**[ICT 2014 - Information and Communications Technologies](http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-ict-2014-1.html)**

**H2020-ICT-2014-1Sub call of:** [**H2020-ICT-2014**](http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/master_calls.html#h2020-ict-2014)

|  |  |  |  |
| --- | --- | --- | --- |
| **Publication date** | 2013-12-11 | **Deadline Date** | 2014-04-23 17:00:00 (Brussels local time) |
| **Total Call Budget** | €658,500,000 | **Main Pillar** | Industrial Leadership |
| **Status** | Open | **OJ reference** | [OJ C361 of 11.12.2013](http://eur-lex.europa.eu/JOHtml.do?uri=OJ:C:2013:361:SOM:EN:HTML) |

**Topic: Support the growth of ICT innovative Creative Industries SMEs**

Specific Challenge: SMEs represent 85% of all actors in the creative industry sector. They co-exist with global players and often face difficulties in adopting state of the art ICT technologies and accessing finance. Moreover, they operate on fragmented and localised target markets and have to bear high market costs which affect their international competitiveness. In this context, ICT tools and technological innovation are fundamental for the creative industries and their competitiveness. They widen creative possibilities and improve efficiency in all sectors.

The goal is to increase the competitiveness of the European creative industries by stimulating ICT innovation in SMEs, by effectively building up and expanding a vibrant EU technological ecosystem for the creative industries' needs and by fostering exchanges between the creative industries SMEs and providers of ICT innovative solutions.

Scope: The scope is to stimulate the adoption and deployment of innovative ICT solutions by the creative industries SMEs. This can be achieved through collaboration with ICT providers and by accelerating and supporting the growth of European creative industries.

The topic should be addressed by the following actions:

**a.      Innovation Actions** to support the creative industries SMEs in leveraging emerging ICT technologies (e.g. 3D, augmented reality, advanced user interfaces, visual computing) for the development of innovative products, tools, applications and services with high commercial potential. Beyond the driving participation of creative industry SMEs and the participation of ICT technology providers, the involvement of research and innovation centres is encouraged. Proposals should be clearly driven by user-needs and demonstrate the market demand for the solution and the innovation potential. Solutions should be cost-effective, market-ready and target international markets.

**b.      Coordination and Support Actions** to stimulate the growth of European creative industries exploiting advanced ICT for the development of new products and services and ICT SMEs innovating in the field of creative industries.

Activities should:

-       include, where beneficial,  investor readiness support (e.g. explaining investors' requirements, assisting in the development of business plans …).

-       connect creative industries SMEs with appropriate sources of funding (e.g. loans, venture capital, business angels investment, crowd-funding …) and with international business networks.

-       increase the market access of creative industries SMEs across borders.

The proposals should encompass a broad geographical coverage, stimulating innovation not only in the leading regions of Europe.

Expected impact:

**a.      Innovation Actions**

·         Tens of innovative solutions with high market potential ready to be deployed by European creative industries SMEs.

·         Stronger collaboration between ICT innovative technologies providers and creative industries SMEs to improve the competitive position of the European creative industries.

**b.      Coordination and Support Actions**

·         An established sustainable network of ICT-driven innovation multipliers active in the creative industries sectors with proven record of stimulating innovation.

·         Tens of examples of fruitful business relations enabled by the network.

Types of action:

a.       Innovation Actions – The Commission considers that proposals requesting a contribution from the EU between EUR 0.5 million and EUR 1 million for a period between 6 and 18 months would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts or duration.

b.      Coordination and Support Actions

[**ICT 2014 - Information and Communications Technologies**](http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-ict-2014-1.html)

**H2020-ICT-2014-1Sub call of:** [**H2020-ICT-2014**](http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/master_calls.html#h2020-ict-2014)

|  |  |  |  |
| --- | --- | --- | --- |
| **Publication date** | 2013-12-11 | **Deadline Date** | 2014-04-23 17:00:00 (Brussels local time) |
| **Total Call Budget** | €658,500,000 | **Main Pillar** | Industrial Leadership |
| **Status** | Open | **OJ reference** | [OJ C361 of 11.12.2013](http://eur-lex.europa.eu/JOHtml.do?uri=OJ:C:2013:361:SOM:EN:HTML) |

**Topic: Smart System Integration**

**ICT-02-2014**

Specific Challenge: The aims are to develop thenext generations of smart systems technologies and solutions, based on systemic miniaturisation and integration, of heterogeneous technologies, functions and materials, and to establish European competitive ecosystems for the design, R&D, prototyping and testing, manufacturing and industrialisation of smaller, smarter (predictive, reactive and cognitive) and energy autonomous Smart Systems. These ecosystems will provide services for cost efficient access to European manufacturing capabilities and expertise, including training, design and pilot line production and testing, in particular for new users of Smart Systems.

