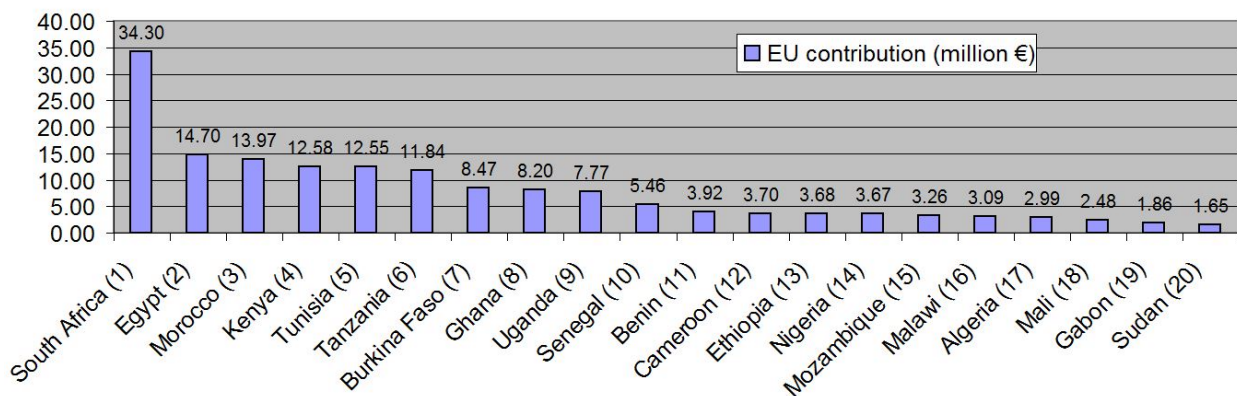
Figure 4: FP7 Research Funding for top 20 African beneficiary countries

Figure 4 above provides an overview of research funding received by the top 20 African beneficiary countries under FP7, which include 11 IST-Africa Partner Countries.

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[10] FP7 projects included participation from 45 African Member States: Algeria; Angola; Benin; Botswana; Burkina Faso; Burundi; Cameroon; Cape Verde; Central African Rep.; Congo; Congo (DRC); Cote d'Ivoire; Egypt; Ethiopia; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Libya; Madagascar; Malawi; Mali; Mauritania; Mauritius; Morocco; Mozambique; Namibia; Niger; Nigeria; Rwanda; Senegal; Seychelles; Somalia; South Africa; Sudan; Swaziland; Tanzania; Togo; Tunisia; Uganda; Zambia; Zimbabwe

Under the 2014 - 2015 Work Programme of Horizon 2020, there were a number of calls under Societal Challenges (Health, Agriculture, Water etc) and ICT-39-2015 Call under LEIT specifically relevant to Africa. As at December 2015, forty-eight projects have been funded with over 100 participations from 26 African Member States and research funding of c. €17 million for to African institutions. This is a very good achievement given the limited number of Calls under the initial stage of Horizon 2020.

The ICT-39-2015[11] (LEIT) Call was specifically designed to focus on initiating collaborative research and innovation projects addressing the end-user communities in Africa in relevant thematic areas addressed by Horizon 2020 including Content Technologies and Societal Challenges. IST-Africa actively promoted this Call in Africa and Europe, provided a mapping of research priorities and research capacity in IST-Africa partner countries, provided targeted training workshops in IST-Africa partner countries and provided Helpdesk support on preparing proposals. This call was very successful - 45 proposals were submitted with 439 participations including 194 participations from Africa, of which over 78% were from IST-Africa partner countries. The proposals submitted were considered to be high quality and relevant to the focus of the call with 23 proposals over threshold. Four projects were selected for funding with 11 African countries represented of which 6 IST-Africa partner countries are participating in all four projects - Ethiopia (3), Kenya (2), Cameroon (1), Malawi (1), South Africa (1) and Senegal (1).

The ICT-39-2017 Call[12], which closes in April 2017 is focused on Innovation actions that address the requirements of end-user communities in low and middle income countries in Sub-Saharan Africa and ASEAN countries. There is considerable work required to write a compelling proposal, so potential consortia are advised to start work as early as possible.

It is recommended that African and European research institutions also actively explore opportunities under relevant Work programmes (LEIT, Societal Challenges, Marie Curie and Research Infrastructures) to co-design Research and Innovation actions that are mutually beneficial.

1.3   Differences between FP7 and Horizon 2020

There are a number of differences between Horizon 2020 and FP7 in relation to its integrated approach, the work programme structure, funding levels including overheads, funding instruments, as well as no negotiation phase under Horizon 2020, a different proposal structure and serious constraints in terms of page length for different sections of proposals. This section summaries the main differences in relation to these aspects.

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[11] https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/915-ict-39-2015.html
[12] http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5078-ict-39-2016-2017.html

1.3.1 Integrated approach

In FP7 there were different programmes and activities related to research activities and innovation.

Horizon 2020 has an integrated approach that addresses all research and innovation funding previously provided by FP7 Framework Programme, Competitiveness and Innovation Programme (CIP) and European Institute of Innovation and Technology. There is now a stronger focus on societal challenges and Innovation. This is a good thing, opening up more opportunities for research and innovation collaboration between Europe and Africa.

1.3.2 Work Programme Structure

Under FP7 the Work Programme fell under Cooperation, Capacities, People and there was one Work Programme that incorporated all ICT research areas with different deadlines.

Under H2020 ICT is now spread across a number of different Work Programmes under Industrial Leadership, Societal Challenges and Excellent Science (see Figure 5) with a range of different deadlines. Work Programmes are now published for a two-year period of time to facilitate researchers to identify and prepare proposals in sufficient time for relevant Calls.

Excellent Science
Frontier Research (ERC)
Future & Emerging Technologies (FET) ICT
Skills & career development (Marie Skłodowska-Curie)
Research Infrastructures ICT

Industrial Leadership
Leadership in enabling
& industrial technologies
    ICT ICT
    Nanotech., Materials, Manuf. & Processing ICT
    Biotechnology
    Space
Access to risk finance
Innovation in SMEs ICT

Societal Challenges
Health, demographic change & wellbeing ICT
Food security, sustainable agriculture,
& the bio-based economy ICT
Secure, clean & efficient energy ICT
Smart, green & integrated transport ICT
Climate action, resource efficiency,
& raw materials ICT
Inclusive, innovative & reflective societies ICT
Secure societies ICT

Figure 5: ICT as components within H2020 Work Programmes (Source: DG CONNECT)

The Work Programmes for 2014 – 2015 Calls under each thematic area were published on 11 December 2013 and subsequently updated in relation to 2015 Calls in July 2014. The individual Work Programmes for 2016 - 2017 were published on 14 October 2015. While the Calls for 2016 are fixed, 2017 Calls are provided on an indicative basis and may be updated during 2016. It is therefore necessary to check during 2016 if an updated Work Programme is publishing that impacts on 2017 Calls.

While this means that more homework has to be done to identify potentially relevant calls, it also places a greater emphasis on the application of ICT in a broad range of relevant thematic areas for research and innovation collaboration with Africa.

As there is enormous thematic expertise in areas including agriculture and food security, education, health and environment, this provides more opportunities for ICT related collaboration as multi-disciplinary research and innovation has increased priority under Horizon 2020. Obviously, there are even more opportunities for those African research and innovation stakeholders involved in areas including eAgriculture, eHealth and Technology Enhanced Learning.

1.3.3   Funding Instruments

Under FP7 there were different types of research projects (STREP, Integrated Projects, Networks of Excellence).

Under Horizon 2020 there are 3 main funding instruments:

- **Grants for Research and Innovation** - Primarily consisting of activities aiming to establish new knowledge and/or to explore the feasibility of a new or improved technology, product, process, service or solution. May include basic and applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment. Projects may contain closely connected but limited demonstration or pilot activities aiming to show technical feasibility in a near to operational environment

- **Grants for Innovation** (closer to market activities) - Primarily consisting of activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services. For this purpose they may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication.

- **Grants for coordination and support actions** – do not undertake research, support activities to the Programme and coordination of research or creation of a network between other research actions for a specific purpose

1.3.4   Funding Levels

Funding under FP7 and Horizon 2020 are grants based on reimbursement of actual costs incurred based on agreed Work Plan and allocation of resources. The grant is provided to the legal entity (organisation) as reimbursement of costs for personnel time based on payroll costs, necessary travel costs etc. It is important to remember that your institution is only entitled to claim reimbursement for actual time and effort and other associated costs incurred on activities that address the objectives of the proposal approved for funding.

In FP7 there were different levels of reimbursement available depending on the instrument and in some cases the type of organisation participating in a project.

To simply the process, Horizon 2020 provides reimbursement at the same level to all organisations for Research and Innovation Actions and Coordination and Support Actions:

- 100% reimbursement of costs for Research activities

- In the case of Innovation Actions Public and not-for-profit organisations receive 100% reimbursement of direct costs, while

- Private organisations receive only 70% reimbursement of direct costs

Under FP7 the partner organisation received different levels of reimbursement towards overheads depending on the instrument funded and the organisational type

To simplify the process under H2020, there is now a flat rate of 25% reimbursement of direct costs (e.g., personnel and travel) as a contribution towards overheads.

This means that for Research and Innovation Actions and Coordination and Support Actions, all organisations receive 125% reimbursement of actual direct costs, while for Innovation Actions, Public and not-for-profit organisations receive 125% reimbursement of actual direct costs, while private organisations receive 87.5% reimbursement of actual direct costs.

African organisations are funded on exactly the same basis as European organisations.

1.3.5   No Negotiation Phase in H2020

Under FP7 evaluators could recommend a proposal for funding, while providing feedback to the European Commission in relation to areas in the proposal that could   be improved, recommendations for modifications to the Work Plan or budget (over-estimation or under-estimation of resources for specific activities). This feedback would be discussed with shortlisted consortia during the Negotiation phase and an updated Work Plan prepared for the grant agreement.

Under Horizon 2020 there is now a shorter time frame from proposal submission to grant awarded for short listed projects (8 months) and as a result there is no negotiation phase.

This is a big change as now all proposals must be judged based on what is submitted within the available page length, rather than their potential if certain agreed modifications are made. If there are inconsistencies, budgetary problems (overestimation or under-estimation of resources) or insufficient justification of the approach, the proposal will receive a lower score and is therefore less likely to be funded. This means that consortia must be much more careful when preparing proposals to ensure that each section is sufficiently strong to receive a good score.

It is also important to make sure that the activities outlined are appropriate and achievable, as in the event of the project being short listed for funding, the initial proposal submitted for evaluation will become the Deliverable of Action for the grant.

1.3.6   Proposal Structure and Page Length

The proposal structure for Horizon 2020 is also different to FP7 – it is necessary to ensure that you download the correct Guide for Proposers for each instrument and ensure that the correct template is followed when preparing the proposal.

The Section B is now submitted online in two parts (two separate pdf documents uploaded):

- Section B Part 1 incorporates Section 1 Excellence, Section 2 Impact and Section 3 Implementation

- Section B Part 2 incorporates Section 4 Members of the Consortium and Section 5 Ethics and Security

Under Horizon 2020 there is also different fixed page lengths that apply to Section B Part 1 depending on the funding instrument:

- Research and Innovation Actions – max of 70 pages

- Innovation Action – max of 70 pages

- Coordination and Support Action – max of 50 pages

The number of pages in Section B Part 1 is checked automatically on the server and in the event that it is longer than the available number of pages, the extra pages are marked in red and any content presented on these pages*cannot* be considered in the evaluation process.

