European Commission

ICT – **Information and communication** technologies

Work programme 2013

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of the European Union for research, technological
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WORK PROGRAMME 2013

COOPERATION

THEME 3

ICT – INFORMATION AND COMMUNICATIONS TECHNOLOGIES

(European Commission C(2012)4536 of 09 July 2012)

This work programme for the ICT theme of the FP7 Specific Programme 'Cooperation' defines the priorities for calls for proposals closing in 2013 and the criteria that will be used for evaluating the proposals responding to these calls.

The priorities reflect the input received from the Programme Committee, the ICT Advisory Group[1] (ISTAG), the European Technology Platforms[2] in ICT and other preparatory activities including workshops involving the main stakeholders.

[1] http://cordis.europa.eu/fp7/ict/istag
[2] http://cordis.europa.eu/technology-platforms

ICT - Information and Communication Technologies

1 Objective

Improving the competitiveness of European industry and enabling Europe to master and shape future developments in ICT so that the demands of its society and economy are met. Activities will continue to strengthen Europe's scientific and technology base and ensure its global leadership in ICT, help drive and stimulate product, service and process innovation and creativity through ICT use and value creation in Europe, and ensure that ICT innovations are rapidly transformed into jobs and growth for the benefits of Europe's citizens, businesses, industry and governments.

2 Policy and socio-economic context

This Work Programme defines the priorities for calls for proposals that will result in projects to be launched in 2013.

2.1 Transforming our society through ICT developments

Deep transformations are under way in our society. ICT innovations are both a driver and a support for these transformations. New enabling technologies and applications are emerging, which have the potential to promote cultural understanding between citizens, seed innovation in institutions and create competitive advantage for businesses in the future. These innovations include:

Internet and cloud computing technologies which will radically impact how citizens and businesses use technology and individuals live their lives. This process is already under way, but new developments and applications will accelerate this trend. We are moving from a business-driven culture to a more 'social-oriented' culture where user-generated innovation becomes more influential and models of production, social organisation and value creation are changing. The connection of everyday devices (eg. home appliances) or of more specialised equipment (eg. medical devices) to the internet, coupled with internet/cloud technologies will create innovations and new business opportunities.

In **Micro- and nano-electronics**, a clear trend is the connection of more devices to the cloud. In order to serve this trend, constant progress in miniaturisation of more powerful systems using less energy is needed. Furthermore the need for integration of more functionality on chips (eg. microsystems for health, automotive, food) is increasing in order to support new advanced capabilities. This will lead to more intelligent machines, systems and processes and will impact all sectors.

Advanced interfaces such as touch screens have already transformed how businesses and consumer interface with technology. However, this is just the beginning of a profound change of how we interact with computers. New 3D displays, augmented-reality and multisensory interfaces as well as more reliable multilingual speech recognition will accelerate this trend. This will continue to transform the information

and entertainment industry and all services industries such as for example the retail sector.

Developing **more intelligent and smart environments** e.g. making use of adaptive, learning, cognitive and bio-inspired systems as well as distributed and embedded control and sensing is an important avenue for the medium to long term development of ICT.

These novel technologies will continue to play an important role in providing **responses to major societal challenges** such as an ageing population, health and social care, sustainable energy, inclusion, education and security. The impact of ICT on social behaviours, on democratic processes and on creativity will continue to grow with the wider diffusion of **web-based social networking** and user generated content and services, driven by the roll-out of broadband. These developments will have an influence on policies and drive economic, societal and cultural development for the decades to come.

2.2 The need for a new approach towards innovation

Whilst European R&D in ICT and other key enabling technologies is generally strong, the translation of ideas arising from basic research into innovative products for global markets is the weakest link in European value chains. To boost future productivity and growth, it is critically important to generate breakthrough technologies and to translate them into innovations (new products, processes and services) which are taken up by the wider economy.

As proposed in the European Commission's Horizon 2020 Proposal, it is key for the success of EU industry to integrate research and innovation and to provide seamless and coherent funding from idea to market. Horizon 2020 will provide more support for innovation and activities close to the market, leading to a direct economic stimulus. A major objective will be to provide SMEs with adequate support in order to help them grow into world-leading companies. The ICT Work Programme 2013 will anticipate and prepare this agenda.

3 Strategy for Work Programme 2013

The final ICT Work Programme in FP7 will cover one year and will use the 2013 budget. It will ensure a certain degree of continuity in priorities and at the same time serve as a bridge to activities in Horizon 2020.

3.1 Completing the work engaged over the first 6 years of FP7

The ICT R&D challenges introduced at the beginning of FP7 express targets to be typically achieved in a mid- to long-term timeframe. They address the core technology and application areas of ICT R&D that will continue to be key challenges for the future. They therefore require a sustained effort until the end of the Framework.

Across all areas, a large part of the work foreseen in 2013 will ensure continuity and completion of activities launched since the start of FP7. This concerns for example networks and service infrastructures and in particular the third phase of the Future

Internet Public Private Partnership, activities in cognitive systems and in advanced components or advanced research in next generation healthcare systems (VPH). The support to the PPPs on Green Car, Smart Cities/Energy-Efficient Buildings and Factory of the Future, in collaboration with other DGs will also be continued.

3.2 Preparing the expected launch of Horizon 2020

The final WP for FP7 has also an important role to play in preparing for the new approaches proposed to be introduced in Horizon 2020. Activities in 2013 should already anticipate the adaptation of the strategy towards a more integrated approach between research and innovation, pilot some of the new approaches and prepare for the initiatives to be launched in 2014.

In several areas (e.g Components and systems, Future Internet PPP and Health and Ageing) activities have been reorganised in order to enable further integration and cross-fertilisation between technologies and applications and to favour inter-disciplinary R&I activities by bringing together different research constituencies.

In order to prepare for a new major ICT activity on "Next Generation Computing" in H2020, various aspects of computing will be addressed in Challenges 1, 3, 6 and 12. The activities will be cross referenced and closely coordinated.

In the areas of robotics and photonics, activities in 2013 will support the preparation of Public Private Partnerships that are to be launched under H2020.

The area Future and Emerging Technologies (FET) trials a lighter submission process (Xtrack), aiming at a faster evaluation and a simpler project implementation. This pilot bridges to the implementation of the FET Open Scheme in H2020.

The expected launch of Horizon 2020 will imply a whole new level of cooperation with other research and policy DGs. In several areas, WP2013 will contribute to reinforcing the cooperation with other DGs in preparation of the next Framework, building in particular on the experience gained in jointly running the recovery package PPPs.

3.3 Involving more SMEs

SMEs are at the heart of innovation in ICT. They play a vital role with their capacities to generate new ideas and quickly transform these into business assets. This Work Programme provides major opportunities for innovative SMEs, both to finance R&D and innovate in their products and services offering, and to build strategic partnerships and operate in wider markets.

Significant opportunities exist for SME involvement in areas of high potential growth (such as photonics, security, embedded systems, and ICT for health and ageing) and in areas focusing on the development of innovative content and data analytics services.

In addition a specific technology take-up and innovation action has been developed to support SMEs in several areas under Components and Systems (see Objectives 3.2, 3.3, 3.4) and under Future Internet PPP (see Objective 1.8). Some areas also offer a lighter scheme for proposal submission, evaluation and contracting (see Objectives 1.8, 4.3 and FET-Open).

Horizontal activities on access to venture capital and supporting clusters and incubator environments for SMEs are also supported (see Objective 11.5).

3.4 Contributing to broader policy agendas

3.4.1 The European Cloud Partnership (ECP)

The ECP is designed to solve the challenges caused by fragmented markets and legislation in Europe for Cloud Computing. The approach is to harmonise public sector requirements for clouds across Member States or regions or across application areas (such as e-health, taxation, social benefit payments). The Private sector will benefit from the existence of such a harmonisation through better coherence of demand and supply.

The ECP will specify common requirements for Cloud systems, undertake standardisation and procure proof of concept and implementation solutions. The Commission will co-fund this initiative to help start building trustworthy Clouds, fit for Europe. In WP2013 Cloud-related research will be supported through Objectives 1.2 and 1.5. This will give an adequate technical base for a joint pre-commercial procurement supported through Objective 11.3 and under the auspices of the European Cloud Partnership.

3.4.2 European Innovation Partnership (EIP) on Active and Healthy Ageing (AHA)

Societies, individuals, health & social care systems and industries are increasingly looking for innovative solutions in order to meet the needs of the changing demographic environment. The EIP on Active and Healthy Ageing brings together a wide array of stakeholders. The partnership aims to increase the healthy lifespan of EU citizens by 2 years.

WP2013 will support the EIP AHA by addressing relevant actions of its strategic implementation plan. This will be done mainly in Challenge 5 through the 'Personalised health, active ageing, and independent living' Objective. Other activities may also contribute, provided that their application areas address active and healthy ageing. This could include the Future Internet PPP, Safe and smart Internet of Things and the Sensing Enterprise, Collective Awareness Platforms for Social Innovation, Robotics and Open Data.

3.4.3 Smart Cities

Smart Cities are identified as a target research and innovation area in Horizon 2020 under the challenge 'Secure Clean and Efficient Energy'. In order to prepare the constituency for Horizon 2020 the themes Energy and ICT have defined in a coordinated way a set of activities, in each respective Work-Programme, addressing jointly Smart Sustainable Cities. This Work Programme includes several activities that will contribute to the Smart Cities initiative. In particular the objective 'Optimising Energy Systems in Smart Cities' will focus on system integration and validation of ICT infrastructures for energy-efficient neighbourhoods for carbon-neutral cities. In addition objectives on 'A reliable, smart and secure Internet of Things for Smart Cities', 'Data Centres in an energy-efficient and environmentally

friendly Internet' and 'Integrated personal mobility for smart cities' will also support Smart cities technologies and applications.

3.5 Key Performance Indicators (KPIs)

To measure the impact of interventions at Programme and project level, it is important to identify upfront well-defined KPIs for the programme and expected impact at the project and challenge or domain level. At programme level, conventional KPIs such as peer-reviewed scientific publications, number of citations, patents, licensing indicators or number of contributions to standards are expected to cover most needs. At lower levels, expected impact sections systematically specify precise and, if possible and relevant, quantitative and measurable impacts.

4 Approach

4.1 A continuing commitment to Europe's presence in the basic ICT technologies and infrastructures

This Work Programme continues to build on European strengths, seizes opportunities in emerging fields and intervenes where public and EU support is needed to share risks and build partnerships. It addresses the following challenges:

Challenge 1: pervasive and trusted network and service infrastructures

Challenge 1 covers tools and platforms for novel Internet application development and deployment through the Public-Private Partnership on Future Internet. At the same time, key technological developments and large scale experimentation in networking, cloud computing, Internet of Things, Trustworthy ICT and connected and social media of the future are targeted.

Challenge 2: cognitive systems and robotics

Challenge 2 initiates a research and innovation agenda, aiming to develop artificial systems that operate in dynamic real life environments, reaching new levels of autonomy and adaptability. There is a strong focus on advanced robotics systems, given their potential to underpin the competitiveness of key manufacturing sectors in Europe and a wide range of innovative products and services across the economy, from home appliances to health, security, space and leisure.

Challenge 3: alternative paths to components and systems

Challenge 3 covers nano/microelectronics and photonics, the heterogeneous integration of these key enabling technologies and related components and systems, as well as advanced computing, embedded and control systems at a higher level. Energy- and cost efficiency as well as recycling/end of life issues are major drivers across the Challenge.

Challenge 4: technologies for digital content and languages

Challenge 4 aims at enabling individuals and small organisations to create quality content and innovative services and at allowing people to access and use online content and services across language barriers; it also aims at ensuring reliability of retrieval and use of digital resources across applications and platforms and at scaling up data analysis to keep pace with extremely large data volumes.

4.2 A new phase for ICT's contribution to major socio-economic challenges in Europe

WP2013 will address Europe's key socio-economic challenges such as:

Challenge 5: ICT for health, ageing well, inclusion and governance

Challenge 5 focuses on development of solutions that empower the individual to improve and manage personal life conditions and participation as a citizen, elderly, patient and consumer. Special emphasis will be given to productivity gains, customer satisfaction, and provision of new capabilities of public interest by spanning across health and social care systems and government and linking up to other areas of ICT R&D.

Challenge 6: ICT for a lower carbon economy

Challenge 6 concentrates on the development of ICT to achieve substantial efficiency gains in the distribution and use of key resources such as energy and water, as well as the application of ICT to decarbonise transport and make it safer. This incorporates the ICT contributions to the Public-Private Partnerships on Energy Efficient Buildings and on Green Cars: ICT for the fully electric vehicle.

Challenge 7: ICT for the Enterprise and Manufacturing

Challenge 7 will support industry in bringing together suppliers and users for experiments that target the broad uptake of ICT in all domains of manufacturing. Focus is on emerging innovative technologies and processes, which need to be validated and tailor-made for customer needs before being able to enter the market. Special emphasis is on strengthening European SMEs, both on the supply and on the demand side.

Challenge 8: ICT for learning and access to cultural resources

Challenge 8 will develop technologies and methodologies that enable people to learn more effectively and support the acquisition of new skills. It also supports production of more powerful and interactive tools for creative industries and anticipate future trends in research and innovation by encouraging interaction in and between different segments of the creative industries.

4.3 Future and Emerging Technologies (FET)

The FET scheme continues to act as the pathfinder for mainstream ICT research. It will lay new foundations for future ICT by exploring unconventional ideas that can challenge our understanding of the scientific concepts behind ICT and that can impact future industrial ICT research agendas. Hence, its priorities are influenced by new developments and emerging opportunities in a wide range of scientific areas, as well as by the need to nurture the emergence of novel, often multidisciplinary, European research communities. FET will operate with a Proactive and an Open scheme, including activities to support new talents and high-tech SMEs.

Included in the FET challenge are the proposals resulting from the FET Flagships preparatory phase, during which six selected topics are being developed. They should each propose a full fledged Flagship initiative, out of which two will be selected to be launched as FET Flagships, initially as a ramp-up phase under FP7.

4.4 Support to international cooperation

International cooperation in the programme aims to support European competitiveness and to jointly address, with other regions of the world, issues of common interest and mutual benefit, thereby also supporting other EU policies (sustainable development, environmental protection, disaster response, security etc).

International cooperation activities in this Work Programme have three main objectives: (1) to jointly respond to major global technological challenges by developing interoperable solutions and standards, (2) to jointly develop ICT solutions to major global societal challenges, and (3) to improve scientific and technological cooperation for mutual benefit.

This Work Programme includes priorities for coordinated calls for international cooperation with Brazil and Japan. It also includes a set of targeted opening of areas throughout the Challenges and FET, as well as horizontal international cooperation actions (cross-cutting for the whole programme) to foster international partnership building and support dialogues.

Standards are an important element in the field of international cooperation. Beyond access to additional research capability, international cooperation in the context of industrial research should have global consensus and standards as a main target, both for the elaboration of new standards and adoption of standards through implementation of research results.

4.5 Ensuring more efficient and higher quality public services through Pre-Commercial Procurement (PCP) in ICT

The ICT Theme includes new incentives to promote further cooperation between public authorities for getting new ICT solutions developed.

This Work Programme contains an Objective open to PCP proposals addressing ICT solutions for any domain of public sector needs (Objective 11.1), as well as Objectives focusing on PCPs in specific areas of public interest: ICT for Health (Objective 5.1), e-learning (Objective 8.2), Digital preservation (Objective 11.2) and Cloud Computing in the e-Government context (Objective 11.3).

4.6 Contributing to European and global standards

Standardisation is recognised as an important research outcome and as a visible way to promote research results. Contribution and active support to industrial consensus eventually leading to standards is strongly encouraged. Integrated Projects are a particularly important vehicle to promote research results through standardisation. Set up of project clusters are also encouraged so that industrial consensus can be facilitated across projects dealing with similar issues and so that smaller Specific Targeted Research Projects (STREPs) can also contribute to a collective effort.

4.7 Contribution to the general activities of the Cooperation Specific Programme

The ICT Theme supports activities such as the Cordis service, experts, EUREKA membership and the COST Programme.

4.8 Encouraging the use of Internet protocol version 6 (IPv6)

The deployment of IPv6 in Europe is of utmost significance as IPv4, with about 4 billion addresses, is not enough to keep pace with the continuing growth and evolution of the Internet. IPv6, with its wide range of addresses, provides a straightforward and long term solution to the address space problem.

Research projects wishing to have a durable impact on the ICT landscape and market should base their developments on future-proof networking technologies. They should therefore consider carefully the choice of the Internet Protocol in their design, and should utilise IPv6 whenever possible.

5 Links to related activities

5.1 Joint Technology Initiatives and Joint National Programmes

Joint Technology Initiatives (JTI) are a pioneering approach to pooling public and private efforts, designed to leverage more R&D investments from Member States, Associated Countries and industry.

The focus of the ENIAC JTI[3] in nanoelectronics is on industrial application-driven developments addressing mainly next generation technologies in the 'More Moore' and 'More than Moore' domains. This complements activities under this Work Programme that essentially cover the 'Beyond CMOS' and more advanced 'More than Moore' domains preparing Europe for the design and manufacturing of the next generation components and miniaturised systems.

The ARTEMIS JTI[4] focuses on developing industrial platforms for the development and implementation of embedded systems responding to industry requirements in specific application domains. This complements activities under this Work Programme that mainly cover new concepts, technologies and tools for engineering next generation systems characterised by wide distribution and interconnection, and responding, in addition to timeliness and dependability, to more stringent constraints in terms of size, power consumption, modularity and interactivity.

The Ambient Assisted Living (AAL)[5] joint national programme covers market-oriented R&D on concrete ICT-based solutions for ageing-well with a time to market of 2-3 years, with a particular focus on involvement of SMEs. This complements activities under this Work Programme that focuses on integrating emerging ICT concepts with a 5-10 years time to market as well as essential research requiring larger scale projects at EU level, e.g. with strong links to standardisation.

[3] www.eniac.eu
[4] www.artemis-ju.eu
[5] www.aal-europe.eu

The Eurostars[6] Programme provides funding for market-oriented *R&D* specifically with the active participation of R&D-performing SMEs in high-tech sectors.

5.2 Links with other FP7 themes

Synergies are sought with other FP7 themes to ensure higher impact. This is achieved notably with the three jointly funded Public-Private Partnerships (PPPs) of the European Economic Recovery Plan: Energy Efficient Buildings, Factories of the Future, and Green Cars. These PPPs are supported within the relevant ICT Challenges. They will be called for separately in coordination with the other FP7 themes.

5.3 Links with other FP7 Specific Programmes

In addition to the ICT theme in the Cooperation Specific Programme, the ICT research and development community will also be able to benefit from the other specific programmes that are open to all research areas including the Ideas, People and Capacities Programmes.

In particular, support is provided to ICT-based research infrastructure (e-Infrastructure) under the Research Infrastructures part of the Capacities programme. This will provide higher performance computing, data handling and networking facilities for European researchers in all science and technology fields. Coordination between this activity and the ICT theme will ensure that the latest and most effective technology is provided to European researchers.

Additionally, support to ICT-related stakeholders and social actors is also provided under the 'Science in Society' part of the Capacities Work Programme for a Mobilisation and Mutual Learning Action Plan on Specific Challenge 5 *'ICT – Internet and Society'*. This topic deals namely with: *'Internet governance issues', 'privacy in the internet world'* and *'IPR: new business models in an internet world and open innovation'.*

5.4 Links with the ICT part of the Competitiveness and Innovation Programme

The ICT theme in FP7 is one of the two main financial instruments in support of the Digital Agenda for Europe initiative that is the Union's policy framework for the information society. The other main financial instrument is the ICT specific programme within the Competitiveness and Innovation Programme (CIP). ICT in the CIP targets the wide uptake and best use of ICT by businesses, governments and citizens. ICT in FP7 and ICT in the CIP are therefore complementary instruments aiming at both progressing ICT and its applications.

6 Funding schemes

The activities supported by FP7 will be funded through a range of funding schemes as specified in Annex III of the FP7 decision. These schemes will be used, either alone or in combination, to fund actions implemented throughout FP7. The funding schemes used for the research objectives identified in this Work Programme are the following (see Appendix 2 for more details):

[6] www.eurostars-eureka.eu

6.1 Collaborative Projects (CP)

Support to research projects carried out by consortia with participants from different countries, aiming at developing new knowledge, new technology, products, demonstration activities or common resources for research. The Funding Scheme allows for two types of projects to be financed: a) 'small or medium-scale focused research actions' (STREP), b) 'large-scale integrating projects' (IP).

STREPs target a specific research objective in a sharply focused approach while large scale integrating projects have a comprehensive 'programme' approach and include a coherent and integrated set of activities dealing with multiple issues.

Both instruments play an important and complementary role. With this Work Programme, the objective is to support a balanced portfolio of projects that will enable on one hand focused and agile scientific and technological exploration through STREPs and on the other hand concentration of efforts - where needed - through IPs.

To this end, an indicative budget distribution per instrument is specified for each objective and also to some extent per funding scheme. The distribution is based on the size of the available budget per objective and on the nature of the research needed to achieve the relevant target outcome and expected impact.

6.2 Networks of Excellence (NoE)

Support to Joint Programme of Activities implemented by a number of research organisations integrating their activities in a given field, carried out by research teams in the framework of longer term cooperation.

6.3 Coordination and Support Actions (CSA)

Support to activities aimed at coordinating or supporting research activities and policies (networking, exchanges, coordination of funded projects, trans-national access to research infrastructures, studies, conferences, etc). These actions may also be implemented by means other than calls for proposals. The Funding Scheme allows for two types of projects to be financed: a) 'Coordination Actions' (CA), b) 'Specific Support Actions' (SA).

6.4 Combination of Collaborative Projects and Coordination and Support Actions (CP-CSA)

CP-CSA involves a combination of the collaborative projects and coordination and support actions (CP-CSA) funding schemes. It enables therefore the financing, under the same grant agreement, of research, coordination and support activities. In this Work Programme, CP-CSAs requiring Pre-Commercial Procurement (PCP) will combine:

- Networking and coordination activities: for public bodies in Europe to cooperate in the innovation of their public services through a strategy that includes PCP.
- Joint research activities: related to validating the PCP strategy jointly defined by the public bodies participating in the action. This includes the exploration, through a joint PCP, of possible solutions for the targeted improvements in public sector

services, and the testing of these solutions against a set of jointly defined performance criteria.

This work programme specifies for each of the research objectives, the type(s) of funding scheme(s) to be used for the topic on which proposals are invited.

7 Content of Calls for Proposals

7.1 Challenge 1: Pervasive and Trusted Network and Service Infrastructures

Challenge 1 is designed with a long term perspective and with a strong focus on the **Internet of the future**, thereby underpinning future economic growth and competitiveness. The research topics in this work programme will build on past achievements with a view to developing future strengths.

It is proposed:

i) To continue technological research on all basic building blocks of the Internet value and delivery chain, i.e. network technologies, digital media, services, security and Internet of objects. Driven by roadmap-based research it progresses the technological characteristics of systems and services.

ii) To leverage new constituencies, in particular technological innovative industry and SMEs, focussing on new generations of web-based applications and services, in line with the Digital Agenda for Europe;

iii) To redefine approaches towards future networked computing systems, laying the basis for the future European cloud computing strategy in all its dimensions, networks, services, security and content, and moving towards user-led applications that exploit both widely distributed devices and sensors and the power of clouds.

iv) To combine technological and social innovation by investigating and experimenting new paradigms related to the Internet, both for future Internet architectures and holistic and multidisciplinary understanding of Internet developments.

v) To take the Future Internet PPP into its third and final phase at which it will open up large-scale trials to new constituencies of innovative developers following an open innovation model.

Taking into consideration the need to future-proof the work to be done, all Challenge 1 proposals are expected to either use or design for IPv6, as appropriate.

In order to move towards an even more integrated, cross-challenges approach, proposals that address more than one objective may require coordinated evaluation and implementation.

Support actions for road-mapping, constituency building (Future Internet Assembly, ETPs, …) and ERAnets should be envisaged to prepare the research community for an even more comprehensive approach bringing together research and innovation aspects of complementary challenges in Horizon 2020.

The objectives under this challenge are linked to the objectives under international cooperation (section 7.10), notably to the EU-Japan Co-ordinated Call detailed under objective ICT-2013.10.1.

Objective ICT-2013.1.1 Future Networks

The target is the development of future broadband (fixed and mobile) networks which will be energy-efficient, secure, and robust, and will use spectrum flexibly and efficiently. Future networks will be the infrastructure which connects the future Internet of people, content, clouds and things, and will meet the targets of the DAE (Digital Agenda Europe). The focus in WP2013 is on a restricted set of technology priorities, which are key to achieving the targets[7].

a) Next generation heterogeneous wireless and mobile broadband systems, based on flexible spectrum usage and reduced EMF and interference.

b) High throughput low-latency infrastructures, based on dynamic all-optical networks and hybrid wireless and cable networks.

c) Internet architectures enabling innovation in network virtualization, specifically through programmability of network functions and protocols.

d) Tighter integration of satellite and terrestrial communications technologies, as a critical infrastructure, in particular for public safety/security applications.

e) Coordination and support actions for (re)structuring the research effort in the sector.

Expected Impact

- Developing key enabling technologies for the future generations of the European high-speed broadband and mobile network infrastructure (factor of 10 overall capacity increase, plus factor of 10 radio efficiency increase).
- Improved flexibility and economic, spectral and energy efficiency of access/transport infrastructures. (factor of 4 reduction in watts/bit).
- Strengthened positioning of European industry in the fields of Future Internet technologies, mobile and wireless broadband systems, optical networks, and network management technologies.
- Contributions to standards and regulation as well as the related IPR.
- Adoption by network operators of integrated all-optical networks and of spectrum-flexible broadband wireless systems (by 2020).

Funding Schemes:
a), b), c), d): IP, STREP
e) CSA
Indicative budget distribution:
IP/STREP: EUR 46.5 million, of which a minimum of 50% to IPs and 30% to STREPs
CSA: EUR 2 million

Call:
FP7-ICT-2013-11

[7] Photonic devices for communication networks supporting the overall vision and requirements of Objective 1.1 are developed in Objective 3.2.

Objective ICT-2013.1.2 Software Engineering, Services and Cloud Computing

Target Outcomes

- Delivering services in an effective, efficient and reliable manner across the future computing continuum embracing clouds, communicating objects, sensors and smart devices, possibly utilising open source approaches.
- Build upon Europe's industrial strength in software and services technologies as to exploit the potential of Internet-based services, including cloud computing and networked software.

This objective is linked to and complements Objective 3.4 Advanced computing, embedded and control systems.

a) Advanced computing architectures and software engineering for the cloud and beyond.

Implementation of computing architectures, patterns and programming models for the efficient and secure usage of heterogeneous and distributed computing resources spanning the smart device to the large data centre, building on European users' needs and advancing cloud architectures and standards.

b) Innovative software and tools for services

Innovative and self-adaptive Internet-based services using agile software technologies and tools for any phase of the service lifecycle and exploiting widely distributed computing architectures, large distributed data sets and smart sensors. This work should take into account the social, open and collaborative dimensions of software development and service provisioning, and be implemented by short duration projects.

c) Coordination and support actions

- Support for the adoption of cloud computing taking into account legal and socio-economics as well as technical issues.
- Support for global interoperability in software and services technologies, achieved through standardization and European and international cooperation.
- Promotion of Open Collaboration models in the scientific community and in the software development community.

Expected Impact

- Accelerating the development and deployment of cloud computing and internet services.
- Increasing Europe's ability to design and deliver innovative services with strong user engagement through better involvement of SMEs and individual researchers/developers.
- Strengthening the European software industry with the know-how to build complex services and big data management in a multi-layered cloud computing continuum.

- Where relevant, successful contribution to international standardization.

Funding Schemes:
a), b): IP, STREP
c): CSA

Indicative budget distribution:
- IP/STREP: EUR 39 million, of which a minimum of 25% allocated to IPs and 25% to STREPs
- CSA: up to EUR 2.5 million

Call:
FP7-ICT-2013-10

Objective ICT-2013.1.3 Digital Enterprise

The work addresses new forms of enterprises with ad-hoc extensive connectivity of digital assets and enhanced business processes through integration of sensing capabilities.

Focus is on:

a) New models for the Digital Enterprise, based on new forms of business relations with valorisation of digital assets, big/public data, and supporting extended, virtual or agile enterprises in the Future Internet. Research targets innovative concepts, methods, architectures, systems and business models for new digital enterprise systems, including web entrepreneur businesses. Multiple intelligent interconnected entities (material and immaterial components, e.g. tweets, personal assistants, crowd-sourcing knowledge, natural interfaces, etc.) should be considered to support co-operation between people, business assets, devices, resources and services.

b) Applications for the Sensing Enterprise to enhance the global and physical context awareness of business systems through the development of applications services and solutions for the "Sensing Enterprise" supported by smart components. These components may be sensors, tags, intelligent agents, smart objects, etc. enabling a continuous awareness and improvement of business operations in a digital environment that will bring new business trends and models not possible otherwise.

c) Coordination and Support Actions

One CSA supporting the international road mapping, research coordination and policy activities aimed at the acceleration of new forms of Internet-based Enterprise innovation throughout Europe.

Expected Impact

- New models of business that support and enhance cooperative networking among the wide range of enterprise assets and artefacts through their entire lifecycle and enabled by sensing capabilities of smart components.
- Take-up and use by European businesses of mobile connectivity and sensing technologies to increase flexibility and productivity by incorporating data from smart sensors directly into business processes.

Funding Schemes

a), b): STREPs

c): One CSA

Indicative budget distribution

- STREP: EUR 15.30 million
- CSA: EUR 0.70 million

Call:

FP7-ICT-2013-10

Objective ICT-2013.1.4 A reliable, smart and secure Internet of Things for Smart Cities

Target Outcomes

The goal is to facilitate wider uptake of IoT-based systems with an emphasis on sustainable smart city applications. The technological focus is on built-in privacy and security, and on scalable data management capabilities applicable to heterogeneous device platforms.

Focus is on:

a) **A reliable and secure Internet of Things**, based on security and privacy by design architectures and technologies for connected objects. Research covers integration of security and privacy by design with core functionalities (e.g., naming, addressing, routing) across the full data and information life cycle: date capture, storage, processing, delivery, exploitation, within a comprehensive IoT governance framework. It includes hardware coded safety and security. It takes into account the cross-application nature of objects supported by use cases in multiple fields such as smart home/spaces, smart living[8], smart communities, and the emerging requirements of smart sustainable cities and related industrial applications.

b) A smart Internet of Things with scalable and adaptive middleware supporting data flows from sensing devices and a high quantity of object instances. It supports the Internet of Things as a heterogeneous network made up of federated private/public area networks composed of devices with different technological properties (virtualisation). It is complemented with event filtering and management capabilities.

For items a) and b) above, the technological work is expected to support intelligent information systems of smart cities. Smart city application are thus expected to drive the requirements.

c) Coordination and Support Actions

One CSA covering: i) International road-mapping activity on the future of the Internet of Things about the integration of research results in various scientific and technological disciplines, including ICT, nanotechnology, biomedicine and cognitive

[8] Where appropriate, smart living projects will contribute to the European Innovation Partnership (EIP) on "Active and Healthy Ageing", as defined in 3.4.2.

sciences, and their further applicability to smart city scenarios; ii) support to research coordination and policy activities of the Internet of Things European activities.

Expected Impact

- Scientific and technological models of resilient and reliable IoT applications supporting confidentiality, authenticity, and integrity of the data sensed and exchanged by smart objects.
- Technological and standardised solutions for IoT virtualised platforms supporting "green" and sustainable smart city applications.
- Enabling European suppliers to reach by 2020 a share of the IoT market above 30%.

Funding Schemes

a, b): STREPs

c): One CSA

Indicative budget distribution

- a, b): EUR 19.25 million.
- CSA: EUR 0.75 million

Call:

FP7-SMARTCITIES-2013

Objective ICT-2013.1.5 Trustworthy[9] ICT

Target Outcomes

This objective addresses cyber security and privacy in three major technological areas: cloud computing, mobile services and the management of cyber incidents. Activities will cover R&D and innovation activities, including the adaptation and integration of technology and demonstration in real life environments, from the design to the implementation stage. This objective also aims at supporting trust and security policies.

This objective will be complemented with an EU-Japan co-ordinated call (see Objective 10.1) and foresees targeted support to EU-Australian cooperation in trustworthy broadband services.

a) Security and privacy in cloud computing

The solutions should be scalable, portable and robust against any type of failure. They should improve the security components, in particular for identification, authentication and encryption, in terms of speed of processing and easiness of

[9] *Trustworthy* is defined in this context as: secure, reliable and resilient to attacks and operational failures; guaranteeing quality of service; protecting user data; ensuring privacy and providing usable and trusted tools to support the user in his security management.

deployment in highly distributed environments, with very large amounts of users. They should ensure the long-term privacy and security of data and applications, including when necessary through hardware solutions, and enhance user control (including on location of data) and usability. New models and tools for inter-domain security breaches detection, notification and reaction should be developed.

b) Security and privacy in mobile services

The efficiency, robustness and performance of the security solutions for mobile environments should be improved, in particular for system security (e.g. malware detection), data management and identification/authentication. They should address the specificities of the mobile devices (smart phone, tablet…) compared to traditional personal computers: lower resources (e.g. computational, power), different models of software development and distribution (e.g. applications marketplaces). They should include privacy-by-design and give to users the long-term control of the security and privacy of their data and processes, including notification for intentional or unintended breach. They should be scalable, inter-operable and applicable across technologies, vendors and operators.

c) Development, demonstration and innovation in cyber security

This activity addresses the application of technologies to increase the level of cyber security in Internet. This includes the development and demonstration of technologies, methodologies and processes to prevent, detect, manage and react to cyber incidents in real-time, and to support the breach notifications, improving the situational awareness and supporting the decision making process. It will also develop and demonstrate advanced technologies and tools that will empower users, notably individuals and SMEs, in handling security incidents and protecting their privacy.

d) Technologies and methodologies to support European trust and security policies

To be successful European strategies for internet security need to be complemented by the adoption of state-of-the-art technologies, processes and methods.

The proposed activities should:

- Develop a cyber security research agenda, including anticipation of future trends, directly inferred from the European strategies for internet security and addressing the needs for interoperability;
- Analyse the innovation process in privacy and cyber security technologies, identifying the obstacles and propose improvements; identify market conditions and economic incentives for organisations to invest in ICT security and integrate it into their products, services and systems;
- Facilitate the application of privacy and security by design practices in the development and implementation of products and services, foster a risk management culture among users and support an unhindered usage of Internet and other telecommunications technologies against arbitrary disruptions, censorship and surveillance.

e) EU-Australia cooperation on building user trust in broadband delivered services

This activity aims at developing and demonstrating an integrated framework for advanced authentication and identity management in broadband delivered services. The solution will rely on existing or emerging schemes, prototype components or recent research results. Where needed, additional components will be developed. The

system should provide assurance to the users of appropriate levels of security and privacy.

Expected Impact for Target Outcomes a), b), c) and d)

- Demonstration of secure and privacy-preserving technical solutions in clouds, mobile services and management of cyber incidents applying state-of-the-art research results, ensuring interoperability and compliance with privacy legislation.
- Widen take-up of research outcomes by service providers and wider adoption of ICT security solutions by European companies and users. Unlock the market restrictions, reveal the incentives to create a functioning cyber security market and increase the number of European spin offs in the field.
- Development and implementation of European strategies for internet security.
- Significant contribution to making Internet a medium that can be used to exercise human rights, including in hostile environments.

Expected Impact for Target Outcome e)

Demonstrate in a real-life environment the maturity and practicality of a digital authentication framework in broadband delivered services working across several jurisdictions (organisational, governmental) with high levels of assurance.

Funding Schemes

a), and b): IPs, STREPs
c): IP (up to one IP)
d): CSAs (up to one CSA per bullet point)
e): STREP (up to one STREP)

Indicative budget distribution

- IP/STREP: EUR 33.5 million, of which a minimum of 40% allocated to IPs and 30% to STREPs and up to 3 million for point e)
- CSA: up to EUR 3 million

Call:

FP7-ICT-2013-10

Objective ICT-2013.1.6 Connected and Social Media

This objective focuses on the development of advanced digital media access and delivery platforms and related technologies supporting innovation in the digital media sector. The aim is to develop a new generation of media clouds and Internet-based applications and services using intuitive and innovative ways of interacting with networked multimedia devices, applications and services (e.g. through enhanced immersive and interactive experiences).