This specific challenge contributes to the strategy of micro and nano electronics KET in the area of More than Moore and complements the activities of topic ICT25.

Scope: The focus is on:

**a.      Research & Innovation Actions** for one or both of the following:

·         To advance the state of the art of **heterogeneous integration of micro and nanotechnologies** (nanoelectronics, micro- electro-mechanic, magnetic, photonic, micro-fluidic, electrochemical, acoustic, bio/chemical principles and microwave technologies)into **smart systems.**

Work will be driven by *industrial requirements* and specifically target multi-disciplinary R&D in the following areas:

-       Miniaturised systems based on high density 3-dimensional heterogeneous integration.

-       Autonomous deployable smart systems that include efficient energy management (Zero Power technologies) and energy harvesting from their operating environment,

-       Advanced Smart systems with multi-functional properties, including sensing, storing, processing, actuation and ultra-wideband communication.

Actions may address performance, design and testing, but the focus will be on the integration into systems, including manufacturability and packaging.

·         Research and development of **application specific** smart systems. Work will be driven by *users-requirements* and will target concrete solutions. It will exploit the convergence of key enabling technologies, focusing on the synergies between micro-nanoelectronics and biotechnologies.

Work should develop along the full value chain and include validation of results in realistic environments and business cases. Relevant industrial supplier(s) in the addressed application(s) must be included in the consortium. Actions should include tests, end-of life and recyclability issues.

[**ICT 2014 - Information and Communications Technologies**](http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-ict-2014-1.html)

**H2020-ICT-2014-1Sub call of:** [**H2020-ICT-2014**](http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/master_calls.html#h2020-ict-2014)

|  |  |  |  |
| --- | --- | --- | --- |
| **Publication date** | 2013-12-11 | **Deadline Date** | 2014-04-23 17:00:00 (Brussels local time) |
| **Total Call Budget** | €658,500,000 | **Main Pillar** | Industrial Leadership |
| **Status** | Open | **OJ reference** | [OJ C361 of 11.12.2013](http://eur-lex.europa.eu/JOHtml.do?uri=OJ:C:2013:361:SOM:EN:HTML) |

**Topic: Cracking the language barrier**

**ICT-17-2014**

Specific Challenge: This topic aims to facilitate multilingual online communication for the benefit of the digital single market which is still fragmented by language barriers that hamper a wide penetration of cross-border commerce, social communication and exchange of cultural content. Current machine translation solutions typically perform well only for a limited number of target languages, and for a given text type.

The aim of this challenge is to launch interdisciplinary work leading to a new paradigm in overcoming the language barrier and progressively, to reach high quality for all language combinations and translation directions, and cater for the most demanded text types and use contexts. Systems and solutions that are intended to overcome the language barriers, are expected to deal with huge volumes, high variety of languages and text styles, and deliver results in reasonable time (in most cases, instantly). Where the methods require automatic learning from language resources, the availability and suitability of the latter need to be addressed.  Special focus is on the 21 EU languages (both as source and target languages) that have "fragmentary" or "weak/no" machine translation support according to the META-net language white papers.

Scope:

**a.      Research & Innovation Actions** to kick off a multidisciplinary research path to develop a new paradigm leading to radically improved quality and coverage (in terms of languages and text types) of machine translation. Special focus is on issues where current methods fall short in quality or fail to adapt to different languages and different needs of translation, or where further improvement with current methods becomes very expensive or requires such amounts of training data that are not available. The projects should use existing and emerging structures (in particular, those developed under action c) below) for testing, validating and evaluating the novel methods against agreed benchmarks.

**b.      Innovative Actions** in view of optimizing translation quality and language/topical coverage in demanding, realistic use situations arising from well documented market needs, for example in pan-European online services. The pilots should focus on areas where multilingualism contributes to competitiveness and user-friendliness and optimize, evaluate and test performance improvements with languages that are poorly served by current machine translation systems. The pilots should make use of and contribute to existing and emerging platforms and infrastructures for pooling, building, and adding value to language resources and tools.

**c.       Coordination actions** to promote benchmarking and competitive evaluation of machine translation, as well as the optimal use of language resources from various sources, in view of federating the sources and repositories towards a single access mechanism, respecting appropriate standards of interoperability and metadata.