This means that consortia must be careful to clearly but concisely complete all necessary sections required under Excellence, Impact and Implementation to ensure that it fits within the available number of pages.

2. Horizon 2020

This section will focus on providing more insight into Horizon 2020 in terms of Research Areas, Participation Rules, Funding Instruments and African participation under initial calls of Horizon 2020.

2.1 Horizon 2002 Research Areas

As outlined in Section 1, Horizon 2020 is divided into three main pillars: Excellent Science, Industrial Leadership and Societal Challenges.

2.1.1 Excellence Science

Excellent Science incorporates Future and Emerging Technologies (Blue Sky Research), Research Infrastructures and Marie-Sklodowska-Curie Actions. Each programme has its own Work programme outlining details of research priorities, specific calls and deadlines.

Future and Emerging Technologies (FET) Research is focused on identifying new technological possibilities beyond what is currently used and requires a multidisciplinary approach across a range of relevant domains including life sciences, social sciences, humanities and engineering. The FET Programme incorporates three main types of activities:

- FET Open - early stage scientific and technological research and innovation around new ideas for future technologies

- FET Proactive - research on future technologies that will support European knowledge and excellence and boost emerging technologies

- FET Flagships - large-scale, multidisciplinary research initiatives aimed at transformational impacts including Graphane and Human Brain projects

Submissions under FET must be state of the art with all consortia members expected to have a very strong, relevant track record. If you find a FET call of interest, please contact the national IST-Africa Partner for your country. They will then put you in touch with the IST-Africa Coordinator, who will work with you to assess the potential opportunity in the context of your organisation's research track record, before helping to identify suitable European partners.

Research Infrastructures incorporate facilities, resources and services that support research communities to undertake research and innovation. This can include digital knowledge-repositories, eInfrastructures (communication networks and computing systems that can be accessed remotely) and scientific equipment. These infrastructures can also be leveraged beyond research to support education and public service delivery. eInfrastructures is focus on supporting open research data, data and computing, intensive science, research and education networking, high performance computing and big data innovation through the integration and consolidation of eInfrastructure platforms.

Research Infrastructure calls are most relevant for African institutions that have special infrastructure of broader interest both inside and outside their country (e.g. large telescope, supercomputer) as well as National Research and Innovation Networks (NRENs).

Marie-Sklodowska-Curie Programme facilitates individuals to access mobility grants to support career development and upskilling for research staff across all thematic domains. This supports researchers to undertake research and training in another country to broaden their skills and competencies. Actions fall across Innovative Training Networks, Individual Fellowships, Research and Innovation Staff Exchange (RISE). Innovative Training networks support early stage researchers to undertake training and/or doctoral programmes through partnerships of universities, research institutions, research infrastructures, businesses and SMEs in different countries (European Training Networks, European Industrial Doctorates or European Joint Doctorates). Individual Fellowships can be either European Fellowships (research coming to Europe or moving within Europe) or Global Fellowships (secondment to third country followed by return period to European host). Fellowships must be applied for by the host European institution through a proposal outlining the career development plan.

RISE was introduced as a new action under Horizon 2020 to support exchange of research staff (all levels) to facilitate knowledge transfer. RISE can be used to support an African researcher to undertake research or training with European host organisation for short period of times in the context of a joint research and innovation project. The researcher remains part of staff of own institution, and receives a monthly stipend to cover living expenses while undertaking research abroad., The proposal should be submitted through a network by the European research institution based on a common research project. There is generally one call for each action type per year.

Marie-Sklodowska-Curie actions are of considerable relevance for African researchers, as a way of strengthening research and innovation capacity, and building linkages with potential European research and innovation partners. They can also be a powerful mechanism to strength departmental or faculty competence by funding European researcher to work in your institution for an agreed period of time, either doing graduate teaching, training staff or carrying out collaborative research using state-of-the-art methods.

2.1.2   Industrial Leadership

The ICT Work Programme (Leadership in Enabling and Industrial Technologies) incorporates six key research themes:

1. ***Components and systems*** - Smart embedded components and systems, micro-nano-bio systems, organic electronics, large area integration, technologies for IoT, smart integrated systems, systems of systems and complex system engineering

2. Next generation *computing* - Processor and system architecture, interconnect and data localization technologies, parallel computing and simulation software

3. *Future Internet* - Networks, software and services, cloud computing, cyber security, privacy and trust, wireless communication and all optical networks, immersive interactive multimedia and connected enterprise

4. *Content technologies* and *information management* - Technologies for language, learning, interaction, digital preservation, content access and analytics; advanced data mining, machine learning, statistical analysis and visual computing, big data technologies

5. *Robotics* - Service robotics, cognitive systems, advanced interfaces, smart spaces and sentient machines

6. Key Enabling Technologies: *Micro-nano-electronics* and *photonics* - Design, advanced processes, pilot lines for fabrication, production technologies and demonstration actions to validate technology developments and innovative business models

It is necessary to read the ICT WorkProgramme carefully to determine the specific areas within these six themes that are open to submit a proposal and the associated deadlines.

It is also important to be realistic about the existing capacity and research and innovation track record of your institution in any area shortlisted, to avoid wasting time targeting otherwise interesting opportunities where the likelihood of success is low.

2.1.3 Societal Challenges

The Societal Challenges pillar consists of seven separate Work programmes addressing:

1. *Health, demographic change and wellbeing*. ICT areas include: Understanding health, ageing and disease; Improving diagnosis; Innovative treatments and technologies, ICT in Healthcare

2. *Food security, sustainable agriculture, marine research & the bio-economy*. ICT areas include: Sustainable Food Security, robot-based precision farming, smart farming

3. *Secure, clean and efficient energy* - ICT areas include: Smart cities; Energy efficient buildings; smart electricity grids; smart metering;

4. *Smart, green and integrated transport* - ICT areas include: Smart transport equipment, infrastructures and services; innovative transport management systems; safety aspects

5. *Climate action, Environment, resource efficiency and raw materials*. ICT areas include: ICT for increased resource efficiency; earth observation and monitoring

6. *Inclusive, innovative and reflective societies.* ICT areas include: Digital inclusion; social innovation platforms; e-government services; e-skills and e-learning; e-culture

7. **Secure societies**. ICT areas include: Cyber security; Digital security

As outlined earlier, ICT is integrated with other disciplines under Societal Challenges call leveraging multidisciplinary teams.

It is necessary to determine which work programmes within Societal Challenges are most relevant to your research capacity and read that work programme carefully to identify opportunities for cooperation. There is considerable scope for African participation under Societal Challenges, as long as your institution has the necessary expertise and track record.

2.2 Horizon 2002 Participation Rules

2.2.1 Types of Organisations

Beneficiaries to a grant agreement are typically legal entities. Legal entities that are normally involved in research and innovation projects include:

- Universities
- Research Institutes
- High-tech Small and Medium sized enterprises (SMEs) and industry who undertake research as part of their overall activities
- Public Administration (where activities and thematic focus are relevant)
- Associations that represent end-user groups
- Other not-for-profit organisations
- European Economic Interest Groups

As outlined previously, Marie Curie provides opportunities for mobility for individual researchers within a structured programme of activities.

Under no circumstances can a researcher be involved in any Horizon 2020 project proposal unless they are full-time or part-time employed by a legal entity.

2.2.2 Eligibility for EU funding

Technically any legal entity can participate in an action under Horizon 2020.

In terms of being eligible for EU funding, legal entities established with the 28 EU Member States, Associated Candidate Countries, Associate States and International Cooperation Partner countries (ICPC third countries with low or medium income) which includes all African countries, are treated equally.

Legal entities from Switzerland can participate in proposals but claim research funding at national level if the proposal in which they are involved is successful.

Legal entities established in High income countries including Brazil, Russia, India, China and Mexico are not automatically eligible for EU funding. In the event that there is a specific joint

Call with high income countries outside the EU, the Work Programme will outline the funding situation for these countries.

2.2.3 Geographic spread of Consortia

Proposals for funding under Horizon 2020 are typically submitted by consortia. The minimum consortia structure is dictated by each Call but in general there is a requirement of a minimum of <u>three</u> independent <u>legal entities</u> from <u>three</u> different EU Member States or Associated countries. The motivation behind this requirement is to actively encourage research organisations to partner with complementary research organisations in other EU Member States to jointly address research challenges that go beyond national borders.

After this minimum criterion has been met, it is then possible to add participants from International Cooperation Partner countries (ICPC).

It is important to remember that in the context of Horizon 2020 being fully open to International Cooperation, any ICPC based research and innovation partner can be added to any proposal on the basis that it is clear that they (like their EU peers) have a necessary role and are making a contribution to addressing the overall research focus of the proposal.

Exceptions to the requirement for a minimum of three legal entities from three different EU Member States or Associated countries are in the case of a Coordination and Support Action, mobility programmes, SME instrument, mobility programmes or if it is explicitly mentioned in the Work Programme.

2.2.4 Cost Reimbursement

Horizon 2020 Grants are based on reimbursement of eligible costs incurred that are aligned with the proposal approved for funding.

Eligible costs are determined based on **actual costs incurred**. by the beneficiary within the duration of the project. They must be necessary for implementation of the action, be identifiable in the beneficiary's financial account, be reasonable, justifiable and cost effective.

Direct costs are cost categories that can be directly linked to the implementation of the project. Eligible direct costs include:

- Personnel costs for full time and temporary employees, based on payroll costs and signed monthly timesheets
- Travel costs directly related to project activities (flight, accommodation, subsistence)
- Depreciation of equipment necessary for project activities and approved in the Description of action based on time used for project requirements
- Project specific costs such as consumables, dissemination, open access costs etc
- Sub-contracting if foreseen in the Description of Action

Indirect costs are calculated based on a flat rate of 25% of eligible direct costs as a contribution towards overheads. Indirect costs can be claimed on sub-contracting.

Costs that are not eligible for reimbursement (**ineligible costs**) include:

- exchange rate loss
- bank transfer costs
- debt and debt service charges
- customs duty
- deductible VAT
- costs related to other projects or activities
- inappropriate costs

Finally, it is very important to understand that it is not possible to sub-contract any activity that is mission critical in a project. Those carrying out work that is essential to the success of the project must be either full-time or part-time employees of an organisation that is a partner in the consortium.

2.3 Funding Instruments

There are three main funding instruments under Horizon 2020: Grants for Research and Innovation, Grants for Innovation and Coordination and Support Actions.

2.3.1 Research and Innovation Actions

Research and Innovation projects primarily consist of activities aiming to <u>establish new knowledge</u> and/or to <u>explore the feasibility of a new or improved technology, product, process, service or solution</u>.

It normally includes applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment. Projects may contain closely connected but limited demonstration or pilot activities aiming to show technical feasibility in a near to operational environment.

Funding level: 100% reimbursement of all eligible direct costs and participants plus 25% indirect costs

Consortia requirement: Minimum of three independent legal entities from three different EU Member States (MS) or Associated countries (AC). Additional information may be defined in the Work Programme

Main activity type: Research and Development

All activities can be covered (Research, Development, Demonstration, Dissemination, Exploitation preparation, Project Management)

2.3.2   Innovation Actions

Innovation actions are considered to be closer to market. They primarily consist of activities directly aiming at <u>producing plans and arrangements or designs for new, altered or improved products, processes or services</u>. For this purpose they may include *prototyping, testing, demonstrating, piloting, large-scale product validation and market replication*.