Target Outcomes

a) Connected Media

- Architectures, technologies for the end-to-end coordination of user terminals (e.g. smart phones and smart devices), home-gateways, networks and cloud infrastructure for delivering highly interactive, personalised and shared media experiences. The work should link cloud-based applications, content delivery networks, peer-to-peer networking and media processing capabilities with content-aware and information-centric networks to allow flexible control over content storage, distribution and processing in an open networked platform.
- Novel platforms for customised and context-adapted hybrid broadcast-Internet services supporting the evolution of broadcasting media towards more interactivity, connectivity and integration with virtual, mixed and augmented realities, including next-generation multisensory games. The combination of multiple screens (of different types) and spatialised audio to augment user interaction, enhance flexible access and enable non-linear play-outs of interactive and user-centric media should be explored.
- Improvement of Quality of Experience by providing surrounding, immersive, multisensory and interactive, always connected and seamless environments on the move, at home and at work. Development of natural user-interaction interfaces and contextual adaptation techniques through smart profiling to provide dynamic user experiences. Increasing quality, frame rates, resolution and dynamic range for more plausible digital media experiences, integrating, notably by means of augmented reality, natural and computer generated AV content.

b) Social Media

- Technologies for intelligent dynamic media adaptation by delivery platforms, beyond the transcoding of individual streams, according to the context of individual consumers and social communities.
- Simplification of access to networked media services in order to broaden the involvement of social communities in crowd sourcing. Seamless and user-friendly interactive media experiences.
- Development of community-focused interactive media systems that facilitate a range of social interactions supported by user- , community-, network- and context-centric search based on effective relevance feedback and real-time social recommendation.
- Optimisation of media exchange according to community usage and interaction patterns extracted from the analysis of relationships and shared activity in social networks.. Extraction and mining of data from social networks, for indexing and searching user-generated content and for research on human behaviour and social activity.

c) Co-ordination and Support Actions

Coordination of stakeholders, and projects, identification of related policy measures to support open innovation, transfer from research to innovation and novel products to drive growth and jobs in Europe. This includes the development of integrated research and innovation roadmaps leading to the creation of business ecosystems.

Expected Impact

- Reinforced positioning of the European ICT and digital media industry and increased market opportunities, leveraging new constituencies, in particular technological innovative industry and SMEs.
- Stimulation of demand for high-performance, bandwidth-hungry media applications and services. Demonstration of the viability of new technologies and validation of innovative solutions through large scale demonstrations, pilots or testing of use cases as to guarantee sustainable deployment.
- Development of a true horizontal market and ecosystem for connected TV, interactive media applications and networked games, avoiding market fragmentation and locking-in of users and applications.
- Further development of social TV and social networks, especially in mobile environments, leveraging mixed (real and virtual) media as an enabler of a new generation of Internet-based applications and services.
- Greater creativity stimulated through technologies and tools to capture, produce, search and exchange professional and user generated immersive and interactive digital media content.

Funding Schemes

a), b): IP, STREP

c): CSA

Indicative budget distribution

- IP/STREP: EUR 32 million, with at least 70% for STREPs
- CSA: EUR 1.4 million

Call:

FP7-ICT-2013-10

Objective ICT-2013.1.7 Future Internet Research Experimentation

Target Outcomes:

The overall goal of Future Internet Research Experimentation (FIRE) is combining technological and social innovation by investigating and experimenting new paradigms related to the Internet, both for future Internet architectures and a holistic and multidisciplinary understanding of Internet developments.

The methodology proposed to maximise the social and economic impact of new technologies is based on an empirical approach, involving the creation of open experimental facilities in key research areas. Engineering systems that integrate computing and physical systems are encouraged.

In addition to the priorities identified in this objective, the objective will be complemented with an EU-Japan co-ordinated call (see Objective 10.1) and an EU-Brazil co-ordinated call (see Objective 10.2).

Specific objectives of FIRE in WP2013 are:

- a) To support new testbed facilities in areas not yet covered by existing ones, or to extend the most successful facilities, where success is to be measured in terms of the innovative nature of the usages, and number of users. The projects should reserve at least 50% of their budget for open calls addressing innovative usages, extensions and experiments, based on open software, open data infrastructures, open hardware, open standards and open platforms, including virtual ones. Pilots and experiments should be replicable, reusable and scalable. The selection criteria should be based on a combination of excellence and crowd-sourcing when possible.
- b) To support experimentally driven research, in particular to conduct multidisciplinary investigation of key techno-social issues (i.e. Internet Science), exploiting any relevant FIRE facilities, considering also benefits for citizens, ethical and sustainability aspects. Examples are network neutrality, privacy by design, identity management, security trade-offs, techniques to ensure free flow of information (e.g. circumventing censorship), cloudification, crowd-sourcing, reputation mechanisms, data ownership, data retrieval and openness, citizen involvement in content generation, new collective economic models for rewarding creators and talents, performance and quality of experience as perceived by final users and behavioural and societal changes. A multidisciplinary approach is encouraged to include beyond technologically oriented partners, also at least two participant entities with a main focus of activity addressing sociology, economy, law, content/culture, and/or perception/interfaces.
- c) CSAs to 1) identify, monitor, coordinate and integrate experimental-based research and large-scale deployment activities, at both European and National level, to promote the sharing of best practices, solutions, applications and services and 2) identify, monitor and publicize European and National Future Internet initiatives with a view to facilitate their coordination and integration as well as the broader use of their results and achievements across Europe.

d) **EU-South Africa** cooperation on future internet experimental research and testbed interconnection

This activity aims at improving the capabilities of testbeds on future internet technologies in Europe and in South Africa. The software developed in the research projects will be deployed and evaluated in the testing facilities in both, Europe and South Africa. To develop affordable technologies for future internet, research activities on delay tolerant networks and opportunistic communications are encouraged as well as developments supporting innovative applications for social integration.

South African organisations are expected to contribute a significant share of the funding they require for participation in this activity.

e) **EU-China** cooperation on future internet experimental research and IPv6

The goal is to build a partnership between European and Chinese organisations to foster cooperation in the domain of future internet research experimentation and IPv6.

This should include in particular:
• strengthening joint research efforts on the future internet by developing interoperable solutions and common standards.

• reinforcing academic and industrial cooperation on future internet experimental research, through a better networking between European and Chinese actors.
• exchanging good practices for IPv6 deployment and supporting the creation of interconnected IPv6 pilots between Europe and China.

Proposals are expected to build upon the achievements by similar past or ongoing projects.

f) **EU-South Korea** cooperation on future internet experimental research

This activity aims to develop experiments on individual testbeds but also across testbeds for understanding the management of heterogeneous resources, the access to these resources and the evaluation of their usage. It will exploit the links between current activities in Europe and in South Korea. Research will focus on software defined networking (SDN) enabling parallel deployment of slices assigned to virtual network providers. The software developed in the research project will be deployed and evaluated in the testing facilities in both, Europe and South Korea.

Expected impact for Target Outcomes a) and c):

- More cost efficient experimentation activities, with more diverse and larger scale testing. Higher number and broader range of experiments running in facilities.
- Broader end-user involvement, including interaction with the real world, leading to a better and faster exploitation of research results in infrastructures, products, services and social innovation mechanisms, being particularly important to obtain user feedback through advanced quality of experience monitoring techniques fully integrated in real scenarios.
- Broader and more innovative use of the Experimental Facilities by a significant number of Future Internet research projects in European and national programmes.

Expected impact for Target Outcomes b) and c):

- New techno-social models and business opportunities contributing to economic and sustainability goals, to be tested at large scale.
- Providing incentives for truly multidisciplinary exploration of new concepts and approaches to innovation and social innovation enabled by ICT tools and networks.

Expected impact for Target Outcome d:

- Advanced technological capabilities tested and validated at global scale
- Broader exchange of research outcomes and applications for social integration developed in European and South African programmes
- Novel technology for future internet access with a focus on interconnection and affordability, targeted to the needs of emerging countries

Expected impact for Target Outcome e):

- Reinforcement of partnerships in future internet experimental research.
- Increased visibility for EU future internet research activities in Asia.
- Facilitation of the emergence of common future internet standards.

Expected impact for Target Outcome f):

- World wide federation of testbeds for future internet research.
- Broader dissemination of the results in order to foster wide adoption, eventually going beyond testbed frameworks if appropriate.
- More durable culture of collaboration between European and South Korean actors.

Funding Schemes

a) IPs
b) STREPs
c) CSAs
d) STREP
e) CSA
f) STREP

Indicative budget distribution
a) and b) IPs and STREPs: 16,5 M€ (min. 8 M€ for IPs, min. 8 M€ for STREPs)
c) CSA: 0.5 M€
d) STREP: 1 M€
e) CSA: 0.5 M€
f) STREP: 0.5 M€

Call:

FP7-ICT-2013-10

Future Internet Public Private Partnership (FI-PPP)

The objective of the third phase of the FI-PPP[10] is (i) to provide and run a stable infrastructure for the large scale trials, expand the core platform, the use case specific functionalities and their demand-driven instantiations, and (ii) to involve through open calls SMEs and web-entrepreneurs as developers of highly innovative, infrastructure based, data-rich services and applications, building on, and extending, the large scale trials and the core platform functionalities. The third phase is an integral part of the FI-PPP and capitalises on the investments and developments of phase one and two.

All projects operating under the FI-PPP contribute and adhere to the governance structures in place and develop cooperation notably with CONCORD and FI-WARE[11]. The third phase of the FI-PPP ensures that technological developments and

[10] See the ongoing activities under the FI-PPP: *www.fi-ppp.eu*

[11] Project website: www.fi-ware.eu

trials taking place in phases one and two will evolve into seed-type activities generating actual take-up of innovative Internet services and applications.

The FI-PPP should also be an accelerator for regional smart growth. Therefore this last phase of the FI-PPP is expected to connect and establish close synergies with regional developments and policies.

Objective ICT-2013.1.8 Expansion of Use Cases

Target Outcomes

A large set of innovative and technologically challenging services and applications in a wide range of Internet usage areas and large scale trials, making innovative use of the technologies and validating the concepts developed under the previous phases of the FI-PPP. These services and applications should make public service infrastructures and business processes significantly smarter (i.e. more intelligent, more efficient, more sustainable) through tight integration with Internet networking and computing capabilities, and notably exploiting open data.

Implementation requirements

This objective calls for projects with participants that can rapidly connect to existing communities of small and innovative ICT users and developers, i.e., SMEs and web-entrepreneurs, to take-up Future Internet technologies developed in previous phases.

Typically projects will bring together partners providing the full ecosystem to successfully involve the SMEs and web-entrepreneurs called to participate, such as partners having access to and experience with SME environments, partners bringing in the innovative ICT infrastructure, trial providers, the user notion, and the public sector to foster local/regional commitment.

Project participants, notably the coordinating organisation, will have to demonstrate their financial viability to receive and manage funds at the level requested, as well as their expertise and capacity, first and foremost in developing and managing the full life-cycle of the open-calls transparently. The projects are encouraged to ensure a sustainable longer-term environment. A combination with other innovation actions, supported by regional, national and European policies and funds, is highly desirable.

The task of projects is to:

i) scope, organise and manage open calls for small and innovative ICT players such as SMEs and web entrepreneurs to develop services/applications that present a clear societal and economic value while exceeding a defined minimum level of functional complexity and thus generating a very large number of small, innovative services, which build on technologies of the ongoing large scale trials and the FI-WARE Generic Enablers. Any IPR generated by the SMEs and web entrepreneurs shall rest with them.

ii) liaise with the other projects selected under this objective in defining the open calls, support SMEs and web entrepreneurs in terms of access to information, tools and services provided by the technology foundation extension selected under objective 1.8, notably on functionalities of the core platform toolbox, the test bed, the large scale trials, the infrastructure availability/accessibility and others, in order to get involved SMEs rapidly up to speed/familiarised with the FI-PPP environment and enable them to focus on their innovation task.

iii) coordinate and collaborate with programme support actions with regard to their offerings to SMEs, notably aiding SMEs and web entrepreneurs in aspects such as innovation, entrepreneurship and business modelling, training and education for and among entrepreneurs, business sustainability, intellectual property.

In addition, projects selected under this objective will link-up to the capacity building activity[12] of phase two of the FI-PPP.

At least 80% of the project budget should be reserved for open calls for SMEs and web-entrepreneurs. Projects must publish widely their open calls using the Commissions publishing channels for public calls[13] and adhere to FP7 standards with respect to evaluation, conflict of interest and confidentially. Projects must also promote widely the participation in their open calls, e.g., by tapping into venture capital communities and corporate venture activities, public/private accelerators and others. SMEs and web entrepreneurs that are successful in the open calls will be granted financial assistance which is typically in the order of EUR 50.000-150.000.

Speed and quality of service to SMEs and web entrepreneurs as well as their successful and sustainable involvement will be a key success measure.

Projects selected under this objective shall jointly set-up an innovation cluster bringing together relevant public sector and private/industrial actors, developers and users to ensure the sustainability of the developments under the FI-PPP, as well as to develop and contribute to a cooperative approach to identify good practices and success cases including dissemination.

Funding Schemes:
Up to 20 CP-CSAs, with a priority given to maximise the geographic and/or sectorial coverage.

Indicative budget distribution:

- EUR 100 million
- Duration: 24 months

Call:

FP7-ICT-2013-FI

Objective FI.ICT-2013.1.9 Technology Foundation Extension and Usage

Target Outcomes

a) Technology Foundation Extension

An updated and extended technology foundation should answer both the needs identified in the use case trials of phase two as well as the needs arising during the use case expansion in the third phase (see objective 1.8). Such needs include technological updates and improvements of existing core platform functionalities, i.e. generic enablers, and the development and implementation of additional enablers

[12] See the previous FP7 ICT work programme 2011/2012 objectives 1.8 and 1.9 - *http://cordis.europa.eu/fp7/ict/docs/3_2012_wp_cooperation_update_2011_wp_ict_en.pdf*

[13] I.e. the participants portal: https://ec.europa.eu/research/participants/portal/page/cooperation

across multiple domains, including work relevant for the adoption of common standards. Continuity with the FI-WARE project[14], in particular with respect to intellectual property, is required.

b) Platform availability

The work must ensure the availability of the FI-PPP generic enablers for use in different infrastructures, in different regional contexts, and across different domains during the remaining lifetime of the FI-PPP, notably under phase 3 to all participants and possibly beyond. This includes support for the further extension and adaptation of these generic enablers to domain-specific instantiations, their reference implementation in open source, operational support for these instances, and the operation of a test infrastructure on generic enablers servicing several trials can be hosted. It particularly, as a service, it includes technological training of the SMEs and web-entrepreneurs involved under objective 1.8 on how to best use developed technologies and knowledge. The work should eventually integrate the achievements of the FI-PPP capacity building and infrastructure support activities (Objective FI-ICT-2011.1.9) of the previous phases.

c) Platform sustainability

Ensure sustainability of the core platform and of domain-specific platform developments in terms of usage and further evolution beyond the FI-PPP lifetime, including exploitation planning, standardisation, interoperability, IP arrangements and other measures maintaining their availability in the longer-term.

d) Usage and participation

While objective 1.8 focuses on the involvement of the take-up actors and direct, full-service support to them, this sub-objective provides for the necessary tools and support across all projects selected under objective 1.8 and the FI-PPP. This includes the provision of:

- support for SMEs and web-entrepreneurs in view of developing and sharing best practices, fostering entrepreneurship, access to finance, matchmaking between regional ecosystems and the financial community, innovation support for the various large-scale trial sites, benchmarking, mentoring, partnering with regional innovation actors, as well as monitoring and coordination across all trial sites and domains (Key Performance Indicators).
- Provide qualitative and quantitative evidence of the socio-economic impact of the activities under the Future Internet PPP until 2020.
- support for communications, networking and dissemination and exploitation activities such as developing success stories, road shows, conferences and presence at conferences and fairs to achieve significant visibility and attract further usage and exploitation using the latest multi-media and Internet tools.
- working with the FI-PPP community and beyond to support the creation, networking and development of Internet innovation hubs by bringing together web entrepreneurs, mentors, investors, students, academia, public sector innovators and industry – this action shall be carried out in collaboration with ongoing work of the EIT ICT Labs.

[14] For details of the ongoing project FI-WARE see www.fi-ware.eu

- support for the future European Internet community to better link research to innovation through technology and business road-mapping (including in relation with activities in US, Japan, Canada and the BRICs), identification of new stakeholder groups, transfer of knowledge and best practices from the FI-PPP towards the larger FI community, including organising European-level conferences and workshops.

Expected Impact of the FI-PPP (the two objectives described above)

- Significant increase of the effectiveness of business processes and novel approaches to the operation of infrastructures and applications of high economic and/or societal value.
- Reinforcement of the European industrial capability for novel service architectures and platforms in view of new business models based on cross-sector industrial partnerships built around Future Internet value chains.
- Increased involvement of users and public authorities at local, regional and national levels.
- New opportunities for high-growth entrepreneurs and SME players to offer new products, equipments, services and applications.

Funding Schemes:
One IP which must cover a), b), c)
2-5 CSAs which cover d)

Indicative budget distribution:

- One IP: EUR 23 million. At least 10% of the budget is expected to be allocated through one open call to allow for adjustments in light of the projects selected under objective 1.8.
- CSAs: EUR 7 million
- Duration: 18-24 months

Call:

FP7-ICT-2013-FI-PPP

7.2 Challenge 2: Cognitive Systems and Robotics

Challenge 2 initiates a research and innovation agenda, aiming to develop artificial systems operating in dynamic real life environments, reaching new levels of autonomy and adaptability and interacting in a symbiotic way with humans.

There is a strong focus on advanced robotics systems, given their potential to underpin the competitiveness of key manufacturing sectors in Europe and a wide range of innovative products and services across the economy, from home appliances to leisure, agriculture, transport and logistics, inspection and security in dynamic environments. Robotics provides us also with important means to address Europe's societal challenges in areas like environment, health and ageing[15]. The work will build on and extend past achievements in scientific research and will also introduce a significant new effort aiming at the widespread introduction of robotics technology in manufacturing and service sectors.

An additional research focus targeted under this challenge will address symbiotic human-machine relations, which aims at a deeper understanding of human behaviour during interaction with ICT, going beyond conventional approaches.

The work on cognitive systems and smart spaces and on symbiotic human-machine relations is not restricted to robotics.

The work will:

i) continue research to strengthen Europe's scientific and technical capital in this domain, by progressing advanced functionalities and cognitive capabilities of robotic systems and by extending this research to smart spaces and symbiotic human-machine interactions;

ii) introduce a special emphasis on systems integration, through use cases which exploit and support the uptake by industries of promising technologies on an international scale.

Support actions will address road-mapping (PPP preparation) and investigate opportunities for pre-commercial procurement (PCP), to prepare the research community for a fully-fledged research - innovation approach in Horizon 2020.

Objective ICT-2013.2.1 Robotics, Cognitive Systems & Smart Spaces, Symbiotic Interaction

Target Outcomes

RTD targets systems that can operate autonomously in the real world through e.g. scene and context understanding, anticipation and reaction / adaptation to changes, manipulation and navigation, as well as symbiotic human-machine relations.

- RTD will help to achieve breakthroughs in the introduction of robotics technology in diverse physical environments and in smart spaces (with energy efficiency improvements). Complementary RTD strands in the Target Outcomes listed below may be combined as appropriate, including through

[15] In line with the goals of the European Innovation Partnerships such as the Active and Healthy Ageing.

demonstration as well as methodological validation approaches and measures of progress (e.g. through suitable benchmarks).

- Foundational research will address cognitive systems and symbiotic human-machine interactions.

a) Intelligent robotics systems

RTD will address advanced robotics functionalities in e.g. manipulation / grasping, mobility and navigation, compliant actuation and locomotion, system-related challenges such as autonomy, adaptability, scalability and robustness in different types of environments, and interaction concerns such as safety, natural human-robot interaction and robot-robot cooperation. This will be achieved via new levels of capabilities in perception, understanding and action based on advanced sensori-motor systems. The robots will be of various shapes and sizes (from micro-robots to large size) and validated in real-life situations.

b) Cognitive systems and smart spaces

RTD will target advanced cognitive systems research, addressing key research bottlenecks and crucial cognitive capabilities which are missing today. Advances will be sought in sensing, perception, understanding, learning, reasoning and action (at appropriate levels of autonomy), including spatio-temporal cognition in real-world environments. This will need fundamental re-thinking of basic scientific methods and will build on emerging inter-disciplinary approaches.

RTD will also address smart spaces consisting of infrastructures (integrating sensors, actuators and processing), intelligent interfaces and robots which proactively support people in their everyday lives in domestic, professional and public environments. The emphasis will be on novel, intuitive, immersive interactions between the environment, objects in the environment, machines and users, individually or in groups.

c) Symbiotic human-machine interaction

Foundational research on symbiotic relations between humans and machines will aim at the design of new interactive technologies based on new theories and models of human cognition and emotion, non-rational decision-making, social behaviour and spatial and temporal perception and processing. RTD will also investigate the influence of such technologies on human behaviour and methods to promote positive co-evolution and co-adaptation of symbiotic systems.

Expected Impact

The overall impact expected is to contribute to an appropriate mix of the following:

- help increase Europe's market share in industrial and service robots to reach one third of market share by 2020, and improve the competitiveness of Europe in manufacturing sector.
- create a substantial upsurge in the involvement of key industry players, including SMEs and mid caps, in EU-level collaborative research, strengthening their links with academia.
- achieve scientific and technical excellence in terms of e.g. improved systems functionality, quality, performance and sustainability and degree of successful integration of such results into real-world scenarios.

- develop innovative concepts and prototypes of co-evolving technologies based on new theories and models and deeper understanding of human behaviour.
- achieve high levels of scientific publication as well as new PhDs and open source software releases or patents.

Funding Schemes

a), b), c): IP, STREP

Indicative budget distribution

IP/STREP: EUR 67 million, of which minimum 52M€ for target a) and b), and minimum 10M€ for target c). Within these constraints, a minimum of 40% of the objective budget to IPs and 25% of the objective budget to STREPS.

Call

FP7-ICT-2013-10

Objective ICT-2013.2.2 Robotics use cases & Accompanying measures

Target Outcomes

The main outcome is to stimulate innovation in robotics research at an EU level, thus accelerating the transition of scientific and technical research results into proof of concept, exploitable technology, prototypes and intellectual / industrial property. The primary focus on developing use-cases which target the emerging robotics service sector will be accompanied by strategic measures in road mapping, networking and outreach.

a) Use-cases in service robots

Projects will test and validate promising robotics applications, in terms of their potential take-up and operational deployment. Potential application areas will include societal challenges (e.g.: food production, maintenance and inspection, healthcare, security[16]) and professional services (e.g.: in agriculture & farming, logistics or cleaning), as well as new industry sectors which have not used robotics so far.

b) Robotics research roadmap coordination and socio-economic aspects

CSAs will develop strategic roadmaps with relevant stakeholders, building on current robotics research networks[17] and supporting the EUROP technology platform in preparing a robotics PPP, as well as supporting academia-industry collaboration. European interests in the relevant standardisation forums will be promoted. Work will also explore the socio-economic drivers and impact of robotics RTD, including market observation, ethical and legal issues and will identify opportunities and prepare the ground for pre-commercial procurement (PcP), including e.g. in robotics

[16] The activities related to security are complementary to the 'Security' Theme of the FP7 Cooperation Programme

[17] E.g. EUROBOTICS, EURON. EUCognition will last beyond 2013 and well into 2014

for search & rescue, public services (e.g.: security[18] and inspection, cleaning, assistance), or intelligent logistics.

c) Robotics networking

CSAs will: establish flexible mechanisms to exchange knowledge and skills via e.g. new educational courses, summer schools or study visits, especially for young post-docs, within and beyond the EU; help identify new users and markets and new research areas through sector-based analysis; establish a strategy towards sustainable international cooperation in robotics, focussing initially on the United States.

d) Dissemination and Outreach

CSAs will: increase the general level of public awareness of robotics through public relations and outreach about Challenge 2, including targeted showcases.

Expected Impact

Use case projects and accompanying measures are all geared towards opening potential new markets in the emerging service robot sector. The actions will aim to achieve:

- Higher use of robotics and stronger levels of participation by EU companies – including those not yet active in EU settings – in industry and user-driven RTD in this domain.
- Successful technology transfer in terms of volume and scale of innovative products and services in the professional service areas described in a) above
- Increased visibility of the programme to the European citizen via traditional and new social media channels.

Funding Schemes

a) STREP

b), c), d) CSA

Topics in b), c) and d) may be covered by one or several CSAs as appropriate.

Indicative budget distribution

- STREP: EUR 20 million
- CSA : EUR 3 million

Call:

- FP7-ICT-2013-10

[18] The activities related to security are complementary to the 'Security' Theme of the FP7 Cooperation Programme

7.3 Challenge 3: Alternative Paths to Components and Systems

Challenge 3 covers nanoelectronics and photonics, the heterogeneous integration of these key enabling technologies with related components and systems, as well as advanced computing and control systems at a higher level. Energy-, resource- and cost efficiency as well as recycling/end of life issues are major drivers across the Challenge. Its overall aims are:

- to reinforce European industrial leadership in these key enabling technologies through miniaturisation, energy-efficiency, performance increase and manufacturability, for information and communication systems and other applications in 2020 and beyond;
- to enable further integration and cross-fertilisation of key enabling technologies towards building energy- and resource-efficient components and systems through the convergence of nanoelectronics, nano-materials, biochemistry, measurement technology and ICT;
- to expand Europe's industrial leadership in embedded and mobile computing systems towards powering the cloud with cost and energy efficient servers, and towards exploring new paradigms for control in systems with mixed criticalities where the embedded world meets the internet world, and systems of autonomous systems with emergent behaviour.
- to promote inter-disciplinary R&I activities by bringing together different research domains and constituencies with the aim of increasing impact and of bridging to Horizon 2020;
- to stimulate the innovation of European industry by well-targeted take-up actions, with special emphasis on SMEs – either as users or as technology suppliers.

In those areas related to the ENIAC[19] and ARTEMIS[20] JTIs, Challenge 3 focuses on research on new paradigms which are applicable across several application domains. Related to Photonics and to the integration of components and systems, work is aligned with the strategic research agendas of Photonics21[21] and EPoSS[22].

Stimulating innovation through take-up

The objectives under this challenge include actions for technology take-up and innovation, which aim at creating an innovation ecosystem where industry is introduced to new technologies and markets. They focus on emerging innovative technologies and processes, which need to be validated and tailored for customer needs before being able to compete on the market. Special emphasis is on strengthening the participation of European SMEs, both on the supply-side and on the demand-side.

[19] http://www.eniac.eu
[20] http://www.artemis-ju.eu
[21] http://www.photonics21.org
[22] http://www.smart-systems-integration.org

Two types of take-up activities are supported at **technology-domain level,** each of which brings together all relevant actors from the use and supply side supported by competence centres:

a) **Assessment experiments** assess new or enhanced equipment, tools, processes, or methodologies, and their use. The objective is to support suppliers, in particular SMEs, in crossing the "valley of death" from research prototypes to successful market adoption (objective 3.3).

b) **Access services** provide fast access to knowledge, training, prototyping, manufacturing, design or engineering services for first users and early adopters, in particular SMEs, through experiments. The objective is to reinforce the competitiveness of users by enabling them to exploit innovative technologies (objectives 3.2, 3.3, and 3.4).

For both types, 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. To better cope with the speed of innovation in ICT, implementation must be flexible and fast. Part of the actions and partnership are to be defined from the outset, while additional experiments or users, may be identified through open calls during the action (max. 50% of the total budget).

To facilitate the emergence of a European **innovation-ecosystem,** a network of innovation multipliers will be established across all take-up projects and disciplines to achieve broader coverage thereby maximising impact and better addressing the needs of SMEs. Tasks include establishing a single innovation portal allowing one-stop-shopping for newcomers; sharing of best practices and experiences; dissemination; and brokering between users and suppliers in light of open calls. The participation of actors traditionally not participating in research projects or programmes is encouraged, e.g. regional innovation clusters, chambers of commerce, societal actors, industrial associations, technology transfer departments of large research labs. This cross-objective action is included under Objective 3.3.

Objective ICT-2013.3.1 Nanoelectronics

This objective addresses overcoming serious barriers, which are currently slowing down the expected evolution of CMOS, including the fundamental limits of devices and materials, system level limits, energy-efficiency, power density issues, design complexity issues, and cost. It is in line with the ITRS roadmap. It complements FET, and the more application driven and closer to market activities carried out under the ENIAC JU. Take-up actions in nanoelectronics, including Europractice-type actions, are addressed under Objective 3.3.

Target Outcomes

a) Integration of advanced nanoelectronics devices and technologies (16nm and below)

- New solutions to boost performance in More Moore. This includes Ge, III-V compound semiconductors, graphene, CNT or nanowires.
- Innovative solutions to boost functionality in More than Moore.

- New switches for Beyond CMOS and beyond silicon, charge-based or non-charge-based with a sufficient level of technological maturity.
- Interconnects and 3D integration at device, chip and wafer level.

b) Advanced nanoelectronics manufacturing processes.

- More Moore IC Manufacturing: efficiency and productivity enhancement
- Manufacturing approaches to Beyond-CMOS and advanced More-than-Moore, and to their integration with nano-CMOS including 3D integration.

c) Design, modelling and simulation for advanced nano-electronics technologies

- Circuit- and system-level modelling and simulation: e.g. quantum and atomic scale effects; electro-thermo- mechanical effects; modelling for new materials, processes and devices.
- Design technologies for "Si complexity" challenges addressing non-ideal scaling of device parasitics and supply/threshold voltages; manufacturing variability; thermal effects; decreased reliability; ageing effects; coupled high-frequency devices and interconnects.
- Innovating with nanoelectronics - designing heterogeneous SOC integration, re-using IP.

d) International Co-operation

One support action to develop a European strategy which addresses the challenges in manufacturing for 450 mm in dialogue with G450C and with the US, Korea, and Taiwan.

Expected impact:

- Secured European **industrial competence** in advanced nanoelectronic technologies, and strengthened European **capacity to manufacture** nanoelectronic products.
- **Improved performance at lower cost**: improvements boosting performance and functionality at all levels (device, circuit, system), and in particular in relation to a few critical parameters which drive integration and miniaturisation such as operating frequency, switching time, throughput, device or circuit complexity;
- **Higher energy efficiency**: reduction of device/circuit/system power consumption through improved energy per operation, efficiency of basic components, and control of leakage currents;
- **Higher levels of integration and miniaturisation**: improvement in component/functions per chip, cost per function, compactness, design productivity exploring new materials, architectures, and design - going beyond just an extension of known practices;
- **Improved structuring**: improvement in coordination of European research priorities and their industrial relevance, exploitation perspectives for Europe in terms of competitiveness and, jobs.

Funding schemes

a) – c): STREP

d): CSA

Indicative budget distribution

EUR 31.5 million for STREPs
EUR 0.5 million for one SA

Call: FP7-ICT-2013-11

Objective ICT-2013.3.2 Photonics

The aim is to advance the state-of-the-art of photonic devices (i.e. components and sub-systems such as transmitters and receivers, lasers and light sources) in application fields where Europe is strong[23] and to develop advanced products with a view to industrialisation. Research actions should demonstrate strong industrial commitment and be driven by user requirements. They should include validation of results for the target applications and address the supply chain as appropriate.

Target Outcomes

a) Application-specific photonic devices

Focus is on new device technologies and architectures, including as appropriate the related materials, processing and device integration issues. Research actions should address:

i) Optical data communications[24]: Photonic devices enabling future networks with increased flexibility, bandwidth, energy efficiency and cost effectiveness. Specific emphasis is on devices for fully converged optical networks allowing several bitrates, modulation formats and/or radio standards on the same infrastructure; and on devices for flexible, dynamic optical networks coping with varying traffic demands, possibly including quality of service management at the optical layer. Device manufacturers, suppliers of communication equipment and network operators should be involved.

ii) Solid-State Lighting (SSL):
   - Large-area, large uniformity OLEDs for general lighting applications with increased lifetime and brightness enabling an effective market introduction.
   - High performance, reliable and low-cost SSL lamps and modules with added intelligence to provide optimal lighting systems.

   Research actions should also address end-of-life/disposal/recyclability issues and involve SSL manufacturers and/or suppliers.

iii) Lasers for industrial processing: Short and ultra-short (below 10 ps) pulsed laser sources with average output power above 200 W, high conversion efficiency and repetition rate for high speed surface processing or cutting at micro/nanometre precision. Activities may include the necessary optical elements for beam

[23] Due to synergies, biophotonics is addressed together with micro-nano-bio systems under objective 3.3

[24] Photonic devices for communication networks support the overall vision and requirements of Objective 1.1 "Future networks"

delivery, guiding and shaping. Laser device and equipment manufacturers and end users should be involved.

b) Cross-cutting technologies for a wide range of applications

Focus is on technologies for automated, low-cost volume manufacturing of highly integrated, complex photonic devices:

i) Integration technologies for photonic integrated circuits offering enhanced capabilities (e.g. integration density, functionality, performance) through the use of innovative materials, nanophotonics or other new functional structures. This may include also heterogeneous integration based on wafer processing technologies. Photonic device manufacturers should be involved.

ii) Cost-effective assembly (including in particular hybrid optical integration) and packaging technology. Actions should also address the related thermal, electrical and mechanical challenges and fabrication technology. Photonic device manufacturers and fabrication tool suppliers should be involved.

c) Technology take-up and Innovation Support

i) Access services enabling the wider adoption and deployment of photonic technologies in innovative products, in particular by SMEs and driven by their business needs[25]. Proposers are referred to the description of take-up actions in the introduction to this Challenge.

ii) Coordination and support actions fostering innovation in SSL[26]: a) Bringing together actors along the value chain to promote innovative design and new business models through open innovation. b) Promoting the cooperation of lighting industry and end users (e.g. architects, designers, installers) to accelerate the wide deployment of SSL. c) Promoting SSL and analysing its effects in applications where there are benefits for people's health and well-being. d) Addressing scarcity of materials, use of hazardous materials and recyclability & disposability of SSL products.

iii) Coordination and support actions: a) Cooperation of photonic clusters and national technology platforms to stimulate the innovation potential of SMEs, based on business cases demonstrating a clear potential for sales and employment growth. b) Raising the interest of European citizens, young people and entrepreneurs in photonics. Actions should be driven by the relevant stakeholders.

d) ERANET-plus action

A joint call for proposals on a photonics topic of strategic interest, to be funded through an ERANET-Plus action between national and regional grant programmes.

Expected Impact

- Secured European **industrial leadership** in photonic applications and technologies, and safeguarded European capacity to manufacture innovative products.
- Broader and faster **take-up** of photonics in innovative products, in particular by SMEs.

[25] This action should cooperate with others in key enabling technologies in Challenge 3 – see Objective 3.3 b) ii)

[26] These actions are in line with the Green Paper "Lighting the Future", COM(2011) 889 final.

- Accelerated innovation and deployment of SSL;
- Improved **innovation** effectiveness of photonics clusters in particular towards SMEs;
- Increased **awareness and interest** in photonics amongst the general public, youngsters and entrepreneurs.
- Closer cooperation and greater alignment between the participating regional, national and EU-wide research programmes through an ERANET+ action.

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Funding schemes

a), b): STREP; c) (i) IP; c) (ii),(iii) CSA; d) ERANET-Plus

Indicative budget distribution

IP and STREP: EUR 50 million, maximum EUR 8 million for IP.
CSA: EUR 7 million
ERANET-Plus: EUR 4 million (any remaining funds will be transferred to target outcomes a) and b)).

Call:
FP7-ICT-2013-11

Objective ICT-2013.3.3 Heterogeneous Integration and take-up of Key Enabling Technologies for Components and Systems

Building energy and resource efficient systems for competitive, highly performing products, applications and services requires further integration of key enabling technologies, components and subsystems. It also needs a functioning ecosystem of actors, in which the research, design, and take-up of innovative technologies is stimulated. Strong industrial participation along the value chain is a must as well as focusing not only on research but also on deployment driven by concrete business cases. End-of-life/disposal and recyclability issues should be addressed as appropriate.

Target outcomes

a) Integrating heterogeneous technologies

This target outcome addresses the integration of Key Enabling Technologies for Components and Systems across multiple research fields (nano-systems. organic electronics, micro-nano-bio systems, bio-photonics), materials (organic and inorganic) and functions (sensing, actuating, communicating, processing, energy harvesting) with emphasis given to supporting the semiconductor heterogeneous integration (hardware, software, photonics, MEMs). The major challenges include mastering interactions and underlying complexity; design, prototyping, manufacturability and recyclability; biocompatibility, safety, security, reliability, miniaturisation; low energy use and resource-efficiency. Focus is on:

i) **Miniaturised smart systems** based on the integration of different key enabling technologies and functions, which have the ability to sense, describe, predict, decide, and to interact with their environment. Being standalone, networked, or embedded into larger systems, smart distributed environments

or smart spaces; they use highly sophisticated interfaces between systems and users and can address and identify each other.

ii) **Hybrid integration of organic electronics and micro/nano electronics** on flexible, large area and/or stretchable substrates, combining different materials, components and subsystems, creating opportunities for application driven integrated systems. Focus is on interfacing different types of material, different types of components and subsystems, different design styles or production processes and dealing with process variations, multi-layers, packaging and encapsulation.

iii) **Further development and validation in real settings of micro-nano-bio and bio-photonics systems** addressing key societal challenges, in particular in the health (for early or fast diagnosis and monitoring or surgery) and the food sectors (quality and safety), with involvement of relevant industrial stakeholders and driven by users.

b) Technology take-up and innovation support

Technology take-up is stimulated by a set of supply- and demand-side measures, supported by a network of innovation multipliers. Proposers are referred to the general description of take-up actions in the introduction to this Challenge.

(i) Assessment experiments in nano-electronics and smart systems for technology suppliers and integrators to evaluate their novel equipment, processes and building blocks with potential customers.

(ii) Access services for new users of nano-electronics design and smart systems spanning the full innovation cycle and ranging from consultation, assistance in conception and design, access to tools and equipment, and training; to feasibility studies, prototyping, pilot runs, and advanced flexible manufacturing – including Europractice-type actions.