Expected impact:

·         Initiating a programme of ground-breaking actions that will deliver, by 2025, an online EU internal market free of language barriers, delivering automated translation quality, equal to currently best performing language pair/direction, in most relevant use situations and for at least 90% of the EU official languages.

·         Significantly improving the quality, coverage and technical maturity of automatic translation for at least half of the 21 EU languages that currently have "weak or no support" or "fragmentary support" of machine translation solutions, according to the META-NET Language White Papers referenced before.

·         Attracting a community of hundreds of contributors of language resources and language technology tools (from all EU Member States and Associated Countries) to adopt and support a single platform for sharing, maintaining and making use of language resources and tools;  establishing widely agreed benchmarks for machine translation quality and stimulating competition between methods and systems.

Types of action:

a.       Research & Innovation Actions – Proposals requesting a *Small contribution* are expected

b.      Innovation Actions – Proposals requesting a *Small contribution* are expected

c.       Coordination and Support Actions

[HORIZO](http://ec.europa.eu/programmes/horizon2020/)

[**Call for Factories of the Future**](http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-fof-2015.html)

**H2020-FoF-2015Sub call of:** [**H2020-FoF-2014-2015**](http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/master_calls.html#h2020-fof-2014-2015)

|  |  |  |  |
| --- | --- | --- | --- |
| **Publication date** | 2013-12-11 | **Deadline Date** | 2015-05-20 17:00:00 (Brussels local time) |
| **Total Call Budget** | €145,000,000 | **Main Pillar** | Industrial Leadership |
| **Status** | Open | **OJ reference** | [OJ C 361 of 11 December 2013](http://eur-lex.europa.eu/JOHtml.do?uri=OJ:C:2013:361:SOM:EN:HTML) |

**Topic: ICT Innovation for Manufacturing SMEs (I4MS)**

**FoF-09-2015**

Scope: As Phase 2[[1]](#footnote-1)[1] of I4MS this objective addresses the adoption of the next generation of ICT advances in the manufacturing domain. Focus is on emerging innovative technologies and processes, which need to be customised, integrated, tested and validated before being released on the market. Special emphasis is on strengthening European SMEs along the value chain by adopting new concepts and business models based on servitisation, for product operation, or for end-of-life use.

 Expected impact:  
• Attract a significant number of new users of advanced ICT in the manufacturing sector, in particular SMEs and the mid-caps.   
• More innovative and competitive technology suppliers, in particular SMEs, both on the level of ICT and on the level of manufacturing equipment, able to supply manufacturers with new equipment, components, and tools for improved manufacturing and engineering operations.  
• More competitive European service providers through provisioning of new types of services; through strengthening the presence on local markets.  
• Exploration of new application areas for advanced ICT in manufacturing at large.

1. Two types of innovation experiments are supported: Driven by the requirements of first-time users, Application Experiments bring together all actors of the value chain and experts necessary to equip new users with novel products or services and assist them in customising and applying these in their respective environments. In Equipment Assessment Experiments, suppliers of innovative high-tech equipment install and assess their prototypes or products in production-like environments and validate them in a manufacturing line or in an industrial environment that is very close to manufacturing conditions.  
   Activities are expected to be clustered in larger projects to achieve critical mass and to better exploit EU-added value. Common tasks include: targeted dissemination; management of calls for new actions; exploitation of synergies across actions.

   The action may involve financial support to third parties, in line with the conditions set out in part K of the General Annexes. The consortium will define the selection process of additional users and suppliers running the experiments for which financial support will be granted (typically in the order of EUR 50 000 – 150 000[2] per party). Maximum 50% of the EU funding should be allocated to this purpose.

   1. **Three areas of technologies are targeted for the Innovation actions:**:  
      • Highly flexible and near-autonomous robotics systems (application experiments).  
      • HPC Cloud-based modelling, simulation and analytics services for modelling multiple interconnected phenomena;  for integrating multiple tools across the process chain; for exploiting the dynamic availability of "big data"; for integrating novel mobile interfaces for data management and decision support; for achieving real-time response (application experiments), and addressing comprehensively security and privacy issues at all levels.  
      • Integration of Cyber-Physical-System modules in manufacturing processes and process chains (application or assessment experiments) to increase sophistication and automation in production SMEs and to create novel value added services linked to process surveillance and maintenance.  
      **b. Support actions**: network of Innovation multipliers leveraging investment in research and innovation is to be reinforced:  
      To advance the European I4MS innovation ecosystem: The aim is to achieve broad coverage in technological, application, innovation, and geographic terms. Its tasks and services shall include maintaining a single innovation portal for newcomers; sharing of best practices and experiences; dissemination; brokering between users and suppliers in view of open calls; leveraging further investment by stimulating replication, by brokering access to venture capital or other private investment, and by exploiting regional funds in the context of the European strategy on "Smart Specialisation".