A 'demonstration or pilot' aims to validate the technical and economic viability of a new or improved technology, product, process, service or solution in an operational (or near to operational) environment, whether industrial or otherwise, involving where appropriate a larger scale prototype or demonstrator.

A 'market replication' aims to support the first application/deployment in the market of an innovation that has already been demonstrated but not yet applied/deployed in the market due to market failures/barriers to uptake. 'Market replication' does not cover multiple applications in the market of an innovation that has already been applied successfully once in the market.

'First' means new at least to Europe or new at least to the application sector in question. Often such projects involve a validation of technical and economic performance at system level in real life operating conditions provided by the market.

Projects may include limited research and development activities.

Funding level: 70% reimbursement of eligible direct costs plus 25% indirect costs (except for non-profit legal entities, where a rate of 100% reimbursement applies)

Consortia requirement: Minimum of three independent legal entities from three different EU Member States (MS) or Associated countries (AC). Additional information may be defined in the Work Programme

Main activity type: Demonstration and market validation (large-scale pilot)

2.3.3   Coordination and Support Actions

Coordination and Support Action do not undertake technological research. They are primarily accompanying measures to support coordination of research, networking, awareness-raising, studies and policy dialogue. As a result, activities can include workshops, conferences, undertaking studies and analysis and supporting networking across specific communities.

Funding level: 100% reimbursement of all eligible direct costs plus 25% indirect costs

Consortia requirement: Minimum of one legal entity. However, normally a support Action will include several complimentary partners from different countries as necessary to fulfil the project objectives.

Main activity type: Support and Coordination activities

2.4   African Participation in Horizon 2020 to date

As outlined in Section 1, Horizon 2020 is fully open to International Cooperation and African countries (ICPC List) can participate in proposal with cooperation with European peers and be reimbursed on the same basis of actual costs. While it is positive that there are some specific calls focused on cooperation between Europe and Africa under Societal Challenges and ICT, it is not necessary to be restricted to these calls. It is recommended that African and European research institutions actively explore opportunities under relevant Work programmes (LEIT, Societal Challenges, Marie Curie and Research Infrastructures) to co-design Research and Innovation actions and other research related collaboration that are mutually beneficial.

As at December 2015, forty-eight projects have been funded with over 100 participations from 26 African Member States and c.€17 million research and innovation funding for African institutions. These projects are a mix of Research and Innovation Actions, Innovation Actions and Coordination and Support Actions.

Twenty-four Research and Innovation Actions with African partners have been funded across the following thematic areas: Environment (5), Food (3), Health (7), ICT (5 including two projects focused on how ICT can support healthcare delivery), Infrastructure (2) and Transport (2). Four Innovation Actions with African partners have commenced focused on Energy, Environment, Space and Water. Nineteen coordination and support actions with African Partners have been funded focused on Disaster Resilience (1), eInfrastructures (4), Environment (3), Food Security (1), Space (3), Science and Society (6) and Security (1). This demonstrates a good participation across all three pillars of Horizon 2020, with almost 10% of all funding secured by African institutions under all of FP7 in the first year of Horizon 2020.

The ICT-39-2015[13] (LEIT) Call was focused on initiating collaborative research and innovation projects addressing the end-user communities in Africa in relevant thematic areas addressed by Horizon 2020 including Content Technologies and Societal Challenges. Four projects were selected for funding with 11 African countries represented of which 6 IST-Africa partner countries are participating in all four projects - Ethiopia (3), Kenya (2), Cameroon (1), Malawi (1), South Africa (1) and Senegal (1). The ICT-39-2017 Call[14], which closes in April 2017 is focused on Innovation actions that address the requirements of end-user communities in low and middle income countries in Sub-Saharan Africa and ASEAN countries.

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[13] https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/915-ict-39-2015.html
[14] http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5078-ict-39-2016-2017.html

3. Preparing a Proposal

There are a number of preparatory steps that need to be considered prior to preparing a proposal for submission under Horizon 2020. These include identification of relevant research areas and calls, identification of complementary partners and correct funding instrument.

3.1 Identification of relevant research areas and Calls

Each university department and research centre has a specific research focus and track record in one or more areas. It is necessary to initially carefully assess and document internal research and innovation capacity of both individual researchers and research groups. This should feed into the organisational strategic direction and research and innovation objectives. Having agreed this, it is then possible to identify those research and innovation areas under Horizon 2020 that are best aligned with the overall strategic focus and available internal human resources of the institution.

As part of the proposal submitted, each partner needs to clearly outline why their expertise is relevant to the research proposed and how they can utilise existing available resources (human resources and physical resources such as equipment, laboratories etc) to ensure successful completion of the research proposed.

It is therefore important to be quite pragmatic when assessing research and innovation that can be undertaken and how proposed research and innovation projects match open Calls. It is important to be able to justify internally why your department would participate in a proposal under a specific area. It is therefore necessary to carefully review Work Programmes as they are published and identify in sufficient time specific action lines that are relevant to your department, and confirm the submission deadlines, types of instruments specified and therefore the research (or innovation) activities that are required. It is then possible to tailor your organisational research and innovation profile to clearly state what expertise you are bringing to bear and identify relevant activities that your organisation can contribute to as part of a proposal.

As part of this qualification process, it is necessary to spend time looking at examples of projects that have been previously funded in specific thematic areas of interest to your organisation, to get a clear picture of the current state-of-the-art in that domain at this point in time. It is also valuable to note the European partners that participated in funded projects as this allows you to identify the main international research players in a specific thematic area.

When you have identified the most relevant thematic areas and research and innovation activities your organisation can undertake, it is then necessary to read the Work Programme very carefully to determine what activities can be funded under specific Calls.

In summary it is necessary to clearly document existing research and innovation capacity and track record, identify which thematic areas within Horizon 2020 are most relevant, download the

relevant Work programmes, identify calls of interest with realistic deadlines and prepare a roadmap. It is necessary to get a clear understanding of the state-of-the-art in these specific domains by looking at previous projects funded. It is possible to search for previously funded projects via Cordis[15]. There is also a very useful repository of FP7 projects that involved African partners available on the IST-Africa Portal.

3.2   Identification of complementary partners

Having identified relevant research areas, it is then necessary to determine complementary European partners that you can cooperate with to prepare a proposal.

It is necessary to identify European partners that you wish to work with in the long term, to justify the initial effort and investment require to build a relationship. It is best to start with senior representatives of organisations that you or your colleagues have met through participation at workshops or conferences or organisations with which your institution has existing bilateral cooperation agreements. A good starting point is to speak with your Dean or Head of Department and compile a list of relevant research organisations which which there has been formal or informal cooperation through supervision of PhD candidates, secondments, bilateral agreements etc. Another excellent way of identifying relevant research teams is through scientific publications.

It is important to have a clear focus when making contact with potential partners. It is therefore a good idea to prepare a short organisational profile that clearly articulates current research and expertise of the research team, outlines thematic areas of interest and activities of interest.

It is not necessary for your organisation to find all relevant partners. This should be undertaken by the initial partners as a group, leveraging their existing networks and introductions to other potentially relevant partners.

As part of the criteria when evaluating all proposals, it is necessary for the Consortium to illustrate the specific expertise of each participating partner and how they as a group are complementary. There is no advantage in having too many partners with the same skill set and not enough partners with relevant skills in another critical area. The Consortium should also be balanced in terms of geographic coverage bearing in mind the minimum requirements for eligibility and expertise. It needs to be clear why partners are involved in specfiic Work Packages and tasks, and that as a collective grouping the partners have the capability to successfully deliver the research and innovation project.

It is important to think through the types of role most appropriate to the research team in your organisation - technical partner undertaking part of the technological research and development, demonstration partner involved in user requirements and pilots or dissemination partner. As your institution has more experience of participation in internationally funded research, these roles are likely to change over time.

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[15] http://cordis.europa.eu/projects/

3.3   Using the correct proposal template

Having identified relevant calls and deadlines, identified complementary partners, the next step is to start co-creating the proposal. One partner (normally the Coordinator) should take responsibility for downloading the correct template structure for the funding instrument relevant to the call that the proposal will be submitted under.

Under a specific call, there may be two or three types of actions open - Research and Innovation Actions, Innovation Actions, Coordination and Support Actions. Under the scope section of the call, it will clearly outline the research and innovation challenge to be addressed and the type of funding instrument for which funding is available. It is critically important to ensure the correct proposal template is used to prepare the proposal for submission.

There are two parts to any proposal:

Part A - this is completed online as a series of forms providing information related to the partners and the proposed budget

Part B is the Technical Annex outlining the objectives, work plan and expected impact. Part B is now submitted online by the project coordinator as two separate pdf files - Section 1 - 3 as one file (Excellence, Impact, Implementation) and Section 4 - 5 (Members of the Consortium, Ethics and Security) as a separate file.

The proposal structure for Part B in a Research and Innovation Action is outlined below:

- Section 1. Excellence - Objectives, Relation to the Work Programme, Concept and Approach, Ambition

- Section 2. Impact - Expected Impacts, Measures to maximise impact (a. Dissemination & Exploitation of Results, b. Communication activities)

- Section 3. Implementation - Work Plan (Work Packages, deliverables & milestones), Management structure and procedures, Consortium as a whole, Resources to be committed

- Section 4. Members of the Consortium (to judge operation capacity) - Participants, Third parties involved in project

- Section 5. Ethics and Security

The structure of Innovation Actions and Coordination and Support Actions are different and should be carefully reviewed.

3.4   Distributing the proposal creation

The preparation of the proposal is normally divided up among a number of partners. It is important to agree globally on the focus and objectives of the proposed research to ensure that it is well aligned with the focus of the call. The next step is to agree the work plan structure - focus of technical work packages, validation work package, dissemination and exploitation and project management work package. Depending on the skills and experience of the different partners, work package leaders will be agreed and each work package leader will then start to

draft the description of the tasks proposed in each work package and ask for contributions from other partners.

Having a general agreement in relation to objectives and work plan structure, it is then possible for some partners, for example, to start work on the Relation to the work programme, and Concept and Approach for Section 1 and other partners to start work on Section 2 related to Impact.

The Ambition section needs to provide a clear and succinct overview of the current state-of-the-art and outline how the proposed activities and outputs will go beyond the state-of-the-art.

All partners should prepare a focused organisational profile using the template provided (description of focus of organisation and relevance to task in the proposal, short profile for staff members with relevant skills, list of up to five of the most relevant publications and up to five previous projects connected to the focus of the proposal and description of infrastructure that can be leveraged for project activities) for inclusion in section 4. This will also assist in writing up the Consortium as a whole part of Section 3.

It is important for the consortium to keep checking that the proposal as it is being developed is still answering the focus of the call.

There is a fixed number of pages for Section B Part 1 (Section 1 - 3) of 70 pages for a Research and Innovation Action and Innovation Action and 50 pages for a Coordination and Support Action. If the proposal submitted is longer than the number of pages allowed, the extra pages will be marked in red and will not be considered in the evaluation process.

It is necessary that the proposal submitted addresses each point in the proposal template in the correct order to facilitate the evaluators to allocate scores. It is the responsibility for each partner to carefully review the proposal structure and content to ensure that it is relevant to the call and is of high quality.