(iii) A **network of innovation multipliers** established across all take-up projects of this Challenge taking an interdisciplinary approach to achieve broader technological, applications, innovation, and regional coverage thereby maximising impact and better addressing the needs of SMEs.

(iv) Supporting the development of an **eco-system for smart systems integration** in Europe, including activities such as co-ordinating regional clusters; developing training material and services; international cooperation related to road-mapping, manufacturing and standardisation; and reaching out to attract the interest of citizens, young talents and young entrepreneurs.

(v) Cooperation of scientists, technology developers and providers, and end users for accelerating the deployment of bio-photonics and micro-nano-bio solutions.

(vi) International co-operation with Africa on roadmapping and constituency building towards the development and deployment of point-of-care diagnosis and treatment of human and animal diseases in rural areas.

Expected impact

- Increased **industrial competitiveness**, in particular of SMEs, through strengthened capabilities in systems and innovative products and services.
- **Improved system characteristics**: higher performance and functionality; physical features; economics/cost; environmental, in the context of the final application.
- More **autonomous** smart systems which are aware of and adaptive to their environment, ubiquitously connected, with cognitive abilities.
- Improvements in **innovation capacity and competitiveness** of European industry measured through indicators such as an increased number of SMEs and other newcomers taking up novel technologies.

Funding schemes

a): IP and STREP;
b) (i), (ii): IP;
b) (iii), (iv), (v), (vi): CSA.

Indicative budget distribution

- IP and STREP: EUR 61 million with a minimum of 25% to IPs and 25% to STREP. It is expected that a minimum of one IP each for a)(i), a)(ii), b)(i), and b(ii) is supported;
- CSA: EUR 3 million.

Call:

FP7-ICT-2013-10

Objective ICT-2013.3.4 Advanced computing, embedded and control systems

Driven by use cases addressing the grand societal challenges in Europe, the objective is to combine and expand Europe's industrial strengths in embedded and mobile computing and in control of networked embedded systems along two dimensions: (1) designing the next generation of cost- and energy-efficient computing systems to power the future "cloud", and (2) expanding the functionality of embedded systems architectures towards controlling their behaviour within a system of systems (SoS) and towards seamlessly integrating safety- and time-critical with non-critical functionalities sharing common computing resources and evolving from the convergence of the embedded and the internet worlds.

Addressing novel paradigms applicable across different applications, work is complementary to what is addressed under the Joint Undertaking ARTEMIS. While computing is addressed under several challenges, work in this objective focuses on computing systems for embedded systems and for data centres, and generic technologies and tools applicable across computing segments. Thereby it is complementary to the work under Objective 1.2 related to computing architectures for future cloud services, and Objective 9.10 related to exa-scale computing, and Objective 6.2 focusing on energy and environmental performance of data centres.

Target outcomes:

a) Next generation of energy- and cost-efficient servers for data-centres

System design addressing the full server eco-system: processor, chip, board, rack, storage, network, data-centre, system software, applications. Research challenges include: taming the data deluge; holistic integration of hardware and software in future servers including 3D-stacked server chips or optical interconnects; operation and load-balancing over a collection of physically distributed sites. Being highly ambitious with strong industrial participation and a clear path to commercialisation, projects should deliver a full prototype and validate it under real-life workloads from various application areas including clouds.

b) Control in embedded systems with mixed criticalities sharing computing resources

Innovative solutions capable to manage design, modelling, verification, validation and certification of networked complex systems featuring an extended functionality through seamless integration of mixed criticalities. Focus is on data, energy and system integrity in addition to security, safety and performance when exploiting multi-core chips or heterogeneous distributed systems. An integrated approach is expected on the one hand addressing fundamentally new perspectives of control and computing and on the other hand building on existing or emerging approaches for standardisation and certification. Work should encompass prototyping and validation of the developed methods and architectures in minimum two application domains.

c) Exploiting synergies and strengths between computing segments

Bringing together teams from embedded computing and high-performance computing to jointly address challenges that are common in these two areas and are magnified by the ubiquity of many-cores and heterogeneity across the whole computing spectrum. Examples of challenges include: low-power and energy efficiency, performance analysis, dependability, time-criticality, hybrid programming, parallelisation, compilation, debugging, co-design, customisation, virtualisation, reconfigurability. Projects should focus on one specific and credible common challenge and prove a real cross-fertilisation of expertise.

d) From analysing to controlling behaviour of Systems of Systems (SoS)

Analysing and modelling SoS with possibly emergent behaviour and their control, and validating new SoS engineering approaches in industry-driven case studies of real applications, such as distributed energy systems and grids, multi-site industrial production, or automated transportation. Generic aspects of the approaches should be stressed, basic concepts elaborated and open research issues identified.

e) Access to novel computing technologies for industry

Access services for technology transfer from academia to industry in computing including activities to strengthen links to venture capital and promoting entrepreneurship. The aim is to facilitate the transformation of research prototypes to products and services and to introduce lead customers to technologies and tools for multi-core and hybrid systems across the computing spectrum. Proposers are referred to the general description of take-up actions in the introduction to this Challenge.

f) Constituency building and road-mapping

Co-ordinating SoS-related projects towards deriving common concepts and research challenges and building constituencies for a European R&I agenda on SoS. Building constituency and developing a R&I agenda towards radical improvements in software development for advanced computing systems.

Expected Impacts

- Reinforced **competitiveness** of European technology suppliers across the computing spectrum; in particular for data-centre servers with two orders of magnitude improvements in total cost of ownership and energy efficiency.
- Reinforced European **technological leadership and industrial competitiveness** in the design, operations, and control of embedded systems with mixed criticalities and SoS.
- **Improved systems characteristics:** energy/cost efficiency, controlling dynamic and emergent behaviour, managing different criticality levels, security, safety, degree of integration in generic architectures and platforms.
- Increased **take-up** of European computing technologies in industry, in particular SMEs.
- More **efficient application software development** by breaking the dependence on dual expertise for application development and customisation for advanced computing systems.

Funding schemes:

a), b): IP – it is expected that a minimum of one IP is supported for each target outcome.
c), d): STREP
e), f): CSA

Indicative budget distribution

- IPs and STREPs: EUR 69 million with a minimum of 40% to IPs and 30% to STREPs
- CSAs: EUR 3.5 million

Calls:

FP7-ICT-2013-10

7.4 Challenge 4: Technologies for Digital Content and Languages

Digital content remains the material basis for a multilingual knowledge based society. However the explosive growth of digital content (both structured and unstructured) makes it important for European citizens and organisations to learn to manage it effectively and to extract from it maximum value in terms of private or public, personal or organisational decision making, planning and management.

The focus of Challenge 4 is on:

- exploring and testing new approaches, methods and techniques to extract, interpret and exploit information from unstructured multilingual and/or multimedia sources, yielding actionable knowledge;
- developing and testing in realistic operating conditions new algorithms and software frameworks to analyse, interact and visualize extremely large volumes of data in real time;
- supporting Small and Medium Enterprises (SMEs) developing innovative applications in structured and unstructured digital content management and, particularly, in the reuse of open data.

Support actions for road-mapping are also envisaged to prepare the constituencies for bringing together research and innovation aspects in Horizon 2020.

Objective ICT-2013.4.1 Content analytics and language technologies

Target Outcomes

Due to the combined effect of globalisation and European integration, there is a growing need for effective solutions that support multilingual business and inter-personal communication, and enable people accessing digital services in Europe's many languages.

a) Cross-media content analytics

Innovative methods and tools for mining unstructured information embedded in text, speech, audio and video for the purposes of context-aware interpretation, correlation, aggregation and summarisation, turning information into usable understanding and actionable knowledge. Special emphasis is placed on social and collective intelligence from multilingual sources. Projects shall achieve broad coverage with efficient semantic interpretation. Of specific interest is the ability to capture sentiment and represent concepts and events, identify relations and similarities, interpreting time and space, within and across individual media, thus increasing our ability to detect and exploit otherwise hidden meaning across a range of applications.

b) High-quality machine translation

Advancing machine translation (MT) by pushing the research frontier and bridging relevant disciplines. Emphasis is placed on high-performance and easily configurable MT yielding high-quality translations suitable for publication with little or no human intervention. Expected innovations include effective hybridization of existing and emerging solutions, the ability to autonomously learn from use and human feedback, and to adapt to new situations with high portability and scalability. Work should cope with everyday language and with the need to compile translation resources

dynamically from the web or enterprise repositories. Projects are expected to demonstrate the successful integration of MT within larger systems.

c) Natural spoken and multimodal interaction

Speech-enabled interfaces based upon multimodal verbal and non-verbal communication. Projects shall address autonomous human-like social agents that can handle conversational speech; learn from interaction and react proactively to new communicative situations; recognize and generate social cues. Systems should be able to cope with spontaneous dialogue and exhibit adequate communicative, affective and cognitive (e.g. question answering) capabilities in relation to the domain/task under consideration and the needs and abilities of the user. Technologies should be designed to match multiple delivery platforms, from virtual assistants e.g. for customer service, through smartphones to games.

For each of the target outcomes (a), (b) and (c), the call invites

(i) a few ambitious R&D projects investigating new approaches and research avenues well beyond the current state of the art; projects will be centred on cross-disciplinary approaches and partnerships, and address multimedia content and multimodal interaction; they will encompass everyday language as found in e.g. consumer-generated content, cover multiple languages, and cater for written and/or spoken language as appropriate; technologies shall be adaptive, cope with massive volumes of content, and have a clear potential to support real-life processes;

(ii) one broad-based support action designed to establish a unifying roadmap in each of the domains under consideration, developing a compelling research and innovation agenda until and beyond 2020, centred on close collaboration between research centres and commercial players (particularly SMEs), and based upon agreed reference architectures, common resources (standards, software, data), and shared development and evaluation facilities.

d) Developing joint plans and services

The call invites one support action intended to design and lay the foundations of a scalable platform for the joint development/enhancement and hosting of (multi-) language data sets, processing tools and basic services. The action will build upon and extend existing and emerging collaborative infrastructures. The aim is to create over time a comprehensive online repository of reusable modules and components, in the broadest possible range of EU languages, underpinning research, technology transfer and industrial development efforts.

Expected Impact

- Strong participation of private-sector players, including SMEs, well above the FP7 ICT average.
- A unifying research roadmap aggregating the vision of more than 200 centres; a common innovation agenda based on the business strategy of more than 100 companies.
- Technological leadership and increased innovation capacity as a result of widely accepted roadmaps encompassing presently fragmented communities.
- A European open-source MT system becomes the most widely adopted worldwide; post-edited MT becomes the standard mode of translation within 5 years, increasing significantly (> 25%) the efficiency of human translation.

Funding Schemes

a), b), c): STREP, CSA

d): CSA

Indicative budget distribution

- STREP: EUR 21 million
- CSA: EUR 6 million

Call:

FP7-ICT-2013-10

Objective ICT-2013.4.2 Scalable data analytics

Target Outcomes

Tools and skills to deploy and manage robust and high performance data analytics processes over extremely large amounts of data. User-driven research with ideally public and methodologically sound quantitative performance evaluation criteria is a strict requirement. As a bridge to activities to be pursued under the Horizon 2020 program, two distinct types inter-disciplinary road-mapping activities can be supported: a roadmap for networking and hardware optimisation in support of next generation Big Data management solutions and a second roadmap for the social, legal, economic study of externalities in the (re)use and linking of data.

a) Scalable algorithms, software frameworks, visualization

- Novel algorithms, software infrastructures and methodologies for real time interaction, visualization, analytics and decision support applications over extremely large volumes of data (both structured and unstructured).
- Data types that are currently experiencing very high growth rates are of special interest including (but not limited to) 3D, biology, genomics, financial, geospatial, social networks, transportation, logistics, telecommunications, engineering, digital content industries and any type of data stream.
- Non-traditional database and storage solutions and data integrity protection tools are solicited for the robust integration and interpretation of heterogeneous data sources such as static and streaming data.

The availability of extremely large and realistically complex data sets and/or streams is a strict requirement for participation as is the availability of appropriate populations of experimental subjects for human factors testing in the domain of usability and effectiveness. Software implementations must be rigorously tested in the environment of professional organisations with a clear stake in the solution and a clear path to deploying it, if effective.

b) Big Data networking and hardware optimisations roadmap

- One inter-disciplinary CSA to bring hardware and networking experts together with designers of algorithms and software frameworks and Big Data practitioners. This will define a shared European vision for future Horizon 2020 R&D activities

on the design of dedicated processing or networking hardware for optimising the performance of Big Data analytics, including programming frameworks that software developers without specialised hardware knowledge could use easily.

The roadmap will chart advances in scalability and run-time performance as well as energy efficiency and sound methods for analysing and optimising capital versus operating costs of Big Data operations. The CSA will also be responsible for disseminating the roadmap across relevant constituencies and establishing cross-disciplinary communities with a shared understanding of concrete problems worth investigating in future programmes.

c) Societal externalities of Big Data roadmap

- One CSA to produce a roadmap for future activities on the sharing and reuse of large and linked datasets including those obtained by data harvesting across heterogeneous data sources. The CSA should bring together social science scholars, open data activists, statisticians, computer scientists and other relevant parties in order to design a European data environment capable of amplifying positive externalities and reducing negative externalities.
- Positive externalities to be addressed include (but are not limited to) economic and legal models for efficient data markets.
- Negative externalities include (but are not limited to) the privacy risks that come from the re-identification of personal information, particularly as a consequence of more and more data sets becoming available and being linked to one another. Ethical and moral considerations should also be taken into account.
- The CSA will also be responsible for disseminating the content of the roadmap across the relevant constituencies and establishing cross-disciplinary communities with a shared understanding of concrete problems worth investigating in future programmes.

Expected Impact

- Advanced querying and analytics applications with sub-second response times over distributed information resources consisting of trillions of records.
- Ability to query or detect in real time complex events against dynamic feeds of millions of data streams generating hundreds of thousands of events per seconds.
- Visualization systems enabling exploratory analysis and manipulation without any perceptible delay on data resources containing billions of items.
- Enabling European suppliers to reach by 2020 a share of the Big Data market compatible with the size of our economy (30% of world market).

Funding Schemes

a): IP, STREP

b), c): CSA

Indicative budget distribution

- IP/STREP: EUR 26 million

- CSA: EUR 5 million

Call:

FP7-ICT-2013-11

Objective ICT-2013.4.3 SME initiative on analytics

Target Outcomes

Helping European Small and Medium Enterprises acquire the competences and resources they need to develop innovative content and data analytics services. Development of services based on the use of available data, particularly from public bodies, is specifically required for theme a) and encouraged for theme c).

a) Integrated Open Data Incubator

An Integrated Project to establish an environment and calling for efficient, small scale development of services of commercial interest based on the use of European open data by Small and Medium Enterprises (SMEs). The IP should:

- devote most of its resources to publish and manage regularly scheduled and well advertised calls for SMEs to submit mini-proposals to be funded for a period between six and twelve months.
- create a computing infrastructure where the winning mini-proposals will find accurate, up-to-date and (when useful and feasible) linked versions of the data they need for their services and, if they so wish, deploy the experimental version of their services.
- establish a mechanism for connecting open data demand and supply by systematically contacting European public bodies for their open data and assisting them in the efficient and sustainable publication of such data, if needed with targeted engagements.
- solicit open data reuse ideas from the general public and conduct a European wide open data reuse information campaign.
- The IP will finally create a process to connect the most successful SMEs with sources of funding and business networks.

b) Easing transfer and take-up of language technologies

Language technologies are often deployed within products and services relating to web or enterprise intelligence, including text and audio mining, social media analytics and sentiment analysis, enterprise search and content management, online and cloud based translation, etc.

This action calls for focused user- and market-oriented projects in any of the above areas, with the overall goal of bringing language technologies closer to commercial maturity through an "industrialisation" process including but not limited to: (i) engineering of promising but commercially untested technologies, e.g. in terms of performance, robustness and coverage; (ii) integration within existing or upcoming products and services; (iii) first-use experimentation and validation in a clearly identified application domain; (iv) in-depth assessment along technical, user related

and economic dimensions; (v) identification of possible exploitation paths and viable business models, and of suitable sources of funding.

Consortia shall include players from the demand and supply sides, in particular SMEs, who have a clear interest in the exploitation of results.

c) Software components and intuitive end user applications based on reuse of open data

Development of software components supporting the whole life cycle of reuse of multilingual open data, particularly from public bodies. This includes:

- usable data publications methodologies and tools, adapted to the operating conditions of typical public bodies and rigorously tested for traceability, usability and sustainability in a public body environment;
- methods and tools for linking open data sets produced by public bodies;
- methods and tools for optimising open data applications based on public demand both in terms of content and in terms of functionalities/usability;
- cross platform development tools for delivering intuitive and responsive open data applications on multimodal devices and environments such as mobile, tablets as well as desktop.

Expected Impact

- A European open-source MT system becomes the most widely adopted worldwide; post-edited MT becomes the standard mode of translation within 5 years, increasing significantly (> 25%) the efficiency of human translation.
- Dozens of data application software components, used by hundreds of developers.
- Hundreds of applications, reusing billions of open data records, used by millions of end users around the EU
- Wider creation of valuable applications by integrating available public data with the users' own data, including contextual information available from mobile devices.

Funding Schemes

a): IP

b), c): STREP

Indicative budget distribution

- IP: EUR 5 million,
- STREP: EUR 15 million

Call:

FP7-ICT-2013-SME-DCA

7.5 Challenge 5: ICT for Health, Ageing Well, Inclusion and Governance

Challenge 5 builds on the previous research activities on health, ageing, inclusion, and governance. Nevertheless, it adapts to support new policy developments such as the Digital Agenda for Europe, the European Innovation Partnership on Active and Healthy Ageing and Horizon 2020. It adapts also to better support innovation and activities closer to the market like pre-commercial procurement actions and platforms supporting social innovation.

The focus will be on development of solutions that empower the individual, in a social context, to improve and manage personal life as a citizen, elderly, patient, consumer, civil servant or worker. Special emphasis will be given to productivity gains, customer satisfaction, and provision of new capabilities of public interest, in particular harnessing the "network effect" typical of ICT networks.

The "ICT for Health activities" will address the "health management" continuum from lifestyle to disease management, including disease prevention and management of co-morbidities. This will be complemented by the research in the computational modelling of human physiology paving the way for the next generation of healthcare services to enable patient empowerment and safer, more personalised care.

The "ICT for Ageing and Independent Living" activities will focus on empowering people with age related dependencies or disabilities to live independently, delay/avoid institutionalisation and staying active as much and as long as possible. Solutions may combine health, social care and smart living systems and 'age-friendly' environments. This will be implemented jointly with ICT for Health activities in direct support of activities defined under the EIP Active and Healthy Ageing. Social and service robotics and early prediction will not be reopened in this call.

"ICT for smart and personalised inclusion", will focus on the development of accessible solutions for personalised interfaces to smart environments and innovative services for all users including those at risk of exclusion (disability, low digital literacy/e-skills). These activities will be complemented by coordination activities on road-mapping on advanced human interactions for accessibility, market strategy for eInclusion services and harmonisation of accessibility strategies.

Research in "ICT for Governance and Policy Modelling" will address collaborative governance supported by ICT tools empowering citizen and increasing transparency in decision making. In particular, research will address the social and economic exclusion of the younger generation, policy modelling for productivity gains and innovation in public service provision and for identifying emerging societal trends.

Finally, a new activity will support collaborative, collective awareness ICT platforms for grassroots social innovation towards a more sustainable future. The scheme will support application specific platforms enabling experiments and prototypes of decentralised grassroots social innovation for collective actions and improvement of societal aspects of human activities as well as related scientific and coordination issues.

Objective ICT-2013.5.1 Personalised health, active ageing, and independent living

This activity is a continuation of the three previous Objectives on "Personal Health Systems", "Patient Guidance Services" and "ICT for Ageing and wellbeing" in the ICT WP 2011-12. It bridges to Horizon 2020 and supports directly the European Innovation Partnership on Active and Healthy Ageing.

Target Outcomes

(a) Personalised Guidance Services for lifestyle management and disease prevention. The aim is the development of personalised services, which enable individuals, from the younger to the elder population, to become **co-producers** of their health and maintain good health status. This will include: (i) a "virtual individual" model, which comprises the personal characteristics of an individual (e.g. personal profile, preconditions, risk factors, unhealthy behaviours, preferences, physical activity, sleep, mental status etc.); (ii) advanced sensors to acquire data on lifestyle aspects, behaviour and surrounding environment; (iii) intelligent systems for recognition of behavioural trends and prediction or early detection of health risks on the basis of heterogeneous data, including data acquired by sensors and individual self assessment; (iv) a supportive environment to engineer awareness about healthy behaviours, offer personalised guidance and provide support to behavioural change; (v) development of a new ecosystem of stakeholders, engaging also actors such as fitness, food and lighting industry, schools, health insurance companies, policy makers and media; (vi) innovation in organisational models and business models for ICT-enabled disease prevention.

(b) Personalised Guidance Services for management of co-morbidities and integrated care. The aim is the development and small-scale validation of personalised services and care programmes, which engage patients as well as their relatives, as active members of the care team, enhance collaboration among carers and promote seamless continuity of care across different care settings. The focus is on patients who suffer from multiple chronic conditions and can benefit from integrated care approaches (i.e. integration between primary, secondary, home and self care). Solutions will encompass: (i) wearable, portable, mobile or web-based systems for monitoring of patient status and activity, therapy compliance or treatment at the point of need; (ii) auto-adaptive and self-calibrating systems that take into account the acquisition of physiological data in non-clinically controlled environments and the variability in the population, to help select and continuously adapt appropriate services to patients; (iii) decision support systems for professionals and patients, as well as patient guidance services, which build on multimodal data fusion (involving e.g. physiological, environmental, emotional and genetic data), data and pattern analysis, and modelling and predictive algorithms of patient health status; (iv) stratification of patients to care programmes and personalisation of such programmes to specific characteristics of patients; (v) innovation in care pathways, organisational models and business models.

(c) Personalised Services for Independent Living and Active Ageing, for empowering people with age related dependencies to live independently for longer. The target is to develop novel prototypes of systemic solutions compensating for prevailing age-related physical and cognitive impairments leading to a significant prolongation of functional capacity, delay in institutionalisation, increased autonomy and participation in society. Proposals will identify and justify selection of key services with high impact such as

activities of daily living, safety, mobility, social inclusion with seamless support in and outside the home, and will build on progress in enabling ICT combined with behavioural and social science. The work should target elderly users and their carers and go clearly beyond state of the art in terms of increasing system efficiency (e.g. easy personalisation and adaptation to specific needs and preferences, with efficient data and context sharing between different required services and artefacts), improving reliability (e.g. handling multi-user identification, auto configuration and calibration systems) and easy end-user acceptance (e.g. by personalised high usability user interactions and unobtrusive sensing).

Each project aiming at target outcomes a), b) or c), shall focus on only one of these target outcomes. However, all projects in target outcomes a), b) and c) shall meet the following requirements: projects will address high risk and multi-disciplinary research, integrating and developing further, where necessary, safe hardware or software technologies; projects shall ensure sufficient user participation, realistic implementation environments and involvement of representatives of care authorities, to support the validation of the developed solutions and adapted organisational models.

Validation will aim to demonstrate, with quantitative indicators, the proof of concept, quality of life and care efficiency gains and, if possible, cost effectiveness of the proposed solution. Appropriate privacy and ethical safeguards should be included. The use and further development of existing open platforms and open architectures is required, to facilitate multiple types of services on interoperable infrastructure. Projects will also address technical and semantic interoperability issues concerning devices and heterogeneous sources of personal data related to health and wellbeing.

(d) Pre-commercial Procurement Actions (PCP). d1) Development of personalised care programmes for effective management of co-morbid patients, implemented with the use of ICT. d2) Development of mobile eHealth services to empower patients and enable patient-centric care, using mobile devices and converging software platforms. Examples include support to chronic disease management, medication intake, mental care, etc. The solutions will include patient-specific medical information, decision support systems and medical device functions. Aspects related to ethics, privacy, safety, risk management and regulatory developments of medical device software shall be conceptualised.

The solutions developed in d1) and d2 shall also explore new approaches in health service redesign, including care pathways, organisational models and business models. Use of open standards and open platforms is encouraged. PCP shall be implemented according to the conditions outlined in Objective 11.1 and Appendix 6.

(e) Coordination and Support Actions. e1) Community building on procurement approaches. To develop a stakeholder ecosystem and a core communications platform interconnecting in particular public procurers from Member States and Associated countries responsible for defining the acquisition strategies for innovative ICT solutions in eHealth, Active Ageing and Independent Living. Focus on sharing and disseminating evidence on procurement practices from European projects, in particular promotion of the risk benefit sharing aspects of and identifying opportunities for the pre-commercial procurement instrument and forward looking procurement strategies.

e2) Communications activities: To network all the eHealth, Active Ageing and Independent Living projects in FP7 and CIP, in order to co-ordinate their communication actions, exploit synergies with existing information services and achieve greater visibility to the general public. e3) IT skills for healthcare workforce in the EU and USA: To promote the development of renewed educational material and programmes in the EU and USA, with the aim of improving the IT skills of healthcare workers and facilitating the implementation of eHealth systems in practice. e4) Interoperability of patient summary between EU and US: To compare specifications of EU and US patient summaries with the aim of developing and testing common and consistent specifications and systems allowing the interoperability of electronic health records across the Atlantic. e5) Interoperability: To explore new ideas to accelerate or improve the international standardisation in the domain of eHealth and to propose a realistic roadmap to implement the recommended measures, taking into account the importance to have a convergent EU-US approach. Consideration to be given, among others, to ways to ensure convergence of health data structure models into one single international standard, and the possibility to establish a "universal exchange language" that allows data to be shared and communicated among diverse EHRs and other applications.

Expected Impact

Each proposal will present quantitative indicators or measures of success, to quantify potential impact along the points listed below for the target outcome concerned.

For target outcome a) only:

- Strengthened evidence of the impact of healthy behaviours on health and well-being.
- Strengthened evidence on the impact of disease prevention on health and expenditure.
- Contribution to a more sustainable European healthcare system through reduction of avoidable disease burden.
- Validated programmes and good practices for health promotion and disease prevention.
- Business ecosystem and new business models for promotion and co-production of health.

For target outcome b) only:

- Improved interaction between patients, their relatives and carers, facilitating more active participation of patients and relatives in care processes.
- Improved cooperation between the providers of health, social and informal care.
- Strengthened evidence base on health outcomes, quality of life, care efficiency gains and economic benefits from the use of ICT in new care models.
- Reinforced medical knowledge with respect to efficient management of co-morbidities.
- Increased confidence in decision support systems for disease/patient management.

- Involvement of care authorities in development of personalised care solutions, with increased commitment in the deployment of innovative services after the R&D phase.
- Increased level of education and acceptance by patients and care givers of ICT solutions for personalised care.

For target outcomes b) and c):

- Reduced admissions and days spent in care institutions, improved disease management and treatment at the point of need, actual improvements in the daily activities of older persons through the effective use of ICT and the better coordination of care processes.
- Increased degree of interoperability and standardisation in the developed solutions, with secure, seamless communication of data related to health and wellbeing among all involved parties, including patients, older persons and carers.
- Strengthened European industrial position in eHealth and independent living products and services by creating new business areas and relevant standardisation efforts.

For target outcome c) only:

- Increased personal independence, prolonging active participation in society and integrated care processes for the ageing population.
- Reinforced European academic and industrial knowledge base and excellence in multi-disciplinary research on ICT for Independent Living and Active Ageing.

For target outcome d) only:

- Improved patient safety and services for patients and health professionals, developed and validated against public sector needs for management of co-morbidities.
- Improved patient safety and chronic disease management, through advanced mobile medical applications that process patient-specific information for medical decisions.

For target outcome e) only:

- Enhanced awareness and enlarged stakeholder community on innovative procurement.
- Enhanced visibility and awareness of the results of EU projects in eHealth, Active Ageing and Independent Living.
- New educational material and programmes for IT-skilled workforce in healthcare.
- Improved international interoperability of eHealth Systems in the US and in Europe.
- Accelerated establishment of interoperability standards in eHealth and of secure, seamless communication of health related data.

Funding Schemes

a-c): IP/STREP; d): CP-CSA; e): CSA

Indicative budget distribution

- IP/STREP: EUR 48.3 million, with the objective to support at least one IP in a), at least one IP in b) and at least one IP in c)

- CP-CSA: EUR 8 million, with the objective to support up to one CP-CSA for d1) and up to two for d2) (maximum 30% of the CP-CSA budget for the CSA part)

- CSA: EUR 1.7 million. For each topic, up to one CSA will be selected with maximum duration of 24 months and maximum EC funding of EUR 500.000 for e1), EUR 400.000 for e2), EUR 200.000 for e3), EUR 200.000 for e4) and EUR 400.000 for e5).

Call:

FP7-ICT-2013-10

Objective ICT-2013.5.2 Virtual Physiological Human

This objective focuses both on consolidation of the VPH effort started in previous work programmes and on bridging towards Horizon 2020. In consolidating the VPH results, a particular focus will be put on the clinical and personal use of the VPH technologies. The preparation of future research activities are also expected through road mapping.

Target outcomes

a) **Clinical proof of concept of patient specific computer based models.** The current VPH research is based on the development of ICT technologies supporting multi-scale modelling and simulation of human organs or systems, aggregating information from multiple biological levels. The clinical objectives in using patient specific computer based models aim at early diagnosis, prediction of disease behaviour and evolution and treatments outcomes. The target is to re-enforce these clinical objectives through further ICT development for a translation and deployment of VPH models into the clinical environment. The work should target the development and integration of software technologies and human-computer interaction techniques into decision support and treatment planning system based on patient specific models of organs or diseases to be directly used by the healthcare professionals. The work focuses on small scale clinical as well as pre-clinical validation/trials demonstrating and providing clinical evidence of the benefits of the use of computer based models.

b) **Personal Health Forecasting** for personalised health status monitoring and prediction. The Digital Patient is a digital representation of the integration of multi-scale computer based models of several organs, systems or diseases. The personal health forecasting will make use of the Digital Patient based on existing representations of multiple organs or systems and will provide to the citizen the next generation welfare services. Projects should address the development and integration of decision support system based on Digital Patient, associated with on-line service to allow for prediction of the evolution of patient health. The citizen will have access to on-line services based on VPH models processing

constantly the patient specific data collected by personal health systems and experience them in real time. The work focuses on demonstrators/pilots for personalised well being, monitoring and prediction of chronic conditions based on predictive models. It could also be applicable to the lifestyle management, wellbeing and disease prevention. Research may also engage in predictive data mining from sensor data, and self-reported health and activity assessment and other potentially heterogeneous data sources to discover risks to people (for example with chronic illnesses) that are not disease specific.

c) **One Coordination and Support Action** to develop an RTD roadmap preparing the ground for **in-silico clinical trials.** In-silico clinical trials aims at using computer based models to simulate how patients cohorts would react to new treatment, new drugs. The different impacts of these new technologies and approaches should be explored. **The work focuses** on roadmap to research and develop methodology to define the role and impact of computer based models in in-silico clinical trials. The full roadmap will consist of investigating the needs, the vision, the gaps, the impact and the research agenda.

Expected Impact

Common to target outcomes a) & b)

- Increased confidence in decision support systems based on predictive models;
- Significant reduction of costs through the use of VPH technologies applicable to early diagnosis, prediction of disease and treatments outcomes.

For target outcome a)

- Strengthened evidence of the clinical benefits in using computer based models.
- Stronger evidence of the clinical impacts of disease prediction
- Acceleration of the deployment of VPH technologies in clinical environments.
- Increased acceptance and use of predictive models by healthcare professionals.

For target outcome b)

- Increased acceptance and use of predictive models by patients or citizen.
- Stronger evidence of the usability of computer based models for patient or citizen.
- Wider deployment of VPH technologies and services to patient or citizen.

For target outcome c)

- Availability to the community of a research agenda on the in-silico clinical trials
- Reinforced leadership of European research in this field through higher visibility of results and recognition.

Funding Schemes
a) and b) : STREPs
c) One CSA

Indicative budget distribution

- STREP: EUR 30.9 million

- CSA: EUR 1 million

Call:

Objective ICT-2013.5.3 ICT for smart and personalised inclusion

This activity is a continuation of the previous Objectives on "**ICT for smart and personalised inclusion**" in the ICT WP 2011-12 and on "**Accessible and Assistive ICT**" in the ICT WP 2009-10. It bridges to Horizon 2020. Projects are addressing advanced research, integrating and further developing where necessary recent results from e-inclusion/e-accessibility domain and from interaction, enhanced learning and information management domains.

Target Outcomes

(a) Accessible and intuitive solutions for personalised interfaces to smart environments and innovative services designed for all, including people at risk of exclusion - notably persons with disabilities, with low levels of digital literacy/skills, and older persons.

The focus is on delivering accessible and usable ICT solutions in a portable and pervasive manner, encompassing devices, applications, services and smart environments. Potential application domains are, education, health, home and leisure, work, mobility and communication activities. The proposed work will include (i) principles, frameworks and architectures to deliver global inclusive services and environments through different infrastructures, personal devices and applications; (ii) repositories of population representative user profiles and innovative mechanisms for interface adaptation, to address personalised accessibility and usability; (iii) development tools to facilitate the integration of inclusive solutions in everyday life applications.

Emphasis will be given on the development of innovative interaction techniques based on technologies such as serious gaming, virtual/mixed augmented reality, crowd-sourcing, ambient intelligence, persuasive and affective interfaces. End-user support may integrate real-time monitoring of user needs to improve the user experience and learning potential and adapt contents and interfaces. The overall approach should allow the creation of an accessibility and usability ecosystem linking interface developers, device makers, service providers, environment designer and user communities.

Interoperability is essential and infrastructure specifications and related standardisation initiation are expected.

(b) **Coordination and Support Actions:**

b1) The work should focus on consolidation of recent results in Brain Neural Computer Interaction (BNCI) and on investigating new BNCI activities and synergies with relevant fields leading to enhancement of human functions in relation to motor, sensory, cognitive and mental disabilities. It should build on past and current roadmapping activities in BNCI.

b2) Industrial strategies and valuation of potential markets for eInclusion components and services, in particular for the web (including connected DTV), the telecom, and public interactive terminals.

b3) Coordination and harmonisation of development, evaluation and monitoring approaches for e-accessibility (including design-for-all and usability), targeting the web and the audio-visual media. Methods and techniques should include crowd-sourcing of content repair, re-usable components production and large scale automatic surveillance.

Expected Impact

Each proposal will present quantitative indicators or measures of success to quantify potential impact along the points listed below for the target outcome concerned.

For target outcome a):

- Novel accessibility solutions for user groups at risk of exclusion.
- Enhanced quality of life for people at risk of exclusion, including people with disabilities, older people and people with low digital literacy and skills.
- Strengthened possibilities of employment to non highly specialised professionals.
- Improved competitiveness of European ICT industry in the field of inclusive smart environments and services.
- Wider availability and effectiveness of developers' tools for creating inclusive smart environments (targeted to SMEs, key mainstream industrialists, open-source developers, and other less technical developers).

For target outcome b):

- Synthesis of results in the area of Brain Computer Interaction in EU and beyond, and provision of ideas for the future activities that could be supported by Horizon 2020 and that will position the EU researchers and industry in a leading role in this area.
- Industrial and economic strategies for eInclusion and design for all. Value demonstration and good-practice for public and private stakeholders to embrace e-inclusion. Enhanced policy strategies towards the adoption of e-Accessibility practices, and the production of components, tools, compatible infrastructures/architectures, and integrating services by the market, in particular for new technologies and channels (web on mobile, DTV, public terminals, etc).
- Empowerment of policy makers to monitor and of communities to participate in achieving accessibility and inclusiveness of information and public services.

Funding Schemes

a): IP/STREP; b): CSA;

Indicative budget distribution

IP/STREP: EUR 16.5 million, with the objective to support at least one IP

CSA: EUR 2.5 million. For each topic, up to one CSA will be selected with maximum duration of 24 months and maximum EC funding of EUR 1.0 million for b1), EUR 0.5 million for b2), and EUR 1 million for b3).

Call: FP7-ICT-2013-10

Objective ICT-2013.5.4 ICT for Governance and Policy Modelling

The public sector has a significant role in stimulating economic growth as has been evident from the current economic and financial crisis. At the same time, citizens and in particular the younger generation are becoming more vocal in monitoring and influencing policy decisions. Current ICT tools for collaborative governance and policy modeling show great opportunities for empowerment of citizens and increased transparency in decision-making. In addition, there is a growing need for research and innovation for future public services that will be a catalyst for growth and sustainability.

Target Outcomes

a) Research will focus on policy modelling and simulation for achieving productivity gains and innovation in public service provision through innovative use of ICT. Such modelling, simulation and prediction should also enable public administrations to develop policies for growth and investment strategies for next generation ICT for public services. This research will also address innovative ICT solutions that build on Web2.0/Web3.0 and social networking, crowd-sourcing and collaborative technologies.

The tools shall include innovative data mining functionalities to identify the emerging societal trends as a result of the economic environment, and should further advance crowd-sourcing techniques to engage citizens in sharing knowledge and expertise to collectively solve complex, large-scale problems in a distributed fashion.