   [**Integrating and opening research infrastructures of European interest**](http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-infraia-2014-2015.html)

   **H2020-INFRAIA-2014-2015**

   |  |  |  |  |
   | --- | --- | --- | --- |
   | **Publication date** | 2013-12-11 | **Deadline Date** | 2014-09-02 17:00:00 (Brussels local time) |
   | **Total Call Budget** | €140,000,000 | **Main Pillar** | Excellent Science |
   | **Status** | Open | **OJ reference** | [OJ C361, p. 9 of 11.12.2013](http://eur-lex.europa.eu/JOHtml.do?uri=OJ:C:2013:361:SOM:EN:HTML) |

   **Topic: Integrating and opening existing national and regional research infrastructures of European interest**

   **INFRAIA-1-2014-2015**

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

   Scope:   
   An Integrating Activity will mobilise a comprehensive consortium of several research infrastructures  in a given field as well as other stakeholders (e.g. public authorities, technological partners, research institutions) from different Member States, Associated Countries and other third countries when appropriate.   
   Funding will be provided to support, in particular, the trans-national and virtual access activities provided to European researchers (and of researchers from Third Countries under certain conditions), the cooperation between research infrastructures, scientific communities, industries and other stakeholders, the improvement of the services the infrastructures provide, the harmonisation, optimisation and improvement of access procedures and interfaces.   
   An Integrating Activity shall combine, in a closely co-ordinated manner:

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

    All three categories of activities are mandatory as synergistic effects are expected from these different components. However, the focus among these categories will differ for 'Starting' and 'Advanced' Communities (see definitions below).  
   Integrating Activities should, whenever appropriate, give due attention to any related initiatives internationally (i.e. outside the EU), foster the use and deployment of standards, carry out research on impacts of the involved research infrastructures (direct and indirect, on social, environmental and economic levels) as well as of the project itself.   
   Integrating Activities should also organise the efficient curation, preservation and provision of access to the data collected or produced under the project, defining a data management plan. Data management, interoperability (definition of metadata and ontologies) as well as advanced data and computing services should be addressed where relevant. To this extent, proposals should build upon the state of the art in ICT and e-infrastructures for data, computing and networking, and either work in cooperation with e-infrastructure service providers or include them in the consortium.  
   Integrating Activities in particular should contribute to fostering the potential for innovation, including social innovation, of research infrastructures by reinforcing the partnership with industry, through e.g. transfer of knowledge and other dissemination activities, activities to promote the use of research infrastructures by industrial researchers, involvement of industrial associations in consortia or in advisory bodies. A specific work package on innovation is therefore recommended in all Integrating Activity proposals.

   In this work programme, Integrating Activities address two classes of different communities:

   (1) 'Starting Communities' whose research infrastructures show a limited degree of coordination and networking at present. The strongest impact for these communities will be expected typically to arise from a focus on networking, standardisation and establishing a common access procedure, which lay the foundation for well-used trans-national and virtual access provision. The Commission considers that proposals requesting a contribution from the EU of up to EUR 5 million would allow this topic to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.  
   (2) 'Advanced Communities' whose research infrastructures show an advanced degree of coordination and networking at present, in particular, through Integrating Activities awarded under previous Framework Programmes. The strongest impact for these communities will be expected typically to arise from focusing on innovation aspects and on widening trans-national and virtual access provision. Proposals from Communities that have benefitted from EU funding for Integrating Activities before will have to clearly demonstrate the added value and the progress beyond current achievements of a continuation project. The Commission considers that proposals requesting a contribution from the EU of up to EUR 10 million would allow this topic to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

   In both cases, Integrating Activities are expected to duly take into account all relevant ESFRI research infrastructures to exploit synergies and to ensure that rationally designed, comprehensive and coherent overall concepts for European Infrastructures are being pursued.   
   As the scope of an integrating activity is to ensure coordination and integration between all the key European infrastructures in a given field and to avoid duplication of effort, at most one proposal per area is expected to be funded.  
   Further conditions and requirements that applicants should fulfil when drafting a proposal are given in part D of the section “Specific features for Research Infrastructures”. Compliance to these provisions will be taken into account during evaluation.  
   Following an open bottom-up consultation with stakeholders and the analysis of the collected input by a panel of independent experts, this work programme calls for proposals addressing one or, where appropriate, more of the following areas listed under the different domains:

   Biological and Medical Sciences - Starting Communities  
   **Health information, clinical data, samples and medical images – support to population studies**. This activity aims at integrating medical information, clinical data, human biological samples and imaging data generated by hospitals, health care and study centres, so as to support large cohort studies in given target population and disease areas as well as personalised and patient stratification approaches for prevention and treatment. Operational interfaces should allow efficient and sustained flow of data, samples and images from and to established European infrastructures, such as the ESFRI ones (e.g. BBMRI, ECRIN, EURO-BIOIMAGING and ELIXIR) and give user-friendly access to these research resources while following applicable ethical requirements. Standardisation of data acquisition and analysis, in particular for imaging data, interoperability and storage aspects are amongst the issues to be addressed.

   **New tools and resources for analysing and integrating genomic, epigenomic, proteomic, metabolomic and phenomic data.**  This activity should link genomics, epigenomics, proteomics, metabolomics and phenomics resources related to animal, plant and micro-organisms, derived from sectors such as health, food, energy and the environment, and provide user-friendly tools to exploit this data for research and innovation. Access and training activities should ensure the optimum use of these tools and resources. The proposal should integrate existing European research infrastructures active in generating and handling such biological data, and exploit synergies with ELIXIR and other relevant ESFRI infrastructures such as INFRAFRONTIER, ISBE,  and MIRRI.

   **Plant and forestry material resources**. This activity should integrate European research facilities working with plant including forestry materials, such as seed and tree banks, to provide researchers with wider and better informed access to high quality plant material, and ensure wide use of advanced technology platforms supporting crop biology, forestry, and agricultural and horticultural research in a wider sense. Synergies with relevant ESFRI infrastructures, such as ELIXIR and EMBRC, should be duly exploited.

   **European nanomedicine characterisation  infrastructure.** This activity aims at integrating European key reference facilities that have the capability to both characterise and engineer nanoparticles for medical applications. It should offer access to a coherent set of tools, resources and expertise to support chemical, physical and biological research on medical applications, supporting both academic research teams and industry (including SMEs). Synergies with relevant ESFRI Infrastructures, such as EATRIS, EURO-BIOIMAGING,INSTRUCT, and INFRAFRONTIER should be duly exploited.

   **Research infrastructures supporting rare diseases research**. This activity aims at integrating sufficient amounts of information and data concerning patients suffering from rare diseases, in order to enable the study of the aetiology of these diseases, the monitoring of their epidemiology and the development and test of diagnostic tools and preventive and therapeutic interventions. Synergies with relevant ESFRI Infrastructures, such as BBMRI, ECRIN, EATRIS, INFRAFRONTIER, EuroBioImaging, ELIXIR, and EU-OPENSCREEN, should be duly exploited.

   Biological and Medical Sciences - Advanced Communities**High-containment biosafety facilities and virus collections including for high-risk animal/human pathogens.** This activity aims at improving the access to high-quality authenticated collections of both human and animal viruses including those requiring high-biosafety level laboratories (BSL 3 and 4), to support upstream virology, microbiology and immunology research as well as translational research aiming at drug and vaccine development, and to support epidemiological studies targeting disease and epidemics control. Giving safe access to high risk virus collections, including providing the necessary training, should be complemented with high containment animal facilities to allow to safely study livestock and transboundary zoonotic diseases. Synergies with relevant ESFRI Infrastructures, such as BBMRI, ERINHA, MIRRI, and EBMRC, should be duly exploited.

   **Vaccine infrastructures**. This activity aims at bridging the 'translational gap' in biomedical research by providing academia- and SME- driven vaccine R&D with easily accessible, high quality services and expertise to support vaccine formulation, access to GMP (Good Manufacturing Practices), preclinical studies including relevant animal models, vaccine trials, compilation of regulatory dossiers and advice on production issues like upscale and quality control. This activity should support the development of both human and veterinary vaccines, for prophylactic and therapeutic applications. Synergies with relevant ESFRI Infrastructures, such as EATRIS, ISBE, ECRIN, INFRAFRONTIER, and INSTRUCT, should be duly exploited.

   **Research Infrastructures for translating research on biological structures into innovation in biomedicine**. This activity should expand the availability of structural biology services (such as X-ray and neutron scattering, advanced NMR and advanced imaging technologies) to new communities of users, and in particular to scientists with backgrounds other than structural biology, including from SMEs, to benefit translational research in drugs discovery, informed drugs and vaccine design and other fields like biotechnology and biomaterials. Synergies with relevant ESFRI Infrastructures, such as INSTRUCT, EUROBIOIMAGING, EU-OPENSCREEN, and EATRIS, should be duly exploited.