3.5   Agree the most appropriate management structure

Section 3.2 requests that the organisational structure and decision making procedures are described. The management structure should be appropriate of the size of the consortium and the complexity of the project activities. An over-engineered management approach for a small consortium is almost as bad as a weak management approach for a complex consortium.

Research and Innovation Actions may have an administrative coordinator who deals with overall project management including liaison with the European Commission as well as a technical coordinator who is responsible for the realization of the technical vision. It is important that the identifies of the management team is clear so that the evaluators can determine if the people proposed have the correct background and experience to lead the project work.

It should also be clear from the partner profiles why different partners are work package leaders based on their expertise.

The decision making structure should be clearly articulated. Risks and mitigation measures need to be listed using the table structure outlined in the proposal template.

3.6   Discuss intellectual property rights and exploitation of project results

It is important for all stakeholders to have appropriate expectations from the time the proposal is being prepared, as it relates to ownership rights associated with project outcomes and exploitation of project results.

It is important to have a clear understanding of what rights and obligations all partners have in relation to protecting and respecting pre-existing knowledge of other partners, providing appropriate access rights to pre-existing knowledge where this is required to carry out the research and finally, the access and exploitation rights of project outcomes.

The basic guidelines provided by the European Commission are straightforward

- If results are capable of commercial or industrial exploitation, they should be protected
- The partner who generates specific results owns the results
- It is possible to have joint-ownership of specific results where a number of partners were involved in the activities carried out to produce those results

In terms of exploitation of research results, the European Commission expects that partners will exploit project results on a best efforts basis, and results should be widely disseminated to have wider societal or industrial impact.

So in summary, if your organisation is involved only in dissemination activities, then you should have low expectations in terms of rights to access or exploit results after the project duration. That having been said, it is possible to agree that all partners have access rights for their own institutions use, without necessarily having commercial exploitation rights.

If your organisations is solely responsible for creating exploitable results, then unless the Consortium Agreement (which must be signed by all partners prior to starting the project) states otherwise, your organisation owns those results and can decide how best to exploit them.

If your organisation contributed to the creation of research results, then you can probably exploit to share ownership rights with other contributing partners. The degree to which this is the case, will probably be determined by the level of contribution made.

3.7   Conclusion

While this document does not attempt to address all possible issues that could arise when getting involved in research and innovation activities under Horizon 2020, if your organisation take account of the insight and advice provided, the process should go smoother.

In any case, please contact your national IST-Africa Partner who will provide necessary support and involve the IST-Africa Coordinator if more specific support is required.

Annex 1:   Overview of Horizon 2016 Calls for Proposals[16]

The IST-Africa Overview to 2014 and 2015 Horizon 2020 Calls can be downloaded from

http://www.ist-africa.org/home/files/IST-Africa_Guide_2014Calls_Horizon2020.pdf
http://www.ist-africa.org/home/files/IST-Africa_Guide_2015Calls_Horizon2020.pdf

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[16] http://www.ist-africa.org/home/files/IST-Africa_Guide_2016Calls_Horizon2020.pdf

Horizon 2020 – The Framework Programme for Research and Innovation

Horizon 2020 commenced in January 2014 as the new Framework Programme to implement the Innovation Union with research and innovation funds of €80 billion from 2014 – 2020. Horizon 2020 addresses all research and innovation funding that was previously provided through the Framework Programmes for Research and Technical Development (e.g. FP7), Competitiveness and Innovation Programme (CIP) and European Institute of Innovation and Technology.

Support proposed for Research and Innovation under Horizon 2020 includes:

- Strengthening research in Science (budget of €24.5 billion)
- Strengthening Industrial leadership in Innovation (budget of €22.6 billion), including investment in key technologies, access to capital and support for SMEs
- Address Societal challenges (budget of €31 billion) such as climate change, sustainable transport and mobility, affordable renewal energy, food security, ageing population

This Guide to Horizon 2020 provides an overview of Calls, themes and deadlines from 2016 Calls for Proposals within the **Marie Curie, eInfrastructures**, **Leadership in Enabling and Industrial Technologies** (LEIT - Components and Systems, Advanced Computing, Future Internet, Content Technologies and Information Management, Robotics and Key enabling Technologies (Micro-nano-electronics and photonics)) and each of the **Societal Challenges** (Health, Food Security and Agriculture, Energy, Transport, Environment, Inclusive and Reflective Societies, Secure Societies) Work Programmes. The individual Work Programmes for 2016-2017 for each thematic area were initially published on 14 October 2015. Please find links to these work programmes within the relevant sections in this Guide.

Horizon 2020 is fully open to International Cooperation. African research institutions can participate as part of International Consortia with partners from Europe to apply for funding as part of an international project addressing the challenges published in the Work Programme.

ICT is a horizontal activity that is included across a number of Work Programmes within LEIT and within Societal Challenges Work Programmes. Download Guide to ICT-related Activities in Work Programmes

Please visit the Horizon 2020 section within the Participants portal to download the Proposers Guide and specific templates to prepare proposals for submission under Horizon 2020 2016 calls within specific Marie Curie, eInfrastructures, LEIT and Societal Challenges themes.

Innovation Union	http://ec.europa.eu/research/innovation-union/index_en.cfm
Guide to ICT-related Activities in H2020 2016-17 Work Programmes	http://www.ist-africa.org/home/files/GuideICTinWPs2016-17.pdf
Horizon 2020 Calls – Participants Portal	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/index.html
IST-Africa Guide to 2016 Calls within Horizon 2020	http://www.ist-africa.org/home/files/IST-Africa_Guide_2016Calls_Horizon2020.pdf
ICT in Horizon 2020 2016 - 2017 Work Programmes - presentation by Mr Morten Moller, DG CONNECT; November 2015	http://www.ist-africa.org/home/files/eChallenges_H2020-WP2016-17-ICT-251115_v4.2_MMoller.pdf

I. Excellent Science

With the aim of increasing excellence in science, it is envisaged that Horizon 2020 will support frontier research, collaborative research on Future and Emerging Technologies (FET), training and career development through Marie Curie Actions and research infrastructures (including eInfrastructures).

Future and Emerging Technologies (FET)	*http://cordis.europa.eu/fp7/ict/programme/fet_en.html*
Marie Curie Actions	*http://ec.europa.eu/research/mariecurieactions/*
Research infrastructures (including eInfrastructures)	*http://ec.europa.eu/research/infrastructures/index_en.cfm*

Marie Curie

Marie Sklodowska-Curie Work Programme 2016 - 2017	*http://www.ist-africa.org/home/files/h2020-wp1617-msca_en.pdf*
Marie Sklodowska-Curie Innovative Training Networks (ITN)	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2056-msca-itn-2016.html*
Single Stage Calls 2016 - Deadline 12 January	
H2020-MSCA-ITN-2016	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-msca-itn-2016.html*
Marie Sklodowska-Curie Research and Innovation Staff Exchange (RISE)	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2117-msca-rise-2016.html*
Single Stage Calls 2016 - Deadline 28 April	
H2020-MSCA-RISE-2016	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-msca-rise-2016.html*
Individual Fellowships (IF)	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2226-msca-if-2016.html*
Single Stage Calls 2016 - Deadline 14 September	
H2020-MSCA-IF-2016	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-msca-if-2016.html*

Research Infrastructures Work Programme

eInfrastructures 2016 – 2017 Work Programme	*http://www.ist-africa.org/home/files/h2020-wp1617-infrastructures_en.pdf*
Single stage calls 2016 - Deadline 30 March	

E-Infrastructures (EINFRA) 　EINFRA-11-2016: Support to the next implementation phase of Pan-European High Performance Computing infrastructure and services (PRACE) 　EINFRA-22-2016: User-driven e-infrastructure innovation	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-einfra-2016-2017.html* *https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2119-einfra-11-2016.html* *https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2120-einfra-22-2016.html*
Development and long-term sustainability of new pan-European research infrastructures (INFRADEV) 　INFRADEV-03-2016-2017: Individual support to ESFRI and other world-class research infrastructures	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-infradev-2016-2017.html* *https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2055-infradev-03-2016-2017.html*
Fostering the innovation potential of Research Infrastructures (INFRAINNOV) 　INFRAINNOV-02-2016: Support to Technological Infrastructures	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-infrainnov-2016-2017.html* *https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2126-infrainnov-02-2016.html*
Support to policy and international cooperation (INFRASUPP) 　INFRASUPP-01-2016: Policy and international cooperation measures for research infrastructures 　INFRASUPP-03-2016: Support to policies and international cooperation for e-infrastructures	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-infrasupp-2016-2017.html* *https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2076-infrasupp-01-2016.html* *https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2077-infrasupp-03-2016.html*
Single stage calls 2016 - Deadline 22 June	
Development and long-term sustainability of new pan-European research infrastructures (INFRADEV) 　INFRADEV-02-2016: Preparatory Phase of ESFRI projects 　INFRADEV-04-2016: European Open Science Cloud for Research	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-infradev-2016-2017.html* *https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2053-infradev-02-2016.html* *https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2054-infradev-04-2016.html*
Single stage calls 2016 - Deadline 20 September	
E-Infrastructures (EINFRA) 　EINFRA-21-2017: Platform-driven e-infrastructure innovation (PPI Public Procurement of Innovative solutions)	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-einfra-2016-2017.html* *https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2122-einfra-21-2017.html*

II. Leadership in Enabling and Industrial Technologies

With the aim to make Europe a more attractive location for investment in research and innovation, it is envisaged that Horizon 2020 will build

- Leadership in enabling and industrial technologies with dedicated support for ICT, nanotechnologies, advanced materials, biotechnology, advanced manufacturing and processing, and space, while also providing support for cross-cutting actions to capture the accumulated benefits from combining several Key Enabling Technologies;
- Facilitate access to risk finance;
- Provide support for innovation in SMEs.

LEIT ICT Work Programme 2016 – 2017	http://www.ist-africa.org/home/files/h2020-wp1617-leit-ict_en.pdf

ICT related challenges include Components and Systems, Advanced Computing, Future Internet, Content Technologies and Information Management, Robotics and Key enabling Technologies (Micro-nano-electronics and photonics). Pursuing the change initiated under Work Programme 2014-2015, activities will continue to promote more innovation-orientation to ensure that the EU industry remains strong in the core technologies that are at the roots of future value chains. The total budget available in 2016 is €762.55 million.