The work in this area should also exploit the vast reserves of Europe's public sector collective and open data and knowledge resources, for new services.

b) **Coordination and Support Actions.**

b1) **Roadmapping of research on ICT for innovative public services and governance.** Apart from addressing Coordination & Support actions should specifically address road mapping of the use of ICT for innovative public services and their governance, in particular cross border services. Another relevant topic that should be addressed is the empowerment of the younger generations through ICT tools. These roadmaps shall point to implementation under Horizon 2020.

b2) Increased **collaboration, on Electronic Identification and Authentication**, in particular with the USA and Asia, that could be a leverage for European solutions worldwide, while ensuring data protection for the citizens. The action is expected to enhance dialogue with countries that have activities on eID and authentication, and to exchange good practices so as to spearhead European solutions for mutual benefit.

Expected Impact

- Improved take up of policy making tools by decision makers in public administrations
- Improved validation of the potential impacts of policies through evidence
- Stronger evidence of productivity gains and reduction of costs in the provision of public services
- Evidence of the younger generation contributing to policy formation/development through social media

- Increased take up of open and public data for provision of public services.

Funding schemes

Area a) STREP; area b): CSA

Indicative budget distribution

EUR 19 million

Call: FP7-ICT-2013-10

Objective ICT-2013.5.5 Collective Awareness Platforms for Sustainability and Social Innovation

Target Outcomes

The objective is to stimulate and support the emergence of innovative ICT based platforms for grassroots Social Innovation, providing *societally, environmentally and economically sustainable approaches and solutions to tackle societal challenges.* Such collective intelligence platforms will include collective decision-making tools and innovation mechanisms allowing and encouraging individual and community creativity, participation and situational awareness.

The vision is that individuals and groups can more effectively and sustainably react to societal challenges by acting on the basis of a direct extended awareness of problems and possible solutions. To foster this, the objective has an experimental approach where concepts and tools are developed and verified in real world cases.

This will be achieved through the following set of complementary and interdependent actions:

a) **Supporting grassroots experiments and prototypes** enabling citizens and communities to create and engage in digital social innovation platforms. These platforms should combine *i)* open/federated social networking systems, *ii)* cooperative creation and sharing of knowledge and *iii)* real-time gathering and management of information coming from people and their living environment (e.g. country, city, home). Possible applications could focus on sustainability (as understood in the wide sense defined above), in e. g. citizen empowerment, health, ageing and well being, inclusion, environment protection, direct democracy, sustainable lifestyles and collaborative management of public goods. Open approaches, including free software, open hardware platforms and open data infrastructures, are strongly encouraged.

b) **Support** bottom-up social innovation and education initiatives based on crowd-sourcing and network intelligence principles, carried out by web innovators, research teams, communities and entrepreneurs. The IP foreseen for this will select the activities to be funded through open calls, based on a combination of excellence (based on novelty and societal dimension of the actions proposed) and crowd funding mechanisms.

c) **Engaging citizens and society at large** (Coordination Actions), aiming at:

   - distilling the best practices from existing and new initiatives, creating synergies and critical mass, and targeting the integration of the various approaches to solve significant societal challenges;

- assessing the impact of the actions on communities allowing broad uptake of societal innovation, representing an empirical approach to the new topic of collective awareness platforms for sustainability and social innovation;
- achieving a multi stakeholder approach, helping social entrepreneurs get in touch with seed funding, e.g. through Venture Capital Networks or crowd-sourcing platforms;
- broadening the societal debate about the ethical aspects of societal sustainability e.g. on the fundamental rights of the citizens resulting from the digital transition, in terms of quality guarantees from collective systems;
- linking the existing and emerging initiatives with regulatory and policy activities on privacy and identity, open data, network neutrality, competitiveness, copyright, and alike, to be able to suggest sustainable approaches based on collective awareness.

d) **Integrating the scientific base for the multidisciplinary understanding of collective awareness platforms for sustainability and social innovation,** addressing innovative mechanisms for value creation beyond monetisation, reputation, motivation and incentives for online collaboration and sustainable collective behaviours, innovative licensing, open government, new forms of "self-regulation" based on individual situational and contextual awareness of global social constraints, self-configuration of communities.

Expected Impact

The overall expected impact is the emergence and take-up of new sustainable organisational and behavioural models at individual and community levels, resulting in sustainable social and economical innovation improving the quality of response to societal and economic challenges, such as growth, employment, inclusion, education, community development, health, environment, energy, and quality of life at large.

Specific impacts are:

- Catalyzing and enabling new production and consumption patterns, lifestyles, and socio-economic processes based on commons, sharing, exchange, and participation at local and global scales.
- Definition of new concrete mechanisms increasing society's resilience, enabled by a more accurate understanding and management of social and environmental problems.
- Strengthened evidence of social innovation based on collective knowledge, which can also make possible new forms of foresight in society (by public bodies, organisations as well as by citizens).
- Providing advanced concepts and tools enabling people and communities to share, collaborate, and make use of data/information generated, empowering future social entrepreneurs and innovators to engage in innovative service creation and delivery.
- Contributing to the emergence of new forms of political expression, "self-regulation", innovative business and economic models and social entrepreneurship.

Funding Schemes

a) STREP

b) 1 IP devoting min. 85% of its budget to open calls, max. 7% to coordination and max. 8% to coordination and visibility actions.

c, d) CSAs

Indicative budget distribution

STREPs (indicatively 0.5 to 2 M€ each): 9 M€. In the selection of the STREPs to be funded a good coverage of different methodological and topical approaches is expected.

IP: 3 M€

CSA 3 M€

Call:

FP7-ICT-2013-10

7.6 Challenge 6: ICT for a low carbon economy

This Challenge explores opportunities for harnessing digital technologies to address climate change, especially to increase energy efficiency and to better manage our water resources. It supports speedy progress towards the EU's energy and climate objectives for 2020 while simultaneously supporting existing and opening new business opportunities. The main role of ICT is reducing resource consumption and CO_2 emissions, in particular related to electricity and water distribution, the built environment, transport and logistics. Particular attention is given to cities as platforms for innovation, encouraging the validation of integrated solutions in user-driven, open innovation environments.

The Challenge focuses on the following:

- Future electricity distribution grids fostering synergies between telecommunication and energy networks to increase automation and to improve coordination between production (including renewable sources), distribution and transmission. The focus is on data management and special attention is given to potential new business models for DSOs (Distribution Systems Operators).
- Data Centres in an energy-efficient and environmentally-friendly Internet. This addresses technologies and associated services to monitor energy consumption and automatically optimise power, cooling, computing, storage, and data transmission operations in function of energy consumption, environmental impact and cost policies. It also covers technologies for the integration of renewable energy sources and reuse of heat.
- Water resources management focuses on ICT-enabled demand-side management and resource efficiency solutions, in an integrated water resources management context. Special attention is given to improving household awareness and modifying consumer behaviour as well as the corporate and government actions in response to demand modifications.
- Smart Cities. The aim is to integrate and validate ICT technologies and services in neighbourhoods to make progress towards carbon neutrality in cities. The idea is to develop ICT able to provide intelligence to electricity grids, to district heating and cooling grids, to storage and renewable energy sources from a single system point of view. In addition to technical developments, attention is given to innovative service business models taking into account data security and privacy. Behavioural sciences are a core activity with a view not only to observing subjects but to soliciting innovative ideas from them. This research will contribute to the Energy-Efficient Buildings Public-Private-Partnership launched in 2008 as part of the European Economic Recovery Plan and it is part of the Smart Cities initiative coordinated with Theme 5 (Energy).
- Co-operative mobility is the interconnection of users, vehicles and infrastructure that enables the creation and sharing of new kinds of information, leading to a better cooperation amongst mobility users. Focus is on supervised automated driving for improving both the energy efficiency and safety of individual and public transport and on energy-efficient, safe and accessible services to enhance mobility of citizens.

- Electro-mobility: This objective contributes to the Public Private Partnership "European Green Car Initiative". Related to the fully electric vehicle, it addresses architectures for electronics in the car; and comprehensive energy management systems for its infrastructure integration.

Objective ICT-2013.6.1 Smart Energy Grids

This objective explores the potential of bringing together stakeholders from both the energy utilities and the telecom sector to develop common approaches for future digital networks and smart energy services infrastructure for electricity distribution. The focus is on data management including the exchange of information with transmission network operators and with end users. Special attention is given to exploring new business models for DSOs (Distribution System Operators).

Targeted Outcome:

Intelligent systems built over existing and future telecommunication networks and services that will assist in the management of the electricity distribution grid in an optimized, controlled and secure manner.

Key research challenges to be addressed:

a) Sharing of backbone infrastructure and last mile connectivity, considering not only technologies (e.g. LTE, GPRS, PLC, and possibility for spectrum allocation) but also the appropriate business models to deliver significant cost and investment savings.

b) Improving robustness and reliability of the existing telecommunication infrastructure in order to cope with mission critical services that require milliseconds response times. Explore the possibility of deploying dedicated services on shared telecoms infrastructure, rather than entirely new infrastructure.

c) ICT technologies for active electricity network management, demand/response, load balancing and forecasting and congestion management. Developing a methodology for capacity calculation.

d) Developing telecommunications services and platforms specific for energy distribution taking into account control of access to customer information and consumer data, in particular smart metering data; data ownership and associated level of security and use of data; business models; system reliability; long term availability; and avoidance of vendor lock-in.

Project should focus on one or a combination of the previous points. Consortia must be compact with partners each making substantial contributions and with expertise in both telecoms and energy domains. In all cases, projects shall include an appropriate validation phase to draw conclusions for future deployment.

Expected Impact:

- Reduction of the percentage of energy lost during energy distribution;
- Reduction of the gap between energy produced and energy consumed;

- Increase of renewable energy sources and Combined Heat and Power - CHP connected to the distribution grid;
- Reduction and shifting of peak loads;
- Number of publications jointly authored by researchers from ICT and energy.

Funding schemes

STREP

Indicative budget distribution

STREP: EUR 18 million

Call: FP7-ICT-2013-11

Objective ICT-2013.6.2 Data Centres in an energy-efficient and environmentally friendly Internet

The action will address system level technologies and associated services that will improve the energy and environmental performance of data centres. Given that data centres are a core element of today's Internet and among the facilities with the highest rate of increase energy consumption and related environmental impact, the action will contribute to a more energy efficient and environmentally friendly Internet.

While computing is addressed under several challenges of this Work Programme, work in this objective focuses on energy and environmental performance of data centres. It is therefore complementary to the work under Objective 1.2 related to computing architectures for future cloud services, Objective 3.4 addressing computing systems for embedded systems and for data centres, and Objective 12.1 related to exa-scale supercomputing.

Target Outcomes

(a) Software and Hardware system level technologies and associated services that monitor energy consumption and automatically optimise power, cooling, computing, storage, and data transmission operations in function of energy consumption, environmental impact and cost policies.

(b) Systems for the integration of networks of renewable energy sources for powering data-centres situated in urban agglomerations.

(c) Systems for the efficient use by urban installations of the heat that is produced by (a network of) data centre(s).

(d) Efficient integration of data centres under smart grid/smart city schemes.

(e) Contribution to standard and industry bodies that develop methods and standards on the measurement of the energy and environmental footprint of data centres. An emphasis on interoperability between different methods/standards will be considered an asset.

(f) Appropriate validation of the resulting systems. Based on defined indicators, during this phase, projects shall record evidence of energy savings and CO_2 emissions reductions, total cost of operations versus

potential benefits, user acceptance and replication potential and extract lessons that may be used in different settings.

All proposals will address as minimum sub-topics (a), (e) and (f) and at least two of (b), (c) and (d).

Consortia must be compact with partners each making substantial contributions. In addition to partners with expertise on ICT, consortia will include partners with expertise on energy.

Expected Impact

- Quantifiable and significant improvement (well beyond what would be achieved under normal evolution conditions) of the overall resource efficiency of data centres. Improvement in this context of their power usage effectiveness (PUE) with a parallel improvement of their environmental effectiveness (indicative metrics can include emerging ones like carbon usage effectiveness (CUE) and water usage effectiveness (WUE)).
- Development at demonstration stage of (networks of) Data Centres powered at levels of 80% or above by renewable energy sources.
- Contribution to the creation of new market opportunities (e.g. in the area of renewable energy systems for data centres).

Funding schemes

STREPs

Indicative budget distribution

EUR 20 million

Call

FP7-SMARTCITIES-2013

Objective ICT-2013.6.3 ICT for water resources management

ICT offers an untapped potential to improve the management of water resources by integrating real-time knowledge about water consumption at domestic, corporate and city level, and by enabling subsequently the implementation of efficient resource and demand management strategies and pricing schemes. This objective brings together the ICT and water stakeholders in joint research, in order to document the ICT potential via lessons learned from real-life testing and demonstration experiments.

Targeted outcomes:

The aim is to pilot and demonstrate innovative ICT systems and services for efficient water use and reuse, in order to improve household, business and societal awareness, to induce changes in consumer behavior and to enable the introduction of innovative resource and demand management schemes and adaptive pricing incentives.

Key research challenges to be addressed include:

a) Providing quantifiable evidence of the potential of ICT to contribute to efficient water resources management by increasing household, business and industry

awareness regarding water use, triggering the adoption of new demand management and pricing schemes, and contributing to meeting EU resource efficiency targets in a digital society.

b) Validating ICT-enabled innovations in real-life operational settings with the active involvement of stakeholders and end users from the water and the ICT domain; demonstrating in public the ICT potential for efficient water use, assessing its impact at domestic, corporate or municipality level, and exploring possible business case scenarios.

Projects should cover: (i) new ICT research and/or innovative integration of ICT-enabled solutions for water resources management at domestic, public/private building industry and/or city level, (ii) substantial validation of the proposed ICT solutions in at least two real-life operational environments, over a sufficient period of time to cover seasonal variations, and with the involvement of real users from the responsible water operators, households and the ICT industry, (iii) assessment of impact of the proposed solutions and preparation of a business case including open access options and possible take-up activities, and iv) a final dissemination event, including a public demonstration and a "hands-on" training of targeted users.

Consortia must be compact with partners each making substantial contributions. In particular, the stakeholders from water authorities/operators and from the ICT industry should have key roles in the validation and business scenario stages.

Expected impact:

- Increased user awareness and modified behaviours concerning the use of water;
- Quantifiable and significant reduction of water consumption;
- Peak-period reduction of water and energy distribution loads;
- Improved resource efficiency and business operations of water utilities due to ICT;
- Increased rate of ICT-innovation in water management companies;
- Number of publications jointly authored by researchers from ICT and the water domain.

Funding schemes:

STREPs

Indicative budget distribution

STREP EUR 14 million

Call

FP7-ICT-2013-11

Objective ICT-2013.6.4 Optimising Energy Systems in Smart Cities

Cities are increasingly recognized for their ability to play a catalytic role in addressing climate and energy challenges using technologically innovative approaches. This can be achieved by creating new partnerships connecting city leaders and stakeholders to secure practical commitments for implementing green digital agendas.

Projects supported under this objective shall contribute to the Energy-Efficient Buildings Public-Private-Partnership launched in 2008 as part of the European Economic Recovery Plan. This objective is part of the Smart Cities initiative with Theme 5 (Energy). In particular it is complementary to the topic "Demonstration of Optimised electricity and heating/cooling systems". Here the focus is on software systems for new business models and user engagement whereas in Theme 5 the focus is the physical integration (including power electronics devices).

Target Outcomes

a) Decision-support systems and/or management and control systems for energy-efficient neighbourhoods. These systems shall consider de-centralised renewable energy production, connection with the smart electricity grid and integration with smart district heating and cooling grids through CHP (Combined Heat and Power) and other renewable energy sources. They shall optimise the use of energy in city areas with different types of demand to enable local balancing, demand response services, variable tariffs and easy change of supplier.

In addition to technical work, proposals shall consider appropriate service business models, privacy and trustworthiness and shall involve users throughout all phases of the project. They are to be considered not only as observed subjects but also as a source of innovation. Systems should be built considering openness and interoperability up front. Both behavioural sciences and economics are to be core activities.

Proposals should cover (i) technical developments, mainly adaptation and integration of existing ICT, (ii) a substantial validation phase in real-life environments in at least two cites and (iii) a precise evaluation phase where proposals shall record evidence of energy savings, total cost of operation, scalability of the solutions, user's acceptance, benefits that accrue, and extract lessons for those planning to deploy and finance such systems.

Considerable resources are expected to be committed, however consortia must be compact with partners each making substantial contributions.

b) Coordination and Support Actions: Bringing together relevant stakeholders including process engineering specialists, ICT software and equipment providers, RES providers, energy companies (including ESCOs - Energy Service Companies), building and construction sector companies, as well as local and regional authorities, to:

- Take over the work done by ICT4E2B Forum and IREEN and extend their roadmaps from buildings and neighbourhoods to smart cities and extended urban/rural communities in a holistic dimension;
- Analyse the relationship between producers, distribution companies and consumers of energy in particular new business models and opportunities for SMEs. Identify best practices and opportunities for knowledge transfer.
- Identify ICT/Energy vocabularies and ontologies to foster interoperability of Energy Management Systems related to the building and construction domain, and beyond the building into public spaces, neighbourhoods and districts, and analyse their relevance and possible evolution towards formal standards; analyse their potential extension to energy management in industry and commerce. Work has to

build on the results of the previous Workshops on Energy Efficiency Vocabularies[27].

- Assess possibilities for making publicly available data obtained from validation activities; work proactively together with project consortia towards this end and assess relevant legal requirements around data protection.
- Support the establishment of European-scale actions spanning research, innovation, standards-setting and deployment in Smart Cities

The tasks shall include drafting and up-dating public documents, organising expert hearings and workshops, dissemination and networking events.

Expected Impact

- Quantifiable and significant reduction of energy consumption and CO2 emissions achieved through ICT.
- Adoption of ICT by city authorities;
- Number of publications jointly authored by researchers from ICT, energy, construction and civil engineering and city experts.

Funding schemes

a) STREP; b) CSA

Indicative budget distribution

STREP: EUR 39 million

CSA: EUR 1 million

Call

FP7-SMARTCITIES-2013

Objective ICT-2013.6.5 Co-operative mobility

The objective is to make use of co-operative mobility technologies to develop supervised automated driving which is expected to be the most viable long-term option for improving both the energy efficiency and safety of individual, public and freight transport by smoother, better informed driving and behavioural change.

Target Outcomes

a) Supervised automated driving

The target is to develop and demonstrate fault-tolerant and resilient supervised automated driving technologies and applications to address issues such as driver take-over situations, automated stop-over to a safe location, rendering the behavior of an automated vehicle predictable for other road users; use of smart lanes or existing dedicated lanes where automated vehicles can circulate under geographical separation or time limits. Research and innovation shall build on and integrate advances in co-operative systems, driver assistance systems, dependable control systems, embedded and sensor systems, and human machine interfaces. Besides technologies and infrastructures required for supervised automated

[27] http://ec.europa.eu/information_society/activities/sustainable_growth/buildings/index_en.htm

driving, proposals should as well address the associated socio-economic, standardisation, and legal issues.

b) Coordination and Support Actions

Make data captured from large scale field operational tests available for data mining and analysis; develop and pilot training programmes and curricula for enhancing the human machine interaction using different levels of automation in the connected car; develop and build consensus on business models for the deployment of automation in public/personal road transport; international co-operation activities based on existing international arrangements in particular with the US and Japan.

Expected Impact

- Supervised automated driving demonstrated in several EU locations showing measurable effects on energy efficiency and safety.
- Increased level of user acceptance of automated driving.

Funding Schemes

a) IP, STREP: it is expected that a minimum of one IP is selected.

b) CSA

Indicative budget distribution

a) EUR 23 million

b) EUR 3 million

Call:

FP7-ICT-2013-10

Objective ICT-2013.6.6 Integrated personal mobility for smart cities

Target Outcomes

Integrated personal mobility for smart cities

Research should build on existing technologies for in-vehicle platforms and traffic management resources and integrate these with transformative technologies such as future internet and cloud computing to capture, store, process and communicate increasing quantities of information. Mobility is seen in a broad sense and could include non-motorised transport modes, electromobility and public transport, combined use of multiple modes of transport, virtual mobility concepts, and innovative mobility sharing schemes. The information used may come from traffic management systems, connected vehicles, the surrounding infrastructure and from mobility users including floating car data and crowd sourcing information. Proposals shall demonstrate the value of new services and business models through pilots involving end-users, paying attention to aspects of data privacy and security of the digital citizen.

Expected Impact

- Increased take-up of transformative European ICT in new mobility services.
- Energy efficiency gains in personal mobility demonstrated when using new mobility services.

Funding Schemes

STREP

Indicative budget distribution

EUR 15 million

Call:

FP7-SMARTCITIES-2013

Objective GC-ICT-2013.6.7 Electro-mobility

The European Green Car Initiative (EGCI) is part of the European Economic Recovery Plan launched in November 2008 to respond to the global economic crisis. This Public-Private-Partnership (PPP) aims at demand-side measures to support the development of new and sustainable forms of road transport. The ICT contribution to this initiative aims at improving the cost- and energy-efficiency of the fully electric vehicle and its value chain through the application of advanced ICT. Objective 6.7 under ICT and relevant objectives under NMP, Environment, Energy and Transport are co-ordinated and jointly support the EGCI PPP.

This objective addresses fully electric vehicles (FEV), meaning electrically-propelled vehicles that provide significant driving range on purely battery-based power. It includes vehicles having an on-board electrical generator as range extenders. The objective also covers small light-weight passenger and duty vehicles. Projects supported under this objective should advance the research, development and integration of major building blocks for the FEV, and for its infrastructure integration.

Target outcomes:

a) Advanced System Architecture for FEV

New or expanded functionality of existing hard and software architectures for electronics leading to radical cost reduction, reduced complexity, increased reliability and flexibility and higher energy efficiency.

Advanced concepts for the integration of multiple functionalities into smart subsystems for energy storage, traction, and power control including e.g. bi-directional energy transfer (managed/controlled charging), energy recovery and improved road handling. Work shall address the re-design of the electric and electronic architecture; assessment of the implication for safety, security, reliability and robustness of the electric power train operation including EMC and the development of related international standards; the usage of low power consuming cooperative systems for cost efficient, real-time and safe operation of the vehicle.

Also included are technical solutions facilitating recycling and reuse of components; standardised, cost-efficient and reproducible testing concepts for vehicles and subsystems; ICT solutions for cost efficient, flexible production of small volume,

customised (sub-) systems and vehicles driven by the different requirements of different customers.

b) Comprehensive Energy Management

ICT for optimising the energy system inside the FEV and the connectivity of the FEV using Comprehensive Energy Management Systems including efficient vehicle-based solutions for grid and road integration taking into account aspects of autonomous driving and integration in cooperative systems as appropriate.

Increased synergies of electric traction, autonomous driving and cooperative road-vehicle systems for energy-, cost- and time-efficiency as well as safe operation of the vehicle including autonomous positioning or guiding are targeted. Work shall address alternative, innovative ICT-based solutions for optimised recharging interfaces and methods (inductive; continuous; fast; en route) and include vehicle-based energy harvesting and the management of combinations of different energy sources and storage as well as the management and optimisation of energy storage ageing, charge monitoring and certification of energy content. Projects in this field are expected to establish cooperation and to coordinate with relevant projects under NMP, Environment, Energy and Transport to jointly support the EGCI PPP.

Also included are the assessment of related safety and health concerns regarding the use of electric vehicles; work towards common user interfaces including privacy and data security standards for flexible subsystems and mobile devices (smart phones, tablets etc.) and the contribution to standards e.g. for dynamic and bi-directional energy exchange between the vehicles and the smart grid.

c) Coordination and support actions

Business models for the deployment of FEV in public, personal, and freight transport; pilot educational and training programmes and curricula; stimulation of the international dimension for European FEV and the global presence of SMEs; and contribution to the setting of standards are envisaged. Proposals should predominantly address SME activities.

Expected impacts:

- Improved energy efficiency and extended driving range of the FEV
- Increased performance and reduced costs of the electronic components and the overall FEV produced in Europe.
- Better integration of the FEV in the smart grids and cooperative infrastructure
- Significant improvement of FEVs' safety and comfort
- Strengthened global competitiveness of the European automobile, ICT and battery sectors; significant market penetration of key components of FEVs.

Funding schemes

a), b) IP, STREP: It is expected that at least one IP is selected per target outcome. Individual proposals may address both target outcomes.

c) CSA

Indicative budget distribution

IP, STREP: EUR 39 million

CSA: EUR 1 million

Call:

FP7-ICT-2013-GC

7.7 Challenge 7: ICT for the Enterprise and Manufacturing

The Factories of the Future (FoF) initiative is part of the European Economic Recovery Plan launched in November 2008 to respond to the global economic crisis. This Public-Private-Partnership (PPP) aims at helping EU manufacturing enterprises, in particular SMEs, to adapt to global competitive pressures by improving the technological base of manufacturing across a broad range of sectors. The ICT contribution to this initiative aims at improving the efficiency, adaptability and sustainability of manufacturing systems as well as their better integration within business processes in an increasingly globalised industrial context. Both Challenge 7 and the relevant Challenge under NMP are supporting the FoF PPP in a co-ordinated manner and are focusing on actions with a strong innovation dimension.

The aim of Challenge 7 is to give support to industry for bringing together ICT suppliers and users for experiments that target the broad uptake of ICT towards a more sustainable, efficient, performant, and smarter European manufacturing industry. Focus is on emerging innovative technologies and processes, which need to be customised, tested and validated before being able to compete on the market. Special emphasis is on strengthening European SMEs, both on the supply and on the demand side.

Two types of take-up activities are supported at **technology level.** Both aim at bringing together relevant actors from the use and the supply side, supported by competence centres as appropriate.

- **Application experiments** will target advanced robot solutions for new manufacturing applications as well as simulation services for engineering and manufacturing SMEs including a cloud-based service infrastructure that provides the needed high performance computing resources (Objective 7.1).
- **Assessment experiments** will target innovative sensor-based equipment solutions in manufacturing and control, and innovative laser applications in manufacturing (Objective 7.2).

For both types, experiments are expected to make the most effective use of funding with explicit and immediate impact in the shortest possible time. 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. To better cope with the speed of innovation in ICT, implementation must be flexible and fast. Part of the actions and partnership are to be defined from the outset, while additional experiments or users, may be identified through open calls during the action (max. 50% of the total budget).

To facilitate the emergence of a European **innovation ecosystem,** a network of innovation multipliers competent in manufacturing is to be established across all take-up projects emerging from the objectives of Challenge 7 with an aim to achieve broad coverage in technological, application, innovation, and geographic terms, thereby maximising the impact of the actions and addressing the needs of SMEs. Its tasks and services shall include establishing a single innovation portal for newcomers; sharing of best practices and experiences; dissemination; and brokering between users and suppliers in view of open calls. The participation of actors, e.g. regional innovation

clusters, chambers of commerce, societal actors, industrial associations, technology transfer departments of large research labs, which usually do not participate in research projects or programmes is encouraged. This cross-objective action is described under Objective 7.2 c).

Objective FoF-ICT-2013.7.1 Application experiments for robotics and simulation

All projects under this objective shall carry out a critical mass of vertical application experiments related to robotics or simulation, complemented by horizontal support services: Driven by the requirements of first-time users, individual experiments shall bring together all actors of the value chain necessary to equip new users with novel products or services and assist them in customising and applying these in their respective environments, e.g. first time users, application experts, technology suppliers, system integrators, and service providers. Special emphasis is on SMEs, both on the supply and the demand side. Proposers are referred to the general description of take-up actions in the introduction to this Challenge.

Target outcomes:

a) **Robot solutions for new manufacturing applications**

Experiments shall showcase the take-up, integration and evaluation of methods, components, and tools reflecting the paradigm shift in industrial robotics, away from immobile, large-sized, pre-programmed robots to more flexible, energy efficient and adaptable service robots (e.g. lightweight, mobile systems). Experiments should target key functionalities such as mobility, reconfigurability, dexterity, safety and human-robot interaction, and focus on downstream activities like systems integration, testing and validation under realistic manufacturing conditions. In areas such as manufacturing, service, maintenance and repair, or monitoring and control, application scenarios must be well motivated in technical terms and exploitation potential. Experiments shall be innovative, e.g. in terms of integrating new materials, advanced sensors and control technologies in robotic systems.

b) **Simulation services for engineering and manufacturing**

Experiments shall showcase the customisation and adoption of HPC-cloud-powered simulation services by users, particularly SMEs. Innovation shall be addressed at three levels: (1) Users get a "one-stop-shop" access to simulation technologies novel for them, including expertise and tools for visualisation, analytics, customisation and integration; and dynamic, easy and affordable access to computing resources; (2) as business owners, independent software vendors and simulation service providers, supported by competence centres, port their applications to a cloud of HPC resources and run experiments with those cloud-based service and business models in controlled environments; (3) HPC resource and service providers join forces in providing, across experiments, a prototype of a sustainable European commercial cloud of HPC resources in manufacturing and engineering including the necessary orchestration and access services. An operational prototype of the targeted cloud infrastructure is expected to become operational at an early stage. HPC-cloud providers shall build on existing infrastructures as far as appropriate.

c) **Constituency building and road-mapping**:

Building constituencies and developing broad research and innovation agendas in areas such as (i) analytics, simulation, and forecasting technologies deployed in manufacturing and engineering; (ii) architectures and services integrating agile and flexible manufacturing processes into distributed, interoperable, "green", and context aware enterprises of the future.

Expected impact:

- Strengthened global competitiveness of EU manufacturing SMEs in terms of innovative high quality products and services at affordable manufacturing costs and prices through adoption of advanced robotics and simulation technologies.
- More competitive European technology and service providers through wider opening to the SME market in the manufacturing sector and through opportunities to experiment with new business models.
- Wider adoption of cloud infrastructures in Europe in a large niche market segment important for Europe's economy.

Funding schemes:

a), b): IP – it is expected that minimum one IP is supported for each target outcome.

c) CSA

Indicative budget distribution

- IPs: EUR 33.5 million
- CSA: EUR 1.5 million

Calls:

FP7-2013-NMP-ICT-FoF

Objective FoF-ICT-2013.7.2: Equipment assessment for sensor and laser based applications

All projects under this objective shall carry out a critical mass of equipment assessment experiments related to laser or sensor-based tools. Suppliers of innovative high-tech equipment are expected to 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. The primary aim is to strengthen the ICT equipment supplier base, predominantly SMEs, through a close cooperation with globally acting manufacturers, by improving the manufacturing processes in relation to quality, speed, environmental and resource efficiency. Equipment assessments require the following steps: (i) definition of requirements for a specific application scenario; (ii) establishment of productivity metrics and (iii) assessment of experiences and results. Special emphasis is on SMEs on the supply side. Proposers are referred to the general description of take-up actions in the introduction to this Challenge.

Target Outcomes

a) **Intelligent equipment solutions in custom manufacturing and/or re-manufacturing:** Equipment assessment of sensor-/actuator-driven equipment targeting smart production flexibly through an effective monitoring and control of small volume, small lot size customisation requirements and/or end-of-life manufacturing operations – such as dismantling, recycling, material reuse. The assessment framework shall address improvements related to precision, speed, cost, flexibility and efficiency of (re-) manufacturing operations.

b) **Innovative laser applications in manufacturing: Equipment assessment** of all equipment relevant to laser manufacturing such as the laser itself, power supplies, handling tools, beam guiding/manipulation and quality, sensors to monitor the equipment and manufacturing process, periphery in general (materials, housing, safety issues etc). The assessment framework shall address improvements related to quality, speed, flexibility and resource efficiency of laser-based manufacturing and processing.

c) Establish a network of **innovation multipliers** in the manufacturing sectors across all take-up projects of this Challenge taking an interdisciplinary approach to achieve broader technological, applications, innovation, and regional coverage thereby maximising impact and addressing better the needs of SMEs.

d) Support a rapid **build-up of new manufacturing skills**: training methodologies and ICT-based tools to attract the interest of young talents in manufacturing and engineering.

Expected Impact

- Reinforced ability to penetrate new application areas (e.g. high customisation, end-of-life product engineering and manufacturing), close to the market and opening new markets
- More competitive supply-side SMEs able to supply manufacturers with new equipment and components for improved manufacturing operations.
- Higher innovation capacity and competitiveness of European producers of laser manufacturing equipment and their suppliers, in particular SMEs, and of the users of such equipment.

Funding schemes:

a), b): IPs – it is expected that minimum one IP is supported for each target outcome.

c), d) CSA

Indicative budget distribution

- IPs: EUR 33.5 million
- CSA: EUR 1.5 million

Calls:

FP7-2013-NMP-ICT-FoF

7.8 Challenge 8: ICT for Creativity and Learning

The culture and creative industries are a powerful motor for jobs, growth, exports and earnings, cultural diversity and social inclusion, representing 4.5% of total European GDP and accounting for 3.8% of the workforce. European industries, in particular small and medium enterprises, are increasingly faced with the need to be more productive, innovative and dynamic in responding to the changing market needs.

This challenge calls upon research and industry to unite their forces to produce more powerful and interactive tools for creative industries, enhance the creativity of workers pursuing different professions, and anticipate future trends in research and innovation by encouraging interaction in and between different segments of the creative industries.

One goal is to create a vibrant creative technology ecosystem and increase the innovation capacity of European industries and enterprises by providing them with better tools, capabilities and foresight. A further goal is to enhance, develop and encourage creativity as an essential 21st century skill in professional contexts.

Education is a strong prerequisite for economic growth. Europe must support national efforts to help students to learn better, teachers to teach better, and school systems to become more effective. We need customised learning systems that can adapt to effective use in a wide variety of diverse contexts. This is key for a successful modernisation of educational and training systems in Europe.

Objective ICT-2013.8.1 Technologies and scientific foundations in the field of creativity

Target Outcomes

Research under this objective will address creativity and the tools and environments in which it takes place. Research activities will contribute to equipping different industries with more effective creative tools, expand the potential of technology in the human creative processes and advance the scientific understanding of creativity thus providing the basis for future innovative technologies. This will be complemented by support activities that promote ways of closer interaction and networking within and between different segments of creative industries.

a) **Creative experience tools** that make use of all our senses and allow for richer, more collaborative and interactive experiences: real time simulation and visualisation, augmented reality, 3D animation, visual computing, games engines, and immersive experiences. The tools created should be cost effective, with special attention to users like SMEs and individual creators, intuitive, and be demonstrated in real environments for the creative and cultural industries (such as advertising, architecture, arts, crafts, design, fashion, films, music, publishing, video games, TV and radio etc.).

b) **Intelligent computational environments stimulating and enhancing human creativity:** Multi-disciplinary research (e.g. computational creativity, brain-based research, cognitive and learning sciences, HCI) should explore the potential of technology to enhancing human creative processes. Research

should address individual and/or collective creative processes in professional contexts involving domain-specific skills (in e.g. creative industries, engineering, medical professions). Work should establish theories and models for hybrid (human-computer) systems to be demonstrated by fully functional prototypes of computational environments. Proposals need to address the balance between scientific insights, technological innovation and practical application to the domain. Proposals should include sound methodology for the assessment and measurement of creative performance.

c) **Progress towards formal understanding of creativity** with a view to advancing the measurable capability of computers to produce results assessed by humans as useful, original and surprising. Proposals should contribute to technological and theoretical insights on creativity, incorporating progress in relevant areas such as AI, psychology, sociology, neuroscience and cognitive science. Proposals should demonstrate how the theoretical insights gained in the project will contribute to the understanding of human creativity. Technological advances should be validated as proofs of concept in innovative autonomous creative systems aiming to rise above the level of pastiche (mimicry).

d) **Roadmaps for future research and innovation** in the creative industries; proposals should target cross- and inter-cluster support activities to boost creative competitiveness in sectors such as advertising, architecture, arts, crafts, design, fashion, films, music, publishing, video games, TV and radio.

Expected Impact

- Improved efficiency of creative processes by two fold at least as regards time and resource investment, and quality of output.
- Improved competitive position of the European cultural and creative industries through the provision of cost effective, innovative and high-value products and services.
- Better understanding of the potential of technology in human creative processes leading to enhanced domain-specific human creative performance.
- Deeper scientific understanding of creativity, fostering the synergy between understanding and enhancing human creativity, and new technologies for autonomous creative systems.
- Better coordination of European and national efforts, closer dialogue between research and industry, better understanding of user requirements, more innovation and technology uptake.

Funding Schemes

a) IP/STREP

b) and c) STREP

d) CSA

Indicative budget distribution

- Target outcomes a) and b) EUR 32 million, with a minimum of 40% for IPs and 30% for STREPs
- Target outcome c) EUR 10 million
- CSA: EUR 1 million

Call: FP7-ICT-2013-10

Objective ICT-2013.8.2 Technology-enhanced learning

Target Outcomes

Research under this objective targets tailored, scaled and tested R&D for stimulating the take-up of learning technologies in different learning contexts, reinforces the evidence-base of effectiveness of learning technologies and encourages their innovative use.

a) ICT-enabled learning environments: joint pre-commercial procurement (PCP) of innovative solutions for teaching national curricular topic(s) in primary and/or secondary education, based on latest advances in pedagogical, cognitive and other relevant scientific disciplines.