   **Research infrastructures in aquaculture**. This activity aims at integrating highly diverse aquaculture research facilities and providing to research teams easy access to them. Specific attention should be given to dedicated facilities for new species, disease aspects, links to high-throughput sequencing and contribution to sustainable aquaculture. Synergies with relevant ESFRI Infrastructures, such as EMBRC, should be duly exploited.

   Energy - Starting Communities **European facilities for electrochemical energy storage testing.** This activity aims at integrating and providing access to research infrastructures supporting research on electrochemical storage devices for renewable energy (such as dry room facilities for assembly of lab cells series, electron microscopy combined with chemical analysis and calorimetric analysis, neutron and x-ray techniques and test rigs). It should support an integrated research approach along the entire value chain, from materials research to applications.

   **Testing of wind turbines, ocean energy converters and electrical subsystems for grid integration under laboratory conditions.** This activity aims at supporting the precompetitive research that is needed to address the challenges that wind and ocean energy creates for the electrical grid, by promoting coordination within the European community and by providing access to research infrastructures, regardless of their location.

   Energy - Advanced Communities**European smart grids research infrastructure**. The transition towards high shares of renewable energy and the tendency to a more decentralised energy supply requires a grid with sufficient hosting capacity and the ability to manage the power fluctuation of the renewable sources. This activity should provide laboratory environments that enable the testing of different smart grid configurations considering different scenarios under safe boundary conditions without influencing end-customers of the electrical power supply.

   Environmental and Earth Sciences - Starting Communities **Research infrastructures for hydrological/ hydrobiological research**. This activity should bring together existing observatories of European freshwaters (river basins, continental, island and overseas territories) covering both abiotic and biotic components, i.e. addressing hydrological, hydrometeorological, sedimental, morphological and hydrochemical aspects as well as biological/ecological indicators of water quality. Water Framework Directive objectives should be considered and access to the infrastructures should be clearly defined.

   **Research infrastructures for research on crustal fluids and geo-resources**. This activity should link the key European analogue experimental, numerical, and observational (imaging)   facilities in providing an additional underpinning pillars to EPOS (European Plate Observing System). Appropriate links with the ICDP (International Continental Scientific Drilling Program) should be made.

   **Research infrastructures for long-term ecosystem and socio-ecological research.** This activity should bring together LTER (Long Term Ecological Research) site-based and properly instrumented facilities and critical zone observatories, covering the widest variety of terrestrial and aquatic environments in Europe (wherever reasonable organised in clusters). It should incorporate long-term socio-ecological research platforms as well as integrate research field sites, associated data management and numerical simulation tools in order to address threats to soil and water and in particular challenges on urbanisation, land use, and food security. The provided access and services should enable researchers addressing the broad range of ecosystem research issues (biodiversity loss, ecosystem services, climate change adaptation and mitigation, land use and management, etc.). Appropriate links with the LIFEWATCH infrastructure for biodiversity research should be made.

   **Research infrastructures for ocean drilling**. This activity should develop a unique EU component for scientific research drilling. It should integrate with IODP (Integrated Ocean Drilling Program) and share technology (drilling and logging, sample and data curation) with ICDP. It should link with EMSO (European Multidisciplinary Seafloor Observation) and other crustal boreholes in creating underground and subseafloor observatory network. It should foster involvement of and links with industry in underpinning joint research projects.

   Environmental and Earth Sciences - Advanced Communities**Aerosol, clouds, and trace gases research infrastructure**. This activity should further integrate state-of-the-art European ground-based stations for long term observations of aerosols, clouds and short lived gases that are essential to climate and air-quality research. New integration tools and long-term sustainability should be addressed, in particular by linking with appropriate ESFRI projects.

   **Research infrastructures for environmental hydraulic research**. This activity should integrate the major rare/unique environmental hydraulic infrastructures in Europe and network with the other European hydraulic infrastructures in order to optimise their use to help solve climate change adaptation problems. Particular attention to harmonising and organising the flux of data is expected.

   **Research infrastructures for terrestrial research in the Arctic**. This activity should integrate, as an international network for terrestrial research and monitoring in the Arctic, key research stations and large research field sites throughout the circumpolar Arctic and adjacent northern countries, aiming at implementing capacity for research, monitoring and education. The network should link with marine and atmospheric networks, aiming at close cooperation.