Leadership in Enabling and Industrial Technologies 2016 Calls

ICT 2015 - Information and Communications Technologies	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-ict-2016-2017.html
Single Stage Calls 2016 - Deadline 19 January	
International Cooperation Activities	
ICT-37-2016: CHINA: Collaboration on Future Internet	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5079-ict-37-2016.html
ICT-38-2016: MEXICO: Collaboration on ICT	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5080-ict-38-2016.html
ICT-39-2016-2017: International partnership building in low and middle income countries	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5078-ict-39-2016-2017.html
EU-Japan Joint Call	
EUJ-01-2016: 5G – Next Generation Communication Networks	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2418-euj-01-2016.html
EUJ-02-2016: IoT/Cloud/Big Data platforms in social application contexts	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2419-euj-02-2016.html
EUJ-03-2016: Experimental testbeds on Information-Centric Networking	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2420-euj-03-2016.html
EU-South Korea Joint Call	
EUK-01-2016: 5G – Next Generation Communication Networks	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2333-euk-01-2016.html
EUK-02-2016: IoT joint research	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2334-euk-02-2016.html
EUK-03-2016: Federated Cloud resource brokerage for mobile cloud services	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2335-euk-03-2016.html

Single Stage Calls 2016 - Deadline 12 April	
A new Generation of Components and Systems	
ICT-01-2016: Smart Cyber-Physical Systems	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5085-ict-01-2016.html*
ICT-02-2016: Thin, Organic and Large Area Electronics	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5082-ict-02-2016.html*
ICT-03-2016: SSI – Smart System Integration	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5090-ict-03-2016.html*
Advanced Computing and Cloud Computing	
ICT-06-2016: Cloud Computing	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5091-ict-06-2016.html*
Future Internet	
ICT-10-2016: Software Technologies	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5098-ict-10-2016.html*
ICT-12-2016: Net Innovation Initiative	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5083-ict-12-2016.html*
ICT-13-2016: Future Internet Experimentation - Building a European experimental Infrastructure	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5089-ict-13-2016.html*
Content	
ICT-14-2016-2017: Big Data PPP: cross-sectorial and cross-lingual data integration and experimentation	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5093-ict-14-2016-2017.html*
ICT-15-2016-2017: Big Data PPP: Large Scale Pilot actions in sectors best benefitting from data-driven innovation	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5097-ict-15-2016-2017.html*
ICT-17-2016-2017: Big data PPP: Support, industrial skills, benchmarking and evaluation	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5074-ict-17-2016-2017.html*
ICT-18-2016: Big data PPP: privacy-preserving big data technologies	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5087-ict-18-2016.html*
ICT-21-2016: Support technology transfer to the creative industries	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5099-ict-21-2016.html*
ICT-22-2016: Technologies for Learning and Skills	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5086-ict-22-2016.html*
ICT-24-2016: Gaming and gamification	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5088-ict-24-2016.html*
Robotics and Autonomous Systems	
ICT-25-2016-2017: Advanced robot capabilities research and take-up	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5081-ict-25-2016-2017.html*
ICT-26-2016: System abilities, development and pilot installations	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5096-ict-26-2016.html*
ICT Key Enabling Technologies	
ICT-29-2016: Photonics KET 2016	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5094-ict-29-2016.html*
Innovation and Entrepreneurship support	
ICT-34-2016: Pre-Commercial Procurement open	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5095-ict-34-2016.html*
Responsibility and Creativity	
ICT-35-2016: Enabling responsible ICT-related research and innovation	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5084-ict-35-2016.html*
ICT-36-2016: Boost synergies between artists, creative people and technologists	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5092-ict-36-2016.html*

Single Stage Calls 2016 - Deadline 8 November	
A new Generation of Components and Systems	
ICT-04-2017: Smart Anything Everywhere Initiative	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5061-ict-04-2017.html*
Future Internet	
ICT-07-2017: 5G PPP Research and Validation of critical technologies and systems	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5064-ict-07-2017.html*
ICT-08-2017: 5G PPP Convergent Technologies	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5062-ict-08-2017.html*
ICT-09-2017: Networking research beyond 5G	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5065-ict-09-2017.html*
Content	
ICT-19-2017: Media and content convergence	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5063-ict-19-2017.html*

III. Societal Challenges

As part of addressing the Europe 2020 strategy, funding will focus on the following challenges:

- Health, demographic change and wellbeing – Download [Work Programme](#)
- Food security, sustainable agriculture, marine and maritime research, and the bio-economy - Download [Work Programme](#)
- Secure, clean and efficient energy - Download [Work Programme](#)
- Smart, green and integrated transport - Download [Work Programme](#)
- Climate action, resource efficiency and raw materials - Download [Work Programme](#)
- Inclusive, innovative and reflective societies – Download [Work Programme](#)
- Secure Societies – Download [Work Programme](#)

Health, Demographic Change and Wellbeing Work Programme	*http://www.ist-africa.org/home/files/h2020-wp1617-health_en.pdf*
Food Security, Sustainable Agriculture, Marine and Maritime Research, and the Bio-Economy Work Programme	*http://www.ist-africa.org/home/files/h2020-wp1617-food_en.pdf*
Secure, Clean and Efficient Energy Work Programme	*http://www.ist-africa.org/home/files/h2020-wp1617-energy_en.pdf*
Smart, Green and Integrated Transport Work Programme	*http://www.ist-africa.org/home/files/h2020-wp1617-transport_en.pdf*
Climate Action, Resource Efficiency and Raw Materials Work Programme	*http://www.ist-africa.org/home/files/h2020-wp1617-climate_en.pdf*
Inclusive, Innovative and Reflective Societies Work Programme	*http://www.ist-africa.org/home/files/h2020-wp1617-societies_en.pdf*
Secure Societies Work Programme	*http://www.ist-africa.org/home/files/h2020-wp1617-security_en.pdf*

Societal Challenge 1: Health Demographic Change and Wellbeing

The Horizon 2020 Societal Challenge of ['Health, Demographic Change and Wellbeing' (SC1)](#) for 2016 and 2017 includes 21 topics in the 'Personalised Health' focus area call (13 in 2016 only, 8 in 2017 only and 4 which are open in both years) and 16 topics in the 'Co-ordination Activities' call (13 in 2015 and 3 in 2017). The estimated budget available for 2016 is €500.18 million.

Topics in the call are divided into 7 areas that reflect the need for a transnational and integrated approach to the challenge, providing support both to longer and mid-term research as well as to shorter-term innovation activities. The overall strategic orientation for the 'Health, Demographic Change and Well-being' Work Programme 2016-2017 is 'promoting healthy ageing and personalised healthcare'. The programme will implement several research priorities: personalised medicine, rare diseases, human biomonitoring, mental health, comparative effectiveness research, advanced technologies, e/mhealth, robotics, patient empowerment, active and healthy ageing, data security, big data, valorisation, anti-microbial resistance, infectious diseases including vaccines, maternal and child health and the silver economy under following areas:

- Understanding health, well-being and disease

- Preventing disease
- Treating and managing diseases
- Active ageing and self-management of health
- Methods and data
- Health care provision and integrated care
- Co-ordination Activities

Societal Challenge 1: Health Demographic Change and Wellbeing	http://ec.europa.eu/programmes/horizon2020/en/h2020-section/health-demographic-change-and-wellbeing
Personalised Medicine (PM &HCO)	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-sc1-2016-2017.html
Single stage calls 2016 - Deadline 16 February	
1.4 Active ageing and self-management of health	
SC1-PM-12-2016: PCP - eHealth innovation in empowering the patient	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2446-sc1-pm-12-2016.html
SC1-PM-13-2016: PPI for deployment and scaling up of ICT solutions for active and healthy ageing	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2447-sc1-pm-13-2016.html
1.5 Methods and data	
SC1-PM-18-2016: Big Data supporting Public Health policies	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2442-sc1-pm-18-2016.html
Coordination activities (HCO)	
SC1-HCO-10-2016: Support for Europe's leading Health ICT SMEs	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2448-sc1-hco-10-2016.html
SC1-HCO-11-2016: Coordinated action to support the recognition of Silver Economy opportunities arising from demographic change	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2438-sc1-hco-11-2016.html
SC1-HCO-12-2016: Digital health literacy	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2439-sc1-hco-12-2016.html
SC1-HCO-13-2016: Healthcare Workforce IT skills	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2444-sc1-hco-13-2016.html
SC1-HCO-14-2016: EU-US interoperability roadmap	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2443-sc1-hco-14-2016.html
SC1-HCO-15-2016: EU eHealth Interoperability conformity assessment	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2440-sc1-hco-15-2016.html
SC1-HCO-16-2016: Standardisation needs in the field of ICT for Active and Healthy Ageing	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2445-sc1-hco-16-2016.html
Single stage calls 2016 - Deadline 12 April	
1.4 Active ageing and self-management of health	
SC1-PM-14-2016: EU-Japan cooperation on Novel ICT Robotics based solutions for active and healthy ageing at	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2433-sc1-pm-14-2016.html

home or in care facilities

Single stage calls 2016 - Deadline 13 April	
Coordination activities (HCO)	
SC1-HCO-01-2016: Valorisation of FP7 Health and H2020 SC1 research results	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3057-sc1-hco-01-2016.html*
SC1-HCO-02-2016: Standardisation of pre-analytical and analytical procedures for in vitro diagnostics in personalised medicine	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3054-sc1-hco-02-2016.html*
SC1-HCO-04-2016: Towards globalisation of the Joint Programming Initiative on Antimicrobial resistance	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3059-sc1-hco-04-2016.html*
SC1-HCO-05-2016: Coordinating personalised medicine research	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2449-sc1-hco-05-2016.html*
SC1-HCO-06-2016: Towards an ERA-NET for building sustainable and resilient health system models	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3058-sc1-hco-06-2016.html*
1.1 Understanding health, well-being and disease	
SC1-PM-01-2016: Multi omics for personalised therapies addressing diseases of the immune system	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3055-sc1-pm-01-2016.html*
SC1-PM-04-2016: Networking and optimising the use of population and patient cohorts at EU level	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3051-sc1-pm-04-2016.html*
1.2 Preventing disease	
SC1-PM-05-2016: The European Human Biomonitoring Initiative	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3050-sc1-pm-05-2016.html*
SC1-PM-06-2016: Vaccine development for malaria and/or neglected infectious diseases	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3052-sc1-pm-06-2016.html*
1.3 Treating and managing diseases	
SC1-PM-09-2016: New therapies for chronic diseases	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3060-sc1-pm-09-2016.html*
Two stage calls 2016 - Stage 1 Deadline: 4 October 2016, Stage 2 Deadline: 11 April 2017	
1.1 Understanding health, well-being and disease	
SC1-PM-02-2017: New concepts in patient stratification	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2434-sc1-pm-02-2017.html*
1.2 Preventing disease	
SC1-PM-07-2017: Promoting mental health and well-being in the young	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2437-sc1-pm-07-2017.html*
1.3 Treating and managing diseases	
SC1-PM-08-2017: New therapies for rare diseases	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2436-sc1-pm-08-2017.html*
SC1-PM-10-2017: Comparing the effectiveness of existing healthcare interventions in the adult population	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2435-sc1-pm-10-2017.html*

Societal Challenge 2: Food security, sustainable agriculture, marine and maritime research, and the bio-economy

The Horizon 2020 Societal Challenge of 'Food Security, Sustainable Agriculture, Marine and Maritime Research and the Bio-economy' (SC2) for 2016 and 2017 is composed of four calls, addressing all the bioeconomy sectors from the sustainable exploration of the oceans and seas and the development of a blue economy, to climate-smart agriculture, new models for development in rural areas, new biobased goods and services.
This Work Programme will leverage research and innovation to address major societal challenges:

- Ensuring food and nutritional security, together with resource efficiency, and facing climate change
- Sustainably exploiting the potential of the oceans
- Promoting dynamic territorial development, through the mobilisation of rural and coastal economies
- Boosting investment, employment and economic growth in the European Union

Many of the challenges addressed in this Work Programme are of global nature, requiring the development of global solutions in cooperation with third countries and relevant international organisations or initiatives. Particular priorities for international cooperation are:

- Blue Growth, which will support the implementation of the Atlantic Ocean Research Alliance (focus on Arctic) and the BLUEMED Initiative on marine and maritime research and innovation activities in the Mediterranean area;
- Sustainable Food Security, which will support flagships initiatives with China and partnerships initiatives with East-Asian countries on aquaculture and Africa on Food and Nutrition Security, Sustainable Agriculture and the establishment of an International Research Consortium on animal health.