These solutions should:

- combine, and operate across different digital media and devices and stretch the boundaries of place, time, type and styles of active learning in the digital age;
- include rich and intuitive interfaces for teachers and students and simulations and representations for teaching, learning and communicating about the topic;
- adapt to different teaching practices and learning methods (e.g. collaborative, inquiry-based and personalised learning and 1:1 tutoring) and provide efficient support for the teacher in planning, monitoring, assessment and in the management of classroom activities.

The participatory design of the systems should involve all key stakeholders in the value chain, e.g. public authorities, researchers, developers and end-users, through iterative processes and take into account contextual variables that affect learning in particular contexts (e.g. local, regional and/or national situations, learner and teacher profiles, types and styles of learning). The proposed solutions should aim for wide adoption at local, regional or national level and their relevance and effectiveness for learning should be demonstrated by appropriate evaluation methods and benchmarking.

PCPs shall be implemented according to the conditions outlined in objective 11.1 and Appendix 6 and cover the full PCP life-cycle encompassing solution design, prototyping, and original development of a limited volume of products/services in the form of a validated test series. They should seek to contribute to standards in digital educational solutions.

b) Learning analytics, educational data mining: tools and processes for collecting, storing, exploring and reasoning on large-scale educational data to better understand learners' knowledge, assess their progress and evaluate environments in which they learn. These tools and processes should aim at improving learning and teaching (including 21st century skills) for students and instructors. These tools should be equipped with intuitive interfaces for visualizing and interacting with the data in order

to ease their integration into the practice of teaching and learning. Cognitive models of learning styles should be provided and tested against actual data sets that record inputs, behaviour and assessment outcomes. They should aim to use and develop standardised nomenclature and categorization for effective comparison of aggregate information from different sources.

c) Holistic learning solutions for managing, reaching and engaging learners in the public administrations.

These systems should:

- provide flexible and cost-effective solutions for adaptation to rapidly changing external/internal environment, changing task/competence requirements;
- support the development of performance culture, engaging the entire organisation at all levels, providing an efficient measuring method based on clearly defined performance metrics;
- aim to develop critical skills, including transversal skills such as effective communication, collaborative building of knowledge resources, critical thinking, self-management.

The solutions should be validated in public administrations. The use of open education resources as well as open source learning and rapid application development tools is encouraged.

d) Support for organising competitions for breakthroughs in the successful adoption and scaling-up of the use of innovative learning technologies in formal learning contexts for raising awareness at European level about effective methods and technologies for learning.

Expected Impact

- Broaden use of ICT in education in at least one curricular topic leading to wider take up by end-users;
- Effective public-private partnerships for providing digital learning solutions in Europe;
- Stronger growth of the European ICT-enabled learning markets;
- More efficient use of ICT for learning through the exploitation of learning analytics tools;
- More timely and effective acquisition of skills/competences through learning technologies, in public administrations, indicated a.o. through % of decrease in time to proven competency and in time to carry out the tasks, and % of savings in study time;
- Increased awareness on the benefit of the adoption of learning technologies.

Funding Schemes

a) CP-CSA, b) STREP, CSA, c) IP/STREP d) CSA (CA only).

Indicative budget distribution

- CP-CSA, IP/STREP: EUR 22 million, of which a minimum of 25% allocated to CP-CSA (max 25% for the CSA part), a minimum of 40% to IPs and 30% to STREPs;
- For outcome b) : 1-2 STREPS to be funded
- CSA: EUR 3 million

Call:

FP7-ICT-2013-11

7.9 Future and Emerging Technologies

Future and Emerging Technologies (FET) fosters exploratory research to open up new avenues across the full breadth of future information and communication technologies. It supports new and alternative ideas, concepts or paradigms of risky or non-conventional nature. FET aims to go beyond the conventional boundaries of ICT and ventures into uncharted areas, often inspired by and in close collaboration with other scientific disciplines.

Radical breakthroughs in ICT increasingly rely on deep synergies with other disciplines (for instance, biology, chemistry, nanoscience, neuro- and cognitive science, ethology, social science, economics) and with the arts and humanities. This requires new attitudes and novel collaborations between a broad diversity of actors in research. In this respect, FET is the home for transformative research that can lead not only to a range of exceptional and unprecedented outcomes in science and technology, but can also create new practices, paradigms and reshape disciplines.

FET Open scheme: challenging current thinking and attracting future potential

FET-Open is a **light, topic-agnostic and deadline free** scheme specifically designed to be open and continuously responsive to novel and fragile ideas that challenge current thinking, whenever they arise and wherever they come from. It aims at foundational breakthroughs that can open radically new directions for information and communication technologies in the future. FET-Open also aims to increase the role of young researchers and high-tech research intensive SMEs in its cooperative research to further enhance their disruptive innovation potential and to unlock longer-term scientific and industrial leadership.

Because of its foundational nature, FET research is especially well placed for **global collaboration**. This work programme provides opportunities to extend on-going FET projects[28] through new collaboration components (top up) involving the best researchers worldwide, so as to create global interest and raise the level of ambition around research avenues incepted within FET.

FET Proactive scheme: tackling targeted transformative research

FET Proactive supports foundational, high-risk research, supporting the design and development of emerging research avenues with the aim of creating novel areas and themes and bringing together emerging communities. In each of these high-risk and high-potential, innovative themes a number of projects are supported, in combination with community building actions that foster activities such as joint events, development of new curricula and research roadmaps. Such clusters of projects spearhead transformative research and enhance Europe's innovation potential around a number of fundamental long-term challenges in ICT, building towards new topics for industrial research agendas.

FET Flagship Initiatives

Complementing these two schemes, **FET Flagship Initiatives** are visionary, science-driven, goal-oriented, large-scale, multidisciplinary research initiatives nucleated from

[28] Ongoing projects selected under any of the FET objectives of the FP7 ICT Work programmes.

research on ICT future and emerging technologies. They are envisioned to be long term programmes on a scale much beyond existing initiatives. Activities in this work programme build on earlier actions and will enable the selection of two such initiatives in 2013.

FET Open scheme

Radically new ideas can come anytime, from anybody and from anywhere. FET-Open is specifically designed to be open and responsive to such fresh thinking. It aims to give promising but still fragile ideas the opportunity to mature into a credible and well-founded new direction of research.

What is common to all objectives under FET-Open is that they seek *proposals on radically new concepts and visions of the nature and use of information and information technologies, grounded in scientifically plausible and often inter-disciplinary ideas on how to achieve them*. In spite of the high risk of failure, FET-Open projects can be the first step on the way towards future European scientific and industrial leadership in areas that today simply do not exist yet.

In this work programme, the FET-Open scheme features the following objectives:

- Objective ICT-2013.9.1: Challenging current Thinking
- Objective ICT-2013.9.2: High-Tech Research Intensive SMEs in FET research
- Objective ICT-2013.9.3: FET Young Explorers
- Objective ICT-2013.9.4: International cooperation on FET research
- Objective ICT-2013.9.5: FET-Open Xtrack

All these objectives are continuously open for submission. The FET-Open Objective ICT-2013.9.5 trials a new and lighter submission process, aims at a faster evaluation and a simpler project implementation. This pilot bridges to the implementation of the FET Open Scheme in Horizon2020, from 2014 onwards.

All FET-Open objectives call for STREPs[29], but with eligibility criteria that are specific to each objective. CSAs are accepted only under objective 2013.9.1. They are submitted directly as full proposals and are evaluated in one step.

Objective ICT-2013.9.1 Challenging current Thinking

Target Outcome

This objective supports the exploration of new and alternative ideas that, because of their risky or non-conventional nature, would not be supported elsewhere in the ICT Workprogramme. It seeks:

- foundational breakthroughs as crucial steps towards radically new forms and uses of information and information technologies within a clear long-term vision that is far beyond the state of the art;

[29] With the exception of Objective ICT-2013.9.4 on International cooperation on FET research.

- ambitious proof-of-concept and its supporting scientific foundation, where novelty comes from new, high-risk ideas rather than from the refinement of current ICT approaches;
- new inter-disciplinary collaborations, possibly with prominent and internationally recognized non-EU research teams where these can provide a significant added value.

This objective also supports Coordination and Support Actions for creating the best conditions within which FET research can flourish and achieve the transformative impacts that it aspires to. These activities may be, for example:

- actions, including networking and dissemination activities, aiming at the emergence of new research communities or collaborations involving a broad diversity of disciplines and actors into FET research;
- actions towards the increased active involvement of high-tech research intensive SMEs in exploratory research directions relevant to future ICT markets;
- actions that stimulate excellence and future leadership of pioneering teams of young researchers along new, exploratory research directions relevant to future ICT;
- actions aiming to strengthen the international dimension of FET.

Expected Impact

For STREP projects:

- opening new avenues of research towards future ICT that may be radically different from present day ICT;
- strengthening the future potential for high-risk / high-impact research and innovation;
- new research alliances in transformative research, exploiting synergies in the global science and technology scene for increased impact and excellence.

For CSA actions:

- catalyse transformative effects on the communities and practices for high-risk and high-impact research and on the mechanisms to support the global nature of such research;
- new, engaged and risk-taking research communities prepared to develop new and non-conventional approaches for addressing future challenges in science and society.

Funding schemes

STREP, CSA

Indicative budget distribution

EUR 34 million[30], out of which a maximum of EUR 3 million for CSA.

Call

FP7-ICT-2013-C[31]

[30] Indicative budget which is expected to be committed for successful proposals from the cut-off dates 25/09/2012 up to and including 12/03/2013 (batch 14 and batch 15).

Proposals are continuously receivable until 11 September 2012 (Short STREP) and 12 March 2013 (CSA). This objective applies a two-stage submission scheme and FET-Open specific eligibility and evaluation criteria (see Appendix 5 of this document).

Objective ICT-2013.9.2 High-Tech Research Intensive SMEs in FET research

Target outcomes

This objective fosters the driving participation of high-tech, research intensive SMEs in collaborative research projects targeting visionary, multi-disciplinary research. This will:

- link novel ideas, results or paradigms from science on the one hand, and marketable ideas on the other, that can lead to new, visionary and non-mainstream business opportunities and create future markets;
- generate a new scientific and technological asset base on which the SMEs can establish themselves firmly as future innovation players in areas with a high potential for future commercial or societal impact.

This objective does not seek short term commercial outcomes. It will therefore not support, for example, the incremental improvement of state-of-the-art technology, mainstream research aimed at short term product or service development, the incremental improvement of existing lines of business activity, research aimed to catch-up with the competition, developing foresights or market studies, or the mere development of new business models or business plans.

The consortium will contain at least one research intensive high-tech SME[32] with an established and proven in-house research capacity and that will play a driving role in setting and executing the research agenda of the project. This objective is expected to be addressed by small STREPs proposals, each requesting a grant in the order of 1M€, where the largest shares of the resources are allocated to the participating SME(s).

Expected Impact

- Opening of new avenues of research towards future ICT that may be radically different from present day ICT;
- Secured and broadened in-house research capacity and research eco-system of the SMEs leading to sustainable future innovation potential;
- high-tech, research-intensive SMEs recognised as first-class players in FET research;
- increased visibility, exposure and impact of FET research.

Funding scheme: STREP

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[31] Note that a FET-Open Xtrack Call (STREPS only) opens right after the FET-Open continuous call closes. It uses a new and lighter submission process and aims at faster evaluation. See FET-Open Xtrack Objective ICT-2013.9.5.

[32] An SME is an enterprise which has fewer than 250 employees, has an annual turnover not exceeding 50 million EUR, and/or has an annual balance-sheet total not exceeding 43 million EUR. Possible relationships with other enterprises must be taken into account when calculating these data of the enterprise. Research centres, research institutes, contract research organisations or consultancy firms are not eligible SMEs for the purpose of the Co-operative and Collective schemes.

Indicative budget distribution: EUR 6 million[33]

Call: FP7-ICT-2013-C

Proposals are continuously receivable until 11 September 2012. This objective applies a two-stage submission scheme and FET-Open specific eligibility and evaluation criteria (see Appendix 5 of this document).

Objective ICT-2013.9.3 FET Young Explorers

Target outcomes

This objective aims at capturing the creative potential of young researchers by fostering their leadership and participation in collaborative research projects targeting first-ever and exploratory, multi-disciplinary research.

This exploration should be grounded in scientifically plausible ideas that can provide a novel basis for the development of radically new concepts and visions that extend the conventional boundaries of ICT. New multi-disciplinary approaches and unconventional methodologies are encouraged.

This objective is expected to be addressed by small STREP proposals, each requesting a grant in the order of 1M€. A project must be led by a young researcher, and the leadership by young researchers of all work packages is also required. No more than six years should have elapsed between the award of a Ph.D. (or equivalent) for each such young researcher and the date of submission of the short proposal.[34]

Expected Impact

- opening of new avenues of research towards future ICT that may be radically different from present day ICT;
- empowered next generation of European science and technology leaders through their increased leadership of collaborative ICT research;
- contribution to early independence of young high potential researchers.

Funding scheme: STREP

Indicative budget: EUR 8 million[35]

Call: FP7-ICT-2013-C

[33] Indicative budget which is expected to be committed for successful proposals from the cut-off dates 25/09/2012 up to and including 12/03/2013 (batch 14 and batch 15).

[34] Proof must be submitted at step 2 of the evaluation, together with the full proposal. Extensions of this period may be allowed only in case of eligible career breaks which must be properly documented: maternity (18 months per child born after the PhD award) & paternity leave (accumulation of actual time off for children born after the PhD award) and leave taken for long-term illness, national service.

[35] Indicative budget which is expected to be committed for successful proposals from the cut-off dates 25/09/2012 up to and including 12/03/2013 (batch 14 and batch 15).

Proposals are continuously receivable until 11 September 2012. This objective applies a two-stage submission scheme and specific eligibility and evaluation criteria (see Appendix 5 of this document).

Objective ICT-2013.9.4 International cooperation on FET research

Target outcomes

This objective aims to increase and accelerate the impact of FET research projects by cooperating with non-EU partners of excellent global standing. It targets the extension of ongoing FET[36] projects with complementary research activities in which collaboration with non-EU research partners brings significant added value.

The research content is expected to focus on new activities that expand the research challenges and reinforce the impact of the ongoing project. The outcome of that research is expected to be made freely and openly available for the benefit of the research community.

Funding can be requested by the partners from the ongoing FET project and by the new non-EU research participant(s) to cover the coordination and joint research activities necessary to complement the ongoing project. At least 50% of the requested funding should be allocated to the new non-EU research participant(s)[37].

Expected Impact

- enhanced outcomes, global reach and impact of ongoing FET research projects through research collaboration with non-EU participants with complementary expertise;
- reinforced research cooperation between world-class EU and non-EU researcher teams facilitating the emergence of global alliances.

Funding scheme: Additional funding to existing grant for on-going FET[38] IP and STREP projects ending at least 18 months after the submission date of the proposal.

Indicative budget distribution: EUR 2 million[39]

Call: FP7-ICT-2013-C

Proposals are continuously receivable until 12 March 2013. This objective applies a one-stage submission scheme and specific eligibility and evaluation criteria (see Appendix 5 of this document).

Objective ICT-2013.9.5 FET-Open Xtrack

Target Outcome

[36] Ongoing projects selected under any of the FET objectives of the FP7 ICT Workprogramme.
[37] This restriction is obligatory for proposals submitted in batch 15.
[38] Ongoing projects selected under any of the FET objectives of the FP7 ICT Workprogrammes.
[39] Indicative budget which is expected to be committed for successful proposals from the cut-off dates 25/09/2012 up to and including 12/03/2013 (batch 14 and batch 15).

This objective supports the exploration of new and alternative ideas that, because of their risky or non-conventional nature, would not be supported elsewhere in the ICT Workprogramme. It seeks:

- foundational breakthroughs as crucial steps towards radically new forms and uses of information and information technologies within a clear long-term vision that is far beyond the state of the art;
- ambitious proof-of-concept and its supporting scientific foundation, where novelty comes from new, high-risk ideas rather than from the refinement of current ICT approaches;
- new inter-disciplinary collaborations, possibly with prominent and internationally recognized non-EU research teams where these can provide a significant added value.

Expected Impact

- opening new avenues of research towards future ICT that may be radically different from present day ICT.

Funding schemes

STREP

Indicative budget distribution

EUR 15 million

Call: FP7-ICT-2013-X

This objective trials a new and lighter submission process, aims at a faster evaluation and a simpler project implementation. It applies a one-stage submission scheme and specific eligibility and evaluation criteria (see Appendix 5 of this document).

FET Proactive

FET Proactive provides support to promising domains where critical mass needs to be built up in to achieve impacts on science, technology, economy and society. This work programme sets out two Proactive Initiatives in key areas in which FET aims to spearhead transformative research, using living organisms and physical phenomena at the atomic scale as inspirations for new ICT.

Long term FET-like research on "Symbiosis between humans and computers" and "Creative ICT" will be addressed under Objective ICT-2013.2.1 (see entry c) and Objective ICT-2013.8.1 (see entry c).

FET Proactive Initiatives apply specific eligibility and evaluation criteria (see Appendix 5).

Objective ICT-2013.9.6 FET Proactive: Evolving Living Technologies (EVLIT)

Computational and self-adapting properties of living organisms are superior to recent ICT technology in many ways. Being composed of physically and chemically embodied entities, where function is associated to physical structure, they show

properties such as scalability, self-reproduction, self-construction, evolvability, self-organization, adaptability and robustness. Learning to build future ICT along these lines offers a promising way to address important issues such as design complexity of ICT systems, difficulty and specificity of manufacturing, energy management, etc.

The objective is to create living technologies using the principles of biological evolution that co-organize information and matter in systems of physical entities. This includes the full range of possible methodologies, such as using living technologies built up with nano-mechatronics, biological information encoding principles, bio-inspired artificial systems or bio-hybrid systems.

Target outcomes

- Empirical, theoretical and synthetic approaches that define the key bio-inspired principles that can drive future living technologies and the environment to use them in a controlled way.
- Significant steps towards embodying these key principles and showing their usefulness in a technological context.

Expected impact

- Foundations, approaches and proofs of concept for a radically new type of living technology.
- Possible contributions beyond the area of ICT (manufacturing, chemistry, biology, agriculture).

Funding schemes

STREP

Indicative budget distribution

EUR 16 million

Call

FP7-ICT-2013-10

Objective ICT-2013.9.7 FET Proactive: Atomic and Molecular Scale Devices and Systems

The research targets the physical access and greater understanding of the behaviour of a single atom or molecule, or small ensembles thereof, as elementary functional resources for future ICT systems. Aspects such as new forms of atomic scale constructs and fabrication processes, control, sensing and picometer interconnection precision of components are addressed in this objective.

Target outcome

a) Investigation, Design, and Demonstration of ICT functionality, at the atomic and molecular scale, through various physical implementations. Working components and systems relying on robust atomic scale fabrication technologies should be targeted.

b) Investigation, Design, and Development of metrology and control systems at the atomic scale for molecular references or precision sensors or procedures to preserve operation integrity.

c) Design and Development of simulation and hierarchical modelling tools (from ab initio to large atomic scale systems, and single device to circuit and system level), taking account time dependencies to explore the response time of the proposed architecture.

d) Investigation, Design and Demonstration of the embedding and interfacing of atomic and molecular scale components with a mesoscopic technological and material environment, considering charge and non-charge transport, physical nano-connectivity and atomic-scale mechanical response.

Integrated Projects should cover at least topics a), c), and d). STREPs should cover at least two of the above topics.

Expected impact

- Opening of disruptive avenues and exploration of new possibilities for components and technologies at the atomic and molecular scale
- Experimental demonstration of principle, tangible realization, and feasibility of such components and systems
- New perspectives on potential applications with concrete advantages (e.g. energy consumption, data and operation integrity, clock frequency, …)

Funding schemes

IP, STREP

Indicative budget distribution

EUR 16 million

Call

FP7-ICT-2013-10

Objective ICT-2013.9.8 Coordinating communities, identifying new research topics for FET Proactive initiatives and fostering interdisciplinary dialogue:

Target Outcome

a) Short duration actions (typically 6-12 Months) to organise consultations of multi-disciplinary communities to formulate novel FET research topics, focussing on new emerging research areas for H2020 related to ICT and beyond. The main objective should be to identify new research avenues from a global perspective, the associated fundamental challenges, and to analyse the expected impact on science, technology and society.

b) Actions supporting the coordination and cooperation of the targeted research communities, fostering the consolidation of research agendas, assessing the impact and proposing measures to increase the visibility of specific topics to the scientific community, to targeted industries and to the public at large.

c) Actions supporting and promoting cooperation with non-EU research teams in foundational research on FET topics, with a balanced participation from partners in the EU and from target countries.

d) Actions to organise conferences and workshops which should foster dialogue between science, policy and society on the role and challenges of interdisciplinary long-term research, increasing Europe's creativity and innovation base and bridging diverse European research communities and disciplines.

Expected impact

- Novel, widely supported research topics to be considered as inputs for future FET work programmes.
- Reinforced coordination of research projects in FET Proactive Initiatives in current or previous calls.
- Strengthened research excellence and co-operation with partners from outside Europe.
- Early identification and increased awareness of new trends emerging on a global scale in support of future proactive initiatives
- Increased visibility of the FET community and links between European research communities

Funding Scheme

CSA

Indicative budget distribution

EUR 3 million

Calls

FP7-ICT-2013-10

FET Flagships

FET Flagships are science-driven, large-scale, multidisciplinary research initiatives oriented towards a unifying goal, with a transformational impact on science and technology and substantial benefits for European competitiveness and society. The goals of such initiatives should be visionary and highly ambitious in terms of scientific challenges, resources required and coordinated efforts. They require cooperation among a range of disciplines, communities and programmes, extending over a long period (in the order of 10 years duration). FET Flagships are based on partnerships that enable effective coordination of efforts.

An earlier call in 2010 (FP7-ICT-FET-F) has identified six potential flagship topics which have been elaborated in a preparatory phase by a number of EU-funded coordination actions, referred to as "FET-Flagships Preparatory Actions". As a next step, the ramp-up phase, this Work Programme calls for proposals to initiate and build up two FET Flagships.

Objective ICT-2013.9.9: FET Flagships

Proposals should address a grand scientific challenge and need to provide a common research roadmap with well-defined goals and ambitious but realistic milestones. Proposals should be justified in terms of expected scientific advance, potential technological breakthroughs and socio-economic impact. Proposals should describe

how the relevant disciplines, stakeholders and resources will be brought together and be efficiently coordinated under strong scientific leadership.

Target outcome:

Two FET Flagships, each one addressing a topic in line with the FET Flagship Preparatory Actions. These actions organised extensive consultations with the relevant scientific communities and identified relevant national/regional initiatives and programmes that could be part of such a common European effort:

The topics of the Preparatory Actions are:

- understanding and managing complex, global, socially interactive systems, with a focus on sustainability and resilience - stemming from the work of FUTURICT;
- exploiting properties of graphene and related two-dimensional materials for the emergence of a graphene-based translational technology and innovative applications - stemming from the work of GRAPHENE;
- smart, energy-efficient devices for personal assistance based on zero-power sensing, computation and communication technologies - stemming from the work of Guardian Angels;
- building a European facility to simulate the working of the human brain by developing and using supercomputers and neuromorphic hardware, and involving the collection and integration of large amounts of medical and neurophysiological information - stemming from the work of HBP;
- building individual computational models of the biological processes that occur in every human for personalised healthcare - stemming from the work of ITFOM;
- unveiling the secrets underlying the embodied perception, cognition, and emotion of natural sentient systems and using this knowledge to build robot companions based on simplexity, morphological computation and sentience - stemming from the work of RoboCom.

Recognizing that FET Flagships are large endeavours that require a common European effort at multiple levels, this Work Programme calls for:

a) Proposals for CP-CSA with a duration of 30 months. They should describe core research tasks, based on the common research roadmap, as well as establishing a contractual framework for collaboration with other projects and initiatives that address research priorities within the same roadmap. This framework needs to ensure a proper coordination and integration of all the research activities that contribute to the FET Flagship both within the CP-CSA project and within other research activities. The governance to be put into place needs to ensure broad participation and effective opportunities for new partners to join.

Proposals should reserve a substantial part of the budget (e.g. 20%) for future partners, foreseeing an enlargement of the consortium in order to create flexibility and openness, and to ensure dynamic responses to unforeseen challenges.

CP-CSA projects will undergo a review after 18 months to assess their contribution to FET-Flagship strategic objectives and their implementation progress.

b) An ERA-NET between national and/or regional funding agencies aiming at supporting the FET Flagships[40]. Proposals for an ERA-NET should describe how they will coordinate national and/or regional efforts with the common research roadmap.

Expected Impact

a) Expected impact of CP-CSA:

- transformational impact on science and technology and substantial benefits for the European economy and society;
- European leadership in key scientific areas;
- strengthening of the interfaces between ICT and other disciplines;
- progress towards the realisation of the fully operational phase of the FET Flagship, following the ramp-up phase.

b) Expected impact of ERANET:

- enhanced complementarities and synergies of regional, national, European and international research programmes and initiatives
- networking between national funding agencies and creation of a discussion forum for matters of interest related to the two FET Flagships
- identification of areas that could complement the CP-CSA and that may be subject of future joint calls
- reduction of the fragmentation of the European Research Area (ERA)

Funding schemes

a): CP-CSA
b): CSA

Indicative budget distribution:

- CP-CSA: EUR 108 million
- ERANET: EUR 2 million

Calls

a): FP7-ICT-2013-FET-F
b): FP7-ICT-2013-11

[40] The closing date for the ERA-NET Call is deferred in time as compared to the CP-CSA Call.

7.10 International Cooperation

Objective ICT-2013.10.1 EU-Japan research and development Cooperation

a) Optical Communications

Target outcome

The activity intends to focus on the Ethernet ecosystem in conjunction with all-optical networks targeting capacities of 100 Gbit/s per wavelength. While components targeting 100 Gbit/s, and also networks are under development and trial, this activity will focus on further enhancement on a system level of the future Ethernet transport networks by advancing the technologies to efficiently incorporate all network layers, to achieve high-rate server connectivity, and reliable and efficient network access and core switching. Developments of components if needed are to be integrated into an overall system view. Specific target is as follows:

- to achieve efficient and reliable Ethernet transport at 100 Gbit/s rates using single mode- or multi mode fibre for enhanced capacities in short and long range all-optical networks.

- to prove, and if needed, contribute to further advancement of standards such as IEEE802.3ba, ITU-T G.709, and OIF Implementation Agreement.

Expected Impact

- Efficient high rate Ethernet transport and standardisation spin off.

- Key enabling technologies for the future generations of high-speed all-optical networks with improved economic, spectral and energy efficiency.

- Joint EU-Japan contribution to standardization bodies and fora.

b) Wireless Communications

Target Outcome

The goal is to develop short-range wireless systems using millimetre-wave and terahertz-wave technologies to realise ultra high data transmission capacities and high resolution sensing inside or outside of buildings. The focus will be on architectures towards ultra-high speed short-range wireless technology, radio transmission technology, terahertz-wave base band and millimetre-wave radio access technologies including spectrum re-use and cognitive technologies. It includes:

- The use of millimetre bands, both in the context of in-door, in-house applications and the possibility to look for use in outdoor applications like sensing or fibre extensions.

- Achievement of short-range wireless transmission and networking in the teraherz frequency bands.

- A roadmap towards a possible common standardisation in future high-capacity short-range technologies and sensing technologies.

Expected Impact

- Better exploitation of new spectrum parts for short range, very high capacity communication and high resolution sensing applications.

- Key enabling technologies for the future generations of short-range wireless systems with improved economic, spectral and energy efficiency.

- Joint identification of standardization requirements and contribution to standardization bodies and fora

c) Cybersecurity for improved resilience against cyber threats

Target outcome

This activity focuses on research on cybersecurity for improved resilience against cyber threats, such as leak of information, denial of service, malware among EU and Japan. It will develop technologies and strategies for improving and enhancing cybersecurity in heterogeneous networked, service and computing environments and facilitate the early identification of cyber attacks.

The goal is to collaboratively develop a demonstrable and state-of-the-art prototype to improve and enhance cybersecurity against existing and emerging cyber threats in Europe and Japan.

This approach may require additional research and technical development in the field of system and fundamental security, such privacy protection, database security, secure software development, fundamental security technologies based on cryptographic methods and protocols for cloud security, smart-phone security and future network security.

Expected impacts

- Established international critical mass to develop new approaches and instruments in the fight against emerging cyber threats.

- Reinforced policy coordination between the EU and Japan as well as other potential international partners.

d) Extending the cloud paradigm to the Internet of Things - Connected objects and sensor clouds within the service perspective

Target outcome

Current cloud technology lacks features for secure and flexible services that make use of distributed sensing devices and a high quantity of object instances.

The research should focus on the combination of Cloud and Internet of Things (IoT) technologies and to investigate the development of cloud-based service platforms taking into account the IoT perspectives on massive data storage and communication needs in the cloud for the execution of real-time services. The scope may include architecture, middleware and services. The research goals are as follows

- Sound demonstration on how the Internet of Things concept can be enriched and completed by the Cloud paradigm and approach (on sensor, infrastructure, middleware and applications towards end-users level).
- Establishment of a scalable and flexible service platform architecture for enabling secure and smart, partly virtualised, services with processing, integrating, and visualizing contents combined with ambient real life information.
- Additional focus on an Internet of Things-Cloud reference test facilities for ensuring global interoperability for connectivity, services and privacy by design / trusted solutions.
- Concentration on the Smart Cities perspective with a) a business context (business process improvements and industrial applications) and b) societal context (social and environmental applications).
- Road-mapping and recommendations for further activities in the combination of Internet of Things and Cloud.
- Technology for enabling realtime secure communication services with connecting trillions objects and cloud service users

Expected Impact

- Development of integrated Cloud & IoT approaches in terms of architecture, middleware and services within a Smart Cities context.

- Harmonisation of international standardisation efforts and sharing of best practices.

e) Global scale experiments over federated testbeds: Control, tools and applications

Target outcome

The goal is to enable experiments across testbeds as a framework for understanding the management of heterogeneous resources, the access to these resources and the evaluation of their usage. It requires software solutions that are suited to control and deploy an experiment, using distributed resources of various testbeds, possibly wired and wireless. Defining APIs, a thin convergence layer for accessing testbeds seamlessly and a monitoring framework is the focus of this activity. Solutions will be demonstrated for various scenarios ranging from wireless testing to Information-Centric networking.

Research focuses on software defined networking (SDN) paradigm which enables parallel deployment of slices assigned to virtual network providers. The slicing can be done on physical or virtual infrastructures, implying multiple levels of virtualization. Proofs of concept for the benefit of network virtualization can be seen in content-centric networks, or other “beyond-IP” networks.

The activity should produce a demonstration of the relevance of the proposed solutions in a heterogeneous environment. It will cover the control plane (for authentication and resource reservation), the experimental plane for setting up the scenario and monitoring it over the lifetime of the experiment, as well as collecting the appropriate measures. A target environment should be used as a common framework, including wireless and Information-Centric networks.

The software developed in the research projects targets deployment and evaluation in the available testing facilities on both sides (OFELIA, OpenLab, JGN-X).

An integration of SDN with processing capabilities available in Data Centers will bring processing closer to the data it is applied to, improving data access and minimizing transit traffic in the network.

The solutions should then be disseminated for a large adoption, eventually going beyond the testbed framework if appropriate.

Expected Impact

- Interoperability of distributed resources for experiments across heterogeneous testbeds.

f) Green & content centric networks

Target outcome

The focus is on a change in network architecture from host-oriented to content-centric networking[41] The content-centric networking seeks to adapt the network architecture to current network usage patterns. This new paradigm can open new possibilities for energy-efficient content distribution. Of particular importance are issues related to naming, addressing and routing as well as resource control, access analysis and Digital Rights Management. The research needs also to address the migration perspective from the current Internet protocols and architecture.

Green contents distribution platform is addressed from the point of view of integration with power consumption information gathering framework on lower layer network and higher layer network controlling framework that enables optimization of contents location and routing. The content-centric networking seeks to adapt the network architecture to current network usage patterns. This new paradigm can open new possibilities for energy-efficient content distribution.

The call targets a theoretical analysis as well as prototyping and standardisation activities to ensure that the joint work will have an impact on the global green content centric networks landscape. It includes an architectural framework and the related performance assessment framework. Migration technology from current Internet and low energy technology for realizing contents centric networking are included as well. Results may be channelled towards the relevant standardisation fora.

Expected Impact

- Content centric networking architecture for low energy efficient content delivery and associated standardisation requirements

Expected Impact, in addition to specific impacts, for a), b), c), d), e) and f)

Collaborative targeted research and prototyping enable deepened and continued collaboration between European and Japanese researchers and industry, towards the creation of sustainable research links benefiting researchers and industry competitiveness of both sides.

Funding Schemes

[41] content-centric networking is also referred to as infomation centric networking in some FP7 projects and Data Aware Networking in ITU-T

One STREP per topic a) to f) above.

Indicative budget distribution

EUR 9 million total

Call: FP7-ICT-2013-EU-Japan

Objective ICT-2013.10.2 EU-Brazil research and development Cooperation

a) Cloud Computing for Science

Target outcome

The targeted output is the development of state-of-the-art Cloud Computing environment that efficiently exploits the computational, communication and data resources in both the EU and Brazil and offers interoperable and user-centred interfaces. Proposed R&D in this topic would target:

- Infrastructure technologies that promote sustainability, including virtualization of distributed resources (conventional or not), low-power and low-cost solutions, federation of existing, heterogeneous e-Infrastructures in the EU and Brazil.
- Support platforms for e-Science applications, including well-defined APIs and underlying mechanisms for services such as composition, execution and management of large workflows, management and protection of huge datasets.
- Software engineering techniques for the provisioning of e-Science applications as efficient and user-friendly services, including rapid development and deployment of scientific gateways, highly scalable parallel and distributed programming models.
- Crosscutting issues such as the alignment and involvement with international standardization efforts, the commitment with industrial involvement at the early stages, and a close collaboration with the end users.

Expected impact

Applications benefitting from this environment could have a direct impact in a number of fields such as health care, water management, climate change mitigation, natural resources management and an indirect impact in poverty reduction. Actions on this topic will increase efficiency in the usage of expertise and e-Infrastructures that exploit the computational, communication and data resources existing on both sides of the Atlantic.

To add, several IT fields could be impacted depending on the exact scope of the proposals, e.g., virtualization, software engineering, management of large workflows, management and protection of huge datasets. This topic may have an impact in international standardization efforts (e.g. common APIs) while guaranteeing industrial involvement and focus on user community needs.

b) Sustainable technologies for a Smarter Society

Target outcome

This activity is expected to exploit the underlying technologies, components and systems that are needed for the deployment of sustainable ICT solutions (e.g. green ICT, smart things, complex and control systems, nano-electronics, micro-systems).

Advancement of the required technologies, in particular systems development platforms, that enable the development of sustainable complex systems that are cost effective, energy

friendly, affordable and based on open standards, to address current societal challenges for better living.

The purpose is to obtain a systems development platform, composed of modules that will take into account different criticalities of the target systems (time-critical, safety critical, etc) as well as its energy consumption.

Priority will be given to projects that integrate and/or reuse existing components while addressing the research and innovation addressed above, and that demonstrate the final platform in a particular application area, for example energy-efficient buildings (including metering and energy management), transport and traffic management systems, smart grids, smart systems for safety control of the food or water supply chain, environment monitoring and control, etc.

Expected impact

Applications benefitting from these systems development platforms are expected to have a direct impact in a number of fields such as:

- electricity, water and other natural resources management;
- communications and transport;
- education and health;
- climate change mitigation

They should enable to design, model and operate systems composed of a large number of independent, autonomous, heterogeneous and interacting (sub)systems as well as to monitor and control their potential emergent behaviours in a systems-of-systems engineering perspective.

This topic may as well have an impact in international standardization efforts and sharing of best practices.

c) Smart services and applications for a Smarter Society

Target outcome

The focus will be on designing, building and deploying interoperable infrastructures, open platforms and scalable solutions exploiting new trends in Future Internet experimentation and open data. One of the key challenges will be to explore data "mash up" processes which synthesizes new information by collecting, connecting, reusing, combining and semantically aggregating disjoint information extracted from a plethora of sources, such as information generated by users (e.g. through social networks), captured from sensors or made available by public authorities (e.g. GIS, traffic). The adoption of a user-centred innovation approach, emphasising trust and privacy aspects is therefore required.

To develop smart, open experimental platforms to enhance the quality-of-experience of urban living (in terms namely of citizen involvement, inclusion, sustainable lifestyles, etc.). The federation of experimental platforms will be encouraged where appropriate, in particular through the use of standards, open software and open data.

To support the deployment of interoperable wireless infrastructures exploiting new trends on Future Internet and open data (namely from sensors and social networks) to create context-aware services and applications of relevance to citizens in areas such as directing and informing large crowds, emergency and crisis management, smart mobility, energy efficiency, etc., especially on the occasion of large-scale events.

Expected impact

The joint EU-Brazilian components will be crucial to foster critical mass to develop new standards and markets driven by Future Internet facilities. Both European and Brazilian industry will benefit from, and contribute to, its growth.

Bringing together relevant context data and already validated experimental facilities under the concept of smart wireless platforms will have a clear impact and direct benefit in light of the upcoming Football World Cup and Olympic Games to be held in Brazil.