   **Research infrastructures for forest ecosystem and resources research**. This activity aims at integrating and facilitating broad access to forest research facilities and methodologies with a view to enabling, coordinating and harmonising research and monitoring including investigation of the biological effects of air pollution and mitigation and adaptation to climate change. Access should be provided to data on genetic and species diversity in forest ecosystems. Support for development of forest management approaches should be part of the project, taking into account environmental and land use changes and the bioeconomy.

   **Research Infrastructures for integrated and sustained coastal observation**. This activity should further harmonise observation techniques in several European coastal and shelf seas, integrating key observing platforms as well as developing further the collection of biological data, in particular exploiting synergies with marine biological observatories. It should link with appropriate ESFRI projects such as EURO-ARGO, EMSO and EMBRC and aim at a single European channel for all physical, chemical and biological coastal data.

   Mathematics and ICT - Starting Communities**Distributed, multidisciplinary European infrastructure on Big Data and social data mining**. This activity should integrate large social data repositories, social data mining methods and tools, and supercomputing facilities for conducting large-scale analytical processing. This integrated infrastructure should enable performing complex processes to extract social knowledge. The proposal should also address training in social data mining, to foster the availability of skilled data scientists.

   Mathematics and ICT - Advanced Communities**Integrating activity for facilitating access to HPC (High Performance Computing) centers**. This activity aims at furthering the services harmonisation and enhancement of national and regional High Performance Computing centers of pan-European interest and at enlarging the European HPC user base preparing it to the use of the top end HPC resources such as PRACE (Partnership for Advanced Computing in Europe).

   Engineering, Material Sciences, and Analytical facilities - Starting Communities   
   **Advanced frontier research in nanoelectronics**. Nanotechnology and particularly nanoelectronics are priority areas of European technology development. The growing interest on 'more than Moore' and beyond CMOS concepts requires long-term vision and focused investment of resources. This activity aims at integrating the corresponding infrastructures, based on frontier research and linked with matching technology platforms, to enable a smooth and consistent transition of the European industry to a new era of nanoelectronics.

   Engineering, Material Sciences, and Analytical facilities - Advanced Communities**Advanced nanofabrication**. This activity aims at furthering the integration of, and access to, infrastructures for micro- and nanofabrication and metrology applications based on nanoscale phenomena, targeting academic and research small-to-medium size laboratory-scale facilities with specific expertise in nanoscience.

   **Advanced material research based on large-scale facilities**. This activity aims at furthering the integration of materials science studies, fabrication and analysis (emerging from nanofoundry and characterisation research) performed at laboratories linked to state-of-the-art large scale facilities such as neutron and synchrotron radiation sources and FELs.

   **Leading-edge research based on advanced laser sources**. This activity aims at furthering the integration of state-of-the art laser technology enabling a wide range of novel applications with high industrial and social impact, such as bio-and nanophotonics, (bio)material analyses, (bio)medical diagnosis and treatment, communication and data processing. Synergies with relevant ESFRI Infrastructures, such as European XFEL, EUROFEL and ELI, should be duly exploited.

   **Functional materials for special applications**. This activity aims at furthering the integration of, and access to, facilities for the development, treatment and characterisation of advanced functional materials ranging from hard to soft matter using advanced technologies.

   **Facilities for research on materials under extreme conditions**. This activity aims at integrating research facilities in physics and materials science dealing with extreme conditions of matter: low and high temperature, high pressure, high (electro-)magnetic fields and aggressive chemical environments. The activity should enable a wider research community to perform experiments, particularly in the field of nanophysics, utilising user-friendly instrumentation.

   **Large-scale testing facilities for engineering applications**. This activity aims at improving and providing access to the European research infrastructures such as wind tunnels and other industrial test benches for transport and particularly for aeronautics, including support for developing future norms for public transportation and safety.

   Physical Sciences - Starting Communities  **European laboratory astrophysics**. Laboratory Astrophysics is a rapidly growing field, not least because the knowledge of fundamental physical properties and processes at nuclear, atomic and molecular levels is crucial for the interpretation of data from ground- and space-based observatories as well as solar-system probes. This activity aims at coordinating and integrating joint efforts of separate laboratories, for all aspects of generation, collection, distribution, curation, and access to data or samples. Links with the respective ESFRI projects in astrophysics (like CTA and SKA) should be established.

   **Research infrastructures for high-energy astrophysics**. This activity aims at opening up existing facilities for developing, calibrating and testing both generic technologies as well as individual instruments developed for space missions in an environment representative of space conditions. Access should be provided in particular to scientists without national access to testing and calibration facilities, at the same time stimulating scientific and technological exchanges among European teams.