The estimated total budget available for 2016 is EUR 364.52 million.

Societal Challenge 2: Food security, sustainable agriculture, marine and maritime research, and the bio-economy	http://ec.europa.eu/programmes/horizon2020/en/h2020-section/food-security-sustainable-agriculture-and-forestry-marine-maritime-and-inland-water
Single stage calls 2016 - Deadline 17 February	
Sustainable Food Security (SFS) - Resilient and resource-efficient value chains	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-sfs-2016-2017.html
More resilient and resource efficient value chains SFS-09-2016: Spotlight on critical outbreak of pests: the case of Xylella fastidiosa SFS-12-2016: Support for international research on animal health SFS-19-2016: ERA-NET Cofund: Public-Public Partnerships in the bioeconomy SFS-24-2016: Reinforcing international cooperation on sustainable aquaculture production with countries from South-East Asia	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/6071-sfs-09-2016.html https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/6073-sfs-12-2016.html https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/6075-sfs-19-2016.html https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/6076-sfs-24-2016.html

SFS-25-2016: Support Action to a common agricultural and wider bioeconomy research agenda	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/6072-sfs-25-2016.html*
Support to the Implementation of the EU-Africa Partnership on Food and Nutrition Security and Sustainable Agriculture	
SFS-41-2016: EU-Africa Research and Innovation partnership on food and nutrition security and sustainable agriculture	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/6074-sfs-41-2016.html*
Blue Growth (BG) - Demonstrating an ocean of opportunities	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-bg-2016-2017.html*
Boosting Innovation for emerging Blue Growth activities	
BG-01-2016: Large-scale algae biomass integrated biorefineries	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5121-bg-01-2016.html*
BG-02-2016-2017: High value-added specialised vessel concepts enabling more efficient servicing of emerging coastal and offshore activities	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5119-bg-02-2016-2017.html*
BG-03-2016: Multi-use of the oceans' marine space, offshore and near-shore: compatibility, regulations, environmental and legal issues	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5117-bg-03-2016.html*
BG-05-2016: ERA-NET Cofund on marine technologies	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5118-bg-05-2016.html*
The Arctic Dimension	
BG-09-2016: An integrated Arctic observation system	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5122-bg-09-2016.html*
BG-10-2016: Impact of Arctic changes on the weather and climate of the Northern Hemisphere	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5123-bg-10-2016.html*
Valorising the Mediterranean Sea Basin	
BG-13-2016: Support to the BLUEMED Initiative: Coordination of marine and maritime research and innovation activities in the Mediterranean	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5120-bg-13-2016.html*
Rural Renaissance (RUR) - Fostering innovation and business opportunities	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-rur-2016-2017.html*
New value chains and business models	
RUR-08-2016: Demonstration of integrated logistics centres for food and non-food applications	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5114-rur-08-2016.html*
Innovation and skill development	
RUR-10-2016-2017: Thematic Networks compiling knowledge ready for practice	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5115-rur-10-2016-2017.html*
RUR-11-2016: On-farm demonstrations: deepening farmer-to-farmer learning mechanisms	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5113-rur-11-2016.html*
Bio-based innovation for sustainable goods and services (BB) - Supporting the development of a European Bioeconomy	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-bb-2016-2017.html*

Securing sustainable biomass supply for bio-based goods and services	
BB-04-2016: Intelligent solutions and tools in forest production systems, fostering a sustainable supply of quality wood for the growing bioeconomy	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/6083-bb-04-2016.html*
Building the "bio-based markets of the future"- mobilising stakeholders engagement	
BB-06-2016: The regional dimension of bio-based industries	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/6082-bb-06-2016.html*
Two stage calls 2016 - Stage 1 Deadline: 17 February, Stage 2 Deadline: 13 September 2016	
Sustainable Food Security (SFS) – Resilient and resource-efficient value chains	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-sfs-2016-2017.html
More resilient and resource efficient value chains	
SFS-01-2016: Solutions to multiple and combined stresses in crop production	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5133-sfs-01-2016.html*
SFS-02-2016: Teaming up for good: Exploiting the benefits of species diversity in cropping systems	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5146-sfs-02-2016.html*
SFS-03-2016: Testing and breeding for sustainability and resilience in crops	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5129-sfs-03-2016.html*
SFS-06-2016: Weeding - strategies, tools and technologies for sustainable weed management	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5142-sfs-06-2016.html*
SFS-07-2016-2017: Organic breeding – Increasing the competitiveness of the organic breeding and farming sectors	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5141-sfs-07-2016-2017.html*
SFS-11-2016: Challenges for disease management: Perennial crops in the tropics and sub-tropics	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5138-sfs-11-2016.html*
SFS-14-2016: Understanding host-pathogen-environment interactions	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5130-sfs-14-2016.html*
SFS-15-2016-2017: Breeding livestock for resilience and efficiency	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5145-sfs-15-2016-2017.html*
SFS-21-2016-2017: Advancing basic biological knowledge and improving management tools for commercially important fish and other seafood species	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5136-sfs-21-2016-2017.html*
SFS-23-2016: Improving the technical performance of the Mediterranean aquaculture	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5135-sfs-23-2016.html*
Environment-smart and climate-smart primary production	
SFS-26-2016: Legumes - transition paths to sustainable legume-based farming systems and agri-feed and food chains	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5134-sfs-26-2016.html*
SFS-31-2016: Farming for tomorrow - developing an enabling environment for resilient and sustainable agricultural systems	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5137-sfs-31-2016.html*

Environment-smart and climate-smart primary production

   SFS-33-2016: Understanding food value chain and network dynamics
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5143-sfs-33-2016.html

Healthy and safe foods and diets for all

   SFS-37-2016: The impact of consumer practices in food safety: risks and mitigation strategies
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5139-sfs-37-2016.html

   SFS-38-2016: Impulsivity and compulsivity and the link with nutrition, lifestyle and the socio-economic environment
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5140-sfs-38-2016.html

Support to the Implementation of the EU-Africa Partnership on Food and Nutrition Security and Sustainable Agriculture

   SFS-42-2016: Promoting food and nutrition security and sustainable agriculture in Africa: the role of innovation
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5132-sfs-42-2016.html

Implementation of the EU-China FAB Flagship initiative

   SFS-44-2016: A joint plant breeding programme to decrease the EU's and China's dependency on protein imports
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5144-sfs-44-2016.html

   SFS-45-2016: Increase overall transparency of processed agri-food products
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5131-sfs-45-2016.html

Blue Growth (BG) - Demonstrating an ocean of opportunities
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-bg-2016-2017.html

Valorising the Mediterranean Sea Basin

   BG-12-2016: Towards an integrated Mediterranean Sea Observing System
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5116-bg-12-2016.html

Rural Renaissance (RUR) - Fostering innovation and business opportunities
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-rur-2016-2017.html

New approaches towards policies and governance

   RUR-01-2016: Consolidated policy framework and governance models for synergies in rural-urban linkages
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5105-rur-01-2016.html

   RUR-04-2016: Water farms – improving farming and its impact on the supply of drinking water
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5107-rur-04-2016.html

New value chains and business models

   RUR-06-2016: Crop diversification systems for the delivery of food, feed, industrial products and ecosystems services - from farm benefits to value-chain organisation
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5106-rur-06-2016.html

   RUR-07-2016: Resource-efficient and profitable industrial crops on marginal land
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5104-rur-07-2016.html

Innovation and skill development

   RUR-14-2016: Advisors' roles in the functioning of AKIS and advisory policies boosting innovation in sustainable agriculture
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5103-rur-14-2016.html

Bio-based innovation for sustainable goods and services (BB) - Supporting the development of a European Bioeconomy	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-bb-2016-2017.html*
Securing sustainable biomass supply for bio-based goods and services BB-01-2016: Sustainability schemes for the bio-based economy	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/6080-bb-01-2016.html*
Single stage calls 2016 - Deadline 13 September	
Sustainable Food Security (SFS) – Resilient and resource-efficient value chains	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-sfs-2016-2017.html*
More resilient and resource efficient value chains SFS-18-2016: Framework Partnership Agreement supporting Joint Actions towards Public-Public Partnerships in the Bioeconomy	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5147*

Societal Challenge 3: Secure, Clean and Efficient Energy

The Horizon 2020 Societal Challenge of "Secure, clean and efficient energy' (SC3) for 2016 and 2017 is composed of two focus areas "Energy Efficiency" and "Competitive Low-Carbon Energy". These activities cover the full innovation cycle – from 'proof of concept' to applied research, pre-commercial demonstration and market uptake measures. They also exploit synergies with other relevant areas, e.g. information and communication technologies. In addition, the Energy Challenge contributes to the 'Blue Growth' focus area as well as to the Public Private Partnerships Energy-efficient Buildings and Sustainable Process Industries (SPIRE - Topic EE17).

International cooperation with strategic partner countries and global technology leaders will support European energy and climate objectives and contribute to the global efforts to mitigate climate change and reduce CO_2 emissions. In line with the objectives of the EU's strategy for international cooperation in research and innovation, all activities are open for third country participants, while certain partner countries are also specifically targeted in a number of topics (Topics targeting third countries: LCE 22-2016, LCE 23-2016, LCE 24-2016, LCE 27-2017, LCE 29-2017 and LCE 30-2017

 The estimated total budget available for 2016 is EUR 674.74 million.

Societal Challenge 3: Secure, Clean and Efficient Energy	*http://ec.europa.eu/programmes/horizon2020/en/h2020-section/secure-clean-and-efficient-energy*
Single stage calls 2016 - Deadline 21 January	
Energy Efficiency (EE)	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-ee-2016-2017.html*
Heating and cooling EE-03-2016: Standardised installation packages integrating renewable and energy efficiency solutions for heating, cooling and/or hot water preparation	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5056-ee-03-2016.html*

EE-04-2016-2017: New heating and cooling solutions using low grade sources of thermal energy
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5055-ee-04-2016-2017.html

EE-05-2016: Models and tools for heating and cooling mapping and planning
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5057-ee-05-2016.html

Engaging consumers towards sustainable energy

EE-07-2016-2017: Behavioural change toward energy efficiency through ICT
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5059-ee-07-2016-2017.html

EE-08-2016: Socio-economic research on consumer's behaviour related to energy efficiency
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5058-ee-08-2016.html

Buildings

EE-10-2016: Supporting accelerated and cost-effective deep renovation of buildings through Public Private Partnership (EeB PPP)
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/4088-ee-10-2016.html

Industry, services and products

EE-17-2016-2017: Valorisation of waste heat in industrial systems (SPIRE PPP)
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/4087-ee-17-2016-2017.html

Single stage calls 2016 - Deadline 16 February

Competitive Low-Carbon Energy (LCE)	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-lce-2016-2017.html*

Renewable energy technologies

LCE-07-2016-2017: Developing the next generation technologies of renewable electricity and heating/cooling
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2180-lce-07-2016-2017.html

LCE-08-2016-2017: Development of next generation biofuel technologies
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2182-lce-08-2016-2017.html

LCE-23-2016: International Cooperation with Mexico on geothermal energy
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2181-lce-23-2016.html

Enabling the decarbonisation of the use of fossil fuels during the transition to a lowcarbon
economy