This collaboration will also allow comparing and exchanging best practices on the contribution of ICT to societal and sustainability targets, including that of standards on the minimum quality guarantees of the shared data.

d) Hybrid broadcast-broadband TV applications and services

Target outcome

Hybrid broadcast-broadband TV applications and services to address a new generation of TV applications taking advantage of the widespread Internet connectivity will be developed, both for commercial use and for educational or other public goals.

Although the TV broadcast transmission standards are different in Brazil and Europe, there is an opportunity to foster the development of intuitive and attractive new services seamlessly connecting broadcast and broadband while enabling new business models.

A key issue is how to develop and author applications which can run on different devices / software platforms. Further relevant aspects are: synchronisation of content from different A/V sources running on different distributed types of devices. Intelligent search and navigation mechanisms, identity management, trust and security as well as hyperlinking of video content, especially for social TV applications are among the key functionalities required for an advanced hybrid media experience.

Expected impact

1. Enhance the competitiveness of the EU and Brazilian industry, including innovative SMEs, web apps and TV apps developers.

2. Allow application developers to market their services and applications worldwide, independently of the terrestrial Digital TV standard used.

3. The development of intuitive and attractive services, seamlessly connecting broadcast and broadband is expected to enable new business models.

Funding Schemes

Small or medium scale focused research projects (STREPs).

Proposals will only be selected on the condition that their corresponding coordinated project will be funded by the Brazilian Authorities.

Indicative budget distribution

STREP: EUR 5 million

Up to one proposal per topic may be funded under this call: That is one proposal for each one of the four topics implemented via STREPs

Call:

FP7-ICT-2013-EU-Brazil

Objective ICT-2013.10.3 International partnership building and support to dialogues – Horizontal International Cooperation Actions

Target outcomes

The target is to support dialogues between the European Commission/the EU and strategic partner countries and regions, and to foster cooperation with strategic third country organisations in collaborative ICT R&D both within the EU's Framework Programmes (FP7, Horizon 2020) and under relevant third country programmes. This could include in particular:

- the organisation of events synchronised with dialogue meetings[42], providing timely input and follow-up for example on common R&D priorities and future cooperation opportunities, assisting in focusing dialogue meetings as well as increasing their visibility.
- strengthening of cooperative research links through the set-up of sustainable cooperative mechanisms or platforms between European organisations and relevant leading third country organisations, with the aim of establishing mutually beneficial partnerships based on synergies to be identified between the Digital Agenda for Europe's (DAE) international agenda and third countries/regions' ICT strategies,
- reinforcement of industrial cooperation on ICT research and development, notably through a better networking between European ICT Technology Platforms and relevant associations in third countries,
- increased co-ordination at EU level with horizontal Framework Programme instruments to promote international cooperation (such as BILAT, INCO-NET and ERA-NET), as well as relevant EU Member State and Associated Countries programmes.

Proposals should build upon the achievements by similar past or ongoing projects, in countries/or regions where applicable, while avoiding duplication of that effort in this Call.

Targeted countries/regions:

a) ACP countries (in particular Africa)

b) Asia (in particular China, India, South-East Asia)

c) Eastern Europe and Central Asia

d) High Income Countries: Subgroup 1: North America (Canada, USA)

e) High Income Countries: Subgroup 2: East Asia/Oceania (Australia, Japan, Korea, New Zealand, Singapore, Taiwan)

f) Latin America

g) Mediterranean Partner Countries

It is expected that each targeted area will be covered by at least one project, and that duplication of effort in an area is avoided (i.e., if more than one proposal / area should be retained, preference will be given to proposals with different and/or additional country(ies) coverage).

[42] This includes Information Society Dialogues (organised by DG INFSO), meetings under S&T Agreements (organised by DG RTD), and other relevant meetings (e.g. Senior Officials or Ministerial level regional meetings).

Expected impact

- Reinforcement of strategic partnerships with key third countries and regions in areas of mutual interest and added value in jointly addressing important issues.
- Increased visibility for EU ICT R&D activities and research excellence.
- Support provided for European organisations/individuals in accessing third country programmes.

Activities under this objective should be covered in balanced partnership with relevant and highly qualified third country organisations, including in particular governmental actors (third country research ministries/agencies), relevant industry associations, and academic partners (research centres/universities). Measureable performance indicators should be included (e.g. minimum numbers of events to be organised, participants, new proposals assisted/helped to initiate, European organisations/individuals supported in accessing third country programmes, etc.).

Funding schemes

CSA (Support Actions)

Indicative budget distribution

- CSA (SA): EUR 8 million (maximum EU grant of EUR 800 K per proposal)

Call

FP7-ICT-2013-10

7.11 Horizontal Actions

Objective ICT-2013.11.1 Ensuring more efficient, higher quality public services through Pre-Commercial Procurement of ICT solutions across sectors of public interest

The aim of this action is to bring radical improvements to the quality and efficiency of public services by supporting the development and validation of breakthrough solutions through Pre-Commercial Procurement[43] (PCP). It is open to proposals in all areas of public sector interest, (e.g. for new ICT solutions in healthcare, inclusion, e-government, transport, energy, environment), in complementarity with actions foreseen under other objectives. Especially where interoperability and coherence of solutions across borders is required, cross-border cooperation between public purchasers can help better address issues of common European interest.

The minimum number of participants is three independent legal entities which are public purchasers. Each of these must be established in a different Member State or associated country. Public purchasers are contracting authorities in the meaning of the public procurement Directives[44] at all levels (local, regional, national and supra-national) that are responsible for the acquisition strategy of the new solutions that could be developed as a result of the PCP undertaken during the action to obtain the required quality and efficiency improvements in their public service offering[45]. Other stakeholders in the public service delivery chain may participate in addition, if their participation is well justified and adds value to the action[46].

Target outcome

Each action focuses on one jointly identified concrete challenge in the mid-to-long term innovation plans of the participating public purchasers that requires new R&D, which is proposed to be procured in cooperation through PCP. Consortia shall demonstrate that they contain a critical mass of public purchasers- with clear financial commitments for jointly undertaking the cross-border PCP – that can trigger wide implementation of the public service innovation strategies and solutions that will be developed during the PCP. In order to have a lasting impact, the co-operation developed during the actions should also provide reliable indications that it could continue beyond the EU funding.

The EU contribution for the action shall take the form of a CP-CSA grant that will combine the reimbursement of eligible costs for the activities linked to the preparation, management and coordination of the joint PCP (activities under the CSA part of the action) plus a reimbursement of maximum 75% of costs for the development of the new ICT solutions procured through the joint PCP (for activities under CP part of the action).

The activities covered by each action will combine, in a closely co-ordinated manner:

(1) Under the CSA part of the action: Networking and coordination activities, in particular activities related to preparation, management and coordination of the joint cross-border PCP undertaken under the CP part of the action, such as:

- Defining together the mid-to-long term solutions requirements for the innovation of public services, and resulting specifications for a joint PCP call for tender

[43] See COM(2007)799 and SEC(2007)1668.
[44] 2004/18/EC and 2004/17/EC
[45] Examples of public purchasers can include public hospitals, public transport operators, relevant ministries (such as for health, welfare, transport, environment, justice, etc), water or energy utilities, communes, police or fire brigades, etc
[46] Examples of "other stakeholders" that can help a consortium of e.g. national/regional public healthcare institutes and public hospital procurers collect the solution requirements of the entire health service delivery chain: private hospitals, health insurance organisations, doctors

- Establishing implementation methods for Multinational PCP evaluation and monitoring
- Cooperation agreements enabling further trans-national PCP projects or programmes
- Awareness raising, experience sharing (including PCP training for public purchasers), dissemination of results and contribution to standardisation bodies or regulations to remove obstacles for introduction of PCP innovations into the market

(2) Under the CP part of the action: Joint research activities related to validating the PCP strategy jointly defined by the public purchasers participating in the action, through:

- Exploration, through a joint PCP, of possible alternative solution paths from a number of suppliers for the targeted improvements in public sector services, and
- Testing of these solutions against a set of jointly defined performance criteria, based on a well-defined public purchasing need that is jointly defined by the public purchasers undertaking the joint cross-border PCP.

Actions shall cover the full PCP life cycle of solution design, prototyping, and original development of a limited volume of products/services in the form of a test series.

The joint cross-border PCP involves the award of PCP contracts to a number of tenderers selected through a joint PCP call for tender organised during the action. Different constellations for joint procurement[47] are allowed (see Appendix 6). A common mechanism, including a common set of selection/award criteria, for evaluating the offers submitted to the joint PCP call for tender shall be foreseen. Detailed rules for companies to participate in the financed projects shall be defined by the public purchasers. The call organisers shall organise the PCP while respecting the Treaty principles, the competition rules and the specific requirements in Appendix 6.

Expected Impact

- More forward-looking, concerted, public sector approach to societal challenges
- Cooperation between stakeholders across public sector departmental boundaries to develop common answers to societal challenges faced by the public sector across a number of EU Member or Associated States
- Reduced fragmentation of public sector demand by enabling public purchasers to collectively implement PCP strategies in areas, which due to their nature are better addressed jointly, or which they would not have been able to tackle independently.
- Increased opportunities for wide market uptake and economies of scale for the supply side by forming critical mass on the public demand side, wide publication of results of cross border PCP activities and contribution to standardisation of jointly defined public sector PCP solution requirements specifications.

Funding Scheme

1 CP-CSA for PCP

Indicative budget distribution

EUR 4 million, of which maximum 30% for the CSA part of the CP-CSA

Call

FP7-ICT-2013-10

[47] "Joint procurement" means combining procurement actions of two or more contracting authorities into one procurement carried out jointly. The defining characteristic for this action is that there should be only one tender published, and one entity awarding the resulting R&D service contracts for all PCP phases, on behalf of all participating contracting authorities.

Objective ICT-2013.11.2 More efficient and affordable solutions for digital preservation developed and validated against public sector needs through joint Pre-Commercial Procurement (PCP)

Target outcome

Continuous technology change has turned the mandate to preserve digital resources into a constantly evolving challenge for public organisations, such as administrations and memory institutions. It requires innovative, ready-to-use, customisable and affordable technical solutions and new skills in curatorial staff.

Projects should involve all key stakeholders, i.e. public digital collection holders as well as industrial preservation technology and service providers, for carrying out R&D work that responds to well-defined needs shared by the public organisations in Europe.

Technology solutions could cover areas such as preservation-relevant metadata, migration, the preservation of particularly challenging types of digital objects, and others. Work could include establishing and implementing best practices, preservation planning, and staff training; integrating digital preservation requirements in existing information systems; and increasing those systems' resiliency against technological changes. Solutions should be tested against a set of functionality / performance criteria, jointly defined by the potential public purchasers undertaking the joint cross-border pre-commercial procurement.

Use of open platforms and contribution to standards is encouraged. PCPs shall be implemented according to the conditions outlined in objective 11.1 and Appendix 6.

Expected impact

- Reduced preservation costs and improved preservation capacity and competences in public organisations dealing with digital preservation, including small archives.
- Strengthened position of European service and technology providers (including SMEs) in the field of digital preservation

Funding Schemes

1-2 CP-CSA for PCP

Indicative budget distribution

EUR 5 million, whereas a maximum of 30% of the funding of a project can be used for the CSA part

Call

FP7-ICT-2013-11

Objective ICT-2013.11.3 High quality cloud computing environment for public sector needs, validated through a joint pre-commercial procurement (PCP)

Target outcome

This action targets the harmonisation of requirements and the implementation of a joint strategy for cloud computing in the European public sector. As public sector bodies at national and European level could equally benefit from the transition towards cloud computing, the implementation of this action is foreseen in the form of a CP-CSA for PCP

undertaken by the public sector bodies in Member States and associated countries. The PCP shall be organised while respecting the Treaty principles, the competition rules and the specific requirements in objective 11.1 and Appendix 6.

Public sector requirements for interoperability, information security, data portability or avoidance of vendor lock-in are likely to be similar across a wide range of different areas of activity (health, pension administration, taxation etc) and across different Member States and regions. The CSA part will support the preparation phase of the joint PCP as to enable public sector bodies in Europe to articulate and federate their requirements for prioritised application areas and to stimulate the emergence of concrete solutions for public sector needs. The CP part will support the execution phase of the joint PCP as to enable public sector bodies to jointly coordinate the development and validation of alternative approaches from different providers against the set of joint requirements defined in the preparation phase.

The scope of the targeted solutions covers both the internal use of Cloud computing for ensuring smooth operation of administrative processes within public sector organisations and the external use of Cloud computing for the provision of e-government type services, through the use of clouds, to citizens and businesses:

- Internal use of Cloud Computing within public sector organisations:

Cloud computing can bring radical improvements in efficiency of IT equipment usage and consequent cost reductions. Improved energy efficiency may also be obtainable. The requirements of public bodies in terms of architecture, interoperability of services, standardisation, data audit and traceability, workflow support etc will be translated into concrete, cloud-based solutions for validation though this action. Certification needs will also be addressed.

- External use of Cloud Computing for the provision of services to citizens and businesses:

Cloud-based services can be a cost-effective way for governments at all levels to provide services to the public as well as other public sector entities. The requirements in terms of mobile access, data protection, security, performance, multi-cultural interfaces will be translated into cloud-based services for validation through this action. The need for interaction with multiple stakeholders will be considered.

The CP-CSA for PCP should build on existing work (e.g. EIF v2.0 or the NIST Reference Model) or identify needs for future standardisation work.

Expected impact

- Improved quality and efficiency of internal public sector operations as well as provisioning of public sector services to external entities, in particular citizens businesses and other public sector organisations, through cloud computing
- Strengthened position of European service and technology providers in the field of cloud computing
- Reduced costs through consolidation of requirements and joint procurement.

Funding Scheme

(a) One CP-CSA for PCP, undertaken jointly by public sector organisations in Member States and associated countries.

Indicative budget distribution

EUR 10 million, of which a maximum of 30% for the CSA part of the CP-CSA.

Call:

FP7-ICT-2013-10

Objective ICT-2013.11.4: Supplements to Strengthen Cooperation in ICT R&D in an Enlarged European Union

Target outcome

The target is to reinforce the cooperation across the enlarged European Union and to strengthen the integration of the European Research Area in ICT.

Integration is characterized by the level of collaboration between relevant organizations within the Member and Associated States and by the appropriate EU-dimension brought into the proposed research results and solutions.

In view of reaching the above target, support will go to the participation of additional partners in on-going FP7/ICT projects with the aim to increase the level of expertise, broaden the scope and/or speed up developments.

Proposals must be presented by the coordinator of the on-going project. In order to ensure the widest impact across the Member and Associated States and European Research Area, the additional partners must be located in countries not already present in the existing consortium and preferably located in countries that are underrepresented at programme level. The funding requested should represent a reasonable extension of the on-going project to achieve the goals of the objective; not exceeding 30% of the Commission funding of the existing project or EUR 1 million, whichever is the lower.

Expected Impact

- Reinforced cooperation and better exploitation of ICT R&D synergies across the enlarged European Union.
- Wider participation in EU-supported ICT research projects across all Member States.
- Paving the way for strategic partnerships in view of gaining access to knowledge, developing standards and interoperable solutions and strengthening European competitiveness.

Funding scheme

Additional funding to on-going FP7 ICT IP and STREP projects ending after June 30, 2014.

Indicative budget distribution

EUR 9 million

Call

FP7-ICT-2013-10

Objective ICT-2013.11.5 Cross border services, investment readiness and legal advice for ICT SMEs, start-ups and entrepreneurs

Target outcomes

(a) Support to groups of leading ICT clusters/incubators/accelerators for delivering cross border services to highly innovative SMEs and entrepreneurs, in view of accelerating their growth.

The aim is to:

- Provide improved facilities and services – eg leading edge experience sharing, high quality networking, training and mentoring activities, markets information - to selected highly innovative ICT start-up's and SME and entrepreneurs;
- Facilitate concrete ways of cooperation to stimulate cross borders development and early European and international exposure of selected highly innovative ICT start-up's and SME and entrepreneurs;
- Put in place operational schemes encouraging more and better cross border venturing in Europe.

(b) Support to a platform to develop investment readiness for participants in ICT projects in EU Framework Programmes; to facilitate interactions with investors and access to finance, for innovative SME's or entrepreneurs in ICT participating in EU programmes or targeted by actions of the Digital Agenda for Europe.

This will build on, continue and rationalise the ICT Finance Marketplace initiative (http://www.ict-finance-marketplace.com/site/). Support will go to a single coordination and Support Action animated by a well focused consortium which members should have demonstrated capacity in mobilising Venture Capital firms, Business Angels and other actors investing in high growth SME's in the ICT Field.

(c) Develop bridges between ICT entrepreneurs and start-ups and law students through "law incubators". The aim is that law students give legal advice under the strict supervision of their university teacher, to ICT start-ups and entrepreneurs – in particular web entrepreneurs. Support will go to a Coordination and Support Action involving in a platform a critical mass of law universities, covering specificities of different national legal systems in Europe, and developing links with communities of ICT start-ups and entrepreneurs.

Activities would combine: networking and coordination activities with the European Law Universities of the consortia; definition of the legal expertise to be provided to ICT start-ups and entrepreneurs; elaboration of guidelines tailored to non-legal experts about the specific legal issues related to the ICT sector; dissemination activities about the services offered to the targeted audience.

(d) Develop bridges, networks, contacts between researchers, (PhD) students in ICT projects in EU Framework Programmes on one hand and high potential SMEs, entrepreneurs and business school students on the other hand in order to develop experience sharing on entrepreneurship and to create opportunities for exploiting results and ideas. Support will go to stakeholders having demonstrated capacity in mobilizing ICT entrepreneurs and organisations being in contact with large communities of researchers and students participating in EU R&D project.

The overall objective is to drive innovation, facilitate technology transfer, support entrepreneurship and the creation of start-ups and spinoffs etc, contributing to the exploitation of more innovative products and services out of EU R&D projects. This should be done through actions and events organised in thematic domains as well as the use of existing electronic platforms and networking tools.

Expected impact

- More intense cross border cooperation for improved support to highly innovative SME and entrepreneurs
- Higher investment readiness and better access to investors for innovative SMEs and entrepreneurs
- Improved access to legal advice for innovative SMEs and entrepreneurs
- Experience sharing on entrepreneurship and innovation, creation of opportunities for exploiting R&I ideas and results.

Funding schemes

CSA (Support Actions)

Indicative budget distribution

EUR 5.7 million (4 M€ for (a); 700 k€ for (b); 500 k€ for (c); 500 k€ for (d))

Call

FP7-ICT-2013-10

7.12 Special Action

Objective ICT-2013.12.1 Exascale computing platforms, software and applications

Target Outcomes

This objective focuses on the development of computing platforms, technologies and applications for exascale computing. It aims at leveraging the existing European strengths for building the next generation of extreme performance computing by 2020 and take advantage of the new opportunities created from the transition from peta to exascale computing. This objective builds on the work started following the previous Call on exascale in WP2011-12.

The objective supports systems development work in hardware and software, and the bridging of critical exascale technological gaps with disruptive and innovative approaches (e.g. in libraries, novel algorithms, I/O systems, and programming models).

While computing is addressed under several challenges of this Work Programme, work in this Objective focuses on exascale computing. Thereby it is complementary to the work under Objective 1.2 related to computing architectures for future cloud services, and Objective 3.4 addressing computing systems for embedded systems and for data centres, and Objective 6.2 focusing on energy and environmental performance of data centres.

a) Exascale computing platforms

- Support to the development of a very small number of extreme performance computing platforms (hardware and software) with potential for exascale computing, addressing major challenges of extreme parallelism with millions of cores, including energy efficiency, resilience, I/O, and data-driven/data-intensive computations. The work should be validated with the appropriate application drivers (grand challenge application requirements for exascale computing).

- Each project should bring together one or more supercomputing centres, technology and system suppliers (including system vendor(s) in case of targeting particular vendors' machines), and industrial or academic centres with expertise in grand-challenge application codes.
- Proposals should demonstrate synergies with on-going EC-supported efforts in exascale platforms and the deployment of leadership-class HPC (High Performance Computing) systems under PRACE.

b) Innovative solutions for exascale "technology gaps"

- To develop innovative solutions and disruptive approaches for key exascale computing challenges for which the evolution of existing technologies is clearly insufficient ("exascale technological gap"). Emphasis will be placed on the following areas: (i) new system libraries in the area of I/O, communications and scheduling; (ii) new middleware, programming models and modeling architectures to address the increasing heterogeneity of systems; (iii) improved modularity, parallelisation and scalability of applications. Generic topics targeting concrete solutions for important exascale computing challenges can also be covered (e.g. improved applications for irregular data, numerical mathematics and simulations, etc.).

Expected Impact

- Platforms with clear and highly ambitious scalability targets (e.g. approaching 500 petaflop/s in 2016 - potential for exascale by 2020)
- Strengthened European industry and research in the supply, operation and use of HPC systems, achieving world-leadership; Development of autonomous technology (along the whole spectrum from processor architectures to applications) for building the next generation of extreme performance computing.
- Improved European competitiveness in application areas that are most important for Europe (fundamental sciences, engineering and technology, tackling global challenges such as fighting diseases, energy, climate change etc).
- European research at the forefront of the development of extreme-performance system software and tools;
- Increased return on investments made in PRACE Tier-0 supercomputers and in on-going EC-supported efforts in exascale platforms

Funding Schemes

a) IPs

b) STREPs

Indicative budget distribution

- IP/STREP: EUR 22 million, of which a minimum of 70% allocated to IPs and 25% to STREPs

Call:

FP7-ICT-2013-10

8 Implementation of calls

	Budget	GC, FoF PPP	Smart Cities Co-ordinated Call	Future Internet PPP	EU-Brazil coord. Call	EU-Japan coord. Call .	SME Initiat.	Call 10	Call 11	FET Flagship	FET Open	FET Open Xtrack
Date of publication		10/7/12	10/7/12	16/5/13	12/9/12	2/10/12	10/7/12	10/7/12	18/9/12	10/7/12	12/9/12	12/9/12
Call deadline		4/12/12	4/12/12	10/12/13	12/12/12	29/11/12	15/1/13	15/1/13	16/4/13	23/10/12	Cont. to 12/3/13	Cont. to 29/1/13
1. Pervasive and Trusted Network and Service Infrastructure	**344.9**											
1.1 Future Networks	**48.5**								48.5			
1.2 Software Engineering, Services and Cloud Computing	**41.5**							41.5				
1.3 Digital Enterprise	**16**							16				
1.4 A reliable, smart and secure Internet of Things for Smart Cities	**20**		20									
1.5 Trustworthy ICT	**36.5**							36.5				
1.6 Connected and Social media	**33.4**							33.4				
1.7 Future Internet Research Experimentation (FIRE)	**19**							19				
1.8 PPP FI: Expansion of Use Cases	**100**			100								
1.9 PPP FI: Technology Foundation Extension and Usage	**30**			30								
2. Cognitive Systems and Robotics	**90**											
2.1 Robotics, Cognitive Systems and Smart Spaces, Symbiotic Interaction	**67**							67				
2.2 Robotics use cases & Accompanying measures	**23**							23				
3. Alternative Paths to Components and Systems	**229.5**											
3.1 Nanoelectronics	**32**								32			
3.2 Photonics	**61**								61			
3.3 Heterogeneous Integration and take-up of Key Enabling Technologies for Components and Systems	**64**							64				
3.4 Advanced Computing, embedded and Control systems	**72.5**							72.5				
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4.1 Content analytics and language technologies	**27**							27				
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5. ICT for Health, Ageing Well, Inclusion and Governance	**142.9**											
5.1 Personalised Health, active ageing and independent living	**58**							58				
5.2 Virtual Physiological Human	**31.9**							31.9				
5.3 ICT for smart and personalised inclusion	**19**							19				
5.4 ICT for governance and policy modelling	**19**							19				
5.5 Collective awareness Platforms for Sustainability and Social Innovation	**15**							15				
6. ICT for a Low Carbon Economy	**173**											
6.1 Smart energy grids	**18**								18			
6.2 Data Centres in an energy-efficient and environmentally friendly Internet	**20**		20									
6.3 ICT for water resources management	**14**								14			
6.4: Optimising Energy Systems in Smart Cities	**40**		40									
6.5 Co-operative mobility	**26**							26				
6.6 Integrated personal mobility for smart cities	**15**		15									
6.7: PPP GC: Electro-mobility	**40**	40										
7. ICT for the Enterprise and Manufacturing	**70**											
7.1 PPP FoF: Application experiments for robotics and simulation	**35**	35										
7.2 PPP FoF: Equipment assessment for sensor and laser based applications	**35**	35										
8. ICT for Creativity and Learning	**68**											
8.1 Technologies and scientific foundations in the field of creativity	**43**							43				
8.2 Technology enhanced learning	**25**								25			
9. Future and Emerging Technologies	**210**											
FET-Open	**65**											
9.1 Challenging current Thinking	**34**										34	
9.2 High-Tech Research Intensive SMEs in FET research	**6**										6	
9.3 FET Young Explorers	**8**										8	
9.4 International cooperation on FET research	**2**										2	
9.5 FET-Open Xtrack	**15**											15
FET-Proactive	**35**											

9.6 FET Proactive: Evolving Living Technologies	**16**							16				
9.7 FET Proactive: Atomic and Molecular Scale Devices and Systems	**16**							16				
9.8 FET Proactive: Coordinating communities	**3**							3				
FET-Flagships	**110**											
9.9 FET Flagships	**110**								2	108		
10. International Cooperation	**22**											
10.1 EU-Japan Research and Development Cooperation	**9**					9						
10.2 EU-Brazil Research and Development Cooperation	**5**				5							
10.3 International Partnership building and support to dialogues	**8**							8				
11. Horizontal Actions	**33.7**											
11.1 Ensuring more efficient higher quality public services through Pre-Commercial Procurement of ICT solutions across sectors of public interest	**4**							4				
11.2 More efficient and affordable solutions for digital preservation developed and validated against public sector needs through joint Pre-Commercial procurement (PCP)	**5**								5			
11.3 High quality cloud computing environment for public sector needs, validated through a joint pre-commercial procurement (PCP)	**10**							10				
11.4 Supplements to Strengthen Cooperation in ICT R&D in an Enlarged European Union	**9**							9				
11.5 Cross border services, investment readiness and legal advice for ICT SMEs, start-ups and entrepreneurs	**5.7**							5.7				
12. Special action	**22**											
12.1 Exascale computing platforms, software and applications	**22**							22				
Total	**1484**	110	95	130	5	9	20	705.5	236.5	108	50	15

Other expenditures

Independent experts assisting in proposal evaluations and project reviews

The ICT priority will support independent experts assisting in proposal evaluations, project reviews and for the ICT theme evaluation and monitoring. Indicative budget in 2013: EUR 15 million.

ICT conference, studies, evaluations and reviews

In addition to calls for proposals, calls for tenders for up to EUR 8 million in 2013 are also expected to be published on specific activities that the ICT priority will support. These include:

– Studies including socio-economics and impact analysis studies and studies to support the monitoring, evaluation and strategy definition for the ICT priority in FP7. DG INFSO plans to launch the calls for tenders during the first semester 2013, and conclude indicatively 20 study contracts before year-end. Indicative budget in 2013: EUR 6 million.

– Publications and support to other events (e.g. information, communication, dissemination etc.), either through the use of existing Framework Contracts, or the launch of indicatively 15 calls for tenders during the first semester 2013. Indicative budget in 2013: EUR 2 million.

Details will be provided in the texts of these calls for tender.

The International Human Frontier Science Programme Organisation

As foreseen in the Cooperation Specific Programme an annual subscription to the International Human Frontier Science Programme Organisation (HFSPO) [48] will be made jointly with the 'Health' theme[49]. This will allow EU non-G8 Member States to fully benefit from the Human Frontier Science Programme (HFSP) and provide increased visibility for European research. According to the conclusions of the Intergovernmental Conference held in Canberra in May 2010 the EU subscriptions for 2013 will be EUR 4 672 000. Out of the total EU subscription EUR 1 869 000 will be paid in 2013 from this Theme[50], and the remainder from the Health Theme.

IMS Secretariat

The ICT Theme will support the Intelligent Manufacturing Systems secretariat[51] for an amount of EUR 140 000 in 2013.

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[48] The European Union is a Management Support Party (member) of the HFSP Organisation (HFSPO) and has funded HFSP under previous Framework Programmes.

[49] In accordance with Article 14(d) of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

[50] In accordance with Article 108(2)(d) of the Financial Regulation and Article 160a of the detailed rules of the implementation of the Financial Regulation.

[51] For more information on IMS: http://cordis.europa.eu/ims. The European Union participates according to Article 108(2)(d) of the Financial Regulation.

ICT Contribution to General FP7 Activities

The ICT priority will contribute to other general activities including the Cordis service, EUREKA membership, the COST Programme and experts (evaluators and reviewers) related with horizontal activities. A summary of this contribution is given below:

	2013
COST	EUR 11.287.640
Experts (evaluators and reviewers) related with horizontal activities	EUR 26.851
CORDIS	EUR 2.121.213
EUREKA	EUR 107.403
Total	**EUR 13.543.107**

A summary table of all the above expenditures is given in Appendix 4 of this document.

Call title: ICT call 10

- Call identifier: FP7-ICT-2013-10
- Date of publication[52]: 10 July 2012
- Deadline[53]: 15 January 2013, at 17:00.00 Brussels local time
- Indicative budget[54]: EUR 705.5 million[55]

  See indicative budget breakdown in section 7 of the ICT work programme.
- Topics called:

Challenge	Objectives	Funding schemes
Challenge 1: Pervasive and Trusted Network and Service Infrastructures	ICT-2013.1.2 Software Engineering, Services and Cloud Computing	IP/STREP, CSA
	ICT-2013.1.3 Digital Enterprise	STREP, CSA
	ICT-2013.1.5 Trustworthy ICT	IP/STREP, CSA
	ICT-2013.1.6 Connected and Social media	IP, STREP, CSA

[52] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

[53] The Director-General responsible may delay this deadline by up to two months

[54] The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

[55] Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

	ICT-2013.1.7 Future Internet Research Experimentation (FIRE)	IP, STREP, CSA
Challenge 2: Cognitive systems and robotics	ICT-2013.2.1 Robotics, Cognitive Systems & Smart Spaces, Symbiotic Interaction	IP/STREP
	ICT-2013.2.2 Robotics use cases & Accompanying measures	STREP, CSA
Challenge 3: Alternative Paths to Components and Systems	ICT-2013.3.3 Heterogeneous Integration and take-up of Key Enabling Technologies for Components and Systems	IP/STREP, CSA
	ICT-2013.3.4 Advanced Computing, embedded and Control Systems	IP/STREP, CSA
Challenge 4: Technologies for Digital Content and Languages	ICT-2013.4.1 Content analytics and language technologies	STREP, CSA
Challenge 5: ICT for Health, Agein Well, Inclusion and Governance	ICT-2013.5.1 Personalised health, active ageing and independent living	IP/STREP, CP-CSA, CSA
	ICT-2013.5.2 Virtual Physiological Human	STREP, CSA
	ICT-2013.5.3: ICT for smart and personalised inclusion	IP/STREP, CSA
	ICT 2013.5.4 ICT for Governance and Policy Modelling	STREP, CSA
	ICT-2013.5.5 Collective Awareness Platforms for Sustainability and Social Innovation	IP/STREP, CSA
Challenge 6: ICT for a Low Carbon Economy	ICT-2013.6.5 Co-operative mobility	IP/STREP, CSA
Challenge 8: ICT for learning and Access to Cultural resources	ICT-2013.8.1 Technologies and scientific foundations in the field of creativity	IP/STREP, CSA
Future and Emerging Technologies	ICT-2013.9.6 FET Proactive: Evolving Living Technologies (EVLIT)	STREP
	ICT-2013.9.7 FET Proactive: Atomic and Molecular Scale Devices and Systems	IP, STREP
	ICT-2013.9.8 Coordinating communities, identifying new research topics for FET Proactive initiatives and fostering interdisciplinary	CSA

	dialogue	
International Cooperation	ICT-2013.10.3 International partnership building and support to dialogues – Horizontal International Cooperation Actions	CSA
Horizontal Actions	ICT-2013.11.1 Ensuring more efficient, higher quality public services through Pre-Commercial Procurement of ICT solutions across various sectors of public interest	CP-CSA
	ICT-2013.11.3 High quality cloud computing environment for public sector needs, validated through a joint pre-commercial procurement (PCP)	CP-CSA
	ICT-2013.11.4 Supplements to Strengthen Cooperation in ICT R&D in an Enlarged European Union	IP, STREP
	ICT-2013.11.5 SME Access to Finance and legal advice	CSA
Special action	ICT-2013.12.1 Exa-scale computing platforms, software and applications	IP, STREP

- Eligibility conditions:

  The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants[56]. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

  Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

  The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.

- Evaluation procedure:

  - A one-stage submission procedure will be followed.
  - The evaluation criteria and sub-criteria (including weights and thresholds), together with the eligibility, selection and award criteria, for the different funding schemes are set out in Annex 2 to the Cooperation work programme.

[56] For CP-CSAs (Objectives 5.3, 5.4, 11.1), according to Annex 2, criteria for "all funding schemes", "collaborative projects" and "coordination and support actions" apply.

Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadline. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template.

- Particular requirements for prioritisation of proposals with the same score[57]:

  The procedure for prioritising proposals which have been awarded the same score (ex aequos) within a ranked list is described below. It will be applied successively for every group of ex aequo proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

  (i) Proposals that address topics not otherwise covered by more highly-rated proposals, will be considered to have the highest priority.

  (ii) These proposals will themselves be prioritised according to the scores they have been awarded for the criterion impact. When these scores are equal, priority will be based on the scores for the criterion scientific and/or technological excellence. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme.

  (iii) The method described in (ii) will then be applied to the remaining ex aequos in the group.

- Specific eligibility and evaluation criteria and specific rules for prioritisation of proposals are applicable to the FET Objectives of this call (see Appendix 5).

- **For Objective ICT-2013.1.7(d) FIRE** additional eligibility, evaluation and selection criteria are as follows:

  Proposals which do not include at least one South African participant will be considered ineligible.

- **For Objective ICT-2013.1.7(e) FIRE** additional eligibility, evaluation and selection criteria are as follows:

  Proposals which do not include at least one Chinese participant will be considered ineligible.

- **For Objective ICT-2013.1.7(f) FIRE** additional eligibility, evaluation and selection criteria are as follows:

  Proposals which do not include at least one South Korean participant will be considered ineligible.

- For **Objective ICT-2013.1.5(e) Trustworthy ICT** additional eligibility, evaluation and selection criteria are as follows:

[57] For this call, the procedure detailed below replaces the procedure foreseen in Annex 2 for the handling of tied scores.

Proposals which do not include at least one Australian participant will be considered ineligible.

Proposals will only be selected on the condition that the Australian participation will be funded by the Australian Authorities.

In the evaluation, under the criteria 'Impact' and 'Implementation', it should be taken into account if the proposals include a balanced effort between EU-Australia participants and a research plan properly involving coordinated research activities between Europe and Australia.

- For **Objective ICT-2013.11.1 Ensuring more efficient, higher quality public services through Pre-Commercial Procurement of ICT solutions across sectors of public interest and Objective ICT-2013.11.3 High quality cloud computing environment for public sector needs, validated through a joint pre-commercial procurement (PCP) and Objective ICT-2013.5.1(d) Personalised Health, active ageing and independent living, Pre-commercial Procurement Actions (PCP)** additional eligibility are as follows:

  The minimum number of participants is three independent legal entities which are public bodies. Each of these must be established in a different Member State or associated country.

- Indicative evaluation and contractual timetable: It is expected that the grant agreement negotiations for the shortlisted proposals will start as of April/May 2013.
- Consortia agreements: Participants in all actions resulting from this call are required to conclude a consortium agreement.
- The forms of grant which will be offered are specified in Annex 3 to the Cooperation work programme.

Call title: ICT call 11

- Call identifier: FP7-ICT-2013-11
- Date of publication[58]: 18 September 2012
- Deadline[59]: 16 April 2013, at 17:00.00 Brussels local time
- Indicative budget[60]: EUR 236.5 million[61]

  See indicative budget breakdown in section 7 of the ICT work programme.
- Topics called:

[58] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

[59] The Director-General responsible may delay this deadline by up to two months

[60] The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:
- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

[61] Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

Challenge	Objectives	Funding schemes
Challenge 1: Pervasive and Trusted Network and Service Infrastructures	ICT-2013.1.1 Future Networks	IP/STREP, CSA
Challenge 3: Alternative Paths to Components and Systems	ICT-2013.3.1 Nanoelectronics	STREP, CSA (SA only)
	ICT-2013.3.2 Photonics	IP, STREP, CSA, ERANET Plus
Challenge 4: Technologies for Digital Content and Languages	ICT-2013.4.2 Scalable data analytics	IP/STREP, CSA
Challenge 6: ICT for a Low Carbon Economy	ICT-2013.6.1 Smart Energy Grids	STREP
	ICT-2013.6.3 ICT for water resources management	STREP
Challenge 8: ICT for learning and Access to Cultural resources	ICT-2013.8.2 Technology-enhanced learning	IP/STREP, CP-CSA, CSA
Future and Emerging Technologies	ICT-2013.9.9 FET Flagship Initiatives (b)	CSA
Horizontal Actions	ICT-2013.11.2 More efficient and affordable solutions for digital preservation developed and validated against public sector needs through joint Pre-Commercial Procurement (PCP)	CP-CSA

- Eligibility conditions:

  The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants[62]. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

  Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

  The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.