   **Science at deep-underground laboratories**. This activity aims at achieving a high level of integration of facilities for deep underground fundamental science (e.g. dark matter and neutrino studies) and other interdisciplinary applications by simultaneously establishing common access procedures, promoting the common planning of experiments, and by coordinating technological efforts in order to optimise use and access to resources and to avoid duplication.

   **Integrating gravitational wave research**. This activity aims at integrating the communities of researchers studying gravitational waves and their astrophysical sources: both laser and atom interferometers with their extreme technological requirements; observations of graviational-wave sources through electromagnetic waves and high-energy particles; numerical/theoretical studies of such sources. It should address also the computing and data handling needs of these communities.

   Physical Sciences - Advanced Communities**Detectors for future accelerators**. This activity aims at furthering the integration of, and access to, the key research infrastructures in Europe for the testing and development of advanced detector technologies.

   **Research infrastructures for nuclear physics**. This activity aims at furthering the integration of, and access to, the key research infrastructures in Europe for studying the properties of exotic nuclei or of nuclear matter at extreme conditions.

   **European planetary science**. This activity aims at furthering the integration of the key research infrastructures in Europe for studying planetary science by drawing in new partners and by providing access to the facilities and to a larger number of users, taking into account the multi- and trans-disciplinary nature of the field.

   Social Sciences and Humanities - Starting Communities **Generations and gender: a cross-national longitudinal data infrastructure for research on social cohesion and social inclusion and for the study of inter-generational relations in an ageing society**. This activity aims at coordinating and integrating national research infrastructures built on longitudinal survey data by implementing common collection procedures and standards, harmonising micro- and macro-level information, and stimulating optimal use of these sources by researchers in demography, sociology, economics and other social sciences.

   **Research infrastructures for studying the role of intangible investment for economic growth and for the study of cultural,  historical and institutional  innovation processes**. This activity aims at bringing together research infrastructures in order to sustain and further develop the empirical analytical framework that includes intangible capital in sources-of-economic-growth analysis. It also aims at bringing together research infrastructures for the study of cultural, historical, and institutional innovation processes.

   Social Sciences and Humanities - Advanced Communities**Contemporary European history: European Holocaust research infrastructure**. This activity aims at building upon existing research infrastructures and expanding them to include new material and new techniques in order to open distributed access of researchers to scattered material.

   **European research infrastructures for restoration and conservation of cultural heritage**. This activity aims at bringing together facilities, located  in research centres, universities and important culture institutions of different countries, for advanced diagnostics as well as the restoration and conservation of cultural heritage overcoming fragmentation, rationalising resources and advancing the international role of European cultural heritage research.

   Expected impact:   
   Integrating Activities are the main instrument to realise the Innovation Union flagship initiative's Commitment n. 4: "Opening of Member State operated research infrastructures to the full European user community", with a structuring impact on the ERA and on the way research infrastructures operate, evolve and interact with similar facilities and with their users. In particular:  
   • Researchers will have wider, simplified, and more efficient access to the best research infrastructures they require to conduct their research, irrespective of location. They benefit from an increased focus on user needs.  
   • A new generation of researchers is educated that is ready to exploit in the best way all the essential tools needed for their research.  
   • Operators of related infrastructures develop synergies and complementary capabilities, leading to improved and harmonised services. There is less duplication of services, leading to an improved use of resources across Europe. Economies of scale and saving of resources are also realised due to the optimisation of operation and common development.  
   • Closer interactions between larger number of researchers active in and around a number of infrastructures facilitate cross-disciplinary fertilisations and a wider sharing of information, knowledge and technologies across fields and between academia and industry.  
   • Innovation is fostered through a reinforced partnership of research organisations with industry.  
   • The integration of major scientific equipment or sets of instruments and of knowledge-based resources (collections, archives, structured scientific information, data infrastructures, etc.) leads to a better management of the continuous flow of data collected or produced by these facilities and resources.  
   • When applicable, the integrated and harmonised access to resources at European level can facilitate the use beyond research and contribute to evidence-based policy making.  
   • When applicable, the socio-economic impact of past investments in research infrastructures from the European Structural and Investment Funds is enhanced.  
   Type of action: Research and innovation actions

   Types of action:  
   a. Innovation Actions The Commission considers that proposals requesting a contribution from the EU between EUR 5 and 8 million would allow this area to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.  
   b. Coordination and Support Actions [↑](#footnote-ref-1)