LCE-24-2016: International Cooperation with South Korea on new generation high-efficiency capture processes
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2179-lce-24-2016.html

LCE-25-2016: Utilisation of captured CO2 as feedstock for the process industry
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2177-lce-25-2016.html

Social, economic and human aspects of the energy system

LCE-31-2016-2017: Social Sciences and Humanities Support for the Energy Union
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2178-lce-31-2016-2017.html

Cross-cutting issues

LCE-36-2016: Support to the energy stakeholders to contribute to the SET-Plan
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2169-lce-36-2016.html

Single stage calls 2016 - Deadline 5 April	
Competitive Low-Carbon Energy (LCE)	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-lce-2016-2017.html*
Towards an integrated EU energy system	
LCE-01-2016-2017: Next generation innovative technologies enabling smart grids, storage and energy system integration with increasing share of renewables: distribution network	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2185-lce-01-2016-2017.html*
LCE-02-2016: Demonstration of smart grid, storage and system integration technologies with increasing share of renewables: distribution system	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2184-lce-02-2016.html*
LCE-03-2016: Support to R&I strategy for smart grid and storage	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2183-lce-03-2016.html*
Enabling the decarbonisation of the use of fossil fuels during the transition to a lowcarbon economy	
LCE-26-2016: Cross-thematic ERA-NET on Applied Geosciences	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2167-lce-26-2016.html*
Social, economic and human aspects of the energy system	
LCE-32-2016: European Platform for energy-related Social Sciences and Humanities research	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2166-lce-32-2016.html*
Supporting the development of a European research area in the field of energy	
LCE-33-2016: European Common Research and Innovation Agendas (ECRIAs) in support of the implementation of the SET Action Plan	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2164-lce-33-2016.html*
LCE-34-2016: Joint Actions towards the demonstration and validation of innovative energy solutions	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2165-lce-34-2016.html*
Single stage calls 2016 - Deadline 8 September	
Competitive Low-Carbon Energy (LCE)	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-lce-2016-2017.html*
Renewable energy technologies	
LCE-09-2016: Increasing the competitiveness of the EU PV manufacturing industry	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2151-lce-09-2016.html*
LCE-13-2016: Solutions for reduced maintenance, increased reliability and extended life-time of off-shore wind turbines/farms	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2155-lce-13-2016.html*
LCE-15-2016: Scaling up in the ocean energy sector to arrays	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2153-lce-15-2016.html*
LCE-19-2016-2017: Demonstration of the most promising advanced biofuel pathways	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2152-lce-19-2016-2017.html*
LCE-20-2016-2017: Enabling pre-commercial production of advanced aviation biofuel	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2154-lce-20-2016-2017.html*

LCE-22-2016: International Cooperation with Brazil on advanced lignocellulosic biofuels	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2150-lce-22-2016.html
Supporting the development of a European research area in the field of energy	
LCE-35-2016: Framework Partnership Agreement supporting Joint Actions towards the demonstration and validation of innovative energy solutions	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2163-lce-35-2016.html
Single stage calls 2016 - Deadline 15 September	
Energy Efficiency (EE)	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-ee-2016-2017.html
Engaging consumers towards sustainable energy	
EE-06-2016-2017: Engaging private consumers towards sustainable energy	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/4095-ee-06-2016-2017.html
EE-09-2016-2017: Engaging and activating public authorities	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/4098-ee-09-2016-2017.html
Buildings	
EE-11-2016-2017: Overcoming market barriers and promoting deep renovation of buildings	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/4097-ee-11-2016-2017.html
EE-13-2016: Cost reduction of new Nearly Zero-Energy buildings	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/4091-ee-13-2016.html
EE-14-2016-2017: Construction skills	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/4092-ee-14-2016-2017.html
Industry, services and products	
EE-16-2016-2017: Effective implementation of EU product efficiency legislation	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/4096-ee-16-2016-2017.html
EE-21-2016: ERA-NET Cofund actions supporting Joint Actions towards increasing energy efficiency in industry and services	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/4090-ee-21-2016.html
Innovative financing for energy efficiency investments	
EE-22-2016-2017: Project Development Assistance	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/4099-ee-22-2016-2017.html
EE-24-2016-2017: Making the energy efficiency market investible	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/4093-ee-24-2016-2017.html
EE-25-2016: Development and roll-out of innovative energy efficiency services	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/4094-ee-25-2016.html

Societal Challenge 4: Smart, Green and Integrated Transport

The Horizon 2020 Societal Challenge of 'Smart, green and integrated transport' (SC4) for 2016 and 2017 is structured in four broad lines of activities aiming at:

a) Resource efficient transport that respects the environment.

b) Better mobility, less congestion, more safety and security.

c) Global leadership for the European transport industry.

d) Socio-economic and behavioural research and forward-looking activities for policy making.

These activities are addressed in this Work Programme by three Calls for proposals:

1. Mobility for Growth
2. Green Vehicles
3. Small Business and Fast Track Innovation for Transport (SME instrument)

The total 2016 budget available is EUR 450.77 million.

Societal Challenge 4: Smart, green and integrated transport	http://ec.europa.eu/programmes/horizon2020/en/h2020-section/smart-green-and-integrated-transport
Two stage calls 2016 - Stage 1 Deadline: 20 January, Stage 2 Deadline: 29 September 2016	
Mobility for Growth (MG)	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-mg-2016-2017.html
Aviation MG-1.1-2016: Reducing energy consumption and environmental impact of aviation	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2094-mg-1.1-2016.html
MG-1.4-2016-2017: Breakthrough innovation	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2085-mg-1.4-2016-2017.html
Intelligent Transport Systems MG-6.1-2016: Innovative concepts, systems and services towards 'mobility as a service'	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2086-mg-6.1-2016.html
MG-6.2-2016: Large-scale demonstration(s) of cooperative ITS	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2087-mg-6.2-2016.html
Logistics MG-5.1-2016: Networked and efficient logistics clusters	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2084-mg-5.1-2016.html
Safety MG-3.3-2016: Safer waterborne transport and maritime operations	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2089-mg-3.3-2016.html
MG-3.4-2016: Transport infrastructure innovation to increase the transport system safety at modal and intermodal level (including nodes and interchanges)	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2088-mg-3.4-2016.html
MG-3.5-2016: Behavioural aspects for safer transport	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2090-mg-3.5-2016.html
Urban Mobility MG-4.5-2016: New ways of supporting development and implementation of neighbourhood-level and urban-district-level transport innovations	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2093-mg-4.5-2016.html

Waterborne	
MG-2.2-2016: Development, production and use of high performance and lightweight materials for vessels and equipment	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2091-mg-2.2-2016.html*
MG-2.3-2016: New and improved transport concepts in waterborne transport	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2092-mg-2.3-2016.html*
Automated Road Transport (ART)	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-art-2016-2017.html*
ART-02-2016: Automation pilots for passenger cars	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2058-art-02-2016.html*
ART-04-2016: Safety and end-user acceptance aspects of road automation in the transition period	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2057-art-04-2016.html*
ART-05-2016: Road infrastructure to support the transition to automation and the coexistence of conventional and automated vehicles on the same network	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2059-art-05-2016.html*
Single stage calls 2016 - Deadline 26 January	
Mobility for Growth (MG)	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-mg-2016-2017.html*
Aviation	
MG-1.5-2016-2017: Identification of gaps, barriers and needs in the aviation research	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2082-mg-1.5-2016-2017.html*
Intelligent Transport Systems	
MG-6.3-2016: Roadmap, new business models, awareness raising, support and incentives for the roll-out of ITS	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2098-mg-6.3-2016.html*
Logistics	
MG-5.3-2016: Promoting the deployment of green transport, towards Eco-labels for logistics	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2099-mg-5.3-2016.html*
Safety	
MG-3.1-2016: Addressing aviation safety challenges	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2083-mg-3.1-2016.html*
MG-3.6-2016: Euro-African initiative on road safety and traffic management	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2097-mg-3.6-2016.html*
Socio-Economic and Behavioural Research and Forward Looking Activities for Policy Making	
MG-8.1-2016: Research, technology development and market trends for the European transport manufacturing industries	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2102-mg-8.1-2016.html*
MG-8.3-2016: Assessing future requirements for skills and jobs across transport modes and systems	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2081-mg-8.3-2016.html*
MG-8.6-2016: Innovation awards for students and researchers in the context of the Transport Research Arena conference - TRA 2018	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2101-mg-8.6-2016.html*
Urban Mobility	
MG-4.4-2016: Facilitating public procurement of innovative sustainable transport and mobility solutions in urban areas	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2100-mg-4.4-2016.html*

Green Vehicles (GV)	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-gv-2016-2017.html
GV-02-2016: Technologies for low emission light duty powertrains	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2064-gv-02-2016.html
GV-03-2016: System and cost optimised hybridisation of road vehicles	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2065-gv-03-2016.html
GV-11-2016: Stimulating European research and development for the implementation of future road transport technologies	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2067-gv-11-2016.html
GV-12-2016: ERA-NET Co-fund on electromobility	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2066-gv-12-2016.html

Societal Challenge 5: Climate action, resource efficiency and raw materials

The Horizon 2020 Societal Challenge of 'Climate action, resource efficiency and raw materials' (SC5) for 2016 and 2017 is composed of following topics, under the "Greening the Economy" call:

- Climate services
- Towards a low-carbon Europe
- Nature-based solutions for territorial resilience
- Water
- Raw materials
- Earth Observation
- Cultural heritage for sustainable growth
- Support to policy and preparing for innovation procurement

Within the overall objective of taking a systemic approach to moving towards a more resource efficient, greener and more competitive economy, this call addresses the priority areas of climate services, moving towards a low-carbon Europe, nature-based solutions for territorial resilience, water, raw materials, Earth observation and cultural heritage for sustainable growth.

The total budget available in 2016 is EUR 358.55 million.