- Specific Eligibility Criteria for ERA-NET proposals (Objectives 3.2(d) and 9.9(b))

  The aim of ERA-NET actions is to network research programmes carried out at national or regional level, with a view to their mutual opening and the development and implementation of joint activities. Such programmes shall have all of the following characteristics:

[62] For CP-CSA (Objectives 8.2), according to Annex 2, criteria for "all funding schemes", "collaborative projects" and "coordination and support actions" apply.

- Be strategically planned (i.e. be composed of a number of research projects focused on a defined subject area or set of problems, that are scheduled to run for a set period of time and that have a co-ordinated management).
- Be carried out at national or regional level.
- Be either financed or managed directly by national or regional public bodies, or by structures (e.g. agencies) closely related to, or mandated by, public authorities.

The minimum number of participants in an ERA-NET action is **3 independent legal entities** which finance or manage publicly funded national or regional programmes**. Each of these shall be established in a different Member State or Associated Country**.

Partners for ERA-NET actions eligible to satisfy the above conditions are:

- Programme owners: typically national ministries/regional authorities responsible for defining, financing or managing research programmes carried out at national or regional level.
- Programme 'managers' (such as research councils or funding agencies) or other national or regional organisations that *implement* research programmes under the supervision of the programme owners.
- Programme owners (typically national ministries/regional authorities) which do not have a running or fully fledged research programme at the moment of submitting an ERA-NET proposal, but which are planning, and have committed, to set up such a programme, are also eligible if their participation is well justified and adds value to the overall programme coordination.

Sole participants (as referred to in Article 10 of the Rules for Participation) are eligible if the above-mentioned minimum conditions are satisfied by the legal entities forming together a sole participant. A sole participant shall explicitly indicate which of its 'members' are either programme owners or programme managers in the proposed action, and indicate for these members the respective national/regional programmes which are at the disposal of the proposed ERA-NET action.

Provided that the proposal complies with the minimum number of participants required in an ERA-NET action as described above, the following legal entities are eligible:

a) Programme owners and programme managers not established in a Member State or Associated Country;

b) Private legal entities (e.g. charities) which own or manage research programmes, if their participation is well justified and adds value to the overall programme coordination.

- For **Objective ICT-2013.11.2 Joint cross-border pre-commercial procurement (PCP) on more efficient digital preservation and Objective ICT-2013.8.2 (a) Technology-enhanced learning, ICT-enabled learning environments** additional eligibility are as follows:

  The minimum number of participants is three independent legal entities which are public bodies. Each of these must be established in a different Member State or associated country.

- Evaluation procedure:
  - A one-stage submission procedure will be followed.

– The evaluation criteria and sub-criteria (including weights and thresholds), together with the eligibility, selection and award criteria, for the different funding schemes are set out in Annex 2 to the Cooperation work programme.

Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadline. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template.

- Particular requirements for prioritisation of proposals with the same score[63]:

  The procedure for prioritising proposals which have been awarded the same score (ex aequos) within a ranked list is described below. It will be applied successively for every group of ex aequo proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

  (i) Proposals that address topics not otherwise covered by more highly-rated proposals, will be considered to have the highest priority.

  (ii) These proposals will themselves be prioritised according to the scores they have been awarded for the criterion impact. When these scores are equal, priority will be based on the scores for the criterion scientific and/or technological excellence. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme.

  (iii) The method described in (ii) will then be applied to the remaining ex aequos in the group.

- Specific eligibility and evaluation criteria and specific rules for prioritisation of proposals are applicable to the FET Objectives of this call (see Appendix 5).

- Indicative evaluation and contractual timetable: It is expected that the grant agreement negotiations for the shortlisted proposals will start as of September/October 2013.
- Consortia agreements: Participants in all actions resulting from this call are required to conclude a consortium agreement.
- The forms of grant which will be offered are specified in Annex 3 to the Cooperation work

Call title: "Factories of the Future"

Public-Private Partnership "Factories of the Future" - Cross-Thematic call implemented between NMP and ICT

- Call identifier: FP7-2013-NMP-ICT-FoF
- Date of publication: 10 July 2012[64]
- Deadline: 4 December 2012[65] at 17.00.00 (Brussels local time).
- Indicative budget[66] : EUR 230 million[67] from the 2013 budget of which:

[63] For this call, the procedure detailed below replaces the procedure foreseen in Annex 2 for the handling of tied scores.
[64] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication
[65] The Director-General responsible may delay this deadline by up to two months

- EUR 160 million from Theme 4 – Nanosciences, Nanotechnologies, Materials & New Production Technologies

- EUR 70 million from Theme 3 – Information and Communication Technologies (ICT)

- Topics called:

Activity/ Area	Topics called	Funding Schemes	Budget (Million EUR)
NMP – Nanosciences, nanotechnologies, Materials and new Production			
FoF.NMP.2013-1	Improved use of renewable resources at factory level	DEMO-targeted collaborative projects	*160*
FoF.NMP.2013-2	Innovative re-use of modular equipment based on integrated factory design	DEMO-targeted collaborative projects	
FoF.NMP.2013-3	Workplaces of the future: the new people-centred production site	Small or medium-sized collaborative projects	
FoF.NMP.2013-4	Innovative methodologies addressing social sustainability in manufacturing	Coordination and Support Actions (Support action)	
FoF.NMP.2013-5	Innovative design of personalised product-services and of their production processes based on collaborative environments	Large-scale integrated collaborative projects	
FoF.NMP.2013-6	Mini-factories for customised products using local flexible production	DEMO-targeted collaborative projects	
FoF.NMP.2013-7	New hybrid production systems in advanced factory environments based on new human-robot interactive cooperation	Large-scale integrated collaborative projects	
FoF.NMP.2013-8	Innovative strategies for renovation and repair in manufacturing systems	Large-scale integrated collaborative projects	

[66] The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:
- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

[67] Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

FoF.NMP.2013-9	Advanced concepts for technology-based business approaches addressing product-services and their manufacturing in globalised markets	Small or medium-sized collaborative projects	
FoF.NMP.2013-10	Manufacturing processes for products made of composites or engineered metallic materials	Small or medium-sized collaborative projects	
FoF.NMP.2013-11	Manufacturing of highly miniaturised components	SME-targeted collaborative projects	
ICT – Information and Communication Technologies			
FoF-ICT-2013.7.1	Application experiments for robotics and simulations	*Collaborative Projects (IP only) and CSA*	70
FoF-ICT-2013.7.2	Equipment assessment for sensor and laser based applications	*Collaborative Projects (IP only) and CSA*	

- **Eligibility conditions:**

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation: For Collaborative projects, the minimum condition shall be the participation of 3 independent legal entities, each of which is established in a Member State or Associated Country and no two of which are established in the same Member State or Associated Country.

For Coordination and Support Actions, the minimum conditions shall be:

- Coordination and Support Actions – **coordinating actions**: at least 3 independent legal entities, each of which is established in a Member State or Associated Country, and no 2 of which are established in the same Member State or Associated Country.

- Coordination and Support Actions – **supporting actions**: at least 1 independent legal entity.

- **Additional eligibility criteria**

Topics FoF.NMP.2013-5, FoF.NMP.2013-7 and FoF.NMP.2013-8: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Large-scale integrating collaborative projects **the minimum requested EU contribution must be greater than EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

Topics FoF.NMP.2013-3, FoF.NMP.2013-9 and FoF.NMP.2013-10: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Small or medium-sized collaborative projects **the maximum requested EU contribution must not exceed EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

Topic FoF.NMP.2013-11: SME-targeted Collaborative Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 35% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Topic FoF.NMP.2013-4: The requested EU contribution must not exceed EUR 500 000, and the project duration must not exceed 18 months.

For the ICT topics, each proposal must indicate the type of funding scheme used (IP for Collaborative Projects where applicable; CA or SA for Coordination and Support Actions). See Appendix 2 to the ICT chapter of the Cooperation work programme for further details.

- **Evaluation procedure:**

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

Each Theme will remain responsible for its own budget and for the implementation of the respective call topics. This includes drawing up ranking lists per Theme and subsequent negotiation and follow-up of the grant agreements resulting from proposals selected under the respective call topics.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	**3/5**
Implementation	**3/5**
Impact	**3/5**
Overall threshold required	**10/15**

Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

See also Annex 2: Eligibility, Evaluation criteria for proposals and priority order for proposals with the same score[68].

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

- **Indicative evaluation and contractual timetable**:

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

- **Consortium agreements**

Participants are required to conclude a consortium agreement.

- **Particular requirements for participation, evaluation and implementation:**

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up by each Theme as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs**

For topics FoF.NMP.2013, and in accordance with Annex 3 to this Work Programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: *http://ec.europa.eu/research/participants/portal/page/fp7_documents*,
under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

[68] For the NMP Programme, and in contrast with Annex 2, at Panel stage, the priority order of the proposals with equal overall scores will be established in accordance with their scores for the S/T Quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If proposals are still tied, they will be prioritised on the basis of the work programme coverage.

Call title: "ICT for Green Cars"

Call identifier: FP7-2013-ICT-GC

- Date of publication[69]: 10 July 2012
- Deadline[70]: 4 December 2012 at 17.00.00 (Brussels local time)
- Indicative budget[71]: EUR 40 million[72]

  See indicative budget breakdown in Section 7 of the ICT work programme.
- Topics called:

Activity/ Area	Objectives	Funding schemes	Budget
ICT – Information and Communication Technologies			
GC-ICT-2013.6.7	Electro-mobility	*Collaborative Projects (IP, STREP) and Coordination and Support Actions (CSA)*	40

An overview of all PPP-related topics is provided in Annex 5.

- Eligibility conditions:

  The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

  Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

  The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.

[69] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.
[70] The Director-General responsible may delay this deadline by up to two months
[71] The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:
- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

[72] Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

- Evaluation procedure:

  A one-stage submission procedure will be followed.

  Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

  For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	**3/5**
Implementation	**3/5**
Impact	**3/5**
Overall threshold required	**10/15**

  See also Annex 2: Eligibility and evaluation criteria for proposals and priority order for proposals with the same score.

  In order to ensure industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation.

  Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

- Indicative evaluation and contractual timetable:

  Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

- Consortia agreements:

  Consortia agreements are required for *all* actions.

- Particular requirements for participation, evaluation and implementation:

  As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up by Theme as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

  The forms of grants and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.

Call title: "Smart Cities and Communities"

Smart Cities is a target research and innovation area in the future European Framework Programme for Research and Innovation. In order to prepare the constituency, the Themes ICT and ENERGY are launching this Cross-Thematic call.

Call title: "Smart Cities and Communities"

- **Call identifier:** FP7-SMARTCITIES-2013

- **Date of publication:** 10 July 2012[73]
- **Deadline:** 4 December 2012 [74] at 17.00.00 (Brussels local time).
- **Indicative budget** [75, 76]: EUR 209 million from the budget of which:
    - EUR 95 million from Theme 3 – Information and Communication Technologies (ICT)
    - EUR 114 million from Theme 5 – Energy

Activity/ Area	Budget (Million EUR)
Theme 3 – Information and Communication Technologies (ICT)	
FP7-ICT-2013.1.4	20
FP7-ICT-2013.6.2	20
FP7-ICT-2013.6.4	40
FP7-ICT-2013.6.6	15
Theme 5 – Energy	
Area Energy.7.1: Development of Inter-Active Distribution Energy Networks Area Energy 7.3: Cross Cutting Issues and Technologies	24
Area ENERGY.8.8: Smart Cities and Communities	90

- **Topics called:**

Activity/ Area	**Topics called**	**Funding Schemes**
Theme 3 – Information and Communication Technologies (ICT)		

[73] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

[74] The Director-General responsible may delay this deadline by up to two months

[75] Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

[76] The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call sub-budgets may also vary by up to 10% of the total value of the indicated budget for the call.

FP7-ICT-2013.1.4	A reliable, smart and secure Internet of Things for Smart Cities	Collaborative Projects (STREP only) and CSA
FP7-ICT-2013.6.2	Data Centres in an energy-efficient and environmental friendly Internet	Collaborative Projects (STREP only)
FP7-ICT-2013.6.4	Optimising Energy Systems in Smart Cities	Collaborative Projects (STREP only) and CSA
FP7-ICT-2013.6.6	Integrated personal mobility for smart cities	Collaborative Projects (STREP only)
Theme 5 – Energy		
Area Energy.7.1: Development of Inter-Active Distribution Energy Networks	Topic ENERGY.2013.7.1.1: Development and validation of methods and tools for network integration of distributed renewable resources	*Collaborative Project*
Area Energy 7.3: Cross Cutting Issues and Technologies	Topic ENERGY.2013.7.3.1: Planning rules for linking electric vehicles (EV) to distributed energy resources *Up to one project may be funded*	
	Topic ENERGY.2013.7.3.2: Enhanced interoperability and conformance testing methods and tools for interaction between grid infrastructure and electric vehicles *Up to one project may be funded*	
Area ENERGY.8.8: Smart Cities and Communities	Topic ENERGY.2013.8.8.1: Demonstration of optimised energy systems for high performance-energy districts	Collaborative Project with a predominant demonstration component

The topics FP7.ENERGY.2013.8.8.1 and FP7-ICT-2013.6.4 contribute to the objectives of the Energy-Efficient building PPP.

Other topics related to Smart Cities and Communities, but not included in this call, are:

- Call FP7-ICT-2013-GC, GC-ICT-2013.6.7: Electro-mobility,
  see Theme 3 (ICT), part of PPP Green Cars
- Call FP7-2013-NMP-ENV-EeB, EeB.NMP.2013-3: Integration of technologies for energy-efficient solutions in the renovation of public buildings,
  see Theme 4 (NMP), part of PPP EeB
- Call FP7-2013-NMP-ENV-EeB, EeB.NMP.2013-4: Integrated control systems and methodologies to monitor and improve building energy performance
  see Theme 4 (NMP), part of PPP EeB
- Call FP7-2013-NMP-ENV-EeB, EeB.NMP.2013-5: Optimised design methodologies

for energy-efficient buildings integrated in the neighbourhood energy systems
see Theme 4 (NMP), part of PPP EeB

- Call FP7-2013-NMP-ENV-EeB, EeB.NMP.2013-6: Achieving high efficiency by deep retrofitting in the case of commercial buildings
see Theme 4 (NMP), part of PPP EeB
- Call FP7-2013-NMP-ENV-EeB, EeB.ENV.2013.6.3-4: Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts,
see Theme 6 (ENV), part of PPP EeB

- **Eligibility conditions**

The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. They are summarised in the table below:

Funding scheme	**Minimum conditions**
Collaborative Projects	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (supporting action)	At least 1 independent legal entity.

- **Evaluation procedure**

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

Each Theme will be responsible for its own budget and for the implementation of the respective call topics. This includes drawing up ranking lists per budgetary envelope and subsequent negotiation and follow-up of the grant agreements resulting from the proposals selected under the respective call topics.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the

possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	**3/5**
Implementation	**3/5**
Impact	**3/5**
Overall threshold required	**10/15**

Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

See also Annex 2: Eligibility and evaluation criteria for proposals and priority order for proposals with the same score.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

The maximum number of projects that may be funded under a specific topic is restricted in the following topics:

- Topic ENERGY.2013.7.3.1: Planning rules for linking electric vehicles (EV) to distributed energy resources: up to one project may be funded
- Topic ENERGY.2013.7.3.2: Enhanced interoperability and conformance testing methods and tools for interaction between grid infrastructure and electric vehicles: up to one project may be funded

- **Indicative evaluation and contractual timetable:**

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

- **Consortia agreements**

Consortia agreements are required for *all* actions.

- **Particular requirements for participation, evaluation and implementation:**

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up for each budget envelope as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

The forms of grants and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.

Call title: "Future Internet"

Public-Private Partnership "Future Internet"

- Call identifier: FP7-2013-ICT-FI
- Date of publication: 16 May 2013

- Deadline: 10 December 2013 at 17.00.00 (Brussels local time)
- Indicative budget[77]: EUR 130 million[78]

  See indicative budget breakdown in section 7 of the ICT work programme.
- Topics called:

Challenge	Objectives	Funding schemes
Challenge 1: Pervasive and Trusted Network and Service Infrastructures	FI.ICT-2013.1.8 Expansion of Use Case	CP-CSA
	FI.ICT-2013.1.9 Technology Foundation Extension and Usage	IP/CSA

- Eligibility conditions:

  The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

  Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

  The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.
- Evaluation procedure:
  - A one-stage submission procedure will be followed.
  - The evaluation criteria and sub-criteria (including weights and thresholds), together with the eligibility, selection and award criteria, for the different funding schemes are set out in Annex 2 to the Cooperation work programme.

  Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadline. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template.
- Particular requirements for prioritisation of proposals with the same score:

  The procedure for prioritising proposals which have been awarded the same score (ex aequos) within a ranked list is described below. It will be applied successively for every group of ex aequo proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

[77] The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:
- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

[78] Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

(i) Proposals that address geographies and/or domains not otherwise covered by more highly-rated proposals, will be considered to have the highest priority.

(ii) These proposals will themselves be prioritised according to the scores they have been awarded for the criterion impact. When these scores are equal, priority will be based on the scores for the criterion Quality and efficiency of the implementation and the management. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme.

(iii) The method described in (ii) will then be applied to the remaining ex aequos in the group.

- Indicative evaluation and contractual timetable: It is expected that the grant agreement negotiations for the shortlisted proposals will start as of May 2014.
- **Typically grant agreements resulting from this call will included Special Clause 39 'Open Access'.**
- Consortia agreements: Participants in all actions resulting from this call are required to conclude a consortium agreement. Special clause 41 'Complementary Grant Agreements' and the provisions therein will be applicable to all projects selected under this call.

The forms of grant which will be offered are specified in Annex 3 to the Cooperation work programme.

Call title: SME Initiative on Analytics

- Call identifier: FP7-ICT-2013-SME-DCA
- Date of publication[79]: 10 July 2012
- Deadline[80]: 15 January 2013, at 17:00.00 Brussels local time
- Indicative budget[81]: EUR 20 million[82]

  See indicative budget breakdown in section 7 of the ICT work programme.
- Topics called:

Challenge	Objectives	Funding schemes
Challenge 4: Technologies for Digital Content and Languages	4.3 SME initiative on analytics	IP, STREP

[79] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

[80] The Director-General responsible may delay this deadline by up to two months

[81] The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

[82] Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

- Eligibility conditions:

  The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

  Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

  The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.

  In addition to the eligibility criteria set out in Annex 2, STREP proposals submitted to this call are subject to the following additional eligibility criteria:

  1. The consortium must contain at least **two SMEs** (this will be declared in Part A of the proposal).[83]
  2. The project duration shall not exceed **24 months** and the maximum EU funding requested must not exceed **EUR 1.500.000**.
  3. A minimum of **30% of the funding** requested in the proposal must be allocated to SME partners and maintained in the negotiated EU grant if the proposal is selected for funding.
  4. The length of Part B should not exceed **20 A4 pages**, excluding a title page.

  In addition to the eligibility criteria set out in Annex 2, IP proposals submitted to this call are subject to the following additional eligibility criteria:

  1. The length of Part B should not exceed 5**0 A4 pages**, excluding a title page.

- Evaluation procedure:

  A one-stage submission and evaluation procedure will be followed:

  Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadlines.

Proposals submitted under this call will be evaluated according to three criteria - Scientific/Technological Excellence, Implementation and Impact. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores.

	1. Scientific and/or technological excellence (relevant to the topics addressed by the call) **(Award)**	**2. Quality and efficiency of the implementation and the management** **(Selection)**	**3. The potential impact through the development, dissemination and use of project results** **(Award)**
STREP	• Soundness of	• Appropriateness	• Contribution, at the

[83] The official definition of SMEs can be found at http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/sme-definition/index_en.htm.

and IP proposal	concept and quality of objectives • Progress beyond the state-of-the-art • Quality and effectiveness of the S/T methodology and associated work plan	of the management structure and procedures. • Quality and relevant experience of the individual participants • Quality of the consortium as a whole (including complementarity, balance) • Appropriateness of the allocation and justification of the resources to be committed (budget, staff, equipment)	European [and/or international] level, to the expected impacts listed in the work programme under relevant topic/activity • Appropriateness of measures for the dissemination and/or exploitation of project results, and management of intellectual property
	Threshold: 4/5	**Threshold: 4/5**	**Threshold: 4/5**

Thresholds are set for each criterion, as indicated in the tables above. A proposal failing to achieve any of these threshold scores will be rejected.

- Particular requirements for prioritisation of proposals with the same score[84]:

  The procedure for prioritising proposals which have been awarded the same score (ex aequos) within a ranked list is described below. It will be applied successively for every group of ex aequo proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

  (i) Proposals that address topics not otherwise covered by more highly-rated proposals, will be considered to have the highest priority.

  (ii) These proposals will themselves be prioritised according to the scores they have been awarded for the criterion impact. When these scores are equal, priority will be based on the scores for the criterion scientific and/or technological excellence. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme.

  (iii) The method described in (ii) will then be applied to the remaining ex aequos in the group.

- Indicative evaluation and contractual timetable: It is expected that the grant agreement negotiations for the shortlisted proposals will start as of April/May 2013.
- Consortia agreements: Participants in all actions resulting from this call are required to conclude a consortium agreement.
- The forms of grant which will be offered are specified in Annex 3 to the Cooperation work programme.

[84] For this call, the procedure detailed below replaces the procedure foreseen in Annex 2 for the handling of tied scores.

- Grant agreements of projects financed under this Call for Proposals under Objective 4.3 will include the Special Clause 39 on the Open Access Pilot in FP7

Call title: "FET Flagship Initiatives"

- Call identifier: FP7-ICT-2013-FET-F
- Date of publication[85]: 10 July 2012
- Deadline[86]: 23 October 2012 at 17.00.00 (Brussels local time)
- Indicative budget[87]: EUR 108 million[88]
- Topics called:

Challenge	Objectives	Funding schemes
Challenge 9: Future and Emerging Technologies	ICT 2013.9.9 FET Flagships	CP-CSA

- Eligibility conditions:

  The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

  Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

  The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.

- Evaluation procedure:

  Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadline. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template.

  – A one-stage submission procedure will be followed.

[85] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

[86] The Director-General responsible may delay this deadline by up to two months

[87] The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

[88] Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

See Appendix 5 of the work programme for specific evaluation criteria applicable to the FET Flagship objective ICT-2013.9.9.

Call title: FET Open

- Call identifier: FP7-ICT-2013-C
- Date of publication[89]: 12 September 2012
- Deadline[90]: 12 March 2013, at 17:00.00, Brussels, local time
- Indicative budget[91]: EUR 50 million[92]
- See indicative budget breakdown in section 7 of the ICT work programme.
- Topics called:

Challenge	Objectives	Funding schemes[93]
Future and emerging technologies	ICT-2013.9.1 FET-Open: Challenging current thinking	CP (STREP only), CSA
	ICT-2013.9.2 High_Tech Research Intensive SMEs in FET research	CP (STREP only)
	ICT-2013.9.3 FET Young Explorers	CP (STREP only)
	ICT-2013.9.4 International Cooperation in FET research	Additional funding to existing grants (IP/STREP)

- Eligibility conditions:

Eligibility, evaluation, selection and award criteria: see Appendix 5 of the work programme for specific eligibility and evaluation criteria applicable to FET Open.

- Evaluation procedure:
  - for objectives ICT-2013.9.1: Challenging current Thinking, ICT-2013.9.2: High-Tech Research Intensive SMEs in FET research, ICT-2013.9.3: FET Young Explorers:

[89] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.
[90] The Director-General responsible may delay this deadline by up to two months
[91] [91] The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:
- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

[92] Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.
[93] Each proposal should indicate the type of funding scheme used (IP or STREP for CP, where applicable; CA or SA for CSA, where applicable)

- proposals for STREP have to be submitted in two stages: first a *short,* strictly anonymous, proposal of maximum five pages (excluding a single title page) is submitted describing the key objectives and motivation for the proposed work;
- *short* proposals may be submitted at any time from the opening of the call until 11/09/2012 (short proposal end date submission period as indicated in the table below). They are evaluated anonymously as they come in with the help of remote evaluators;
- Evaluation Summary Reports will be sent to all proposers after the first stage evaluation;
- if the *short* proposal is successful, the proposers are invited to submit a *full* proposal by a specified cut-off date. This cut-off date is determined by the submission date of the *short* proposal, as indicated in the table below;
- *full* proposals are evaluated through a combination of remote evaluation and panels of experts that convene in Brussels; they are not evaluated anonymously.
- proposals for CSA are submitted in one stage and are not evaluated anonymously. They are continuously receivable until 12 March 2013

o for objectives ICT-2013.9.4: International cooperation on FET research:

- proposals for additional funding to existing grant for on-going FET[94] IP and STREP are submitted in one stage and are not evaluated anonymously
- proposals are evaluated through a combination of remote evaluation and panels of experts that convene in Brussels
- proposals are continuously receivable until 12 March 2013.

Batch	Short STREP proposals start date submission period	Short STREP proposals end date submission period	full STREP and CSA cut-off date (at 17:00 Brussels time)
14	26/10/2011	10/04/2012	25/09/2012
15	11/04/2012	11/09/2012	12/03/2013

FET-Open proposals submitted to batch 14 will be evaluated based on call text and eligibility, evaluation, selection and award criteria set-out in ICT Work Programme 2011/2012.

- Indicative evaluation and contractual timetable
  - Evaluation results for *short* proposals: three months from proposal reception;
  - Evaluation results for *full* proposals: three months from the cut-off or closure date.
- Consortia agreements

It is not mandatory that participants in RTD actions resulting from this call conclude a consortium agreement although such agreements are strongly recommended.

Call title: FET Open Xtrack

- Call identifier: FP7-ICT-2013-X

[94] Projects selected under the FET objectives of the FP7 ICT Workprogrammes.

- Date of publication[95]: 12 September 2012
- Deadline[96]: 29 January 2013, at 17:00.00, Brussels, local time
- Indicative budget[97]: EUR 15 million[98]
- See indicative budget breakdown in section 7 of the ICT work programme.
- Topics called:

Challenge	Objectives	Funding schemes
Future and emerging technologies	ICT-2013.9.5 FET-Open Xtrack	CP (STREP only)

- Eligibility conditions:

See Appendix 5 of the work programme for specific eligibility and evaluation criteria applicable to the FET Open objective ICT-2013.9.5 FET-Open Xtrack.

- Evaluation procedure:
  - proposals for STREP can be submitted anytime during the submission period. The submission is single stage.
  - Section 1 of any eligible proposal is evaluated anonymously as it comes in with the help of a minimum of 3 remote evaluators. At this stage only the S/T Quality, in the sense of Appendix 5 of the ICT workprogramme, is evaluated;
  - An Evaluation Summary Report is sent to all proposers that fail to pass the evaluation threshold for S/T Quality;
  - Proposals that pass the evaluation threshold for S/T Quality are further evaluated on all criteria through a combination of remote evaluation and panels of experts that convene in Brussels; they are not evaluated anonymously.
- Indicative evaluation and contractual timetable
  - Proposals that fail to pass the first step of remote evaluation of S/T Quality: Evaluation results expected by May 2013.
  - Proposals that pass the first step of remote evaluation of S/T Quality: Evaluation results expected by June 2013.
- Consortium agreements

It is not mandatory that participants in RTD actions resulting from this call conclude a consortium agreement although such agreements are strongly recommended.

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[95] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

[96] The Director-General responsible may delay this deadline by up to two months

[97] [97] The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

[98] Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

Call title: ICT – EU Japan Coordinated Call

- Call identifier: FP7-ICT-2013-EU-Japan
- Date of publication: 2 October, 2012.[99]
- Deadline: 29 November 2012 at 17.00.00 (Brussels local time)[100] and for the coordinated projects funded by the Japanese authorities (Ministry of Internal Affairs and Communications, MIC, and the National Institute of Information and Communications Technology, NICT) on 29 November 2012 at 17.00.00 (Tokyo local time) according to the respective requirements of the EU and Japan.
- Indicative budget[101]: EUR 9 million[102] (a similar budget for the call is expected from MIC and NICT).

All budgetary figures given in this work programme are indicative. The final EU budget awarded to this call, following the evaluation of proposals, may vary by up to 10% of the total value of the call.

See indicative budget breakdown in section 7 of the ICT work programme.

- Topics called

Topic called	Topics	Funding Scheme
ICT-2013.10.1 EU-Japan Research and Development cooperation	**a): Optical communications**	Small or medium scale focused research projects (STREPs)
	b) Wireless communications	
	c) Cybersecurity for improved resilience against cyber threats	
	d) Extending the cloud paradigm to the Internet of Things – Connected object and sensor clouds within the service perspective	
	e) Federation of testbeds: Control, tools and experiments	

[99] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

[100] The Director-General responsible may delay this deadline by up to two months.

[101] [101] The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

[102] Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

	f) Green & content centric networks	

- Eligibility conditions:

The eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating legal entities required for this call is summarised in the table below[103]:

Funding scheme	**Minimum conditions**
Collaborative Projects STREPs	At least 3 independent legal entities, each of which is established in a MS or AC , and no two of which are established in the same MS or AC.

- Additional eligibility criterion:

Proposals submitted to this call which do not include coordination with a Japanese proposal will be considered ineligible.

- Evaluation procedure:
  - The evaluation shall follow a single-step procedure.
  - The proposals will be evaluated by a panel including both European and Japanese experts.
  - Proposals will not be evaluated anonymously.
- Evaluation criteria and thresholds:

The evaluation criteria and sub-criteria to be applied to this coordinated call are given in Annex 2 of this work programme.

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum scores
S/T quality	**3/5**
Implementation	**3/5**
Impact	**3/5**
Overall required score	**10/15**

The following points will be reflected in the evaluation:

[103] MS = Member States of the EU; AC = Associated Country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated country.

The financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

In order to ensure a more genuine EU-Japan cooperation, a balanced effort between the two coordinated projects and a research plan properly involving coordinated research activities between Europe and Japan, represent an added value to the activities and this will be reflected in the evaluation under the criteria 'Impact' and 'Implementation'.

At Panel stage, the priority order of the proposals with equal overall scores will be established.

- Additional selection criterion:

Proposals will only be selected on the condition that their corresponding coordinated Japanese project will be funded by MIC or NICT.

Up to one proposal per topic may be funded under this call: That is one proposal for each one of the six topics implemented via Small or medium scale focused research projects (STREPs).

- Submission conditions:

Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadline. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template.

In terms of reciprocity, EU retained proposals will be made available to MIC/NICT and vice versa.

- Indicative evaluation and contractual timetable:

Evaluations are expected to be carried out in January 2013; Evaluation results: estimated to be available within 10-12 weeks after the closure date. Negotiations will be carried out in parallel by the EU and MIC or NICT, in order to have a simultaneous start of the respective grant agreements. It is expected that the grant agreement negotiations for the short-listed proposals will start as of February 2013 and that all projects will start work early in April 2013.

- Consortium agreements:

Participants in all EU actions resulting from this call are required to conclude a consortium agreement prior to the grant agreement.

- Coordination agreements:

Participants in the EU Collaborative Projects are required to conclude a coordination agreement with the participants in the coordinated project funded by MIC or NICT. A final draft of these agreements has to be provided with the proposal.

- Other points:

The forms of grant and maximum reimbursement rates which will be offered for projects funded through the Cooperation Programme are specified in Annex 3 to this work programme.

Call title: ICT – EU Brazil Coordinated Call

- Call identifier: FP7-ICT-2013-EU-Brazil

- Date of publication: 12 September, 2012.[104]
- Deadline: 12 December, 2012 at 17.00.00 (Brussels local time)[105] and for the coordinated projects funded by the Brazilian Authorities on 12 December, 2012 at 18.00.00 (Brasilia local time) according to the respective requirements of the EU and the Brazilian Ministry of Science and Technology and Innovation (MCTI).
- Indicative budget[106]: EUR 5 million[107] (a similar budget for the call is expected from the Brazilian Ministry of Science, Technology and Innovation (MCTI).

All budgetary figures given in this work programme are indicative. The final budget awarded to this call, following the evaluation of proposals, may vary by up to 10% of the total value of the call.

See indicative budget breakdown in section 7 of the ICT work programme.

- Topics called

Topic called	Topics	Funding Scheme
ICT-2013.10.2 EU-Brazil Research and Development cooperation	**a): Cloud computing for Science**	Small or medium scale focused research projects (STREPs)
	b) Sustainable technologies for a Smarter Society	
	c) Smart Services and applications for a Smarter Society	
	d) hybrid broadcast-broadband TV applications and services	

- Eligibility conditions:

The eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

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[104] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

[105] The Director-General responsible may delay this deadline by up to two months.

[106] [106] The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

[107] Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

The minimum number of participating legal entities required for this call is summarised in the table below[108]:

Funding scheme	Minimum conditions
Collaborative Projects STREPs	At least 3 independent legal entities, each of which is established in a MS or AC , and no two of which are established in the same MS or AC.

- Additional eligibility criterion:

Proposals which do not include coordination with a Brazilian project will be considered ineligible. Therefore, the EU project proposals must include detailed explanations about the coordinated Brazilian proposal submitted in parallel to the Brazilian Authorities.

In addition, for each small or medium scale focused research project, the proposed project duration shall not exceed 36 months and the maximum EU funding requested must not exceed **EUR 1.500.000.**

- Evaluation procedure:
  - The evaluation shall follow a single-step procedure.
  - The proposals will be evaluated by a panel including both European and Brazilian experts.
  - Proposals will not be evaluated anonymously.
- Evaluation criteria and thresholds:

The evaluation criteria and sub-criteria to be applied to this coordinated call are given in Annex 2 of this work programme.

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	**3/5**
Implementation	**3/5**
Impact	**3/5**
Overall threshold required	**10/15**

The following points will be reflected in the evaluation:

The financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

In order to ensure a more genuine EU-Brazil cooperation, a balanced effort between the two coordinated projects and a research plan properly involving coordinated research activities between Europe and Brazil, represent an added value to the activities and this will be reflected in the evaluation under the criteria 'Impact' and 'Implementation'.

[108] MS = Member States of the EU; AC = Associated Country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated country.

At Panel stage, the priority order of the proposals with equal overall scores will be established in accordance with work programme coverage. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If they are still tied, they will be prioritised according to their scores for the S/T Quality criterion.

- Additional selection criterion:

Proposals will only be selected on the condition that their corresponding coordinated Brazilian project will be funded by the Brazilian Authorities.

Up to one proposal per topic may be funded under this call: That is one proposal for each one of the four topics implemented via Small or medium scale focused research projects (STREPs).

- Submission conditions:

Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadline. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template.

In terms of reciprocity, non confidential abstracts of EU retained proposals will be made available to the Brazilian Authorities.

- Indicative evaluation and contractual timetable:

Evaluations are expected to be carried out in January-February, 2013. Evaluation results: estimated to be available within 9-11 weeks after the closure date. Negotiations will be carried out in parallel by the EU and the Brazilian Authorities, in order to have a simultaneous start of the respective grant agreements. It is expected that the grant agreement negotiations for the short-listed proposals will start as of end February 2013 and that all projects will start work early in July 2013.

- Consortium agreements:

Participants in all EU actions resulting from this call are required to conclude a consortium agreement prior to the grant agreement.

- Coordination agreements:

Participants in the EU Collaborative Projects are required to conclude a coordination agreement with the participants in the coordinated project funded by the Brazilian Authorities. A final draft of these agreements has to be provided with the proposal.

- Other points:

The forms of grant and maximum reimbursement rates which will be offered for projects funded through the Cooperation Programme are specified in Annex 3 to this work programme.

Appendix 1: Minimum number of participants

Minimum number of participants[109] as set out in the Rules for Participation

Funding scheme	Minimum conditions
Collaborative project	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Collaborative project for specific cooperation actions dedicated to international cooperation partner countries (SICAs)	At least 4 independent legal entities. Of these, 2 must be established in different MS or AC. The other two must be established in different international cooperation partner countries
Network of excellence	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Co-ordination action	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Support action	At least 1 independent legal entity
Collaborative Project and Coordination and Support Action	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.

Appendix 2: Funding schemes

1. Collaborative projects (CP)

Support to research projects carried out by consortia with participants from different countries, aiming at developing new knowledge, new technology, products, demonstration activities or common resources for research. The size, scope and internal organisation of projects can vary from field to field and from topic to topic. Projects can range from small or medium-scale focused research actions to large-scale integrating projects for achieving a defined objective. Projects may also be targeted to special groups such as SMEs.

The Funding Scheme allows for two types of projects to be financed: a) '*small or medium-scale focused research actions'*, b) *'large-scale integrating projects*'.

[109] MS = Member States of the EU; AC = Associated Country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated country

a) ***Small or medium-scale focused research actions*** **(STREP)**

Purpose

Small or medium-scale focused research projects (STREP) are objective-driven research projects, which aim at generating new knowledge, including new technology, or common resources for research in order to improve European competitiveness, or to address major societal needs. They have clearly defined scientific and technological objectives directed at obtaining specific results, which could be applicable in terms of development or improvement of products, processes, services or policy.

STREPs target a specific research objective in a sharply focused approach. They have a fixed overall work plan where the principal deliverables are not expected to change during the lifetime of the project.