Societal Challenge 5: Climate action, resource efficiency and raw materials	http://ec.europa.eu/programmes/horizon2020/en/h2020-section/climate-action-environment-resource-efficiency-and-raw-materials
Single stage calls 2016 - Deadline 26 January	
Support to policy and preparing for innovation procurement SC5-24-2016: Support to confirmed Presidency event (conference) in Slovakia	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2186-sc5-24-2016.html
Water SC5-12-2016: Food systems and water resources for the development of inclusive, sustainable and healthy Euro-Mediterranean societies	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2187-sc5-12-2016.html
Single stage calls 2016 - Deadline 8 March	
Climate services SC5-03-2016: Climate services market research SC5-05-2016: A 1.5 million year look into the past for improving climate predictions	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2200-sc5-03-2016.html https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2212-sc5-05-2016.html
Earth Observation SC5-20-2016: European data hub of the GEOSS information system	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2207-sc5-20-2016.html

Nature-based solutions for territorial resilience

SC5-09-2016: Operationalising insurance value of ecosystems

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2208-sc5-09-2016.html

SC5-10-2016: Multi-stakeholder dialogue platform to promote innovation with nature to address societal challenges

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2209-sc5-10-2016.html

Raw materials

SC5-13-2016-2017: New solutions for sustainable production of raw materials

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2205-sc5-13-2016-2017.html

SC5-15-2016-2017: Raw materials policy support actions

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2202-sc5-15-2016-2017.html

SC5-16-2016-2017: Raw materials international co-operation

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2203-sc5-16-2016-2017.html

SC5-17-2016: ERA-NET Cofund on Raw materials

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2206-sc5-17-2016.html

Support to policy and preparing for innovation procurement

SC5-23-2016-2017: Support to confirmed Presidency events (conferences) – Malta, United Kingdom, Estonia

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2211-sc5-23-2016-2017.html

SC5-25-2016: Macro-economic and societal benefits from creating new markets in a circular economy

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2214-sc5-25-2016.html

SC5-27-2016: Preparing for pre-commercial procurement (PCP) and/or public procurement of innovative solutions (PPI) in support of climate action, environment, resource efficiency and raw materials

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2210-sc5-27-2016.html

SC5-28-2016: Transformations to sustainability

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2204-sc5-28-2016.html

Towards a low-carbon Europe

SC5-06-2016-2017: Pathways towards the decarbonisation and resilience of the European economy in the timeframe 2030-2050 and beyond

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2201-sc5-06-2016-2017.html

Water

SC5-11-2016: Supporting international cooperation activities on water

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2213-sc5-11-2016.html

Support to policy and preparing for innovation procurement

SC5-29-2016: Framework Partnership Agreement supporting Joint Actions towards a sustainable green economy in Europe and beyond

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2197-sc5-29-2016.html

Two stage calls 2016 - Stage 1 Deadline: 8 March, Stage 2 Deadline: 6 September 2016

Climate services

SC5-01-2016-2017: Exploiting the added value of climate services (IA Innovation action)

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2190-sc5-01-2016-2017.html

Cultural heritage for sustainable growth
   SC5-21-2016-2017: Cultural heritage as a driver for sustainable growth

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2199-sc5-21-2016-2017.html

Raw materials
   SC5-14-2016-2017: Raw materials Innovation actions

https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2198-sc5-14-2016-2017.html

Societal Challenge 6: Inclusive, innovative and reflective societies

The Horizon 2020 Societal Challenge of 'Europe in a changing world – Inclusive, innovative and reflective societies' (SC6) for 2016 and 2016 is composed of four calls,

- Co-Creation for Growth and Inclusion
- Reversing Inequalities and Promoting Fairness
- Engaging Together Globally
- Understanding Europe - Promoting the European Public and Cultural Space

This Societal Challenge 6 Work Programme addresses key challenges of the beginning of 21st century like radicalisation and migration that appear in cross-cutting way in several Topics throughout the Work Programme and complementarily with Societal Challenge 7 - Secure societies "Protecting freedom and security of Europe and its citizens". Many of the Topics of this Work Programme aim also to reduce the gap between institutions and citizens - through better understanding, analysis and practical solutions - in order to build a more trustful European society. Many Topics also integrate the gender dimension as a key element of inclusive societies.

The total budget available for 2016 is EUR 155.78 million

Societal Challenge 6: Inclusive, innovative and reflective societies	http://ec.europa.eu/programmes/horizon2020/en/h2020-section/europe-changing-world-inclusive-innovative-and-reflective-societies
Single stage calls 2016 - Deadline 4 February	
Co-Creation for Growth and Inclusion	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-sc6-co-creation-2016-2017.html
CO-CREATION-02-2016: User-driven innovation: value creation through design-enabled innovation	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3077-co-creation-02-2016.html
CO-CREATION-03-2016: Piloting demand-driven collaborative innovation models in Europe	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3076-co-creation-03-2016.html
CO-CREATION-08-2016-2017: Better integration of evidence on the impact of research and innovation in policy making	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3075-co-creation-08-2016-2017.html
CO-CREATION-09-2016: A European map of knowledge production and co-creation in support of research and innovation for societal challenges	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3078-co-creation-09-2016.html
Understanding Europe - Promoting the European Public and Cultural Space	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-sc6-cult-coop-2016-2017.html
CULT-COOP-08-2016: Virtual museums and social platform on European digital heritage, memory, identity and cultural interaction.	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3089-cult-coop-08-2016.html
CULT-COOP-11-2016-2017: Understanding the transformation of European public administrations	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3088-ccult-coop-11-2016-2017.html

Reversing Inequalities and Promoting Fairness	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-sc6-rev-inequal-2016-2017.html*
REV-INEQUAL-01-2016: An empirically informed European theory of justice and fairness	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2300-rev-inequal-01-2016.html*
REV-INEQUAL-02-2016: Contemporary radicalisation trends and their implications for Europe	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2295-rev-inequal-02-2016.html*
REV-INEQUAL-03-2016: Dynamics of inequalities across the life-course	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2292-rev-inequal-03-2016.html*
REV-INEQUAL-04-2016: Intra-EU mobility and its impacts for social and economic systems	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2294-rev-inequal-04-2016.html*
REV-INEQUAL-05-2016: Inequalities in the EU and their consequences for democracy, social cohesion and inclusion	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2299-rev-inequal-05-2016.html*
REV-INEQUAL-06-2016: Tackling inequalities at their roots: new policies for fairness in education from early age	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2298-rev-inequal-06-2016.html*
REV-INEQUAL-07-2016: Spatial justice, social cohesion and territorial inequalities	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2297-rev-inequal-07-2016.html*
REV-INEQUAL-08-2016: Fighting inequalities through policies against tax fraud and tax evasion	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2296-rev-inequal-08-2016.html*
REV-INEQUAL-10-2016: Multi-stakeholder platform for enhancing youth digital opportunities	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2293-rev-inequal-10-2016.html*
Single stage calls 2016 - Deadline 14 April	
Engaging Together Globally	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-sc6-eng-globally-2016-2017.html*
ENG-GLOBALLY-08-2016-2017: EU-China cooperation on sustainable urbanisation (CSA Coordination and support action)	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2304-eng-globally-08-2016-2017.html*
ENG-GLOBALLY-09-2016: Centres/Networks of European research and innovation	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2310-eng-globally-09-2016.html*
Single stage calls 2016 - Deadline 24 May	
Co-Creation for Growth and Inclusion	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-sc6-co-creation-2016-2017.html*
CO-CREATION-05-2016: Co-creation between public administrations: once-only principle	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/3074-co-creation-05-2016.html*

Societal Challenge 7: Secure Societies

The Horizon 2020 Societal Challenge of 'Secure Societies - Protecting freedom and security of Europe and its citizens' (SC7) for 2016 and 2017 is composed of three calls:

- Critical Infrastructure Protection

- Security, addressing following topics:
  - Disaster-resilience: safeguarding and securing society
  - Fight against crime and Terrorism
  - Border Security and External Security
  - General Matters

- Digital Security Focus Area

The primary aims of the Secure Societies Challenge are: to enhance the resilience of our society against natural and man-made disasters, ranging from the development of new crisis management tools to communication interoperability, and to develop novel solutions for the protection of critical infrastructure; to fight crime and terrorism ranging from new forensic tools to protection against explosives; to improve border security, ranging from improved maritime border protection to supply chain security and to support the Union's external security policies including through conflict prevention and peace building and to provide enhanced cyber-security, ranging from secure information sharing to new assurance models.

The total budget available for 2016 is approximately EUR 185.34 million.

Societal Challenge 7: Secure Societies	http://ec.europa.eu/programmes/horizon2020/en/h2020-section/secure-societies-%E2%80%93-protecting-freedom-and-security-europe-and-its-citizens
Single stage calls 2016 - Deadline 16 February	
Digital Security Focus Area (DS)	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-ds-2016-2017.html
DS-03-2016: Increasing digital security of health related data on a systemic level	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2329-sec-16-bes-2017.html
Single stage calls 2016 - Deadline 12 April	
Digital Security Focus Area (DS)	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-ds-2016-2017.html
DS-01-2016: Assurance and Certification for Trustworthy and Secure ICT systems, services and components	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2323-sec-14-bes-2016.html
Single stage calls 2016 - Deadline 25 August	
Critical Infrastructure Protection (CIP)	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-cip-2016-2017.html
CIP-01-2016-2017: Prevention, detection, response and mitigation of the combination of physical and cyber threats to the critical infrastructure of Europe.	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2301-cip-01-2016-2017.html
Digital Security Focus Area (DS)	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-ds-2016-2017.html
DS-02-2016: Cyber Security for SMEs, local public	https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2328-sec-15-bes-2017.html

administration and Individuals	
DS-04-2016: Economics of Cybersecurity	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2331-sec-17-bes-2017.html*
DS-05-2016: EU Cooperation and International Dialogues in Cybersecurity and Privacy Research and Innovation	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2332-sec-18-bes-2017.html*
Security (SEC)	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-sec-2016-2017.html*
Disaster-resilience: safeguarding and securing society	
SEC-01-DRS-2016: Integrated tools for response planning and scenario building	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2425-ds-01-2016.html*
SEC-02-DRS-2016: Situational awareness systems to support civil protection preparation and operational decision making	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2423-ds-02-2016.html*
SEC-03-DRS-2016: Validation of biological toxins measurements after an incident: Development of tools and procedures for quality control	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2424-ds-03-2016.html*
Fight against crime and Terrorism	
SEC-05-DRS-2016-2017: Chemical, biological, radiological and nuclear (CBRN) cluster (CSA Coordination and support action)	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2422-ds-05-2016.html*
SEC-06-FCT-2016: Developing a comprehensive approach to violent radicalization in the EU from early understanding to improving protection	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2426-ds-06-2017.html*
SEC-07-FCT-2016-2017: Human Factor for the Prevention, Investigation, and Mitigation of criminal and terrorist acts	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2427-ds-07-2017.html*
SEC-08-FCT-2016: Forensics techniques on: a) trace qualification, and b) broadened use of DNA	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2428-ds-08-2017.html*
SEC-11-FCT-2016: Detection techniques on explosives: Countering an explosive threat, across the timeline of a plot	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2320-sec-03-drs-2016.html*
SEC-12-FCT-2016-2017: Technologies for prevention, investigation, and mitigation in the context of fight against crime and terrorism	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2326-sec-04-drs-2017.html*
Border Security and External Security	
SEC-14-BES–2016: Towards reducing the cost of technologies in land border security applications	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2317-sec-06-fct-2016.html*
SEC-19-BES-2016: Data fusion for maritime security applications	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2315-sec-11-fct-2016.html*
SEC-20-BES-2016: Border Security: autonomous systems and control systems	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2314-sec-12-fct-2016-2017.html*
General Matters	
SEC-21–GM-2016-2017: Pan European Networks of practitioners and other actors in the field of security	*https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2327-sec-13-bes-2017.html*

Relevant Links

Please visit the Horizon 2020 section within the Participants portal to download the Proposers Guide and specific templates to prepare proposals for submission under calls open in 2016 within specific Societal Challenges and LEIT themes:
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/index.html

Relevant Links to get more information	
Horizon 2020 Official site	*http://ec.europa.eu/programmes/horizon2020/*
Horizon 2020 Calls on Participants Portal	*http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/index.html*
Frequently Asked Questions on Horizon 2020	*http://ec.europa.eu/programmes/horizon2020/en/faq*
International Cooperation in Research and Innovation, Communication COM (2012) 497 Sept 2012	*http://www.ist-africa.org/home/files/InternationalCooperation_ResearchInnovation_Com_2012_497_Sept2012.pdf*
ICT in Horizon 2020 2016 - 2017 Work Programmes - presentation by Mr Morten Moller, DG CONNECT; November 2015	*http://www.ist-africa.org/home/files/eChallenges_H2020-WP2016-17-ICT-251115_v4.2_MMoller.pdf*