Size and resources

There must be at least three 'legal entities' established in different EU Member States or Associated countries. The entities must be independent of each other.

A higher number of participants may be specified on a call-by-call basis: check the call fiche.

The size, scope and internal organisation of collaborative projects can vary from research theme to research theme and from topic to topic. During FP6 the number of participants in STREPs for the IST priority varied from 6 to 15 participants and the EU contribution varied between EUR 1 million and EUR 4 million, with an average around the EUR 2 million.

Duration

STREPs are expected to last typically eighteen months to three years. However, there is no formal minimum or maximum duration.

Activities

The activities to be carried out in the context of a STREP can include:

a) research and technological development activities, reflecting the core activities of the project, aimed at a significant advance beyond the established state-of-the-art

b) demonstration activities, designed to prove the viability of new technologies that offer a potential economic advantage, but which cannot be commercialised directly (e.g. testing of product-like prototypes)

c) management activities, over and above the technical management of individual work packages, linking together all the project components and maintaining communication with the Commission.

SICAs

STREPs may also be used to support a special form of international co-operation projects, the so-called Specific International Cooperation Actions (SICAs) with ICPC countries in areas of mutual interest and dedicated to cooperation on topics selected on the basis of their scientific and technological competences and needs.

These SICAs have specific rules for participation. For the SICA projects there must be at least four independent legal entities of which at least two must be established in different Member States or Associated countries and at least two must be established in different ICPC countries in the target regions defined in the objective for the project.

A higher number of participants may be specified on a call-by-call basis: check the call fiche.

Financial Regime

Reimbursement will be based on eligible costs (based on maximum rates of reimbursement specified in the grant agreement for different types of activities within the project). In some cases the reimbursement of indirect costs is based on a flat rate.

The work programmes shall specify if other forms of reimbursement are to be used in the actions concerned. Participants in International Cooperation Partner countries (see Annex 1 of the Cooperation work programme) may opt for a lump sum.

Specific Characteristics

The description of work (Annex 1 to the grant agreement) is normally fixed for the duration of the project.

The composition of the consortium is normally fixed for the duration of the project.

b) ***Large-scale integrating projects*** **(IP)**

Purpose

Large scale integrating collaborative projects (IP) are objective-driven research projects, which aim at generating new knowledge, including new technology, or common resources for research in order to improve European competitiveness, or to address major societal needs. They have clearly defined scientific and technological objectives directed at obtaining specific results, which could be applicable in terms of development or improvement of products, processes, services or policy. As such, they may also be targeted to special groups, such as SMEs.

Large scale integrating projects have a comprehensive 'programme' approach: including a coherent integrated set of activities dealing with a range of aspects and tackling multiple issues and aimed at specific deliverables; there will be a large degree of autonomy to adapt content and partnership (all types of stakeholders) and update the work plan, where/as appropriate.

Size and resources

There must be at least three ‘legal entities’ established in different EU Member States or Associated countries. The entities must be independent of each other.

A higher number may be specified on a call-by-call basis: check the call fiche.

The size, scope and internal organisation of collaborative projects can vary from research theme to research theme and from topic to topic. During FP6 the number of participants in IPs for the IST priority varied between 10–20 and the total EU contribution was between EUR 4 million and EUR 25 million, with an average around EUR 10 million.

Duration

IPs are expected to last typically three to five years. However, there is no formal minimum or maximum duration.

Activities

The activities to be carried out in the context of an IP can include (indents a) and/or b) being a must):

a) research and technological development activities, reflecting the core activities of the project, aimed at a significant advance beyond the established state-of-the-art

b) demonstration activities, designed to prove the viability of new technologies that offer a potential economic advantage, but which cannot be commercialised directly (e.g. testing of product-like prototypes)

c) activities to disseminate research results and to prepare for their uptake and use, including knowledge management and IPR protection

d) management activities, over and above the technical management of individual work packages, linking together all the project components and maintaining communication with the Commission

e) training of researchers and key staff, including research managers and industrial executives (in particular for SMEs and any potential users of the knowledge generated by the project). The training should aim to improve the professional development of the personnel concerned

f) other activities, if required

Financial Regime

Reimbursement will be based on eligible costs (based on maximum rates of reimbursement specified in the grant agreement for different types of activities within the project). In some cases the reimbursement of indirect costs is based on a flat rate.

The work programmes shall specify if other forms of reimbursement are to be used in the actions concerned. Participants in International Cooperation Partner countries (see Annex 1 of the Cooperation work programme) may opt for a lump sum.

Specific Characteristics

A sequence of updates of the description of work (Annex 1 of the grant agreement) may be provided for in the grant agreement.

Enlargement of partnership, within the initial budget, is possible.

2. Networks of Excellence (NoE)

Support to *a Joint Programme of Activities* implemented by a number of research organisations integrating their activities in a given field, carried out by research teams in the framework of longer term co-operation. The implementation of *this Joint Programme of* Activities will require a formal commitment from the organisations integrating part of their resources and their activities.

The funding scheme will support the long-term durable integration of research resources and capacities (researchers, services, teams, organisations, institutions) in fields of strategic importance for European research, through the establishment of a single virtual centre of research, in order to overcome demonstrable, detrimental fragmentation, thus strengthening European scientific and technological excellence on a particular research topic.

Networks of Excellence will aim at consolidating or establishing European leadership at world level in their respective fields by integrating at European level the resources and expertise needed for the purpose. This will be achieved through the implementation of a Joint Programme of Activities (JPA) aimed principally at creating a progressive and durable integration of the research capacities of the network partners while at the same time advancing knowledge on the topic.

Since Networks of Excellence are aimed at tackling fragmentation of existing research capacities, they should be implemented provided that:

- research capacity is fragmented in the (thematic) area being considered;
- this fragmentation prevents Europe from being competitive at international level in that area;
- the proposed integration of research capacity will lead to higher scientific excellence and more efficient use of resources.

The implementation of the Joint Programme of Activities will require a formal commitment from the organisations integrating part or the entirety of their research capacities and activities.

The Joint Programme of Activities (JPA) is the collective vehicle for achieving the durable integration of the research resources and capacities of the Network of Excellence. In order to do so, the JPA should consist of a coherent set of integrating activities that the participants undertake jointly. The JPA will have several components:

- activities aimed at bringing about the integration of the participants research activities on the topic considered, such as:
    - establishing mechanisms for co-ordinating and eventually merging the research portfolios of the partners
    - staff exchange schemes
    - complete or partial relocation of staff
    - establishment of shared and mutually accessible research equipment, managerial and research infrastructures, facilities and services
    - exploration of the legal requirements (facilitators/barriers) for durable integration,
    - setting up of joint supervisory bodies
    - measures for joint public relations …
- jointly executed research to support the durable integration, e.g. systemic development, or development of common tools, or at filling gaps in the collective knowledge portfolio of the network, in order to make the research facilities useable by the network. (NB: in addition to this research, participants in a network will pursue their 'own institutional portfolio', including research, development or demonstration in the area covered by the network itself. The latter research, development or demonstration activities are not part of the 'joint programme of activities' and thus will not be part of the eligible costs of the network)
- activities designed to spread excellence, such as:
    - The main component of these activities will be a joint training programme for researchers and other key staff;
    - Other spreading of excellence activities may include: dissemination and communication activities (including public awareness and understanding of science), and, more generally, networking activities to help transfer knowledge to teams external to the network.
    - Spreading of excellence may also include the promotion of the results generated by the network; in such a context, networks should, when appropriate, include innovation-related activities (protection of knowledge generated within the network, assessment of the socio-economic impact of the knowledge and

technologies used and development of a plan for dissemination and use of knowledge), as well as any appropriate gender and/or ethical related activities

- all the network's activities should be carried out within a coherent framework for the management of the consortium linking together all the project components and maintaining communications with the Commission.

3. Coordination and support actions (CSA)

Support to activities aimed at coordinating or supporting research activities and policies (networking, exchanges, trans-national access to research infrastructures, studies, conferences, etc). These actions may also be implemented by means other than calls for proposals.

The Funding Scheme allows for two types of actions to be financed: a) '*co-ordination or networking actions',* b) *'specific support actions*'.

a) *Coordination or networking actions* (**CA**)

Coordinating or networking actions will always have to be carried out by a consortium of participants, normally three from three different countries.

The coordination or networking actions cover the following activities:

the organisation of events - including conferences, meetings, workshops or seminars -, related studies, exchanges of personnel, exchange and dissemination of good practices, and, if necessary, the definition, organisation and management of joint or common initiatives together of course with management of the action.

The coordination and networking actions normally stretches over a longer period.

b) *Specific support actions* (**SA**)

Specific support actions may be carried out by a single participant, which can be based in any member state, associated country or a third country. Therefore there are no restrictions on the size of the consortium.

Although normally awarded following calls for proposals, there are also the possibilities to award specific support actions through public procurement carried out on behalf of the EU or to grant support to legal entities identified in the Specific Programmes or in the work programmes where the Specific Programme permits the work programmes to identify beneficiaries.

The objective of specific support actions are to contribute to the implementation of the Framework Programmes and the preparation of future EU research and technological development policy or the development of synergies with other policies, or to stimulate, encourage and facilitate the participation of SMEs, civil society organisations and their networks, small research teams and newly developed or remote research centres in the activities of the thematic areas of the Cooperation programme, or for setting up of research-intensive clusters across the EU regions.

The specific support actions can be of different types covering different activities:

- monitoring and assessment activities, conferences, seminars, studies, expert groups, high level scientific awards and competitions, operational support and dissemination, information and communication activities, support for transnational access to research infrastructures or preparatory technical work, including feasibility studies, for the development of new infrastructures, support for cooperation with other European research schemes, the use by the Commission of external experts, management or a combination of these.

4. Combination of Collaborative Projects and Coordination and Support Actions (CP-CSA)

CP-CSA involves a combination of the collaborative projects and coordination and support actions (CP-CSA) funding schemes. It enables therefore the financing, under the same grant agreement, of research, coordination and support activities.

In this Work Programme, CP-CSAs for Pre-Commercial Procurement (PCP) will combine, in a closely co-ordinated manner:
- Networking and coordination activities: for public bodies in Europe to cooperate in the innovation of their public services through a strategy that includes PCP.
- Joint research activities: related to validating the PCP strategy jointly defined by the public bodies participating in the action. This includes the exploration, through a joint PCP, of possible solutions for the targeted improvements in public sector services, and the testing of these solutions against a set of jointly defined performance criteria for addressing a concrete, shared public sector purchasing need.

The two categories of activities are mandatory due to the synergistic effects between the two components.

Appendix 3: Coordination of national or regional research programmes

The objective of these actions is to step up the cooperation and coordination of research programmes carried out at national or regional level in the Member or Associated States through the networking of research programmes, towards their mutual opening and the development and implementation of joint activities.

Under FP7 the coordination of national or research programmes is continued and reinforced.

Coordination projects can network four types of activities: (1) Information exchange – (2) Definition and preparation of joint activities – (3) Implementation of joint activities – (4) Funding of joint trans-national research actions:

- **ERA-NETs** and other coordination actions launched under FP6 wishing to submit a follow-up proposal under FP7 have to propose a strong coordination action focusing directly on steps three and four, in order to achieve mutual opening and trans-national research via joint/common calls, joint/common programmes or, if appropriate, other joint trans-national actions. New coordination actions, which address new topics and without any experience from FP6, should address at least the first three steps, but are encouraged to aim at the 'four step approach', as described above.

- Under **ERA-NET Plus actions**, the Commission provides an incentive to the organisation of joint calls between national or regional research programmes by 'topping-up' joint trans-national funding with EU funding. These joint calls will entail the award of grants to third parties participating in calls for proposals launched under the ERA-NET Plus actions. These actions require programme owners or programme managers from at least 5 different Member or Associated States to plan a single joint call with a clear financial commitment from the participating national or regional research programmes. Full details of the ERA-NET Plus scheme are given in Annex 4 of the Cooperation work programme.

Appendix 4: Distribution of indicative budget commitment

Indicative budget for the ICT Theme (2013)[110]

	2013 (in EUR)
Calls for proposals	
ICT Call 10	705.500.000
ICT Call 11	236.500.000
PPP Cross-Thematic Call - Factories of the Future – 2013	70.000.000
PPP Cross-Thematic Call - Green Cars – 2013	40.000.000
SMART Cities co-ordinated Call	95.000.000
PPP Future Internet – 2013	130.000.000
FET Flagship Initiatives	108.000.000
FET Open	50.000.000
FET Open Xtrack	15.000.000
ICT – EU Brazil	5.000.000
ICT – EU Japan	9.000.000
SME initiative on Digital Content and Languages	20.000.000
Other expenditures	
Independent experts assisting in proposal evaluations and project reviews	15.000.000
Studies	6.000.000
Publications and communication activities and event support	2.000.000
HFSP	1.869.000
IMS secretariat	140.000
AAL Joint National Programme[111]	25.000.000
ICT Contribution to General FP7 Activities[112]	
COST	11.287.640
Experts (evaluators and reviewers) related with horizontal activities	26.851
CORDIS	2.121.213
EUREKA	107.403

[110] Under the condition that the draft Budget 2013 is adopted without modification by the Budgetary Authority

[111] Joint research and development programme aimed at enhancing the quality of life of older people through the use of new information and communication technologies, cf. Decision No 742/2008/EC. The EU financial contribution to the implementation of the AAL JP is implemented through annual financing agreements which sets out in detail the planned topics for call for tenders and calls for proposals and the associated financial commitments by participating countries as a condition for the EU co-financing. See http://www.aal-europe.eu

[112] These are specified in Annex 4 to the work programme under Activities A4.1 (CORDIS), A4.2.2.3 (ERA-NET Thematic Coordination Actions), A4.4 (EUREKA) and A4.5 (COST).

Total	**1.547.552.107**

Appendix 5: FET eligibility and evaluation criteria

Additional eligibility criteria applicable to FET-Open Objectives ICT-2013.9.1, ICT-2013.9.2, ICT-2013.9.3 and ICT-2013.9.4

In addition to the eligibility criteria set out in Annex 2 to this work programme, all FET-Open short proposals submitted under objectives ICT-2013.9.1, ICT-2013.9.2 and ICT-2013.9.3 are subject to the following eligibility criteria:

1. Part B should not exceed 5 A4 pages, excluding a single title page with acronym, title and abstract of the proposal;
2. Part B of a short STREP proposal should be fully anonymous, meaning that it may not include the name of any organisation or its staff involved in the consortium or any other information which could identify an applicant. Furthermore, strictly no bibliographic references or any other link to additional information are permitted.

Proposals (short and full) submitted to FET-Open Objective ICT-2013.9.2: High-Tech Research Intensive SMEs in FET research are subject to the following additional eligibility criteria:

3. The consortium must contain at least one SME.[113]

Proposals (short and full) submitted to FET-Open Objective ICT-2013.9.3: FET Young Explorers are subject to the following additional eligibility criteria:

4. A project must be led by a young researcher, and the leadership by young researchers of all work packages is also required. No more than six years should have elapsed between the award of a Ph.D. (or equivalent) for each such young researcher and the date of submission of the short proposal.[114]

Proposals submitted to FET-Open Objective ICT-2013.9.4: International cooperation on FET research are subject to the following additional eligibility criteria:

5. Proposals must be presented by the coordinator of an on-going FET[115] IP or STREP project ending at least 18 months after the submission date of the proposal.

Additional eligibility criteria applicable to FET-Open Objective ICT-2013.9.5

In addition to the eligibility criteria set out in Annex 2 to this work programme, all FET-Open proposals submitted under objectives ICT-2013.9.5 are subject to the following eligibility criteria:

[113] An SME is an enterprise which has fewer than 250 employees, has an annual turnover not exceeding 50 million EUR, and/or has an annual balance-sheet total not exceeding 43 million EUR. Possible relationships with other enterprises must be taken into account when calculating these data of the enterprise. Research centres, research institutes, contract research organisations or consultancy firms are not eligible SMEs for the purpose of the Co-operative and Collective schemes.

[114] Extensions of this period may be allowed only in case of eligible career breaks which must be properly documented: maternity (18 months per child born after the PhD award) & paternity leave (accumulation of actual time off for children born after the PhD award) and leave taken for long-term illness, national service.

[115] Ongoing projects selected under any of the FET objectives of the FP7 ICT Work Programmes.

1. Part B (sections 1, 2 and 3) should not exceed 10 A4 pages, excluding section 4 and a single title page with acronym, title and abstract of the proposal. Section lengths should respect the following limitations:
   - The length of Section 1 (S&T Quality) is maximally 8 A4 pages;
   - The length of Section 2 (Implementation) is maximally 1 A4 page;
   - The length of Section 3 (Impact) is maximally 1 A4 page
2. The title page and Section 1 of Part B should be fully anonymous, meaning that it may not include the name of any organisation or its staff involved in the consortium or any other information which could identify an applicant. Furthermore, on the title page and in Section 1 strictly no bibliographic references or links to additional information are permitted.

FET Evaluation criteria

Eligible proposals under the FET objectives will be evaluated according to three criteria - Scientific/Technological Quality, Implementation and Impact. A score will be awarded for each of these criteria, based on the considerations listed below. For FET-Open short proposals submitted under objectives ICT-2013.9.1, ICT-2013.9.2 and ICT-2013.9.3 only Scientific/technological Quality applies. Specific evaluation criteria are applicable to FET-Open Objective ICT-2013.9.5.

	1. S/T quality	***2. Implementation***	***3. Impact***
***short* STREP (FET Open) Objective 9.1, 9.2 and 9.3**	• Clarity of targeted breakthrough and its relevance towards a long-term vision. • Novelty and foundational character. • Plausibility of the S/T approach.	*(not applicable to short STREP)*	*(not applicable to short STREP)*
	Threshold: 4/5		
Collaborative Projects (FET Open[116] and FET Proactive, STREPs and IPs)	• Clarity of targeted breakthrough and its relevance towards a long-term vision. • Novelty and foundational character. • Specific contribution to progress in science and technology. • Quality and effectiveness of the S/T methodology.	• Quality of workplan and management. • Quality and relevant experience of the individual participants. • Quality of the consortium as a whole (including complementarity, balance). • Appropriate allocation and justification of the resources to be committed (person-months, equipment, budget).	• Transformational impact of the results on science, technology and/or society. • Impact towards the targeted objective in the workprogramme. • Appropriateness of measures envisaged for the dissemination and/or use of project results.
	Threshold: 4/5 **Weight: 50%**	**Threshold: 3/5** **Weight: 20%**	**Threshold: STREP 3.5/5** **IP 4/5** **Weight: 30%**

[116] Not applicable to FET-Open Objective ICT-2013.9.5.

Coordination and Support Actions (FET Open and FET Proactive)	• Clarity of objectives. • Contribution to the co-ordination and/or support of high-risk and high-impact research, for new or emerging areas or horizontally. • Quality and effectiveness of the coordination and/or support activities.	• Quality of workplan and management. • Quality and relevant experience of the individual participants. • Quality of the consortium. • Appropriate management of the resources to be committed (person-months equipment, budget).	• Transformational impact on the communities and/or practices for high-risk and high-impact research. • Appropriateness of measures for spreading excellence, use of results, and dissemination of knowledge, including engagement with stakeholders.
	Threshold: 3/5 **Weight: 40%**	**Threshold: 3/5** **Weight: 20%**	**Threshold: 3/5** **Weight: 40%**

Specific evaluation criteria applicable to FET-Open Objective ICT-2013.9.5

Eligible proposals under this FET objective will be evaluated in two steps. In a first step the anonymous section 1 of part B of an eligible proposal will be evaluated only on Scientific/technological quality criteria. In a second step, only the proposals scoring above threshold on the Scientific/technological quality criteria will be evaluated on Implementation and on Impact. Scores are awarded per criteria, based on the considerations listed below.

	1. S/T quality	***2. Implementation***	***3. Impact***
Collaborative Projects (FET-Open Objective ICT-2013.9.5 - STREPs)	• Clarity of targeted breakthrough and its relevance towards a long-term vision. • Novelty and foundational character. • Specific contribution to progress in science and technology. • Quality and effectiveness of the S/T methodology and workplan.	• Quality of management. • Quality of the participants and of the consortium as a whole. • Appropriate allocation and justification of resources (person-months, equipment, budget).	• Appropriateness of measures envisaged towards getting a transformational impact of the results on science, technology and/or society. • Appropriateness of measures envisaged for the dissemination and/or use of project results.
	Threshold: 4/5 **Weight: 80%**	**Threshold: 3/5** **Weight: 10%**	**Threshold: 3.5/5** **Weight: 10%**

Thresholds are set for each criterion, as indicated in the tables above. A proposal failing to achieve any of these threshold scores will be rejected.

<u>Priority order for proposals with the same score</u>

As part of the evaluation by independent experts, a panel review will recommend one or more ranked lists for the proposals under evaluation, following the scoring systems indicated above. A ranked list will be drawn up for every indicative budget shown in the call fiche.

If necessary, the panel will determine a priority order for proposals which have been awarded the same score within a ranked list. Whether or not such a prioritisation is carried out will depend on the available budget or other conditions set out in the call fiche. The following

approach will be applied successively for every group of *ex aequo* proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

Proposals will be prioritised according to the scores they have been awarded for the criterion *scientific and/or technological excellence*. When these scores are equal, priority will be based on scores for the criterion *impact.* If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme.

Specific Evaluation criteria for the Objective ICT-2013.9.9 FET Flagships

Eligible proposals under the FET Flagships call will be evaluated according to three criteria - Scientific/Technological Quality, Implementation and Impact. A score will be awarded for each of these criteria, based on the aspects listed below.

	Sub-criteria
Criterion 1 S/T quality Weight: 50% Threshold: 4/5	• Degree of adherence to the Flagship concept as specified in the work programme • Soundness of scientific concept, quality of objectives and progress beyond the state-of-the-art • Quality and effectiveness of the strategic research roadmap, the associated workplan (including milestones, flexibility and metrics to monitor progress), and the resources available to achieve them • Quality and effectiveness of the coordination of activities and research communities
Criterion 2 Implementation Weight: 20% Threshold: 3/5	• Quality of the governance, including management procedures and risk management • Quality and relevant experience of the individual participants, and their contribution to the common goal • Quality of the core project consortium as a whole (including complementarity, balance) • Openness and flexibility of the Partnership and involvement of key actors • Appropriateness of the allocation and justification of the resources to be committed (e.g. in-kind contributions, infrastructures, person-months, equipment and budget)
Criterion 3 Impact Weight: 30% Threshold: 4/5	• Contribution to the expected impacts listed in the work programme at the European and global level • Extent to which the proposal makes use of complementarities, exploits synergies, and enhance the overall outcome of regional, national, European and international research programmes • Quality of measures for use of results, management of intellectual property and dissemination of knowledge • Impact on human capital, education and training at European level • Approach to address social benefit and potential ethical and legal implications, including engagement with authorities and end-users

Thresholds are set for each criterion, as indicated in the tables above. A proposal failing to achieve any of these threshold scores will be rejected.

Priority order for proposals with the same score

As part of the evaluation by independent experts, a panel review will recommend a ranked list of the proposals under evaluation, following the scoring system indicated above.

If necessary, the panel will determine a priority order for proposals which have been awarded the same score within a ranked list. Whether or not such a prioritisation is carried out will depend on the available budget or other conditions set out in the call fiche. The following approach will be applied successively for every group of *ex aequo* proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

Proposals will be prioritised according to the scores they have been awarded for the criterion *scientific and/or technological excellence*. When these scores are equal, priority will be based on scores for the criterion *impact.* If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme.

- Indicative evaluation and contractual timetable: It is expected that the grant agreement negotiations for the shortlisted proposals will start as of January/February 2013.
- Consortia agreements: Participants in all actions resulting from this call are required to conclude a consortium agreement.
- The forms of grant which will be offered are specified in Annex 3 to the Cooperation work programme.

Appendix 6: Specific Requirements for the implementation of Pre-Commercial Procurement (PCP)

The following requirements are applicable to PCP calls for tender launched under actions requiring PCP to ensure that the conditions for the Article 16f/24e exemption of the public procurement directives[117] are respected, that the risk-benefit sharing in PCP takes place according to market conditions and that the Treaty principles[118] and competition rules are fully respected throughout the PCP process:

– The consortium of public purchasers should verify that the topic proposed for the joint PCP call for tender would **fit the scope of an R&D[119] services contract**. During the preparation

[117] Directives 2004/18/EC and 2004/17/EC.

[118] In particular the fundamental Treaty principles on the free movement of goods, the free movement of workers, the freedom to provide services, the freedom of establishment and the free movement of capital, as well as the principles deriving there from, such as the principles of non-discrimination, transparency and equal treatment

[119] R&D can cover activities such as solution exploration and design, prototyping, up to the original development
of a limited volume of first products or services in the form of a test series. Original development of a first product or service may include limited production or supply in order to incorporate the results of field testing and to demonstrate that the product or service is suitable for production or supply in quantity to acceptable quality standards. R&D does not include commercial development activities such as quantity production, supply to establish commercial viability or to recover R&D costs, integration, customisation, incremental adaptations and improvements to existing products or processes.

phase of the PCP call for tender, the consortium should encourage an open dialogue[120] with potential tenderers and end-users to broach the views of the market about the R&D scope of the PCP. Regarding scope, PCP only covers the procurement of R&D services, in a way that is clearly separated from any potential subsequent purchases of large volumes of end-products (ref COM/2007/799). Participation to a PCP action therefore does not commit participating public purchasers to subsequent procurement of large volumes of end-products resulting from a PCP. Public purchasers undertaking a PCP can if they so desire, but are not obliged to, procure at market price R&D results resulting from a PCP (e.g. limited set of prototypes or test series products/services that were developed during a PCP[121])."

– **The practical set-up foreseen for the PCP** shall be clearly announced in the PCP contract notice. This shall include the intention to select multiple companies to start the pre-commercial procurement in parallel, as well as the number of phases and the expected duration of each phase.

– **Functional specifications** shall be used in order to formulate the object of the PCP tender as a problem to be solved without prescribing a specific solution approach to be followed.

– In view of triggering tenderers to send in innovative offers that include R&D that can bring breakthrough improvements to the quality and efficiency of public services, the selection of offers shall not be based on lowest price only. The PCP contracts shall be awarded to the tenders offering **best value for money**, that is to say, to the tender offering the best price-quality ratio, while taking care to avoid any conflict of interests[122]. In case public purchasers use external experts to assist e.g. in the preparation of the PCP call for tender or in the evaluation of offers, they should ensure that these are independent experts.

– In respect of the Treaty principles the public purchasers shall ensure **EU wide publication** for the PCP call for tender[123] in at least English, shall accept offers and enable communication with stakeholders at all stages throughout the PCP project in at least English, and shall evaluate all offers according to the same objective criteria regardless of the geographic location of company head offices, company size or governance structure. The PCP process should require participating companies to locate the majority of the R&D and operational activities related to the PCP contract, including in particular the principal researcher(s) working for the PCP contract, in the Member States or Associated Countries. Subcontracting of R&D work by companies/consortia participating in a PCP to other third parties should be limited. Companies/consortia participating in a PCP should pass on to any of their

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[120] The open dialogue should be organised in a way not to preclude or distort competition. In respect of the Treaty principles, the open dialogue should be announced widely and well in advance and enable companies regardless of the geographic location to participate to the dialogue at least in English. All information given in answers to questions from participants in the dialogue should be documented and published.

[121] Contracts providing more than only services are still considered a public service contract if the value of the services exceeds that of the products covered by the contract.
Art. 31(2)(a) resp. Art. 40(3)(b) of public procurement directives 2004/18/EC resp. 2004/17/EC.

[122] For more info refer to Staff Working Document on PCP: SEC (1668) 2007

[123] Through the Official Journal of the European Union (OJEU), using the TED (Tenders Electronic Daily) web portal

subcontractors the obligation to respect the rights assigned in PCP projects to the public purchasers and the EC that are financially supporting the PCP."

– In PCP, the public purchaser does not reserve the R&D results exclusively for its own use. To ensure that such an arrangement is beneficial both for the public purchaser and for the companies involved in PCP, **R&D risks and benefits are shared** between them in such a way that both parties have an incentive to pursue wide commercialisation and take up of the new solutions. Therefore, for PCP, ownership rights of **IPRs** generated by a company during the PCP contract should be assigned to that company. The public purchasers should be assigned a free licence to use the R&D results for internal use as well as the right to require participating companies to license IPRs to third parties under fair and reasonable market conditions. A call-back provision should ensure that IPRs from companies that do not succeed to exploit the IPRs themselves within a given period after the PCP project return back to the public purchasers. The public purchasers should inform participating companies of their right to publish - after consultation with each participating company - public summaries of the results of the PCP project, including information about key R&D results attained and lessons learnt by the public purchaser during the PCP (e.g. on the feasibility of the explored solution approaches to meet the purchasers' requirements and lessons learnt for potential future deployment of solutions). Details should not be disclosed that would hinder application of the law, would be contrary to the public interest, would harm the legitimate business interests of the companies involved in the PCP (e.g. regarding IPR protected specificities of their individual solution approaches) or could distort fair competition between the participating companies or others on the market.

– In order to enable the public purchasers to **establish the correct (best value for money) market price for the R&D service, in which case the presence of State aid can in principle be excluded** according to the definition contained in Art. 107 of the Treaty on the functioning of the European Union, the distribution of rights and obligations between public purchasers and companies participating in the PCP, including the allocation of IPRs, shall be published upfront in the PCP call for tender documents and the PCP call for tender shall be carried out in a competitive and transparent way in line with the Treaty principles which leads to a price according to market conditions, and does not involve any indication of manipulation. The consortium of public purchasers should ensure that the PCP contracts with participating companies contain a financial compensation according to market conditions[124] compared to exclusive development price for assigning IPR ownership rights to participating companies, in order for the PCP call for tender not to involve State aid.

– The PCP contract that will be concluded with each selected organisation shall take the form of **one single framework contract covering all the PCP phases**, in which the distribution of rights and obligations of the parties is published upfront in the tender documents and which does not involve contract renegotiations on rights and obligations taking place after the choice of participating organisations. This framework contract shall contain an agreement on the future procedure for implementing the different phases (through specific contracts), including the format of the intermediate evaluations after the solution design and prototype development stages that progressively select organisations with the best competing solutions.

[124] The financial compensation compared to exclusive development cost should reflect the market value of the benefits received and the risks assumed by the participating company. In case of IPR sharing in PCP, the market price of the benefits should reflect the commercialisation opportunities opened up by the IPRs to the company, the associated risks assumed by the company comprise for instance the cost carried by the company for maintaining the IPRs and commercialising the products.

- In order to remove unnecessary barriers for innovative new companies, typically SMEs, to make offers for the PCP call for tender, consortia should avoid the use of selection criteria based on stringent qualification requirements and disproportionate financial guarantee requirements (e.g. with regards to prior customer references and minimum turnover). As an alternative, the commercialisation plan can be a factor in the evaluation criteria used along the PCP process, requiring participating companies to demonstrate that they are able to build up - gradually throughout the PCP process - sufficient financial capacity[125] to successfully commercialise the solutions developed during the PCP.

[125] e.g. by requiring in the later PCP phases proof of support of an external financial investor such as a Venture Capitalist, or the commitment of a first buyer – e.g. a public procurer – to make a follow-up investment in the solutions developed during the PCP (e.g. to further scale up the production chain to large scale production and/or deploy a first batch of commercial end-solutions once successfully tested at the end of the PCP).

Glossary

3D	Three Dimensional
AAL	Ambient Assisted Living
API	Application Programming Interface
ARTEMIS	Advanced Research & Technology for Embedded Intelligence & Systems
Associated Countries	See Section 3 of the 'Guide for Applicants'
ACP	Africa, Caribbean, Pacific
BNCI	Brain-Neural Computer Interfaces
CA	Coordination action
CAD	Computer Aided Design
CAE	Computer Aided Engineering
Call for Proposals	As published in the Official Journal. Opens parts of the workprogramme for proposals, indicating what types of actions (RTD projects, Accompanying actions etc.) are required. A provisional timetable for such calls is included in the workprogramme
CAS	Collective Adaptive Systems
CFD	Computational fluid dynamics
CIP	Competitiveness and Innovation Programme *(http://ec.europa.eu/enterprise/enterprise_policy/cip/index_en.htm)*
CMOS	Complementary metal-oxide semiconductor
COST	COST supports co-operation among scientists and researchers across Europe http://www.cost.esf.org/
COTS	Components off the shelf
CRI	Colour Rendering Index
CSA	Coordination and Support Action
CSS	Complex Systems Science
DNA	Deoxyribonucleic acid
EHR	
EIB	European Investment Bank
EIROForum	Partnership of Europe's seven largest intergovernmental research organisations *(http://www.eiroforum.org/)*
EMI-EMC	Electromagnetic Interference/Electromagnetic Compatibility
EMF	Electromagnetic Fields
ENIAC	European Nanoelectronics Initiative Advisory Council
ERA	European Research Area
ERA-NET	European Research Area Network
ESCO	Energy Service Company
ETP	European Technology Platform http://cordis.europa.eu/technology-platforms/home_en.html
EU	European Union

EUREKA	A Europe-wide Network for Industrial RTD (*www.eureka.be*)
Eurostars	European innovation programme managed by EUREKA, to provide funding for market-oriented research and development specifically with the active participation of R&D-performing small and medium-sized enterprises (http://www.eurostars-eureka.eu/)
Evaluation	The process by which proposals are retained with a view to selection as projects, or are not retained Evaluation is conducted through the application of Evaluation Criteria identified in the Workprogramme.
EWSP	European Wide Service Platform
FET	Future and Emerging Technologies
FEV	Full Electric Vehicle
FI-PPP	Future Internet PPP
FIRE	Future Internet Research and Experimentation
FoF	Factory of the Future
FP	Framework Programme (EU – Seventh FP is FP7, etc. – *cordis.europa.eu*)
FPGA	Field-Programmable Gate Array
GEANT	Pan-European Data Network *(http://www.geant.net/)*
GHG	Greenhouse Gas
GPU	Graphics Processing Unit
HD	High Definition
HFSP	Human Frontier Science Program (*www.hfsp.org*)
HPC	High Performance Computing
ICPC	International Cooperation Partner Countries (see list in Annex 1 to the Cooperation Work Programme)
ICT	Information and communications technologies
ICTC	Information and Communication Technologies Committee
IMS	Intelligent Manufacturing Systems Initiative (*http://www.ims.org/*)
IoT	Internet of Things
IP	Large-scale integrating project
IP	Internet Protocol
IPR	Intellectual Property Rights
Ipv6	Internet Protocol Version 6
IST	Information Society Technologies (FP6 programme)
ISTAG	Information Society Technologies Advisory Group
ITRS	International Technology Roadmap for Semiconductors
IWRM	Integrated water resources management
JTI	Joint Technology Initiative
LED	Light Emitting Diode
LTE	Long Term Evolution (4th Generation Mobile Networks)
MNBS	Micro-Nano Bio Systems
NoE	Network of Excellence

NREN	National Research and Education Network
OECD	Organisation for Economic Cooperation and Development
OFDM	Orthogonal Frequency Division Multiplexing
OLAE	Organic photonics technologies such as OLEDs (Organic Light-Emitting Diode) or OPVs (Organic Photovoltaics)
OLED	Organic Light Emitting Diode
OPV	Organic Photovoltaic
P2P	Peer to peer
PCP	Pre-Commercial Procurement
PGS	Patient Guidance System
PHR	Patient Health Record
PHS	Personal Health System
PIC	Photonic integrated circuits
PPP	Public-Private Partnership
QIPC	Quantum information processing and communication
QoS	Quality of Service
R2V	Road-to-Vehicle
RES	Renewable Energy Systems
RF	Radio Frequency
RFID	Radio Frequency Identification
RTD	Research and Technology Development.
SDK	Software Development Kit
SiC	Silicon Carbide
SICA	Specific International Cooperation Actions
SA	Specific Support Actions
SME	Small or Medium Enterprise
SoS	System of Systems
STREPs	Small or medium scale focused research action
V2G	Vehicle-to-Grid
V2I	Vehicle-to-Infrastructure
V2V	Vehicle-to-Vehicle
VPH	Virtual Physiological Human
VR	Virtual Reality
WDM	Wave-length Division Multiplexing

GENERAL ANNEXES

General Introduction

Annex 1: International Cooperation Partner Countries (ICPC)

Annex 2: Eligibility and Evaluation Criteria for Proposals

Annex 3: Forms of grant and maximum reimbursement rates for projects funded through the Cooperation Work Programme

Annex 4: General Activities

In this annex, the activities which are funded across the Programme are presented. These activities concern in particular the following:

Dissemination, knowledge transfer and broader engagement

1. The CORDIS services

Co-ordination of non-Community research programmes

2. The horizontal ERA-NET scheme
3. Research organisations in the EU
4. Strengthened coordination with EUREKA
5. Scientific and technological cooperation activities carried out in COST

Annex 5: Recovery Package - Public-Private Partnership Initiatives

Annex 5 brings together for easy reference all the WP2013 topics of the three Public-Private-Partnerships (PPP) from the different participating Themes: NMP, ICT, Transport, Environment and Energy.

The three PPPs are:

- Factories of the Future (FoF)
- Energy-efficient Buildings (EeB)
- Green cars (GC)

Details of these Annexes are available at:
http://ec.europa.eu/research/participants/portal

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